MADRAS
TRANSPORTATION SYSTEM PLAN
APPENDICES

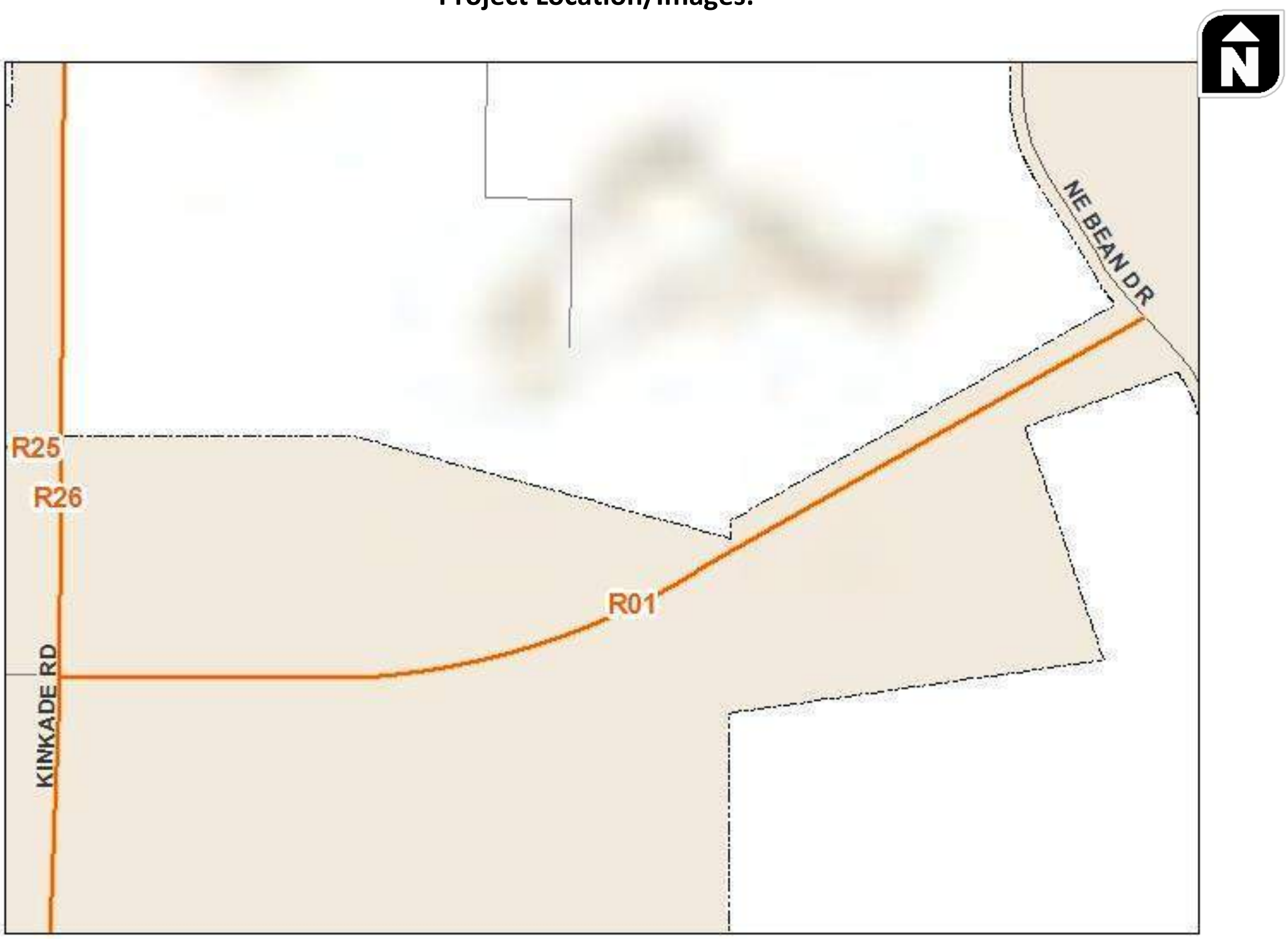
Appendix 1: Prospectus Sheets

ID: R01	Marigold Street Extension
Description:	Extension from Marigold Street from Claremont Drive to Bean Drive. This extension will improve east/west connectivity.
Project Type: Roadway	**Priority:** Development Drive
Cost: $2,000,000	

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	○	●	○

Project Location/Images:



ID: R02

Future Industrial Extension

Description: Future Road within Industrial Park. Project park of Industrial Readiness Plan

Project Type: Roadway

Priority: Development Driven

Cost: $1,500,000

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	○	○	○

Project Location/Images:

ID: R03

E Street Connection

Description: Realign E Street in the vicinity of 4th Street and 5th Street to provide a continuous east/west connection. The location of this proposed realignment will need to be determined during project development, pending land availability and constraints.

Project Type: Roadway

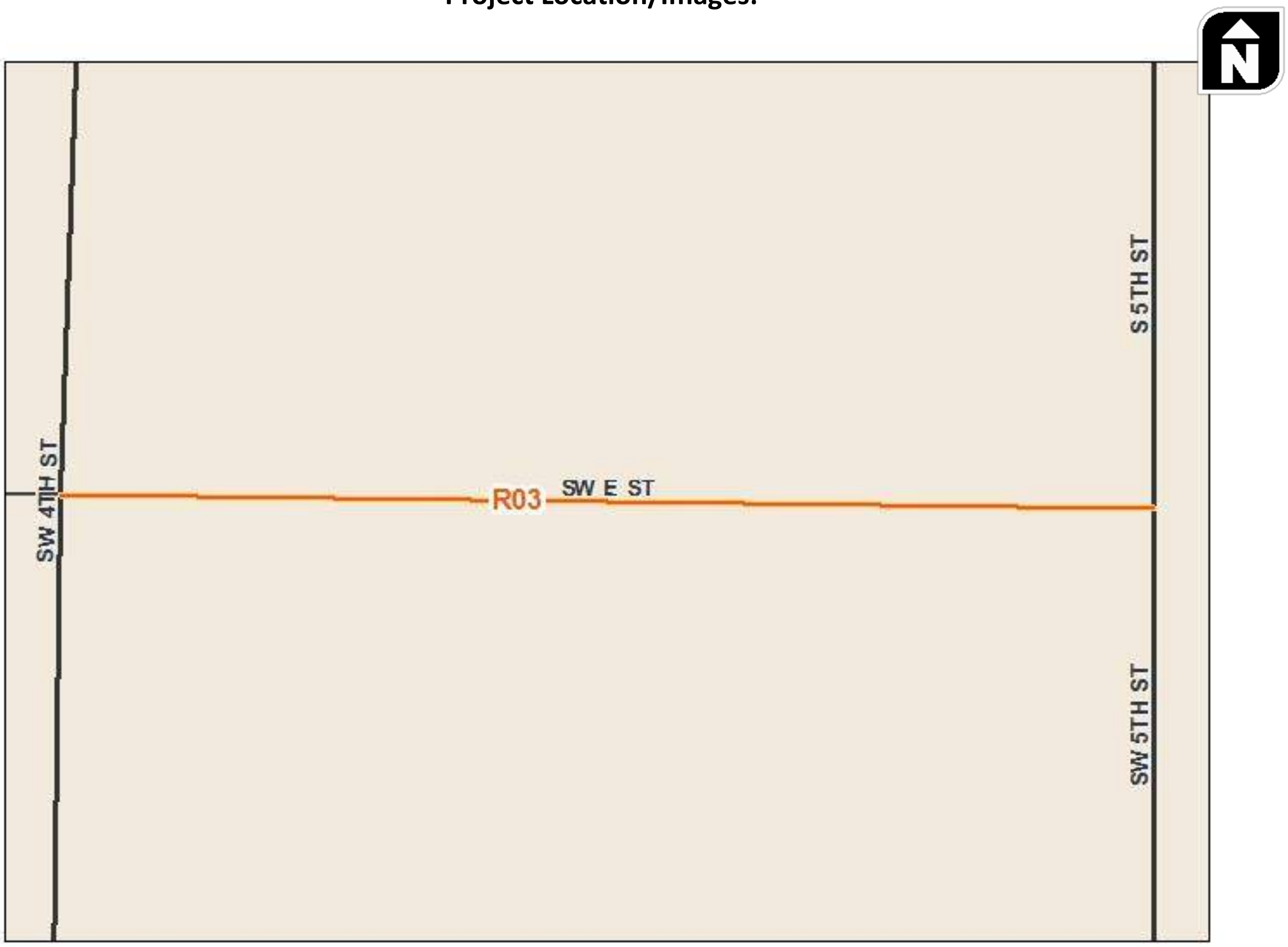
Priority: Medium

Cost: $120,000

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
○	○	○	●	○

Project Location/Images:



ID: R04

Buff Street Extension

Description: Extend Buff Street to Grizzly Road to improve connectivity in east Madras.

Project Type: Roadway

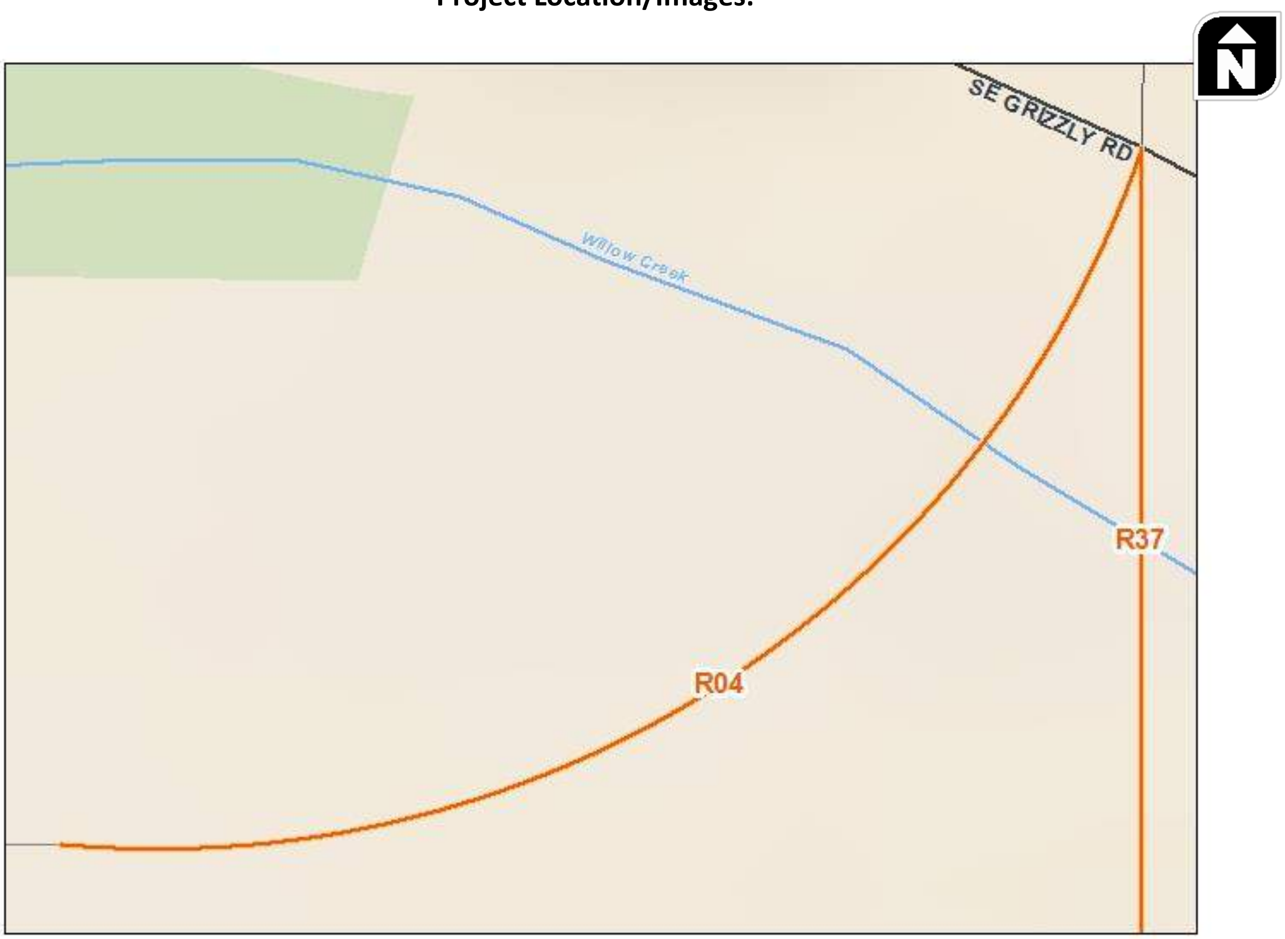
Priority: High

Cost: $430,000

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	○	●	○

Project Location/Images:



ID: R05

Plum Street Extension

Description: Extend Plum Street to Henry Street & 9th Street to improve connections east of US 97.

Project Type: Roadway

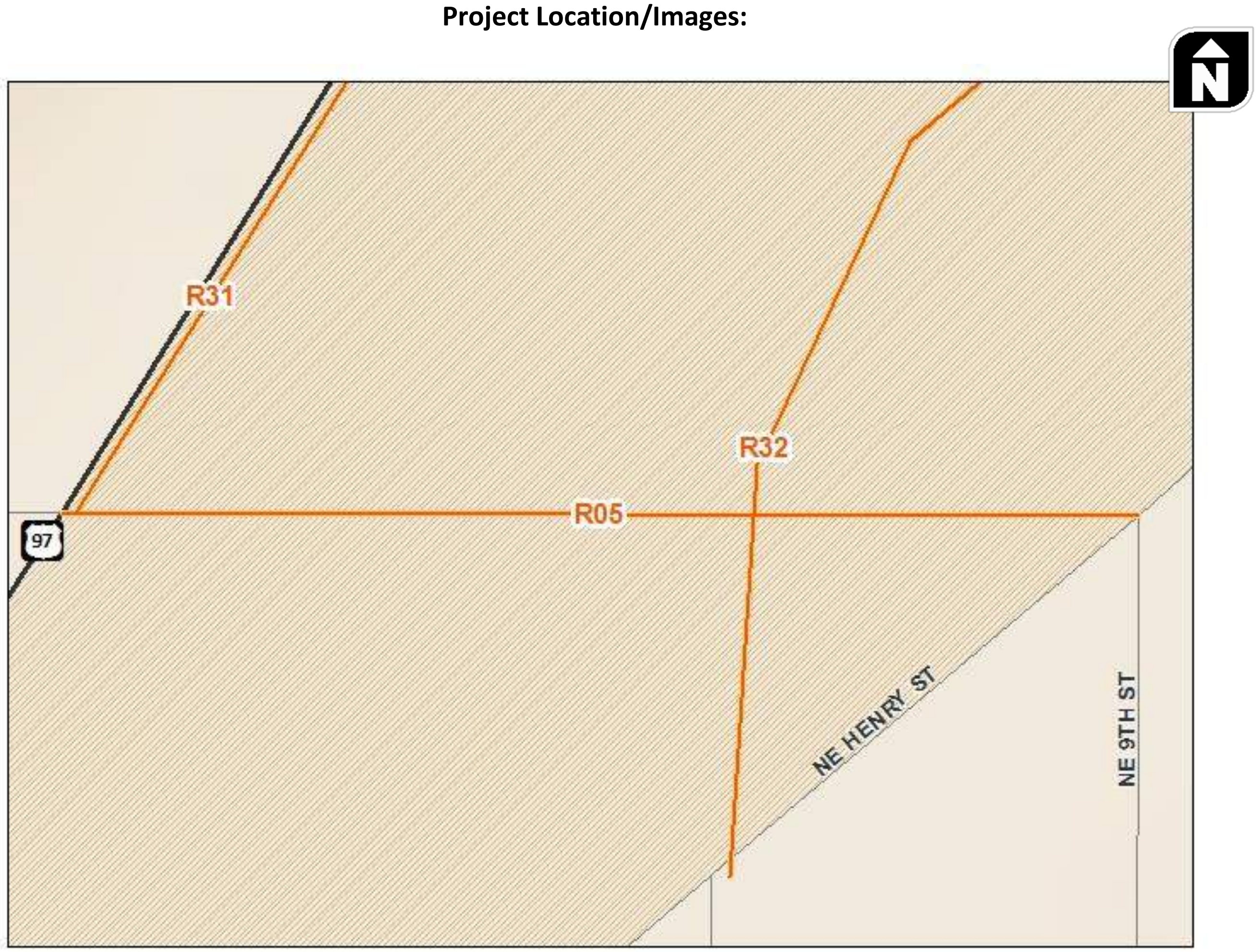
Priority: Medium

Cost: $590,000

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	○	●	●	○

Project Location/Images:

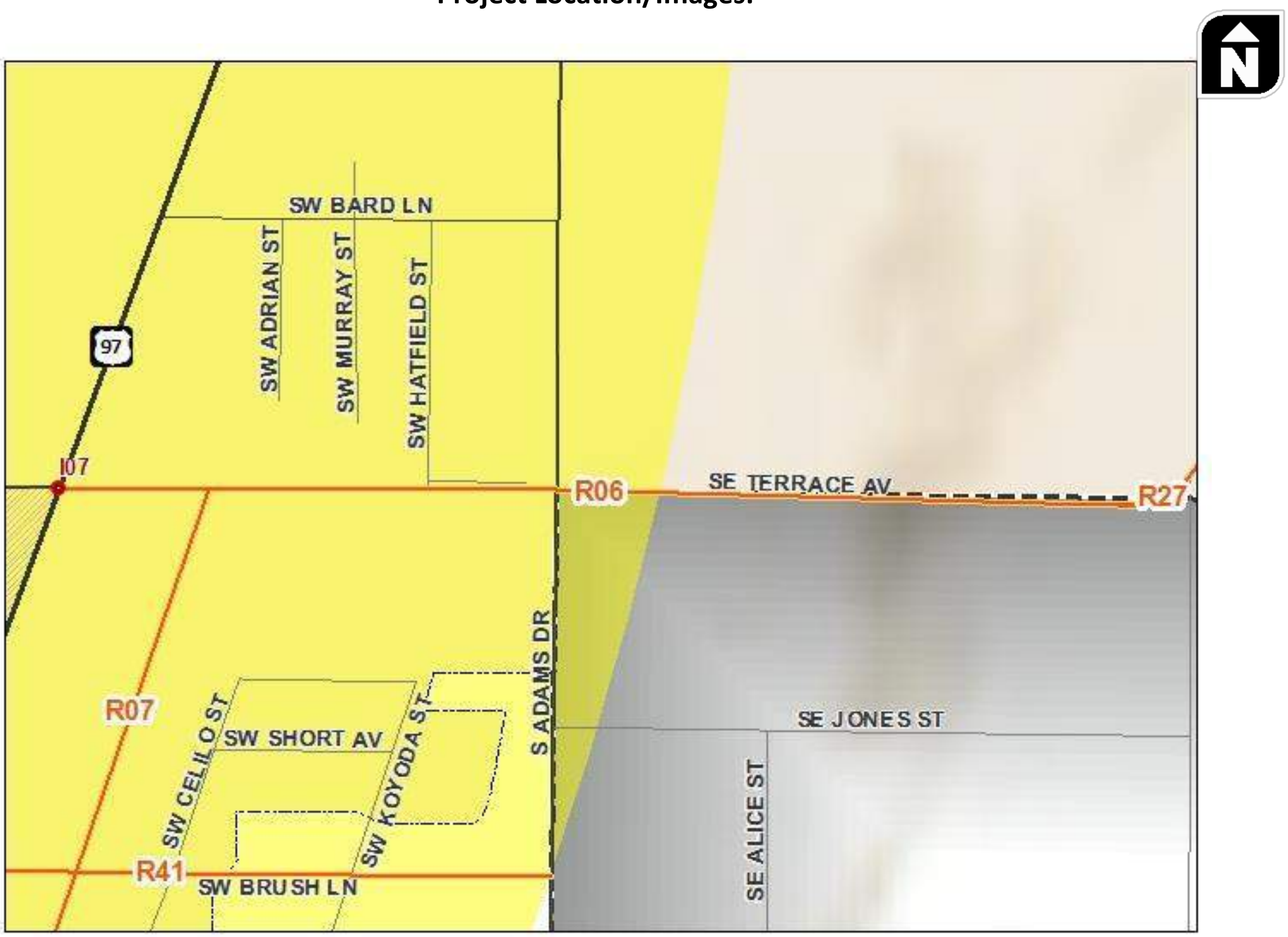


ID: R06	Fairgrounds Road Eastern Extension
Description:	Extend Fairgrounds Road to 10th Street extension to enhance connectivity and route choice between US 97, Adams Drive, and 10th Street.
Project Type: Roadway	**Priority:** High
Cost: $2,300,000	

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	●	●	●

Project Location/Images:

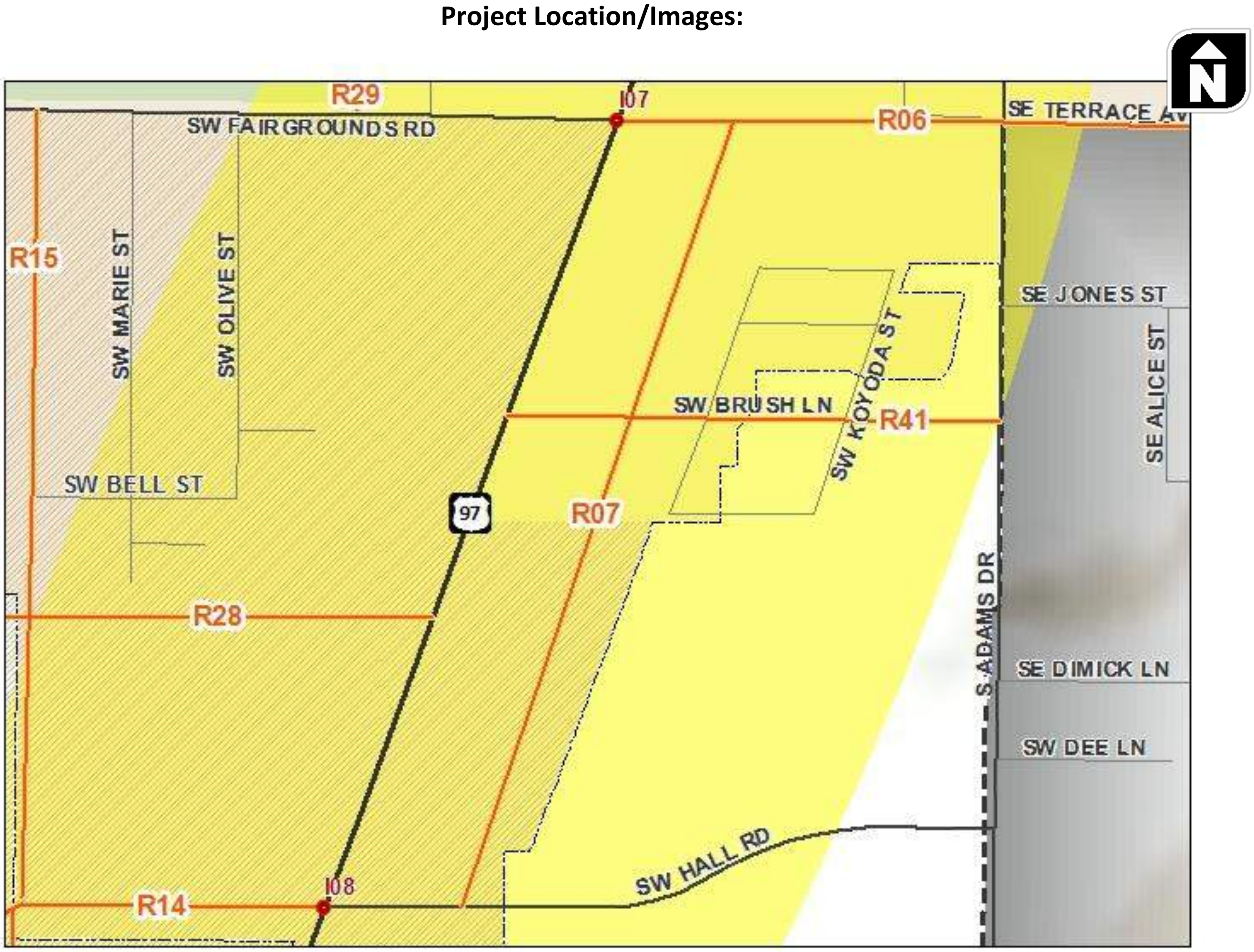


ID: R07	Hall Road to Fairgrounds Road Eastern N/S Connection
Description:	Construct new roadway between proposed Fairgrounds Road Extension (R06) and Hall Road. Connection will increase north-south connectivity and provide alternative access options for businesses along US 97.
Project Type: Roadway	**Priority:** High
Cost: $1,900,000	

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	○	●	○

Project Location/Images:

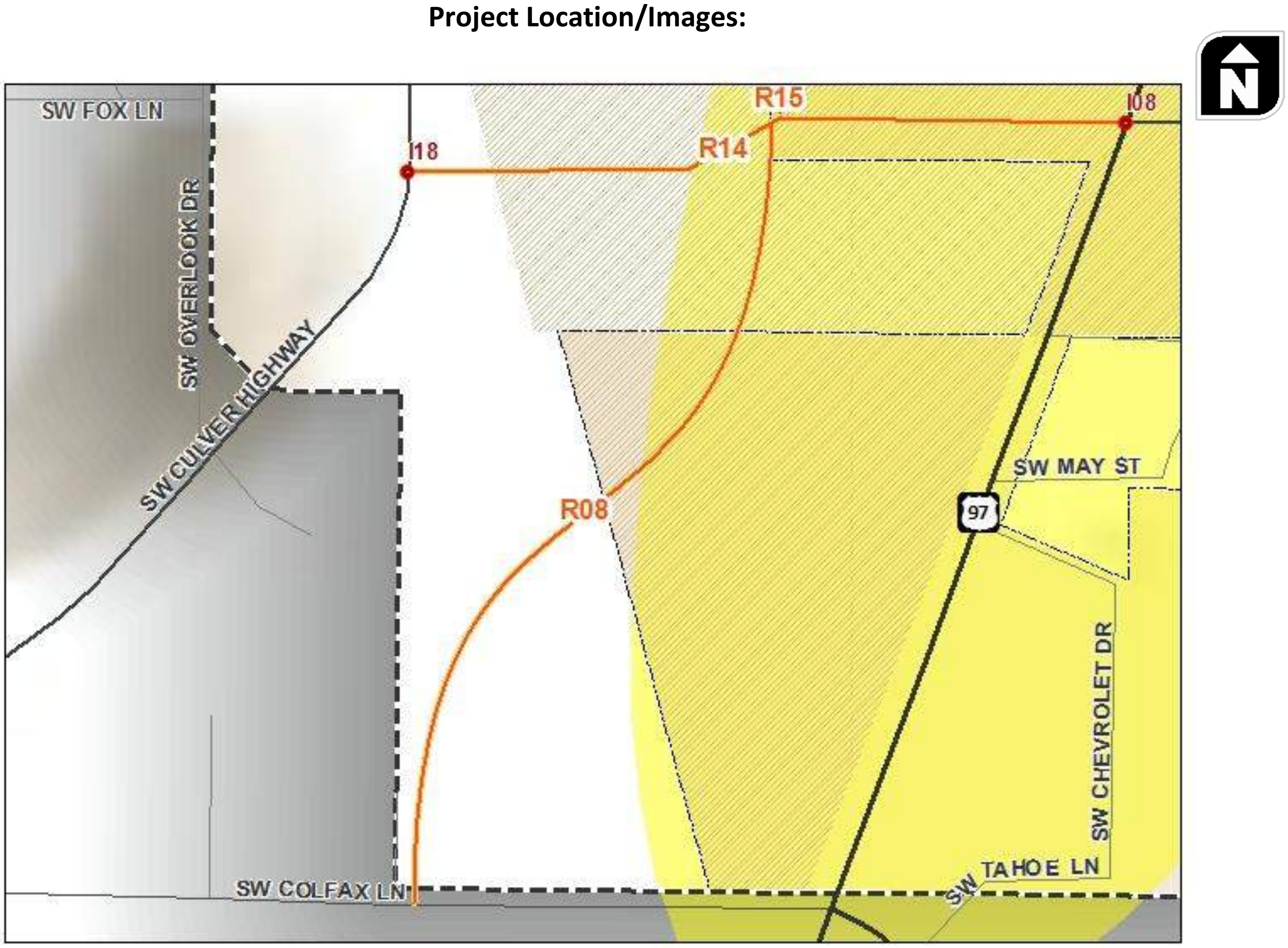


ID: R08	Hall Road to Colfax Lane Connection
Description:	Construct new roadway between proposed Hall Road extension to Colfax Lane. Connection will increase north-south connectivity and provides alternative access options for future development west of US 97.
Project Type: Roadway	**Priority:** Development Driven
Cost: $2,100,000	

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	○	●	●

Project Location/Images:



ID: R09

Paul Jasa Way Extension

Description: Extend Paul Jasa Way to connect to Demers Drive. Timing and construction of extension will likely coincide with future development.

Project Type: Roadway

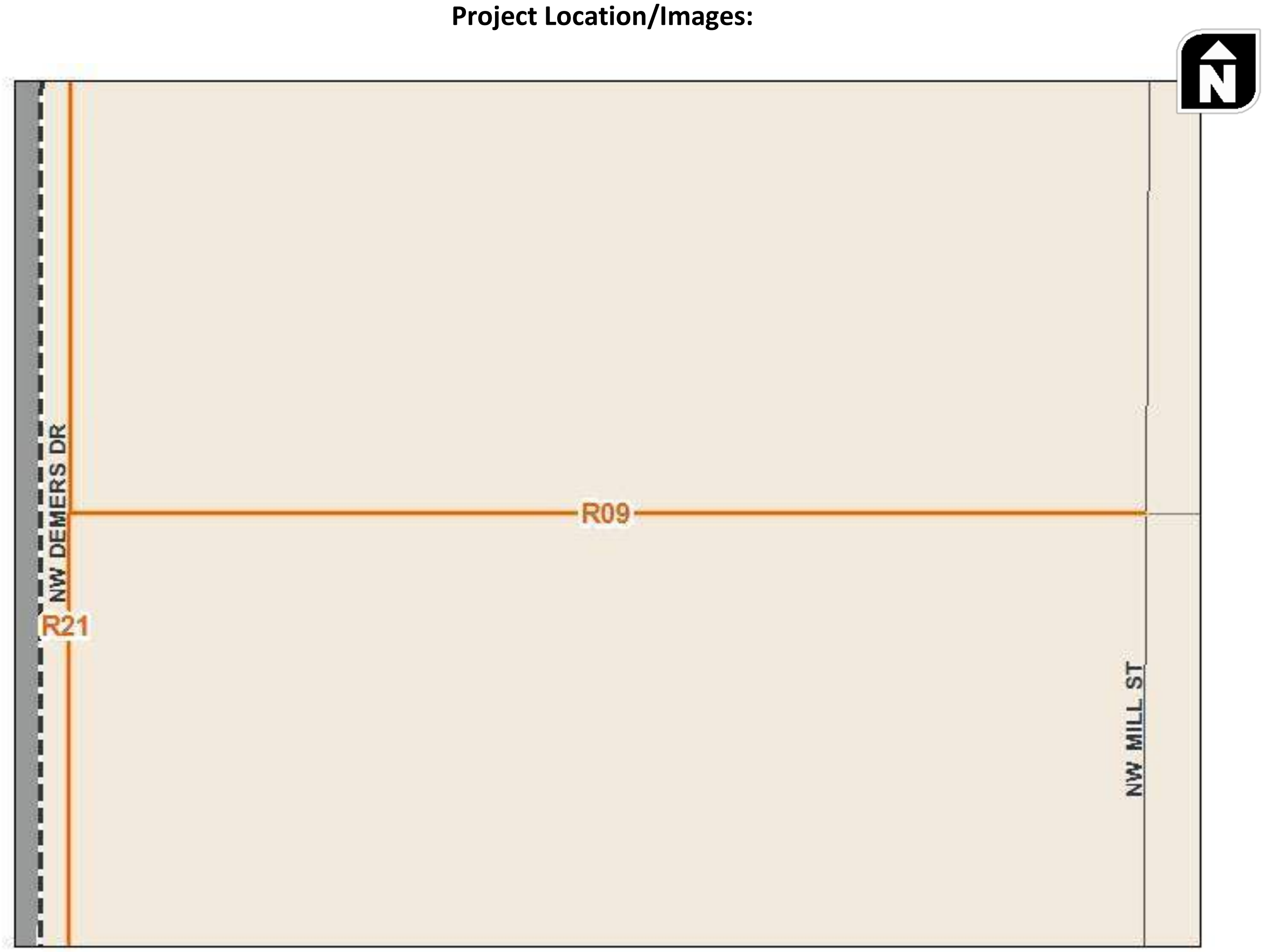
Priority: Development Driven

Cost: $1,200,000

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	○	○	○

Project Location/Images:



ID: R10

Andrews Drive Extension

Description: Extend Andrews Drive to connect to future Industrial Roads. Part of Industrial Readiness Plan

Project Type: Roadway	**Priority:** Development Driven
Cost: $2,700,000	

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	○	○	○

Project Location/Images:

ID: R11

Mill Street Extension

Description: Extend Mill Street to Andrews Drive Extension. Part of Industrial Readiness Plan

Project Type: Roadway

Priority: Development Driven

Cost: $800,000

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	○	○	○

Project Location/Images:

ID: R12

Future Industrial Extension

Description: Road within Industrial area. Part of Industrial Readiness Plan

Project Type: Roadway

Priority: Development Driven

Cost: $1,000,000

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	○	○	○

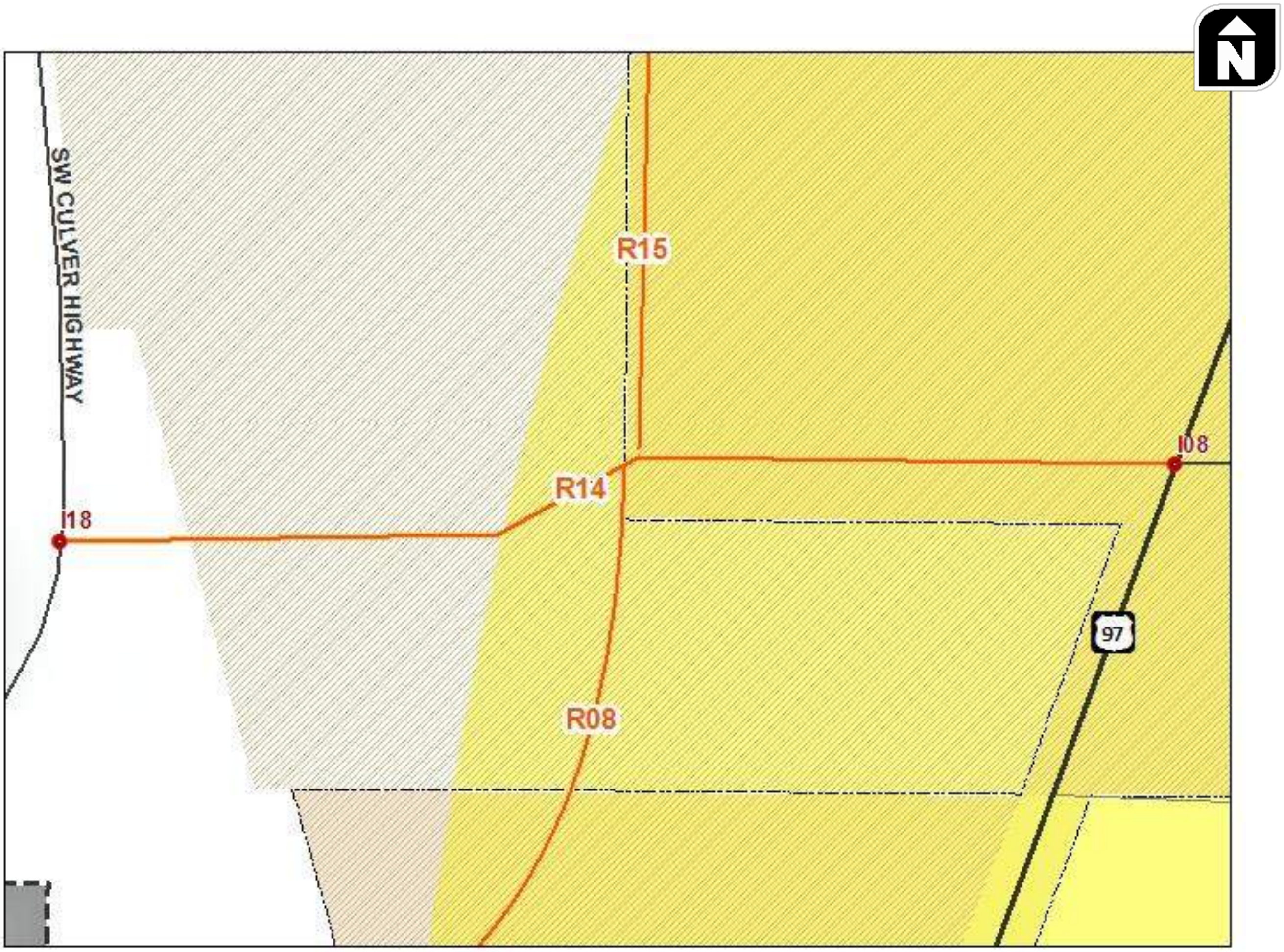
Project Location/Images:

ID: R14	Hall Road Extension
Description:	Extend Hall Road to Culver Highway to provide east-west connectivity through south concept area.
Project Type: Roadway	**Priority:** Development Driven
Cost: $1,700,000	

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	●	●	●

Project Location/Images:



ID: R15	Hall Street-Fairgrounds Road Connection
Description:	Construct new roadway to connect Hall Road Extension to Fairgrounds Road to provide north-south connectivity and through south concept area.
Project Type: Roadway	**Priority:** Development Driven
Cost: $2,100,000	

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	○	●	●

Project Location/Images:

ID: R16

Maple Street Extension

Description: Extend Maple Street west to 3rd Street extension (R10) to improve connectivity around north Y intersection.

Project Type: Roadway

Priority: High

Cost: $260,000

Potential Funding Sources:

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	○	○	●	○

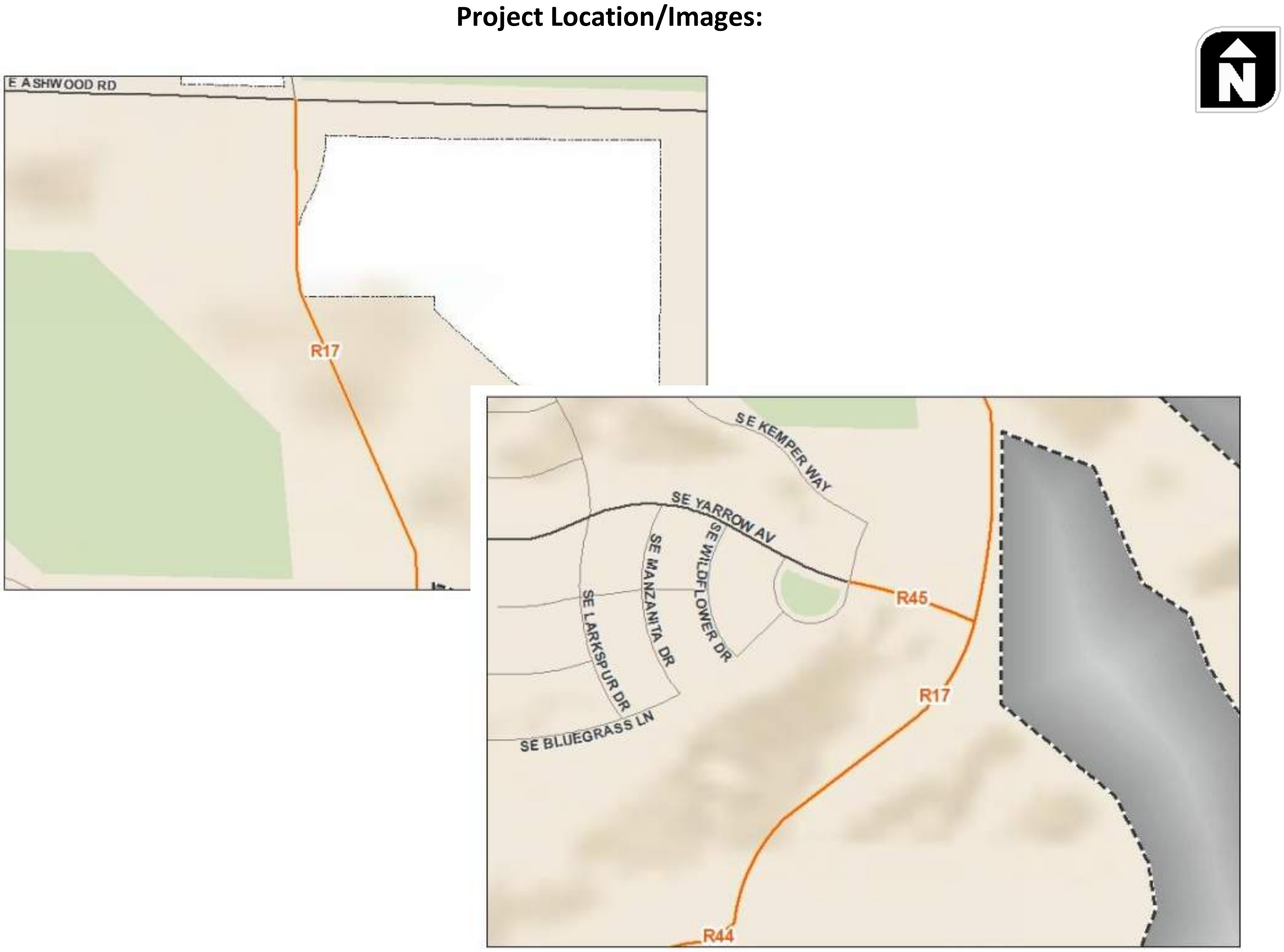
Project Location/Images:

ID: R17	Southern Bean Drive Extension
Description:	Extend Bean Drive from B Street to Yarrow master plan area. The location of this proposed realignment will need to be determined during project development, pending review of topographical constraints and development activity in the area.
Project Type: Roadway	**Priority:** Development Driven
Cost: $4,000,000	

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	○	○	●	○

Project Location/Images:

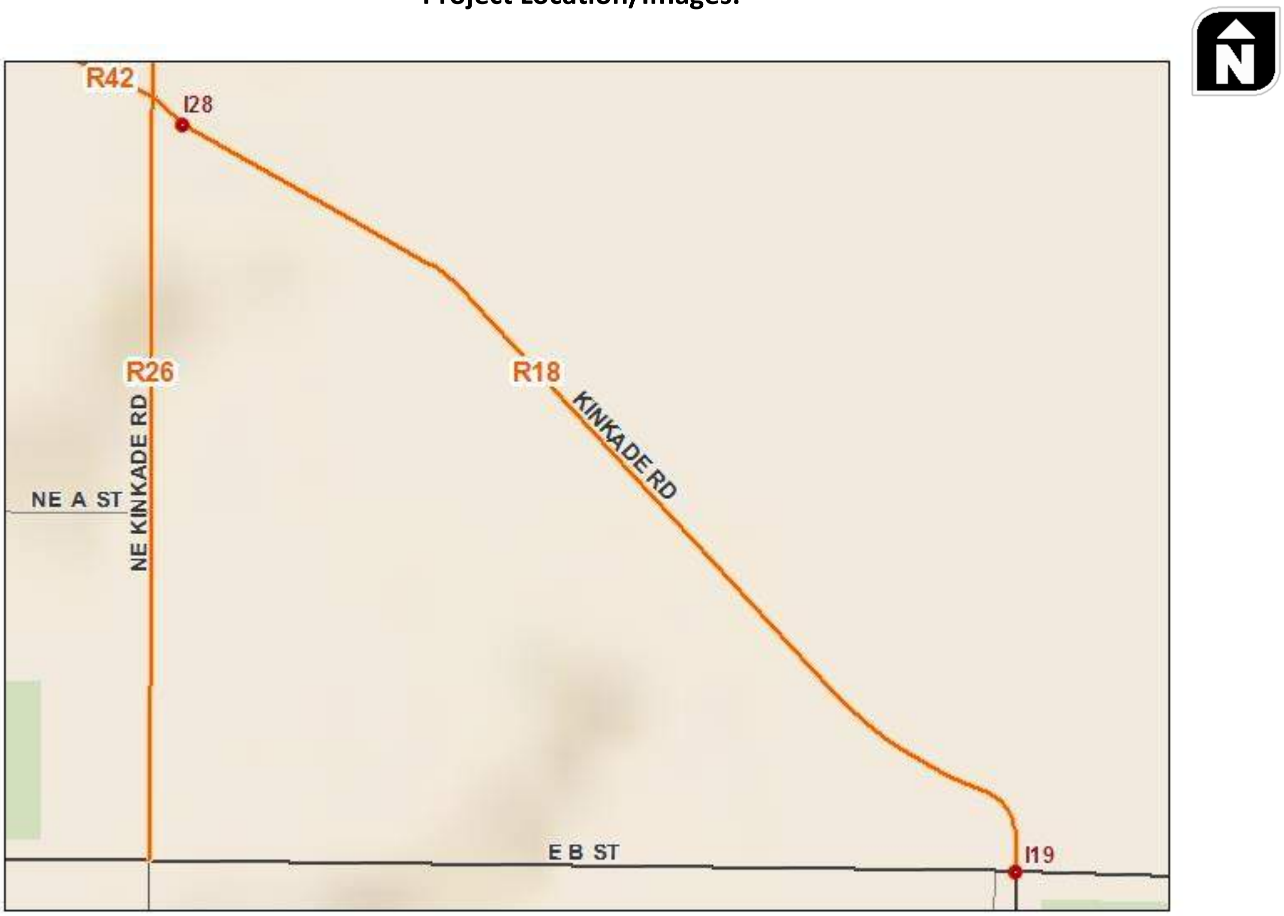


ID: R18	Claremont Drive Improvement
Description:	Improve Claremont Drive between B Street and future Claremont Drive/Oak Street intersection to improve connectivity in east Madras.
Project Type: Roadway	**Priority:** Medium
Cost: $1,600,000	

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	○	●	○

Project Location/Images:



ID: R19

Jersey Street Extension

Description: Extend Jersey Street from Mill Street to the Wright Street Extension. Construct US 26 frontage roadway between Jersey St/Mill St intersection. Timing and construction of extension will likely coincide with future development.

Project Type: Roadway

Priority: Development Driven

Cost: $1,300,000

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	○	○	○

Project Location/Images:

ID: R20

E/W Minor Collector

Description: Construct Minor Collector south of Cherry Lane and east of US 26

Project Type: Roadway

Priority: Development Driven

Cost: $750,00

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	○	○	○

Project Location/Images:

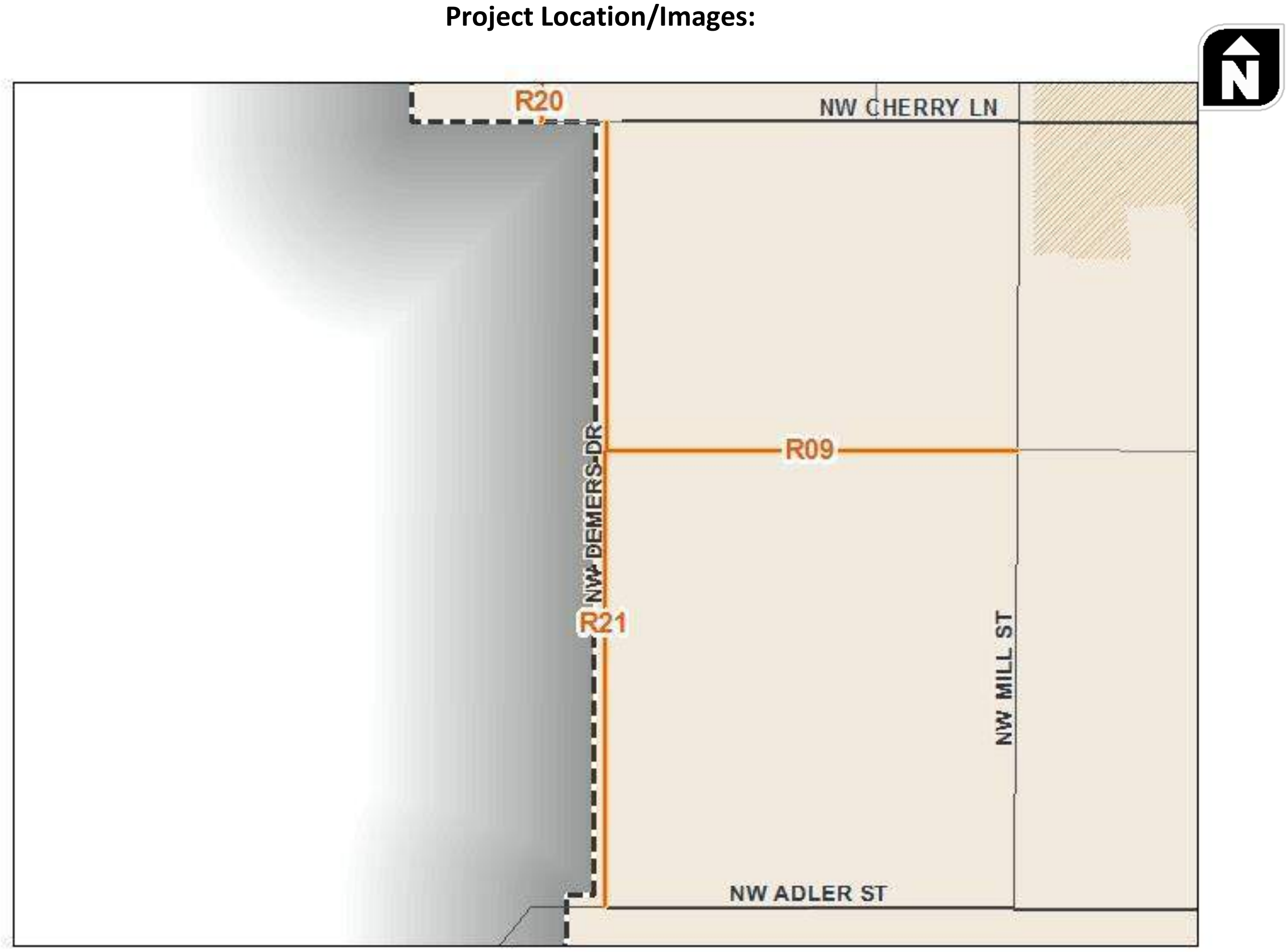
N

ID: R21	Demers Drive Extension
Description:	Extend/improve Demers Drive between Adler Street and Cherry Lane. Timing and construction of extension will likely coincide with future development.
Project Type: Roadway	**Priority:** Development Driven
Cost: $2,100,000	

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	○	○	○

Project Location/Images:

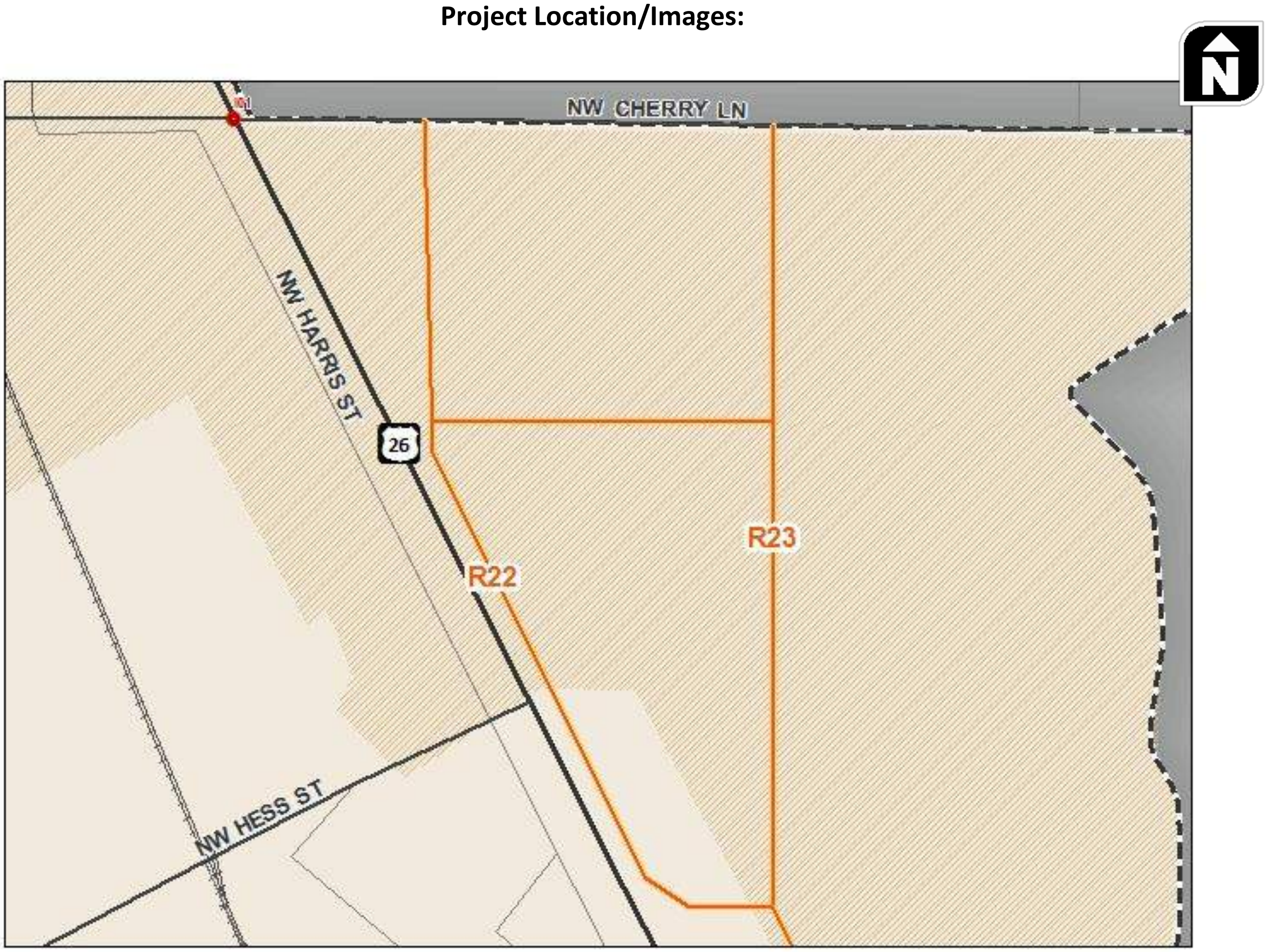


ID: R22	Easterly US 26 Frontage Road
Description:	Construct US 26 frontage roadway between Cherry Lane and the proposed Easterly Early Street Extension. Timing and construction of frontage road will likely coincide with future development.
Project Type: Roadway	**Priority:** Development Driven
Cost: $1,600,000	

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	○	○	○

Project Location/Images:



ID: R23

Easterly Earl Street Extension

Description: Construct new roadway between Cherry Lane and Earl Street/US 26 intersection. Timing and construction of extension will likely coincide with future development.

Project Type: Roadway

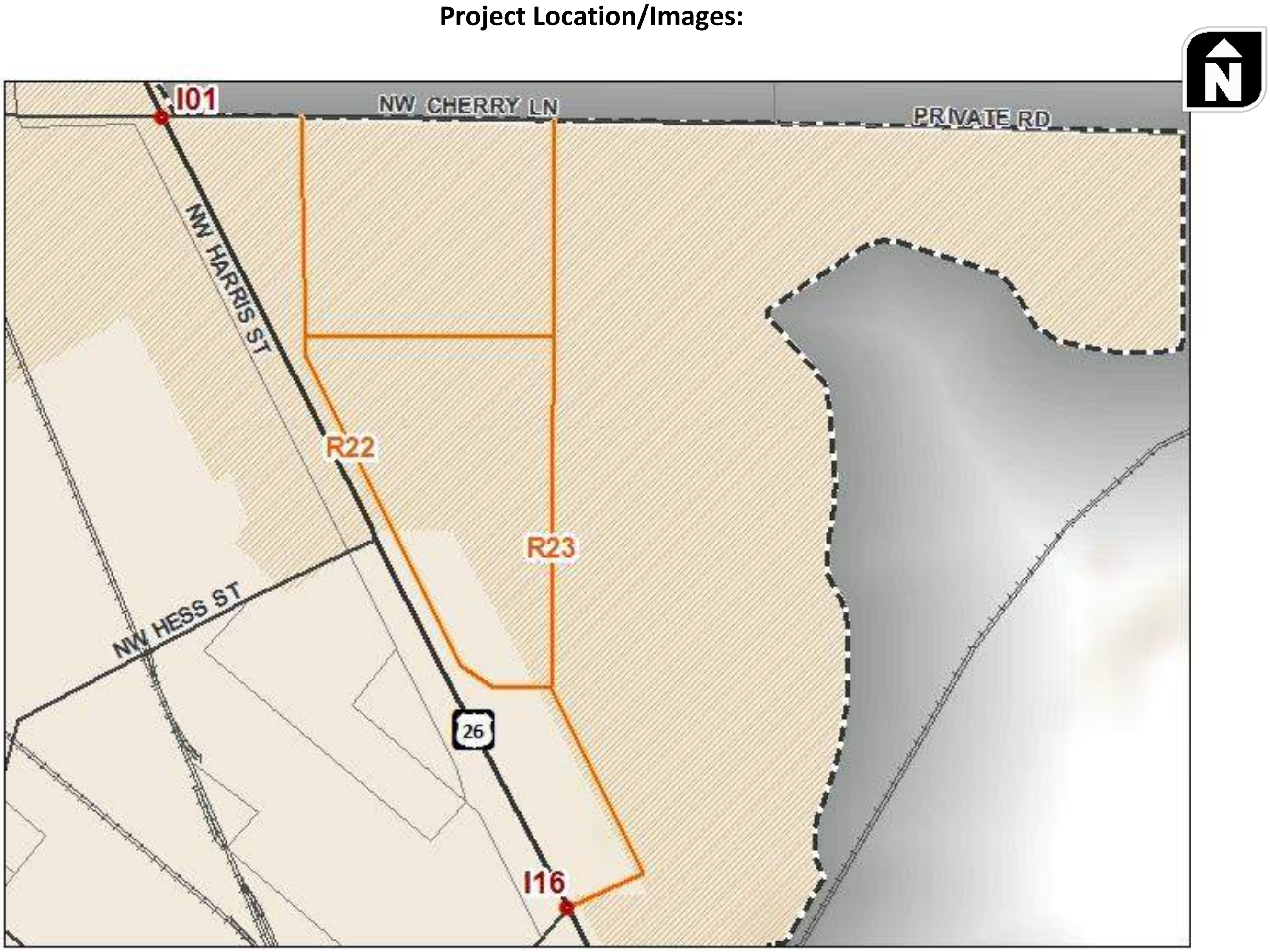
Priority: Development Driven

Cost: $2,300,000

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	○	○	○

Project Location/Images:

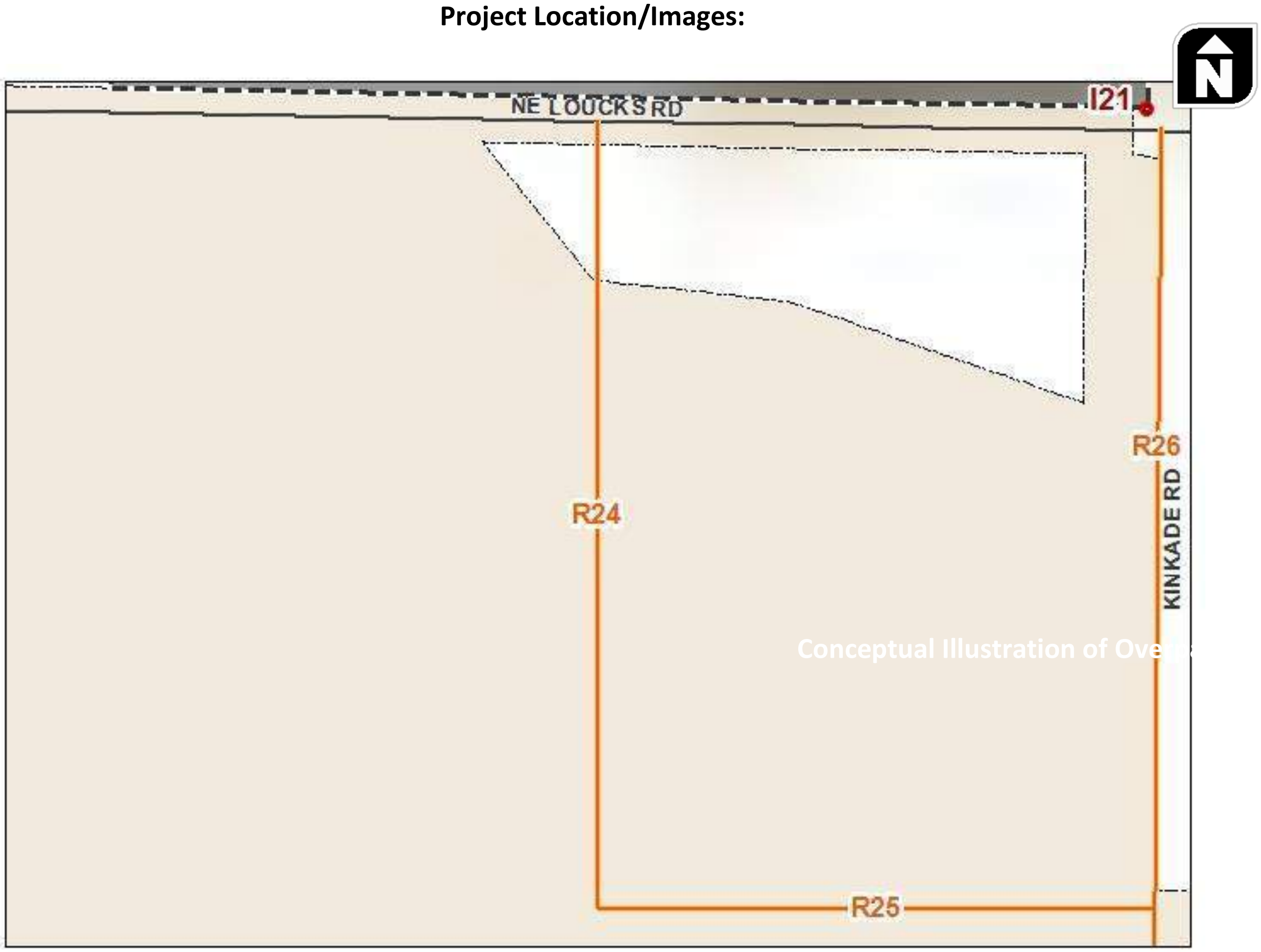


ID: R24	**16th Street Extension**
Description:	Extend 16th Street from Loucks Rd to Cedar Street Extension. Timing and construction of extension will likely coincide with future development.
Project Type: Roadway	**Priority:** Development Driven
Cost: $880,000	

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
◎	●	◎	●	◎

Project Location/Images:

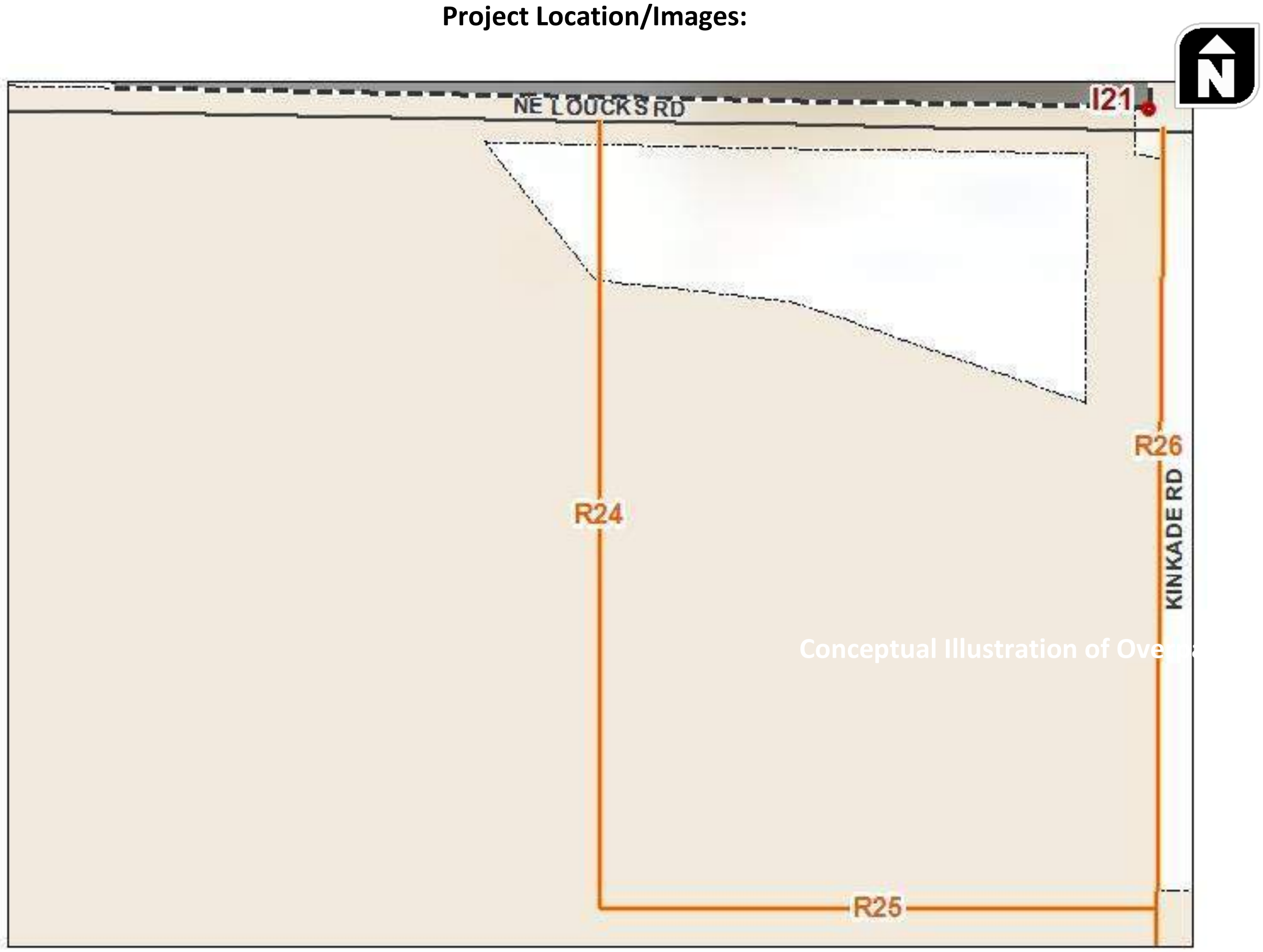


ID: R25	16th Street Extension
Description:	New Minor Collector between Kinkade Road and 16th Street Extension. Timing and construction of extension will likely coincide with future development.
Project Type: Roadway	**Priority:** Development Driven
Cost: $500,000	

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
○	●	○	●	○

Project Location/Images:

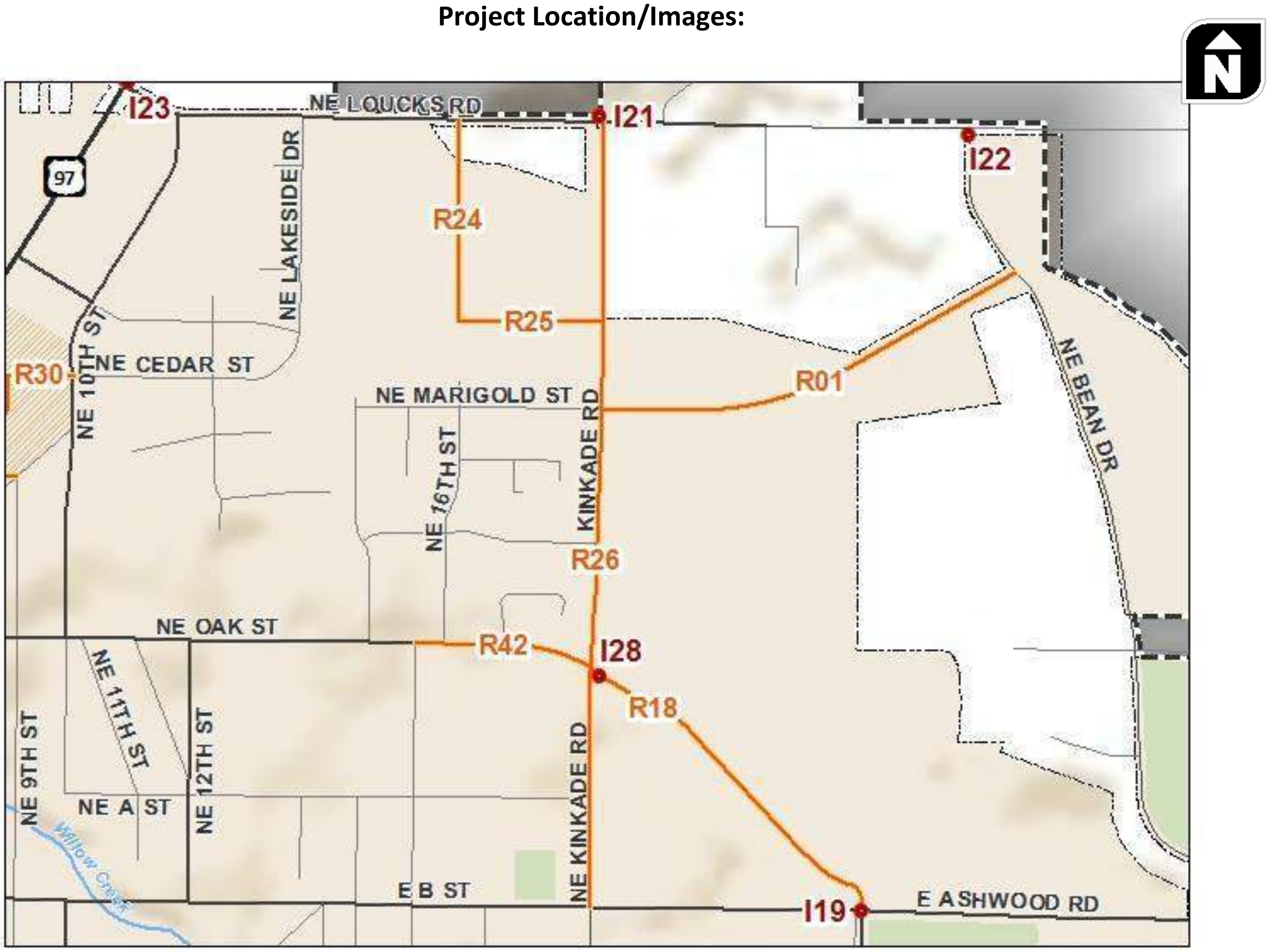


ID: R26	Kinkade Road/Claremont Drive Extension
Description:	Extend Kinkade Road/Claremont Drive from B Street to Loucks Drive to improve north/south connectivity between Loucks Drive and J Street.
Project Type: Roadway	**Priority:** High
Cost: $2,400,000	

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	○	●	○

Project Location/Images:



ID: R27	10th Street Extension

Description: Extend 10th Street to Fairground Road extension (R06) to improve connectivity.

Project Type: Roadway

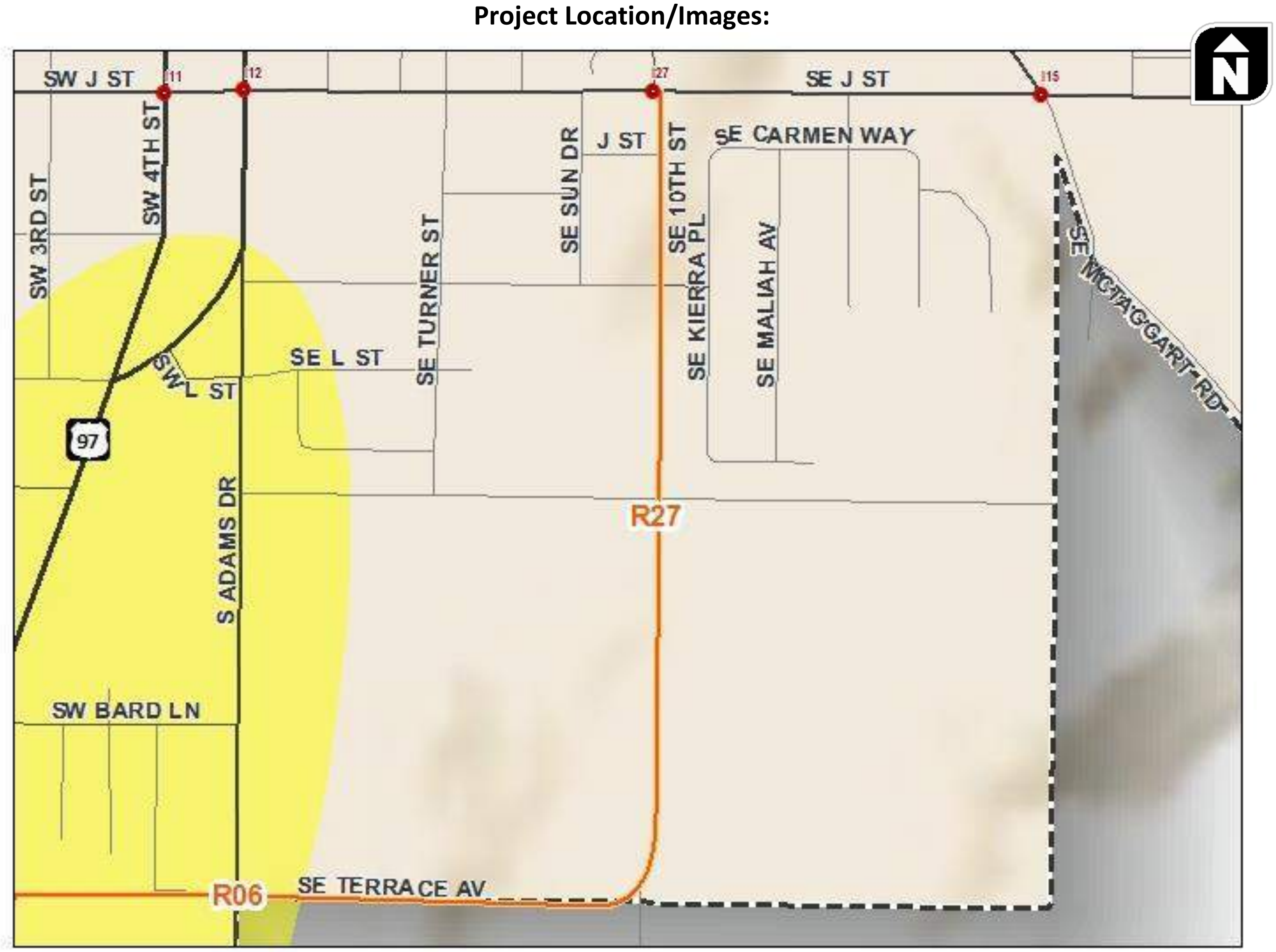
Priority: High

Cost: $2,200,000

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	●	●	●

Project Location/Images:



ID: R28	E/W connection between Fairgrounds Road and Hall Road
Description:	Create new east/west connection between Fairgrounds Road and Hall Road within the South Concept Area. The location of this proposed connection will need to be determined during project development, pending review of future development patterns. Potential for providing access to US 97 and Culver Highway should be evaluated.
Project Type: Roadway	**Priority:** Development Driven
Cost: $2,000,000	

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	○	●	○

Project Location/Images:

ID: R29	Fairgrounds Road to 2nd Street Connection
Description:	Construct a roadway connecting Fairgrounds Road and 2nd Street to provide local street connection from South Concept Area to downtown Madras.
Project Type: Roadway	**Priority:** Medium
Cost: $1,300,000	

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	○	●	○

Project Location/Images:

ID: R30

Cedar Street Western Extension

Description: Connect Cedar Street from US 97 on the west to 10th Street on the east with a new major collector. Should be coordinated with improvements to the US 97/Cedar Street intersection (I25).

Project Type: Roadway

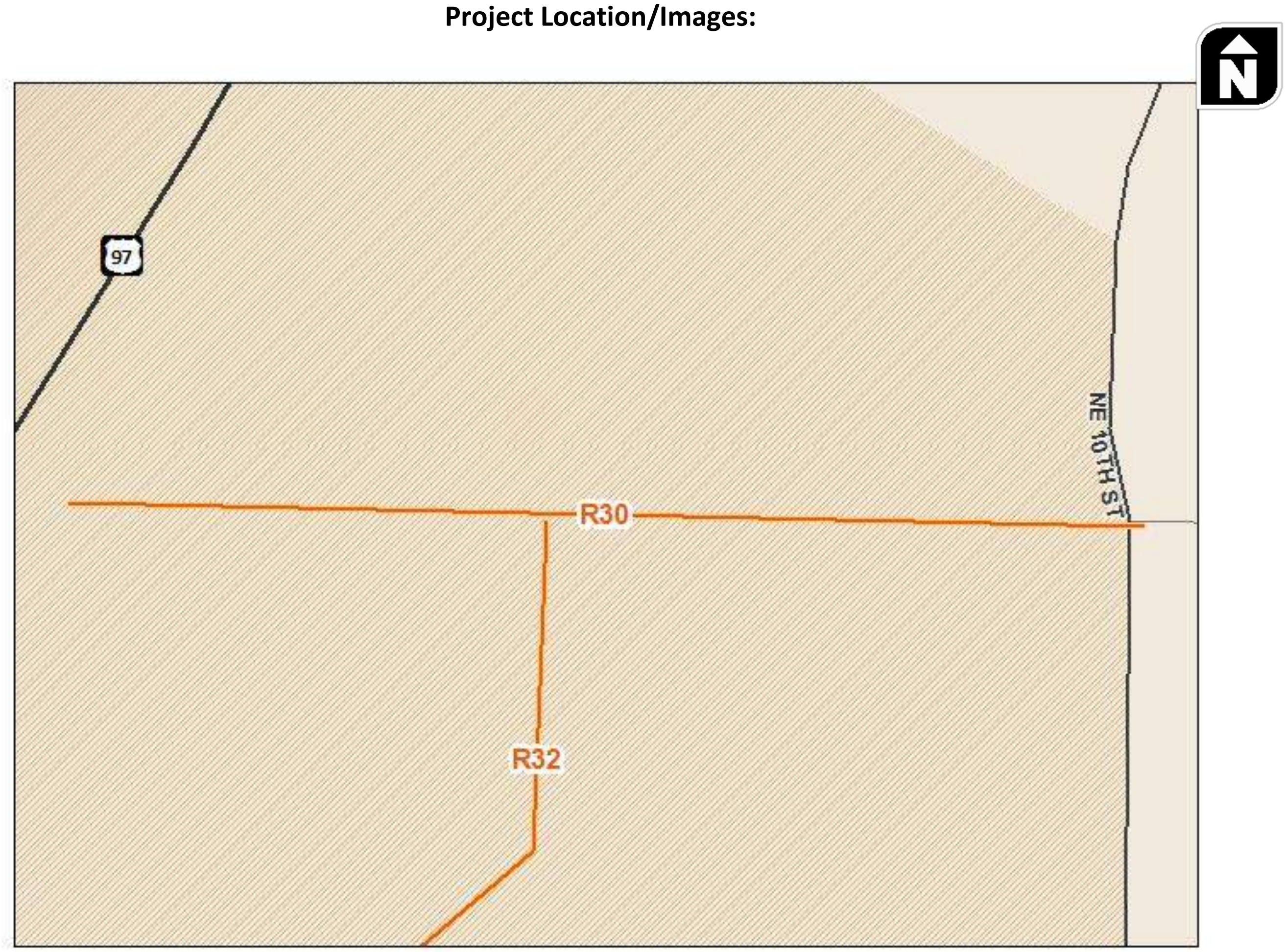
Priority: Medium

Cost: $520,000

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
○	●	●	●	○

Project Location/Images:



ID: R31

U 97 Widening

Description: Widen US 97 to 3-lane section south of Cedar Street to Plum Street to provide a center turn lane to improve accessibility to local street system and businesses.

Project Type: Roadway

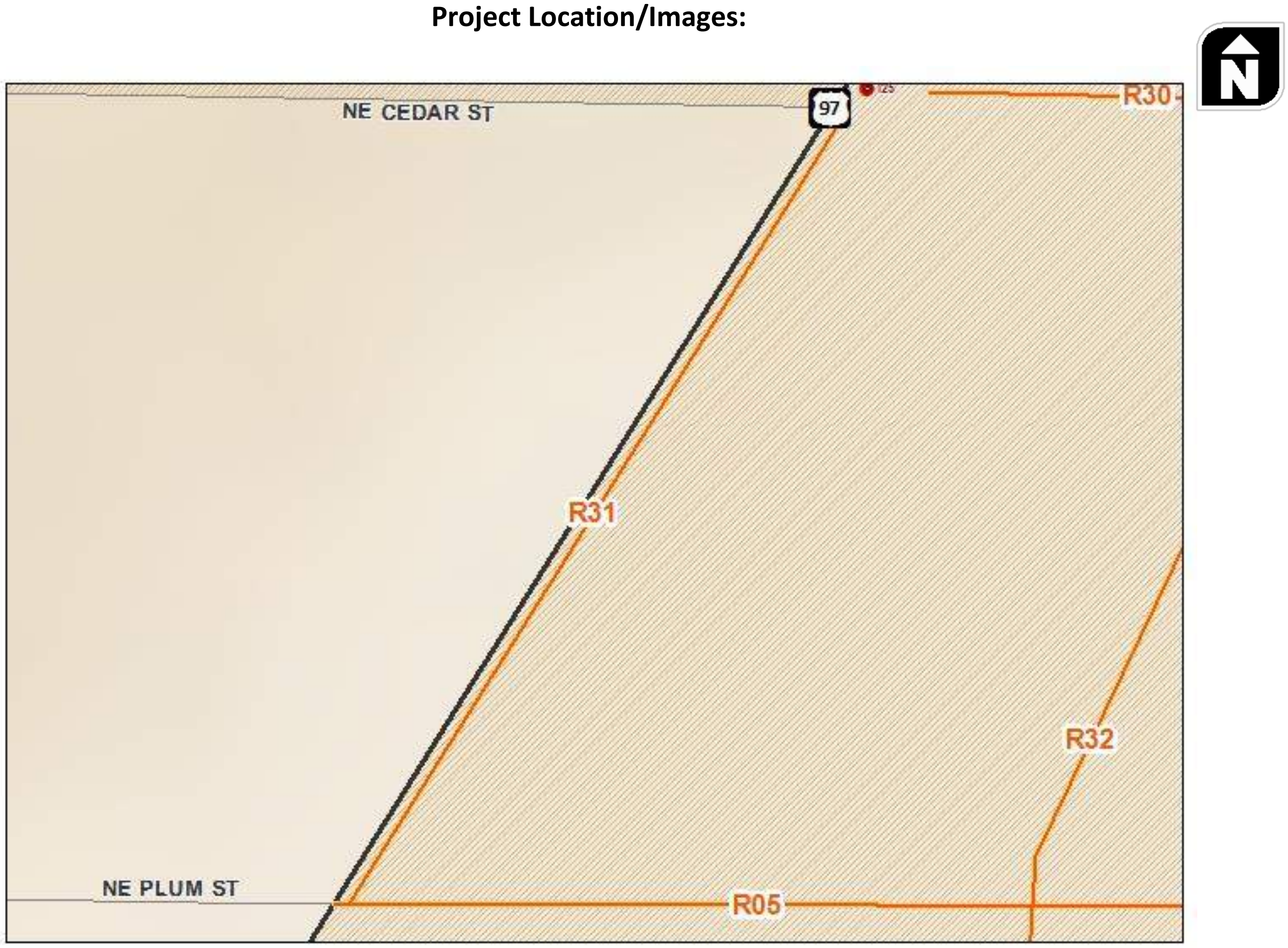
Priority: High

Cost: $300,000

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	○	●	○	●

Project Location/Images:



ID: R32

8th Street Extension

Description: Extend 8th Street to Cedar Street to improve connectivity in central concept area.

Project Type: Roadway

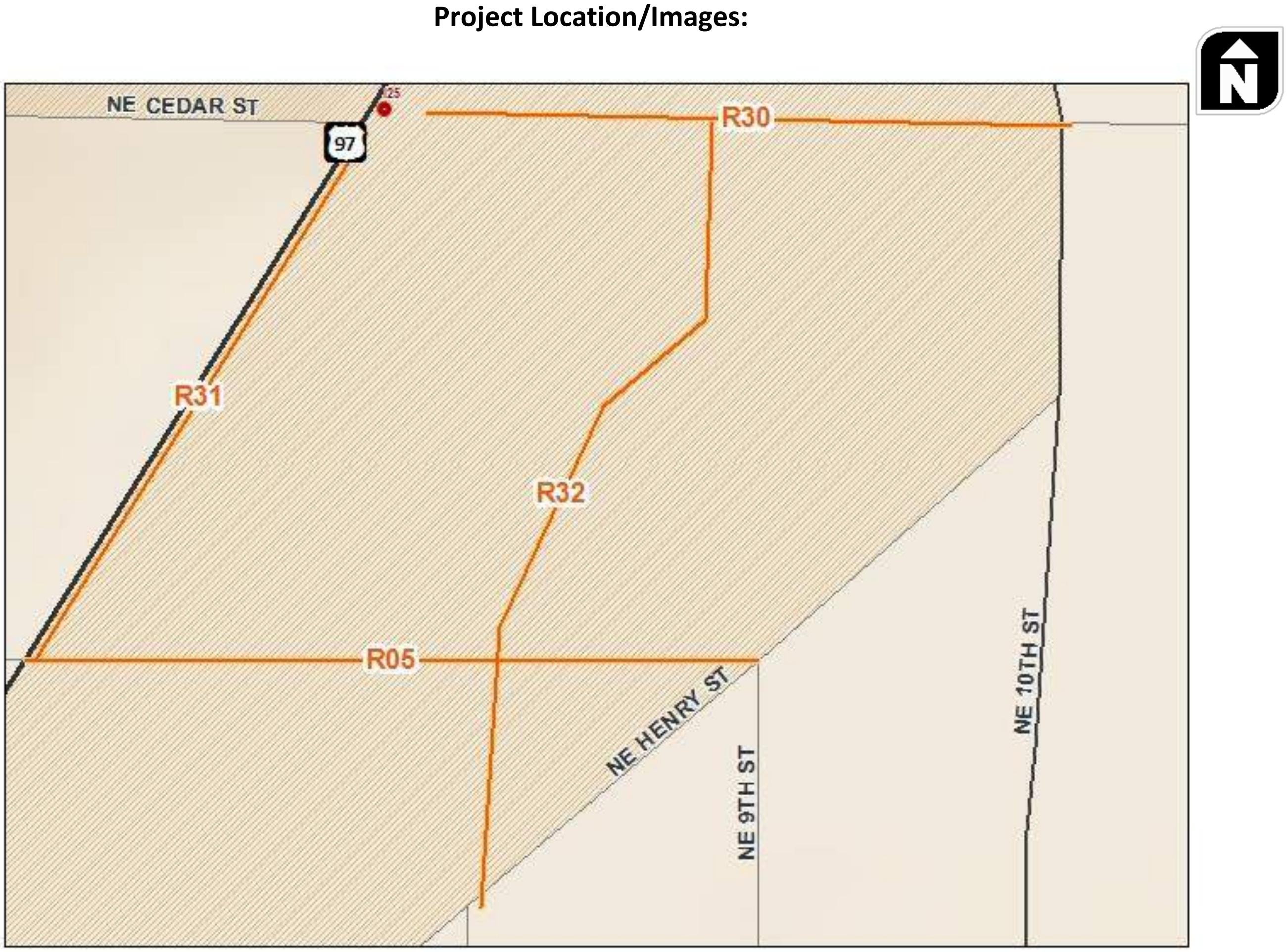
Priority: Medium

Cost: $700,000

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
○	●	●	●	○

Project Location/Images:



ID: R33

Central Concept Area Connecting Roads

Description: Construct roadways connecting Lee Street, US 26 and Poplar Street in the Central Concept Area to improve connectivity and local access west of US 26 alignment.

Project Type: Roadway

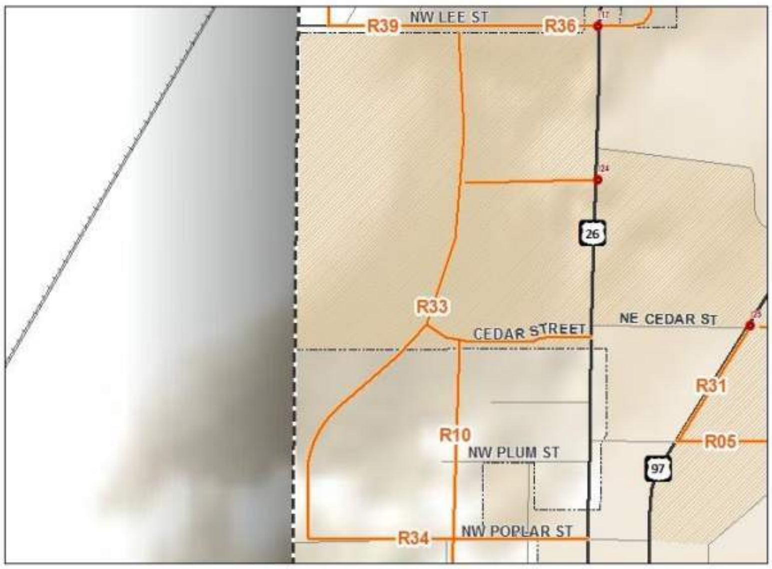
Priority: Development Driven

Cost: $2,300,000

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	●	●	○

Project Location/Images:

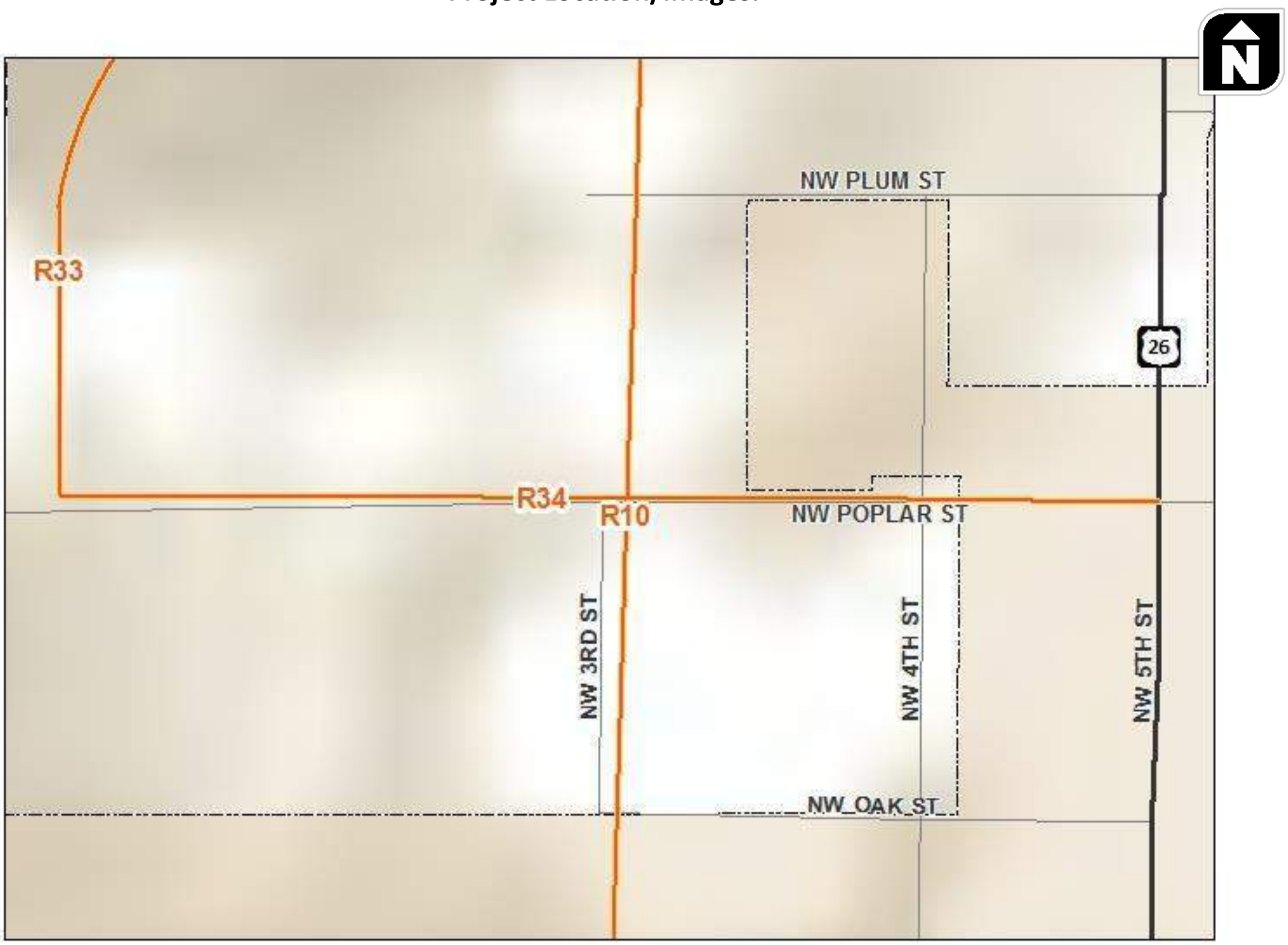


ID: R34	Poplar Street Extension
Description:	Extend Poplar Street from 4th Street to the Central Concept Area Connecting Roads (R33) to connectivity and local access west of US 26 alignment.
Project Type: Roadway	**Priority:** Medium
Cost: $950,000	

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	●	●	○

Project Location/Images:



ID: R35	US 97 Traffic Calming
Description:	Implement speed treatments and advance warning signs on US 97 approaching Loucks Road. Addresses safety needs related to existing speed transition as vehicles enter Madras from north of US 97.
Project Type: Roadway	**Priority:** Medium
Cost: $500,000	**Potential Funding Sources:**

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
○	○	●	○	○

Project Location/Images:

ID: R36

Jefferson Street Realignment

Description: Realign Jefferson Street to connect with Lee Street to improve circulation between US 97 and US 26 north of the north Y. Will require grade adjustment on the east side of US 26 to facilitate the realignment.

Project Type: Roadway

Priority: Medium

Cost: $2,000,000

Potential Funding Sources:

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	○	●	○	○

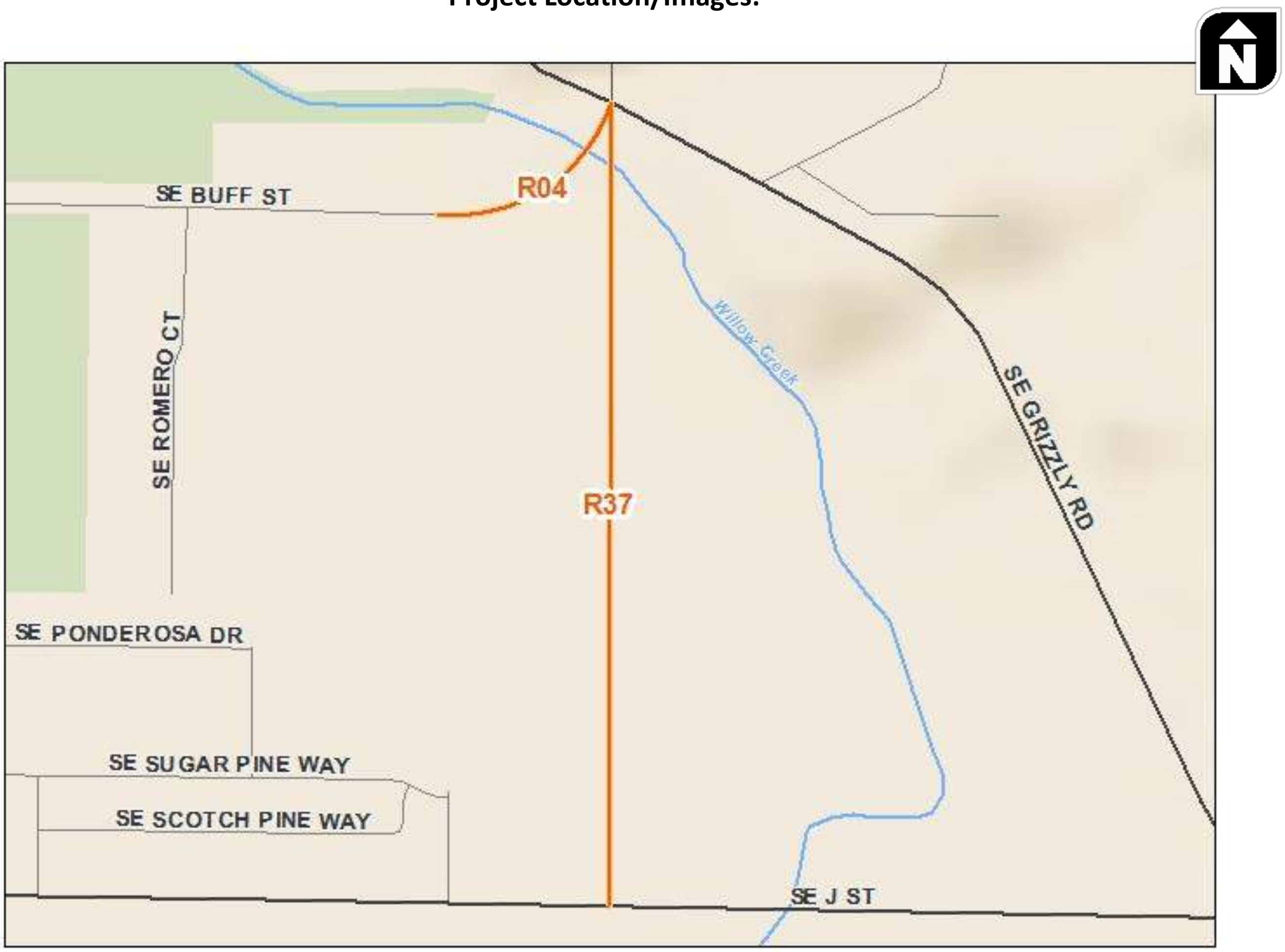
Project Location/Images:

ID: R37	Kinkade Road Extension
Description:	Extend Kinkade Road from Grizzly Road to J Street to improve connectivity and local access on the east side of Madras. Requires crossing of Willow Creek.
Project Type: Roadway	**Priority:** High 
Cost: $1,400,000	

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	○	●	○

Project Location/Images:

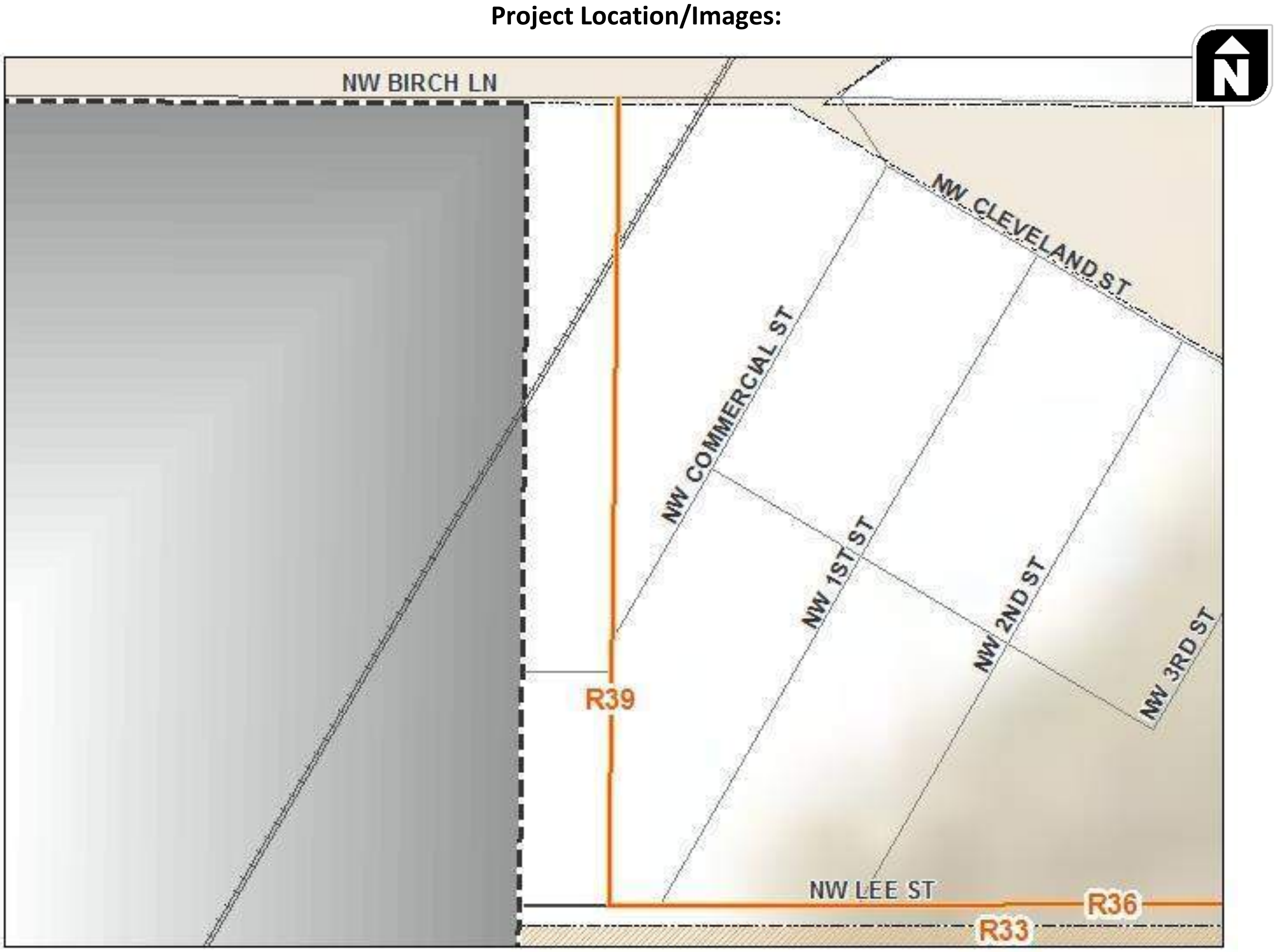


ID: R39	Road extension from Lee Street to Birch Lane
Description:	Construct a roadway extension between Lee Street and Birch Lane and improves connectivity local circulation between central and north Madras and reduce highway reliance.
Project Type: Roadway	**Priority:** High
Cost: $2,000,000	**Potential Funding Sources:**

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	○	○	●	○

Project Location/Images:



ID: R40	Realign 10th Street with McTaggart Road

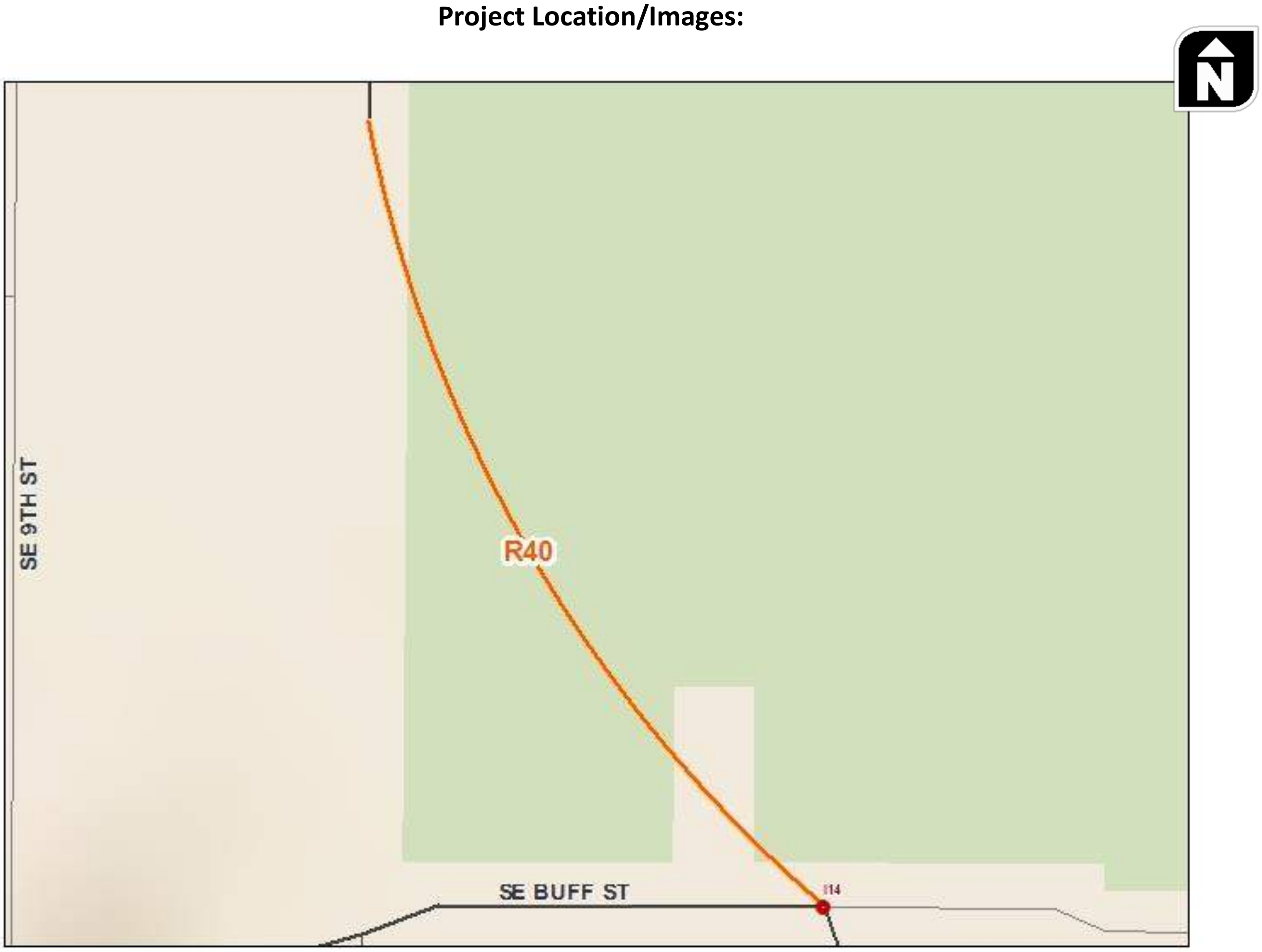
Description: Realign 10th Street to align with Buff Street/Mcaggart Road intersection. A portion of the existing 10th Street alignment may be vacated or repurposed. Improves north/south connectivity through central Madras and consolidates intersections along Buff Street.

Project Type: Roadway	**Priority:** High 
Cost: $750,000	**Potential Funding Sources:**

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	○	○	●	○

Project Location/Images:



ID: R41	Upgrade Brush Lane to Minor Collector
Description:	Construct cross-section improvements to facility to conform to Minor Collector standard to improve local circulation and reduces highway reliance.
Project Type: Roadway	**Priority:** Medium
Cost: $1,200,000	**Potential Funding Sources:**

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	○	○	●	○

Project Location/Images:

ID: R42

Extend Oak Street

Description: Construct road to Minor Collector standard to improve east/west connectivity through Madras.

Project Type: Roadway

Priority: Medium

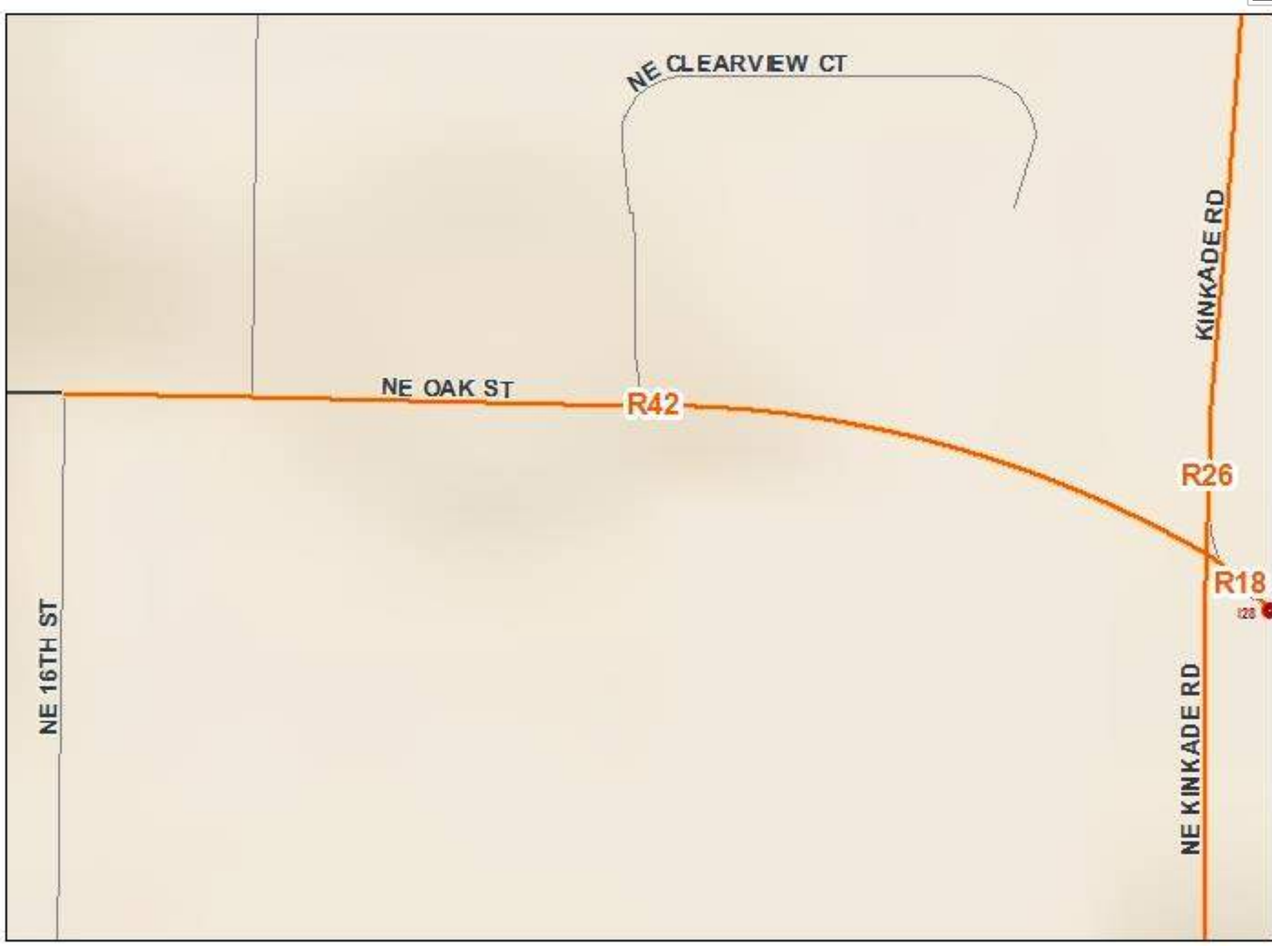
Cost: $600,000

Potential Funding Sources:

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	○	○	●	○

Project Location/Images:



ID: R43	Extend E Street to City View Street/Yarrow Avenue

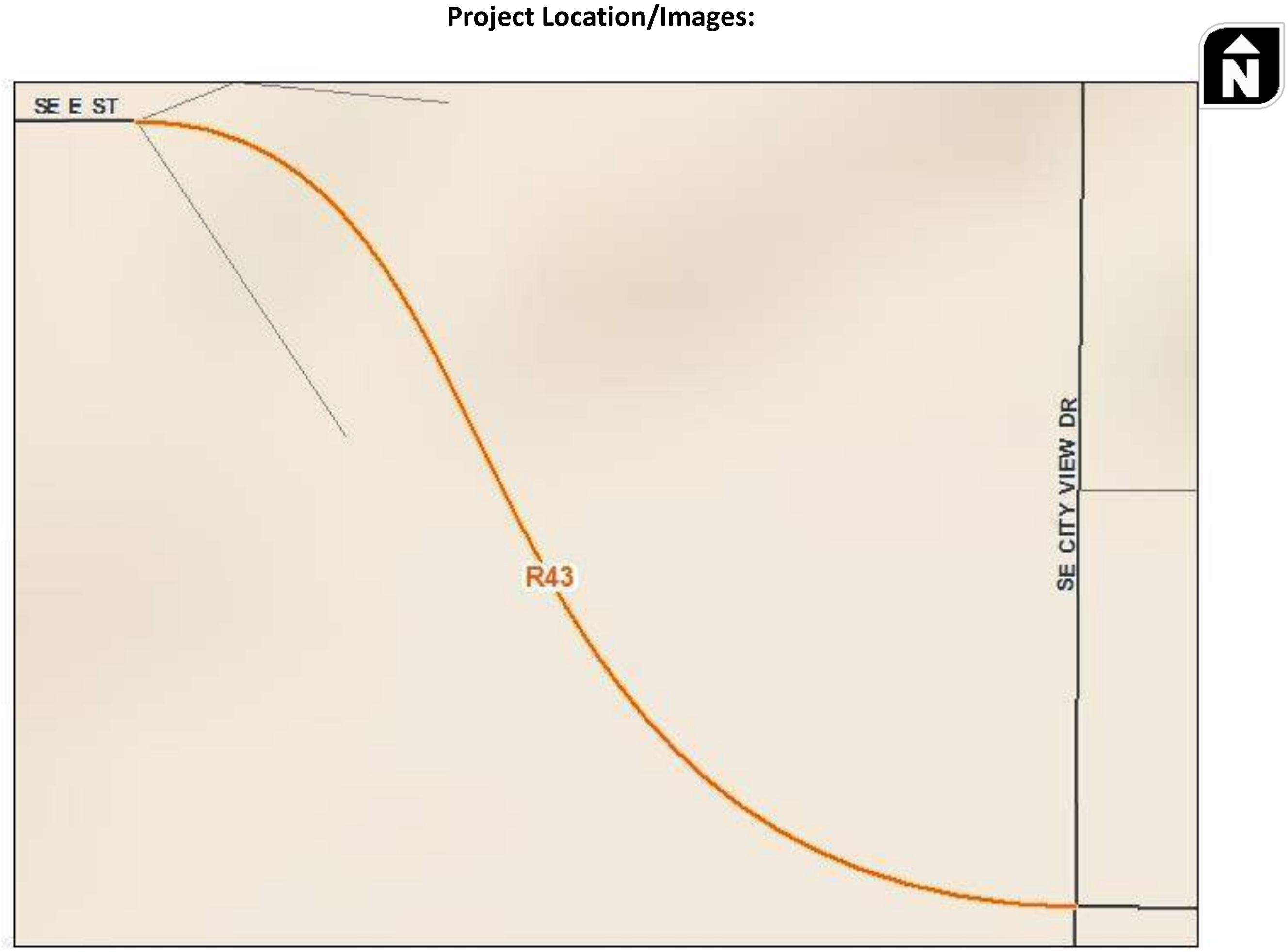
Description: Construct road to Minor Collector standard to improve east/west connectivity through Madras.

Project Type: Roadway	**Priority:** Medium
Cost: $800,000	**Potential Funding Sources:**

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	○	○	●	○

Project Location/Images:

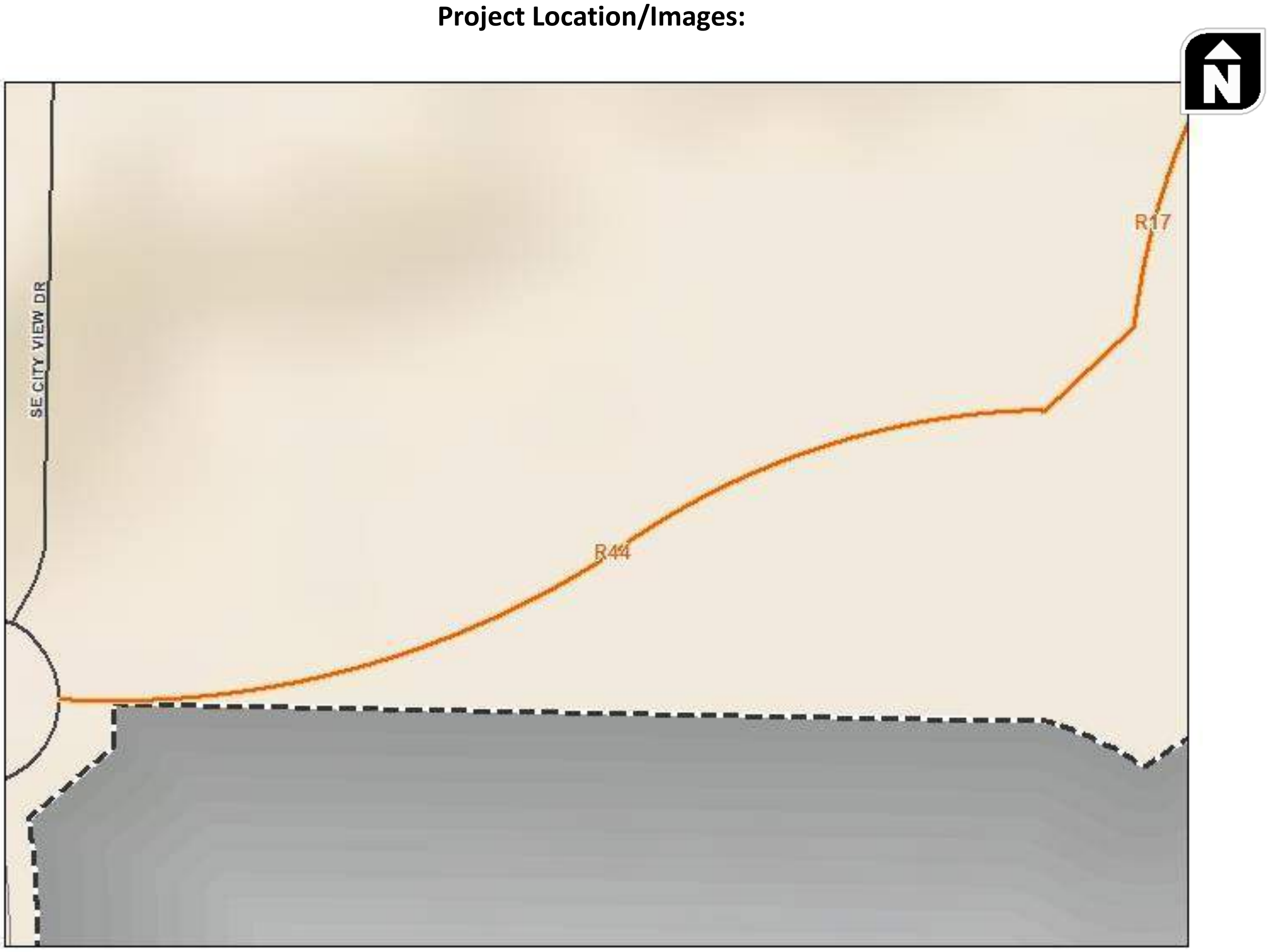


ID: R44	**Extend J Street to Bean Drive extension**
Description:	Construct road to Major Collector standard to improve connectivity within Yarrow Master Plan Area.
Project Type: Roadway	**Priority:** Development Driven
Cost: $2,00,000	

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	○	○	●	○

Project Location/Images:



ID: R45 — **Extend Yarrow Avenue to Bean Drive extension**

Description: Construct road to Major Collector standard to improve connectivity within Yarrow Master Plan Area.

Project Type: Roadway

Priority: Development Driven

Cost: $400,000

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	○	○	●	○

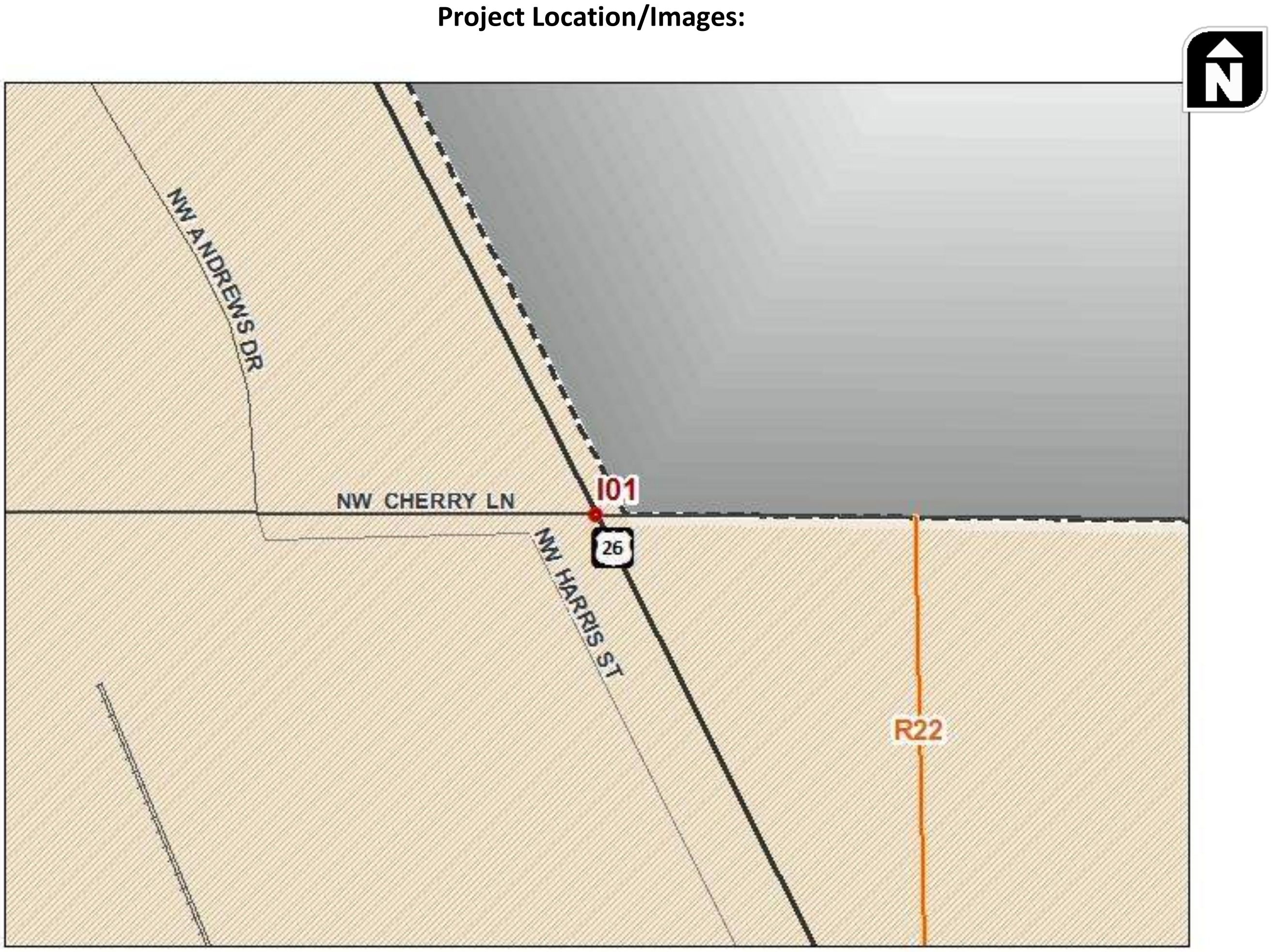
Project Location/Images:

ID: I01	US 26/Cherry Lane
Description:	Realign Cherry Lane to the east to eliminate intersection skew. Capacity enhancements may be required in the future due to increased development east or west of the highway. Final design of intersection will be determined during project development phase. Realignment of Cherry Lane east of US 26 may require modification to the UGB.
Project Type: Intersection	**Priority:** High 
Cost: $500,000	

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
○	●	○	○	○

Project Location/Images:

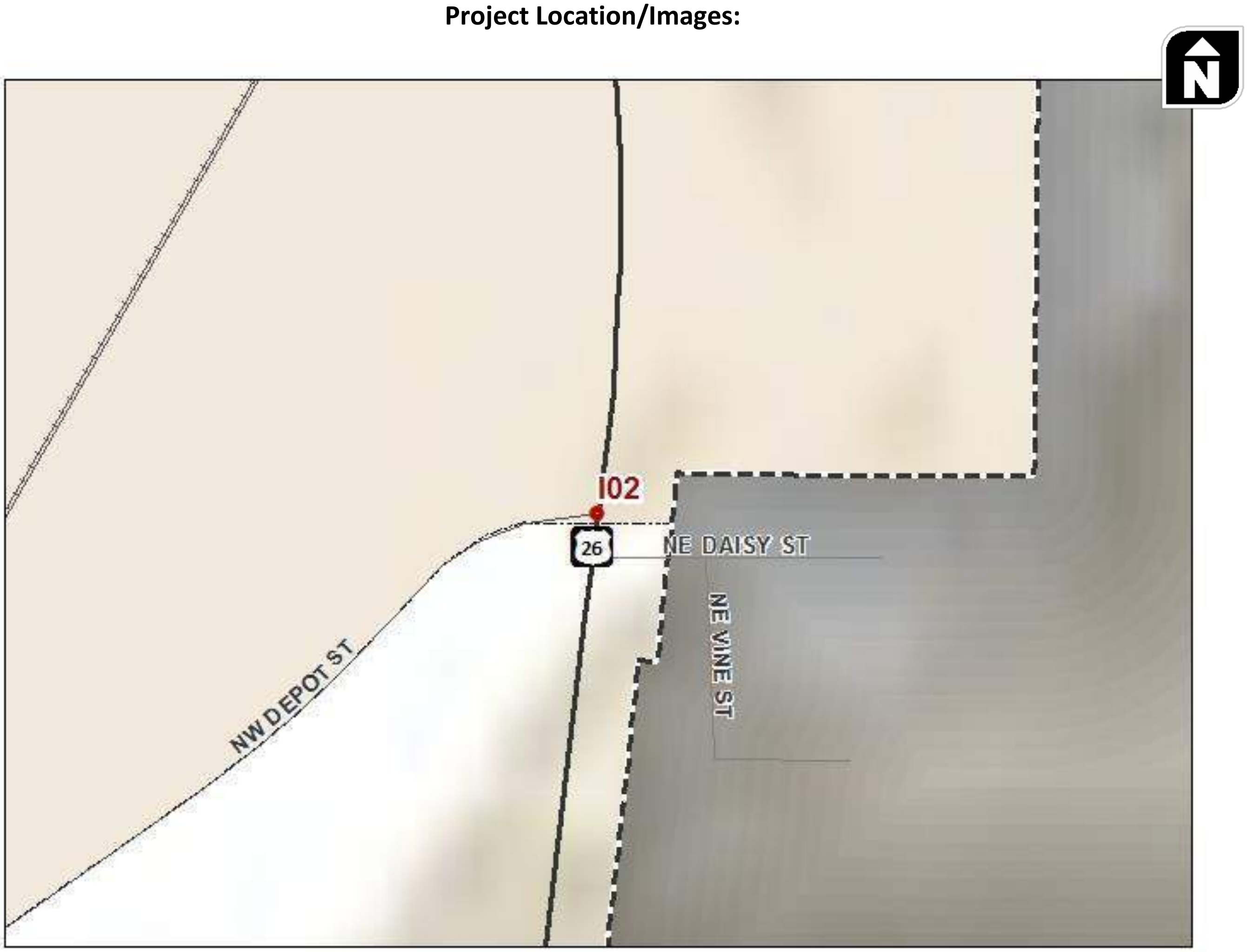


ID: I02	US 26/Depot Road
Description:	Upgrade intersection to address capacity needs. Timing and construction of intersection modifications will likely coincide with future development and potential for Depot Road extension to east.
Project Type: Intersection	**Priority:** Development Driven
Cost: $500,000	

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
○	●	○	○	○

Project Location/Images:

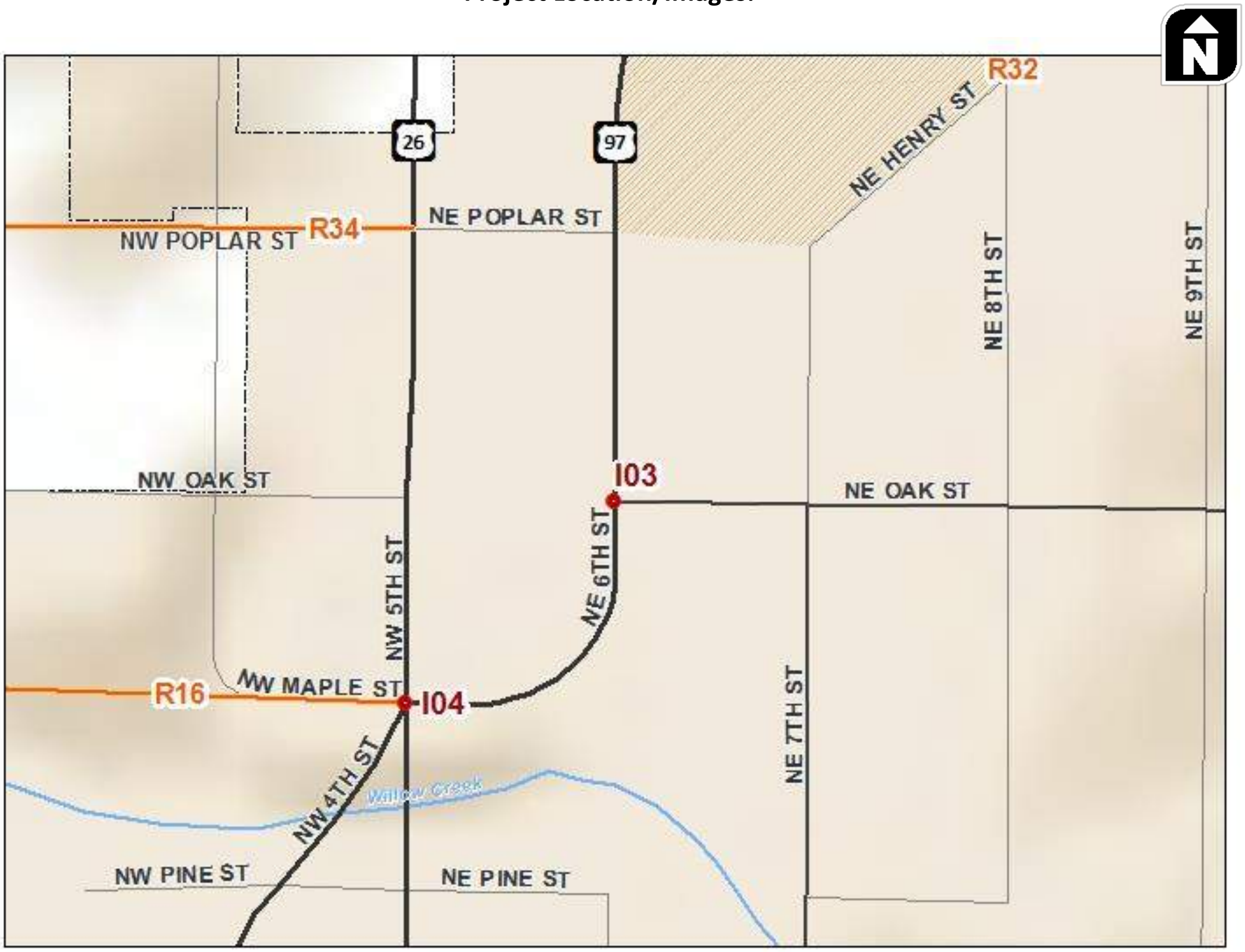


ID: I03	US 97/Oak Street
Description:	Upgrade intersection to address capacity and safety needs. Timing and construction of intersection modifications will likely coincide with future development needs.
Project Type: Intersection	**Priority:** Development Driven
Cost: $500,000	

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
○	○	●	○	○

Project Location/Images:

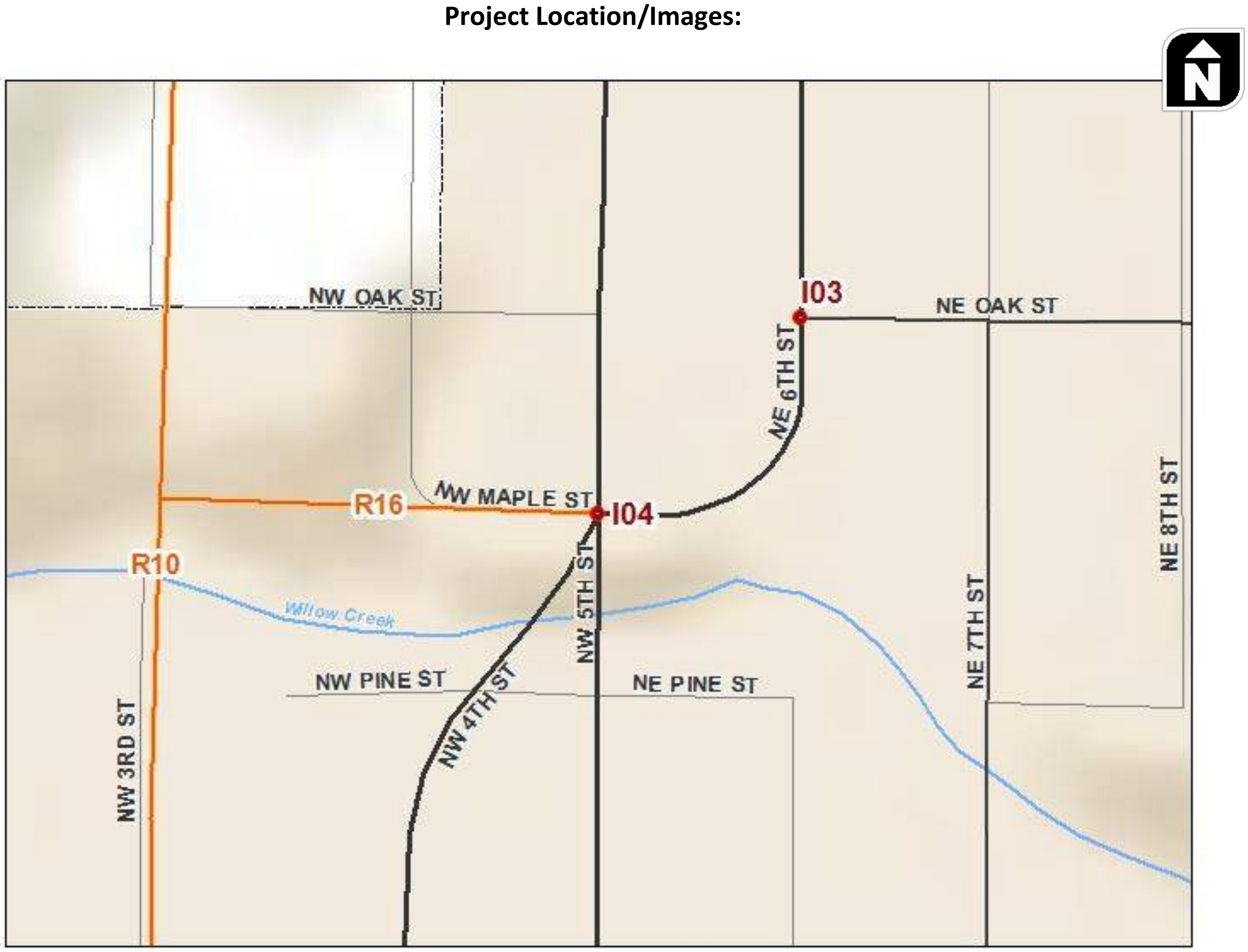


ID: I04	North Y Intersection Improvements		
Description:	Upgrade intersection to address capacity and safety needs for concept area. Final decision should consider need for turn lanes from US 97 southbound to 4th Street as well as feasibility of construction of roundabout at this location.		
Project Type: Intersection		**Priority:** High	
Cost: $1,000,000		**Potential Funding Sources:**	

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	●	○	○

Project Location/Images:

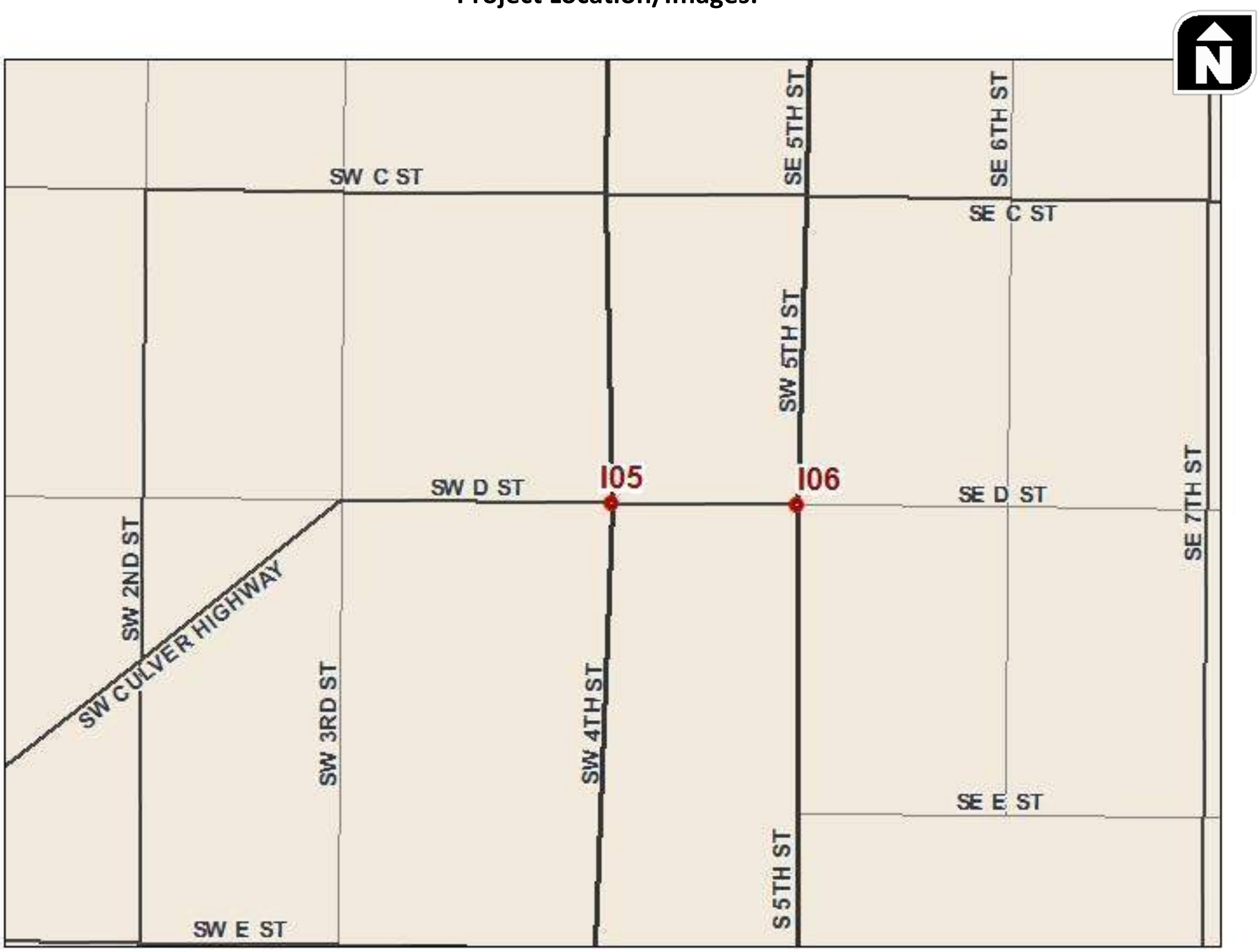


ID: I05	D Street/4th Street
Description:	Upgrade intersection to address capacity and safety needs. Consider adding curb extensions and pedestrian countdown timers to improve pedestrian comfort, convenience and safety.
Project Type: Intersection	**Priority:** High
Cost: $300,000	

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
◉	◉	●	●	◉

Project Location/Images:



ID: I06	D Street/5th Street
Description:	Upgrade intersection to address capacity and safety needs. Final design should incorporate potential safety improvements based on crash history.
Project Type: Intersection	**Priority:** High 
Cost: $300,000	**Potential Funding Sources:**

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
○	○	●	●	○

Project Location/Images:

ID: I07	US 97/Fairgrounds
Description:	Construct intersection improvement to address capacity and safety needs for concept area. Included in South 97 Highway Alternatives.
Project Type: Intersection	**Priority:** Development Driven
Cost: TBD	

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	●	●	○

Project Location/Images:

ID: I08	S 97/Hall Road
Description:	Construct intersection improvement to address capacity and geometric design needs for concept area. Included in South 97 Highway Alternatives.
Project Type: Intersection	**Priority:** Development Driven
Cost: TBD	

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	●	●	○

Project Location/Images:

ID: I09

B Street/4th Street

Description: Upgrade intersection to address safety needs. Final design should incorporate potential safety improvements based on crash history.

Project Type: Intersection

Priority: High

Cost: $300,000

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
○	○	●	●	○

Project Location/Images:

ID: I10

B Street/5th Street

Description: Upgrade intersection to address safety needs. Final design should incorporate potential safety improvements based on crash history.

Project Type: Intersection

Priority: High

Cost: $300,000

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
○	○	●	●	○

Project Location/Images:

ID: I11 & I 12

J Street/4th Street & 5th

Description:

- Install signals at 4th Street (SB US 97) and J Street, and 5th Street (NB US 97) and J Street
- Widen eastbound J Street west of SB US 97 to have sidewalk and full bike lane
- Construct new sidewalks and ADA ramps at the NW and SW corners of J Street and SB US 97
- Reconstruct ADA ramps at the other intersection corners
- Construct sidewalks along west side of SB US 97 between J Street and K Street

Project Type: Intersection

Priority: High 

Cost: $1,125,000

Potential Funding Sources:

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	●	●	○

Project Location/Images:

ID: I13

Culver Highway/Fairgrounds Road

Description: Eliminate intersection skew angle. Would likely require right-of-way acquisition.

Project Type: Intersection

Priority: Medium 

Cost: $500,000

Potential Funding Sources:

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
○	○	○	○	○

Project Location/Images:

ID: I14

SE 10th Street, Buff Street/McTaggart Road

Description: Construct intersection improvement that connects SE 10th Street, Buff Street and McTaggart Road. Consider the feasibility of a roundabout.

Project Type: Intersection

Priority: Medium

Cost: $1,500,000

Potential Funding Sources:

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	○	○	●	○

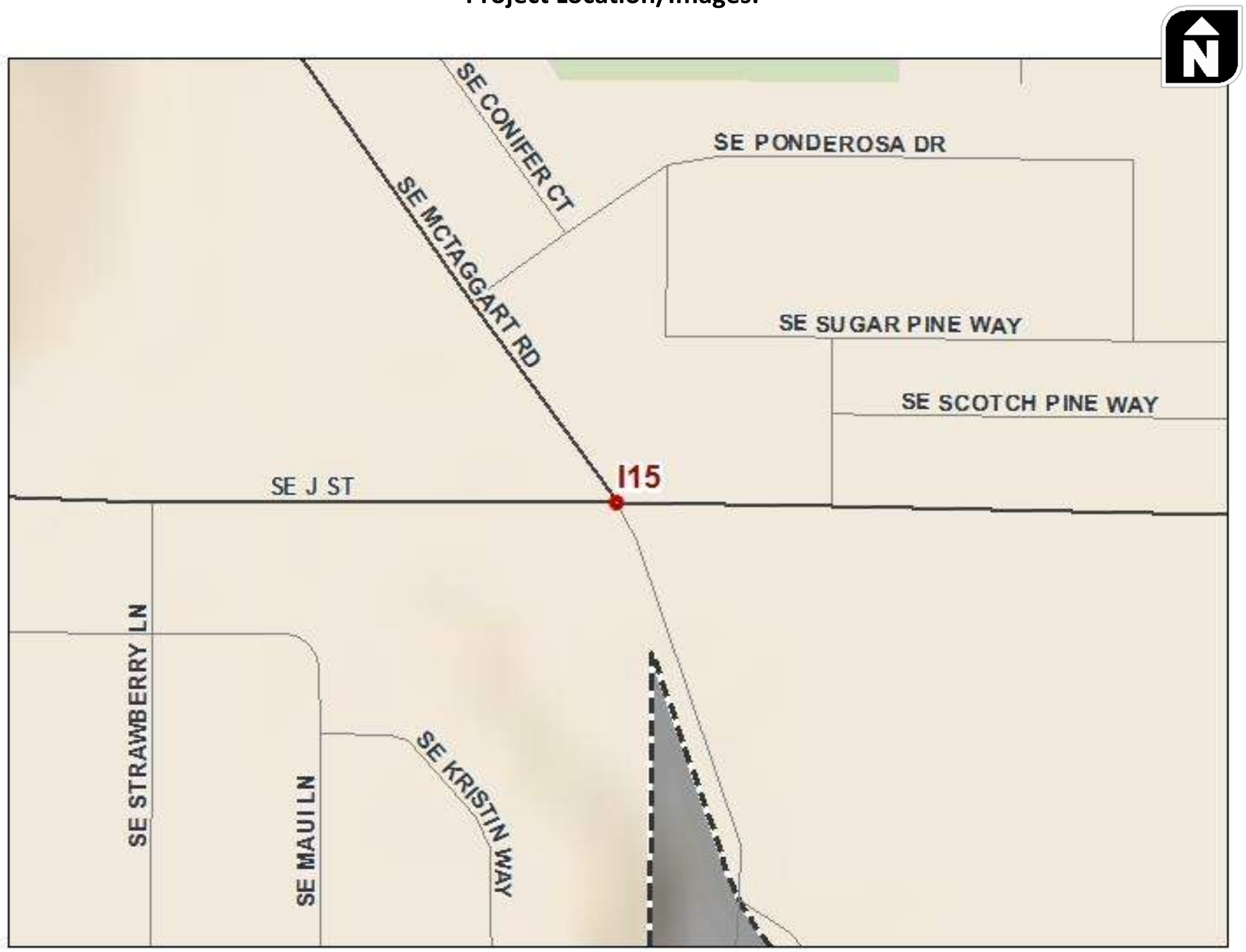
Project Location/Images:

ID: I15	J Street/McTaggart Road
Description:	Construct intersection improvement at J Street and McTaggart Road. Consider the feasibility of a roundabout.
Project Type: Intersection	**Priority:** Medium
Cost: $1,500,000	**Potential Funding Sources:**

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	○	○	●	○

Project Location/Images:

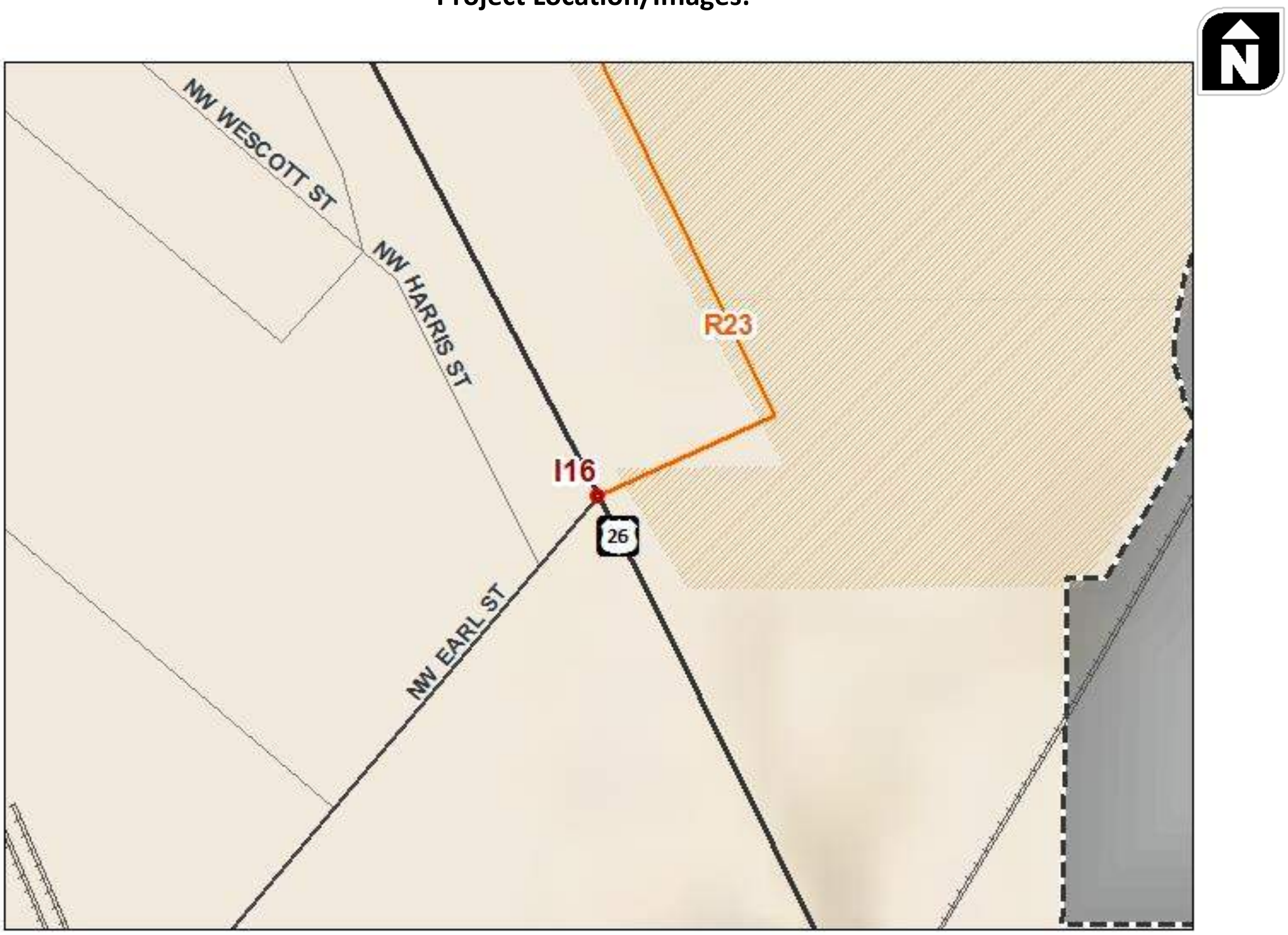


ID: I16	US 26/Earl Street Concept Area Intersection Enhancements
Description:	Upgrade intersection to address capacity needs for concept area. Construct two parallel frontage roads between the railroad tracks and Earl Street. Current eastbound left-turn and northbound left-turn movements would be removed. A non-traversable median will be constructed on US 26 to prevent left-turns between US 26 and Earl Street. Timing and construction of intersection modifications will likely coincide with future development needs.
Project Type: Intersection	**Priority:** Development Driven
Cost: $750,000	

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	○	○	○

Project Location/Images:



ID: I17	US 26/Lee Street Concept Area Intersection Enhancements
Description:	Upgrade intersection to address capacity needs for concept area. Should be coordinated with Jefferson Street Realignment (R36).
Project Type: Intersection	**Priority:** Development Driven
Cost: $750,000	

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
○	●	○	○	○

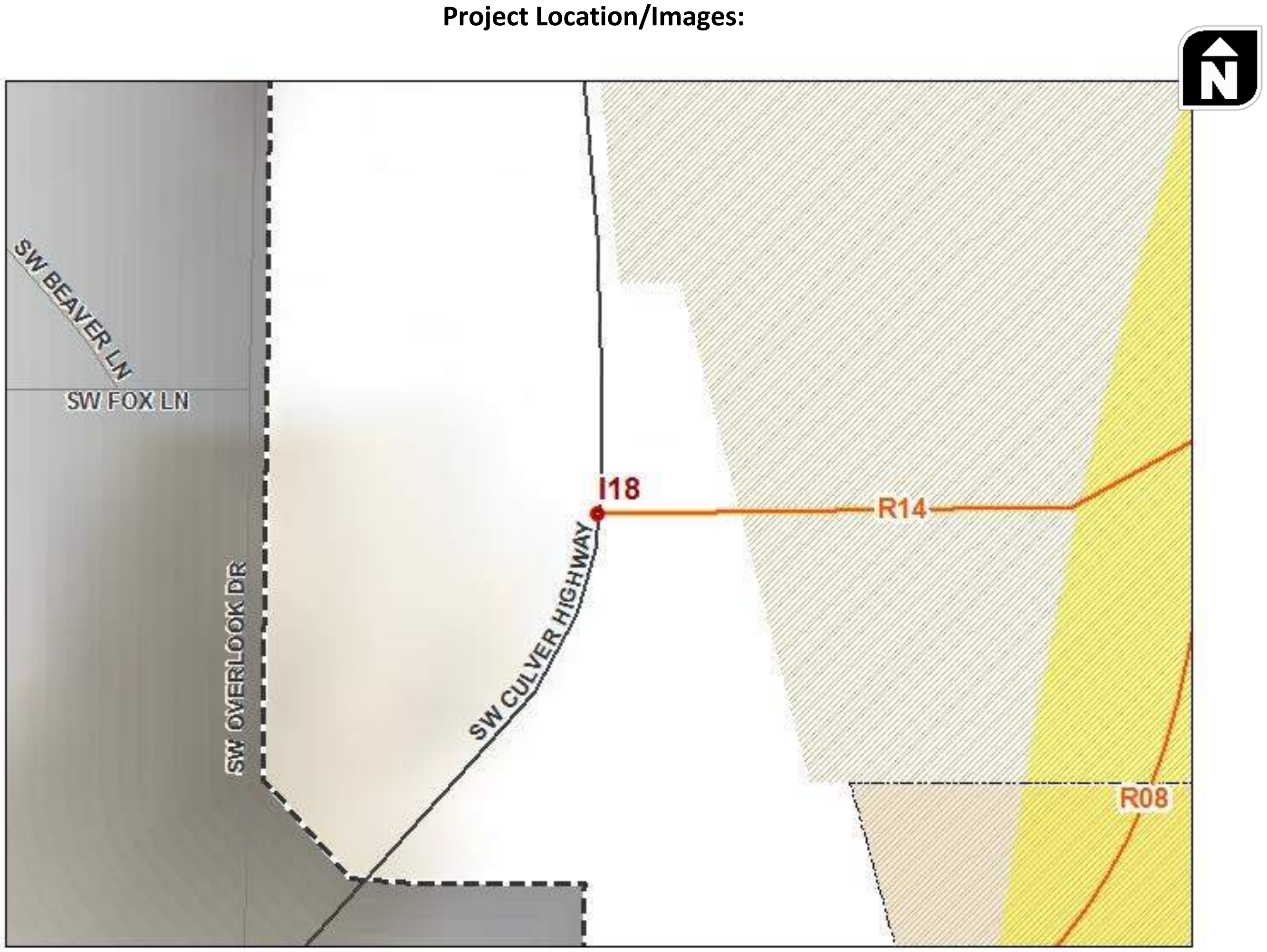
Project Location/Images:

ID: I18	Culver Highway/Hall Road Extension Concept Area Intersection Enhancements
Description:	Upgrade intersection to address capacity needs for concept area. Timing and construction of intersection modifications will likely coincide with future development needs.
Project Type: Intersection	**Priority:** Development Driven
Cost: $300,000	

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
○	●	○	○	○

Project Location/Images:



ID: I19	City View Drive/B Street
Description:	Construct intersection improvement at City View Drive and B Street. Consider the feasibility of a roundabout.
Project Type: Intersection	**Priority:** Medium
Cost: $1,500,000	

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	○	○	●	○

Project Location/Images:

ID: I20

US 20/New Industrial Road

Description: Construct intersection improvement at future Industrial Road extension and US 26. Location and design of future intersection to be determined with ODOT coordination.

Project Type: Intersection

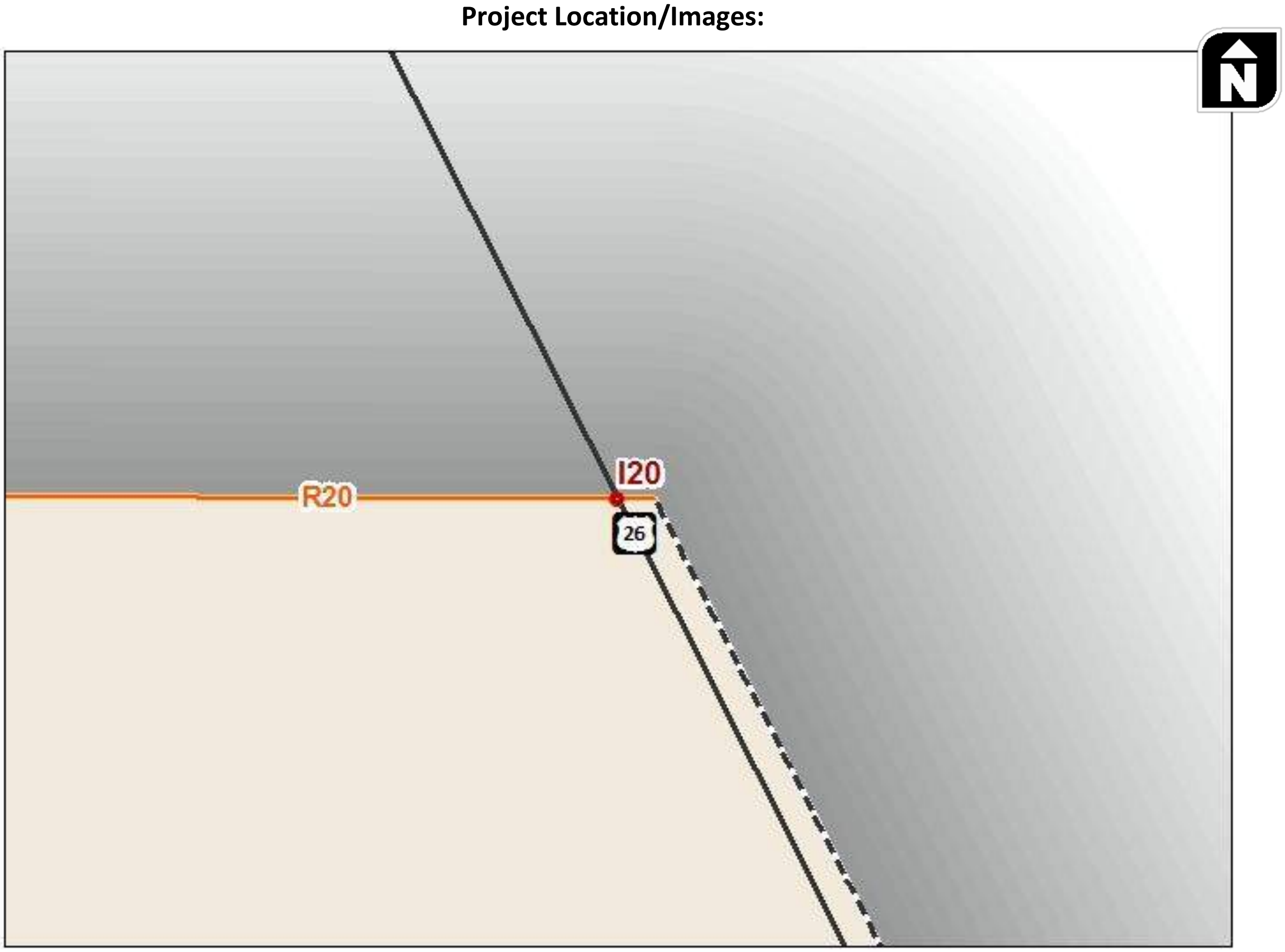
Priority: Development Driven

Cost: $750,000

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	○	○	○

Project Location/Images:

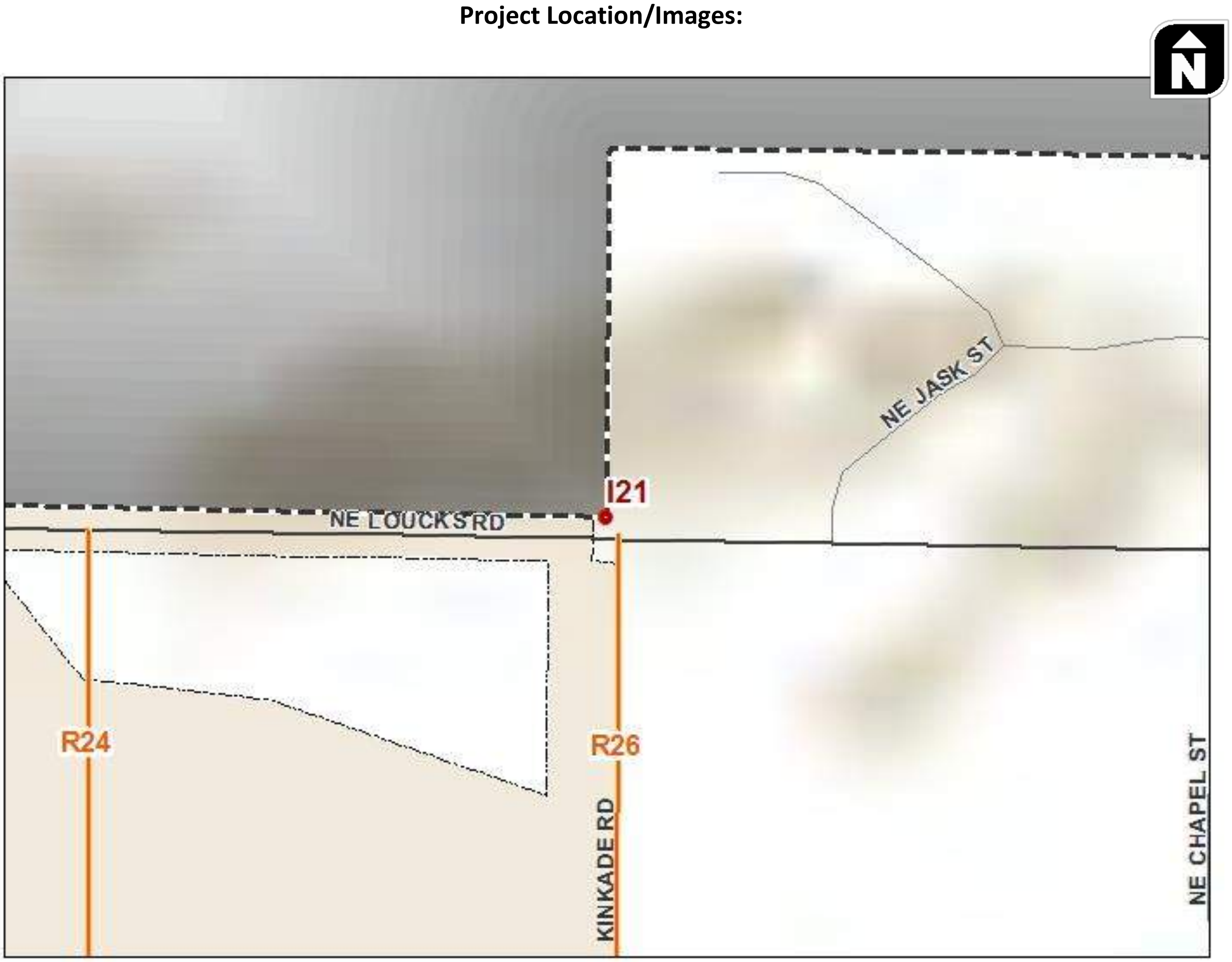


ID: I21	Loucks Road/Claremont Drive
Description:	Construction intersection improvement at Loucks Road and Claremont Drive. Consider the feasibility of a roundabout.
Project Type: Intersection	**Priority:** Medium
Cost: $1,500,000	

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	○	○	○

Project Location/Images:

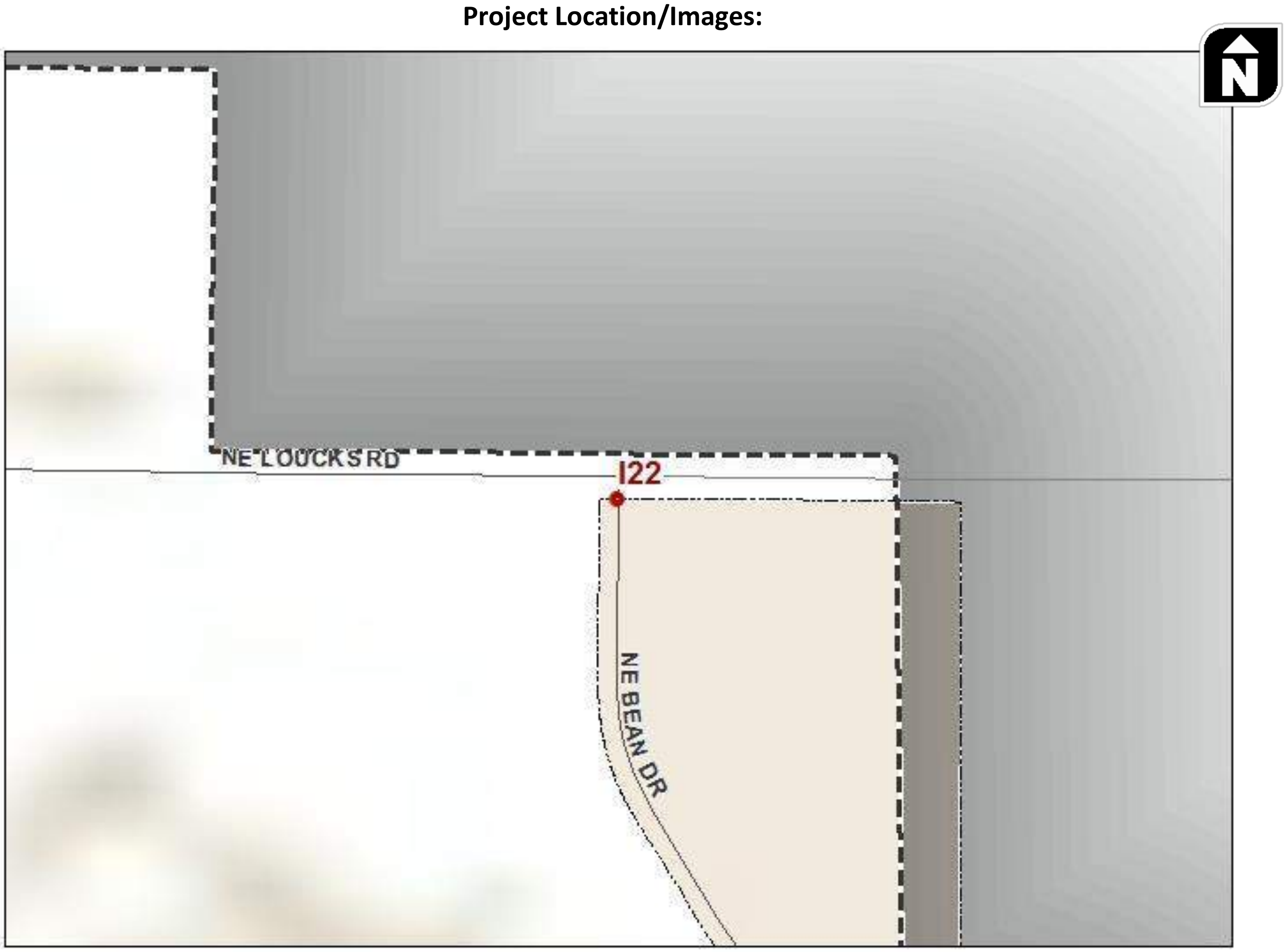


ID: I22	Loucks Road/Bean Drive
Description:	Construct intersection improvement at Loucks Road and Bean Drive. Consider the feasibility of a roundabout.
Project Type: Intersection	**Priority:** Medium
Cost: $1,500,000	**Potential Funding Sources:**

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	○	○	○

Project Location/Images:



ID: I23

US 97/Loucks Road Realignment

Description: Reconfigure intersection to eliminate the existing alignment issue for vehicles westbound on Loucks Road. Final decision options should address driver expectation and potential for safety improvements.

Project Type: Intersection

Priority: High

Cost: $500,000

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	○	○	●	○

Project Location/Images:

ID: I24

US 26/Mazatlan Intersection

Description: Add west leg to intersection and construct southbound right-turn lane. Need for improvement related to development. Mazatlán would only provide right-in-right-out movements at US 26.

Project Type: Intersection

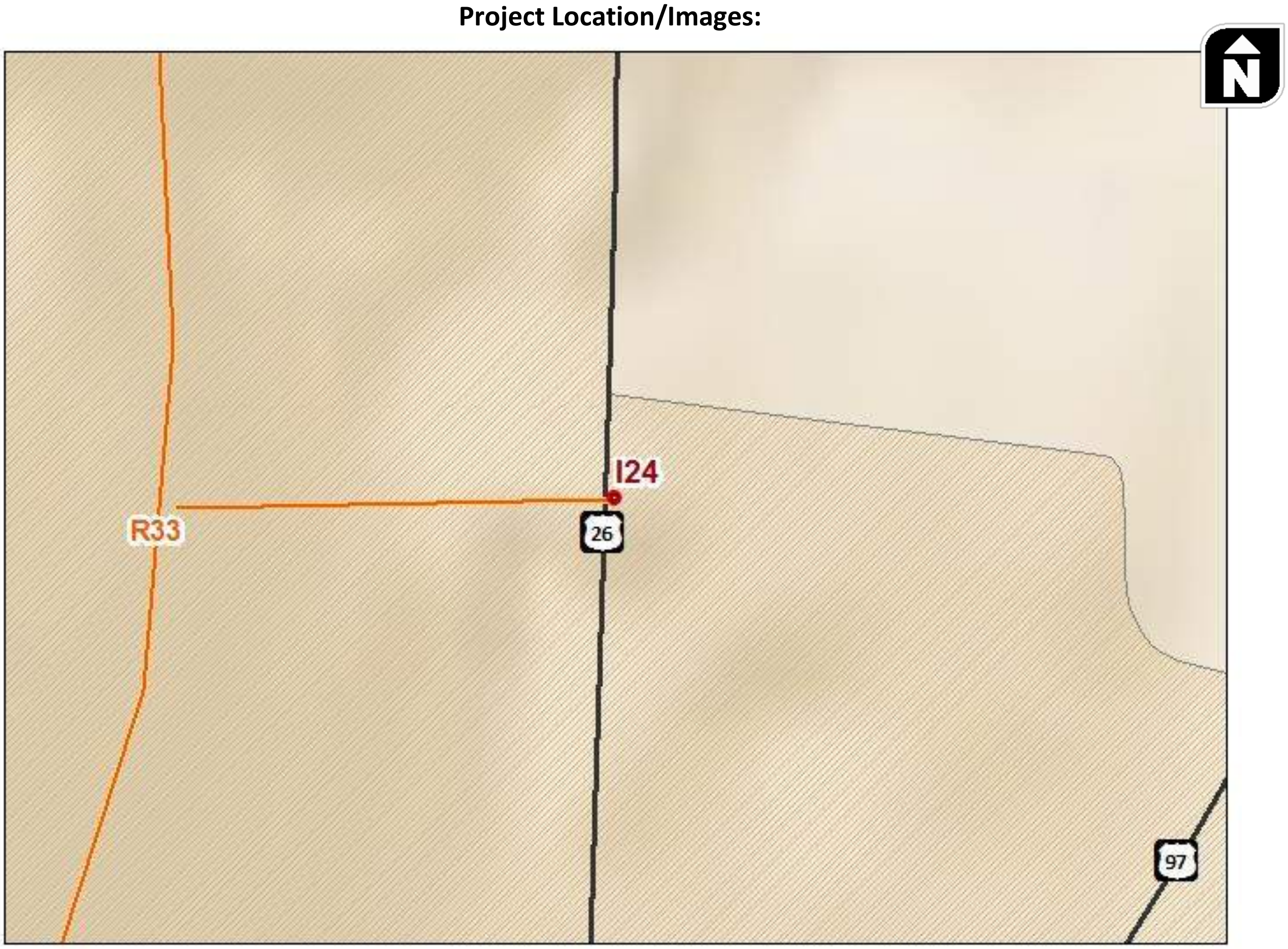
Priority: Development Driven

Cost: $250,000

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
○	○	○	○	○

Project Location/Images:

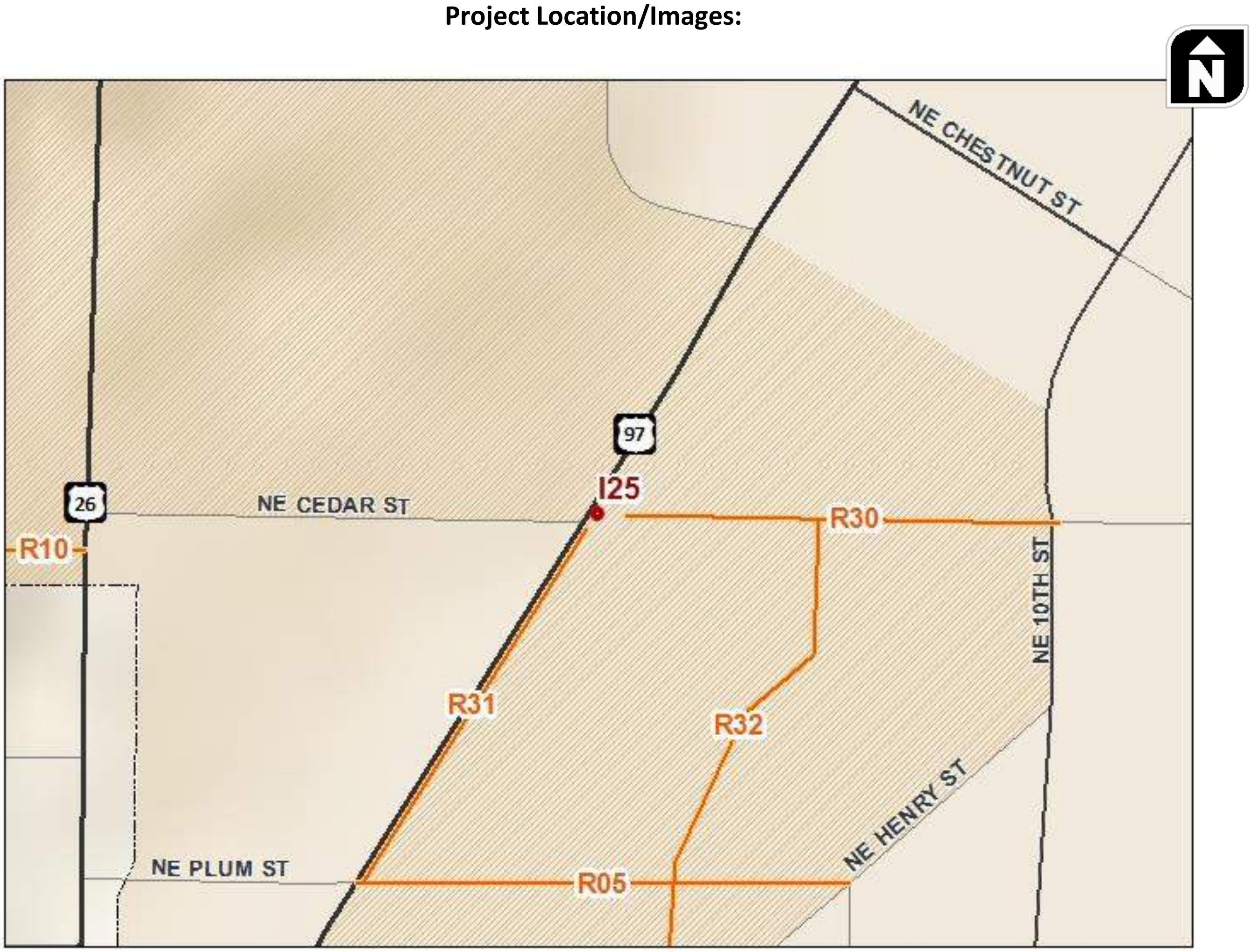


ID: I25	US 97/Cedar Street
Description:	Construct intersection for connection between US 97 and Cedar Street Eastern Extension. Should be coordinated with project R30.
Project Type: Intersection	**Priority:** High
Cost: $500,000	

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	○	●	○

Project Location/Images:

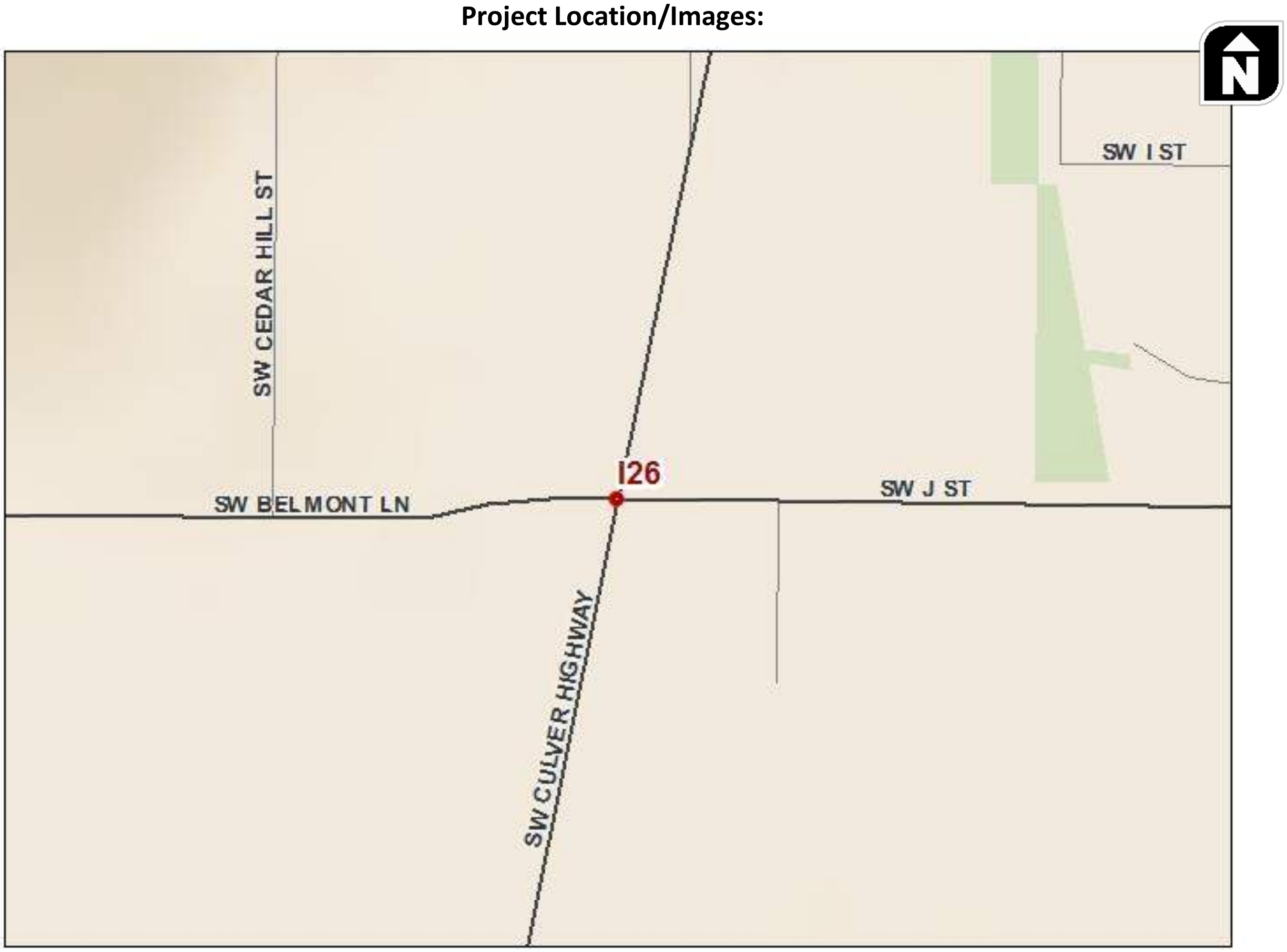


ID: I26	**J Street/Culver Highway**
Description:	Consider long-term capacity enhancements. Monitor need for improvements based on long-term growth needs.
Project Type: Intersection	**Priority:** Development Driven
Cost: $300,000	**Potential Funding Sources:**

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	○	○	○

Project Location/Images:



ID: I27

J Street/10th Street

Description: Construct intersection improvement at J Street and 10th Street. Consider the feasibility of a roundabout.

Project Type: Intersection

Priority: Medium

Cost: $1,500,000

Potential Funding Sources:

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	○	○	○

Project Location/Images:

ID: I28	City View Drive/Kinkade Road
Description:	Construct intersection improvement at City View Drive and Kinkade Road. Consider the feasibility of a roundabout.
Project Type: Intersection	**Priority:** Medium
Cost: $1,500,000	

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	○	○	○

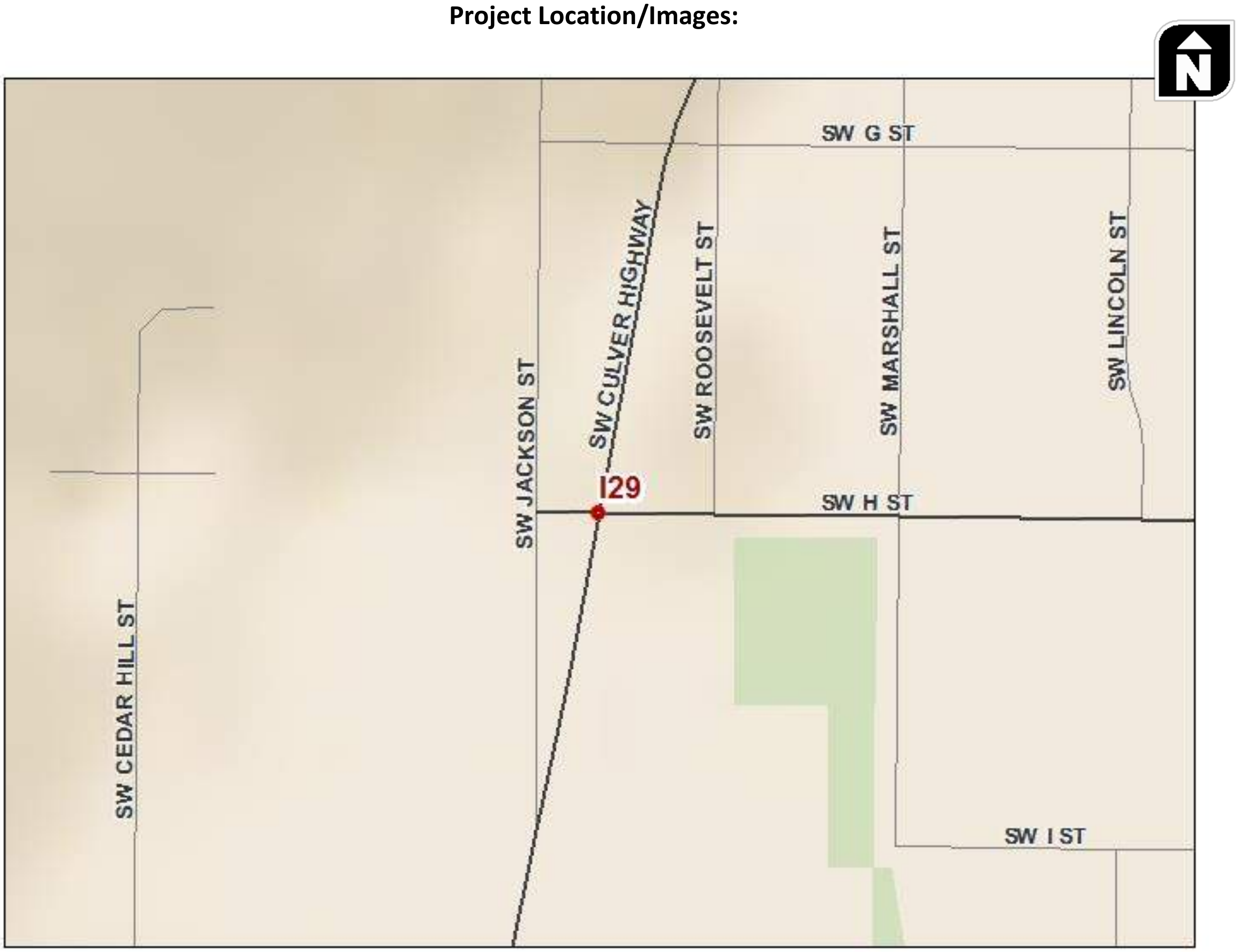
Project Location/Images:

ID: I29	H Street/Culver Highway
Description:	Consider long-term capacity enhancements. Monitor need for improvements based on long-term growth needs.
Project Type: Intersection	**Priority:** Development Driven
Cost: $3,000,000	**Potential Funding Sources:**

Project Goals:

Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment
●	●	○	○	○

Project Location/Images:



Appendix 2: Plans & Policy Review

MEMORANDUM

DATE: January 27, 2016

TO: Matt Kittelson, Project Manager

FROM: DJ Heffernan

SUBJECT: Madras Transportation System Plan Update – Technical Memo 1
Task 2.3 - Plan and Policy Review and Funding Review

Overview

This memorandum addresses the work scope for 2016 Madras Transportation System Plan (TSP) update, Task 2.3. It reviews state, federal, and local plans that may affect transportation system planning for the Madras Urban Area (Madras) and also reviews how Madras transportation systems and services are funded. The intent of the memo is to develop an understanding for the policy and regulatory framework that is applicable to the Madras TSP.

Transportation System Plans also address other transportation infrastructure, including pipelines and water transportation infrastructure. There are no major oil and gas pipelines through Madras. There are no navigable waterways or canals.

The review is divided into three sections. The first section reviews adopted State of Oregon plans and regulatory measures whose policies, rules, and programs affect the preparation of local transportation system plans (TSP). This includes documents like the Oregon Transportation Plan, the Oregon Highway Plan, the Oregon Rail Plan and other documents that provide guidance for transportation planning in Madras.

The second section reviews adopted state, regional, and local plans that have a direct effect on the Madras transportation system, including the State Transportation Improvement Program (STIP), the Cascade East Transit Plan, and other regional and local transportation plans. The distinction between sections 1 and 2 is that the first section focuses on policy documents and regulations that influence the planning process while the second section focuses on documents that directly affect the delivery of transportation services and system improvements. A table at the end of the memo lists all of the reviewed documents.

The third section of the memorandum reviews funding for the Madras transportation system, including federal, state, and local resources that are dedicated to or tapped on a discretionary basis to finance transportation improvements and services.

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Section 1 - State Plans and Regulatory Documents

This section reviews state plans and regulations that affect the preparation of local TSPs. Federal plans and programs that are integral to state plans and rules are not reviewed separately. For example, the federal MAP-21 and Highway System Plans are not specifically reviewed but their effect on Oregon transportation plans, facilities, and programs are captured in the following reviews for state transportation planning documents.

1999 Oregon Highway Plan (Updated 2015)

The Oregon Highway Plan (OHP) is a modal plan that is adopted by the Oregon Transportation Commission (OTC) that guides the Oregon Department of Transportation's (ODOT's) Highway Division in planning, operations, and financing the state road network. Policies in the OHP emphasize the efficient management of the state highway system to increase safety and to extend highway capacity, partnerships with other agencies and local governments.

The plan makes use of new techniques to improve road safety and capacity. The plan is organized around policies that establish links between land use and transportation, set standards for highway performance and access management, and emphasize the relationship between state highways and local road, bicycle, pedestrian, transit, rail, and air systems. The following policies, in particular, are relevant to the Madras TSP update process.

Policy 1A: State Highway Classification System

The OHP classifies the state highway system into four levels of importance: Interstate, Statewide, Regional, and District. ODOT uses this classification system to guide management and investment decisions regarding state highway facilities. The system guides the development of facility plans, as well as ODOT's review of local plan and zoning amendments, highway project selection, design and development, and facility management decisions including road approach permits.

In Madras, US 97 and US 26 are classified as statewide highways and OR 361 (Culver Highway) is classified as a district highway in the state classification system. The purpose and management objectives of these highways are provided in Policy 1A, as summarized below. There are no regional highways in Madras and are described for reference only.

Statewide highways (US 97, and OR 26) typically provide inter-urban and inter-regional mobility and provide connections to larger urban areas, ports, and major recreation areas that are not directly served by Interstate Highways. A secondary function is to provide connections for intra-urban and intra-regional trips. The management objective is to provide safe and efficient, high-speed, continuous-flow operation. In addition they have been given the following national designations:

- US 97 – National Highway System (NHS), State Freight Route (FR), federally designated Truck Route (TR), Reduction Review Route (RRR)

- US 26 – National Highway System (NHS), State Freight Route (FR), federally designated Truck Route (TR), Reduction Review Route (RRR)

Regional highways typically provide connections and links to regional centers, Statewide or Interstate highways, or economic or activity centers of regional significance. The management objective for these facilities is to provide safe and efficient, high-speed, continuous-flow operation in rural areas and moderate to high-speed operations in urban and urbanizing areas.

District highways (OR 361) are facilities of county-wide significance and function largely as county and city arterials or collectors. They provide connections and links between small urbanized areas, rural centers and urban hubs, and also serve local access and traffic.

Policy 1B: Land Use and Transportation

Policy 1B applies to all state highways. It is designed to clarify how ODOT will work with local governments and others to coordinate land use and transportation needs in transportation plans, facility and corridor plans, plan amendments, access permitting and project development. Policy 1B recognizes that state highways serve as the main streets of many communities and strives to maintain a balance between serving local communities (accessibility) and the through traveler (mobility). This policy recognizes the role of both the state and local governments related to the state highway system and calls for a coordinated approach to land use and transportation planning.

Inside designated Special Transportation Area (STAs) local access is a priority; inside designated Urban Business Areas (UBAs), mobility is balanced with local access. These special highway segment designations require an amendment to the OHP and allow for changes to the applicable ODOT design standards, mobility standards and access management spacing standards within the designated segments. Madras is not designated an STA or UBA in the OHP.

Policy 1C: State Highway Freight System

The primary purpose of the State Highway Freight System is to facilitate efficient and reliable interstate, intrastate, and regional truck movement through a designated freight system. This freight system, made up of the Interstate Highways and select Statewide, Regional, and District Highways, includes routes that carry significant tonnage of freight by truck and serve as the primary interstate and intrastate highway freight connection to ports, intermodal terminals, and urban areas. Highways included in this designation have higher highway mobility standards than other statewide highways. US 97 and US 26 in Madras are part of the State Highway Freight System.

Policy 1D: Scenic Byways

The primary purpose of Scenic Byways is to preserve and enhance the highway by considering aesthetic and design elements along with safety and performance considerations. Aesthetic and design elements are applied within the public right-of-way through developed guidelines. Plans and projects on highways with this designation should consider impacts to the scenic qualities of the roadway. The Madras transportation planning area includes no designated state or federal scenic routes.

Policy 1F: Highway Mobility Standards Access Management Policy

Policy 1F sets mobility targets for ensuring a reliable and acceptable level of mobility on the state highway system. The standards are used to assess system needs as part of long range, comprehensive planning transportation planning projects, during development review, and to demonstrate compliance with the Transportation Planning Rule (TPR).

Amendments to Policy 1F were adopted in 2015. The revisions were made to address concerns that state transportation policy and requirements have led to unintended consequences and inhibited economic development. Policy 1F now provides a clearer policy framework for considering measures other than volume-to-capacity (v/c) ratios for evaluating mobility performance. Also as part of these amendments, v/c ratios established in Policy 1F were changed from being standards to "targets." These targets are to be used to determine significant effect pursuant to OAR 660-012–0060 of the TPR.

Table 1 includes the mobility targets include for the state facilities in the Madras TSP study area. For this policy, the mobility analysis shall focus on peak hour conditions with peak hour represented by mobility at the 30th highest annual hour. This approximates weekday peak hour traffic in urban areas. Alternatives to the 30th highest annual hour may be considered and established through an alternative mobility target processes.

Table 1 – State Facility Mobility Targets

	Inside Urban Growth Boundary			Outside of Urban Growth Boundary	
	Non-MPO Outside of STAs where non-freeway posted speed limits is			Unincorporated Communities	Rural Lands
	<= 35 mph	> 35 mph	>= 45 mph		
Statewide Expressways	0.85	0.80	0.80	0.70	0.70
	Inside Urban Growth Boundary			Outside of Urban Growth Boundary	

	Non-MPO Outside of STAs where non-freeway posted speed limits is			Unincorporated Communities	Rural Lands
Freight Route on a Statewide Highway	0.85	0.80	0.80	0.70	0.70
District Highway	0.90	0.85	0.80	0.80	0.75

Policy 1G: Major Improvements

This policy requires that the state maintain performance and improve safety on the highway system by improving efficiency and management of the existing roadway network before adding capacity. The state's highest priority is to preserve the functionality of the existing highway system. Tools that could be employed to improve the function of the existing system include access management, transportation demand management (TDM), traffic operations improvements (e.g. signal timing to improve traffic flow), and changes to local land use designations or development regulations.

After existing system preservation, the second priority is to make minor improvements to existing highway facilities, such as adding ramp signals at highway interchanges, or making improvements to the local street network to minimize or reduce local trips on a state facility.

The third priority is to make major roadway improvements such as adding lanes to increase capacity on existing roadways. As part of this TSP process, ODOT will work with Madras and other stakeholders to determine appropriate strategies and tools that can be implemented at the local level that are consistent with this policy.

Policy 2B: Off-System Improvements

This policy recognizes that the state may provide financial assistance to local jurisdictions to make improvements to local transportation systems if the improvements would provide a cost-effective means of improving the operations of the state highway system. As part of this TSP update process, ODOT will work with Madras and project stakeholders to identify improvements to the local road system that support the planned land use designations in the study area and that will help preserve capacity and ensure the long-term efficient and effective operation of state highway facilities.

Policy 2F: Traffic Safety

This policy emphasizes the state's efforts to improve safety of all users of the highway system. Action 2F.4 addresses the development and implementation of the Safety Management System to target resources to sites with the most significant safety issues.

Policy 3A: Classification and Spacing Standards

It is the policy of the State of Oregon to manage the location, spacing, and type of road intersections on state highways to ensure the safe and efficient operation of state highways consistent with the classification of the highways.

Action 3A.2 calls for spacing standards to be established for state highways based on highway classification, type of area, and posted speed. Tables in OHP Appendix C present access spacing standards which consider urban and rural highway classification, traffic volumes, speed, safety, and operational needs. The access management spacing standards established in the OHP are implemented by access management rules in OAR 734, Division 51, addressed later in this memorandum.

Policy 4A: Efficiency of Freight Movement

This policy emphasizes the need to maintain and improve the efficiency of freight movement on the state highway system. US 97 and US 26 are state freight routes and federally designated truck routes.

Relevance: *ODOT is an important stakeholder and participant in the TSP update. Important programs, policies, and regulations that affect the updated TSP will be reviewed to ensure that the TSP complies or moves in the direction of meeting the standards and targets established in the OHP related to safety, access, and mobility.*

Oregon Bicycle and Pedestrian Plan (Updated 2011)

The intent of the Oregon Bicycle and Pedestrian Plan (OBPP) is to provide safe and accessible bicycling and walking facilities in an effort to encourage increased levels of bicycling and walking. The plan is comprised of two parts: the Policy and Action Plan and the Oregon Bicycle and Pedestrian Design Guide.

The current plan was adopted in 1995 and reaffirmed as an element of the OTP in 2006. The second part of the plan – the Design Guide – was updated in 2011. ODOT is now updating the OBPP. According to the ODOT scope of work, the update will include a broader policy framework and be reviewed for consistency with OTP modal plan requirements, federal requirements, and the statewide planning program. The updated OBPP plan is being developed in collaboration with stakeholders representing a variety of transportation interests. The update is due to be completed in 2016.

Madras will have initiated its TSP update process before adoption of the updated OBPP plan. New requirements in the OBPP will not effect the 2016 Madras TSP update but will affect future updates. The TSP planning team will monitor the OBPP update process for possible changes to bike and pedestrian facility plans on state roadways and the feasibility for following the emerging guidance.

The existing OBPP Policy and Action Plan provides background information for relevant state and federal laws, as well as goals, actions, and implementation strategies to improve bicycle and pedestrian transportation. The plan states that bikeway and walkway systems will be established on state highways as follows:

- As part of modernization projects (bike lanes and sidewalks will be included);
- As part of preservation projects, where minor upgrades can be made;
- By re-striping roads with bike lanes;
- With improvement projects, such as completing missing sidewalk segments;
- As bikeway or walkway modernization projects;
- By developers as part of permit conditions, where warranted.

The OBPP Design Guide is the technical element of the plan that guides the design and management of bicycle and pedestrian facilities on state-owned facilities. It has been designated as a companion piece to the Highway Design Manual and includes updated pedestrian and bicycle treatments.

Relevance: *The standards and guidelines for pedestrian and bicycle facilities in the OBPP serve as "best practices" and will inform the recommended bicycle and pedestrian improvements on state highway facilities in the updated TSP. In addition, the advisory committee for the TSP update includes members that represent pedestrian and bicycle interests.*

Oregon State Rail Plan (2014)

The Oregon State Rail Plan ("State Rail Plan") is a modal plan that is part of the OTP. It addresses long-term freight and passenger rail planning in Oregon. The State Rail Plan provides a comprehensive assessment of the state's rail planning, freight rail, and passenger rail systems. The State Rail Plan identifies specific policies and planning processes concerning rail in the state, establishes a system of integration between freight and passenger elements into the land use and transportation planning processes, and calls for cooperation between state, regional and local jurisdictions in completing the plan.

Currently, freight rail service in Madras is offered by Union Pacific Railroad (UP), which owns the Oregon Trunk railroad line that passes through Madras. Burlington Northern Santa Fe Railroad (BNSF) also operates on the Oregon Trunk line under the terms of a hauling agreement with UP. The agreement allows BNSF to serve the Madras industrial area rail spur. There is no passenger rail service in Madras or Jefferson County.

Madras is currently analyzing options for improving rail access and safety in the Madras area. The railroads are cooperating with the City on this study. The study may affect the way that businesses can access rail service and improve operational safety on the mainline. The result of the study should be completed in time to include recommendations in the TSP update.

Relevance*: The TSP update will consider the needs of the rail freight system in developing recommended policies and projects related to improving rail safety and accessibility in Madras. In addition, the TSP's advisory committee includes representatives that represent rail interests.*

Oregon Freight Plan (2011)

The Oregon Freight Plan (OFP) is another modal plan of the OTP and implements the state goals, and policies related to the movement of goods and commodities. Its purpose statement identifies the state's intent "to improve freight connections to local, Native American, state, regional, national, and global markets in order to increase trade-related jobs and income for workers and businesses." The objectives of the OFP include prioritizing and facilitating investments in freight facilities, including rail, marine, air, and pipeline infrastructure, and adopting strategies to maintain and improve the freight transportation system.

The OFP summarizes the importance of freight-dependent industries to Oregon and identifies strategic freight routes based on factors that drive freight transportation demand in Oregon: the economy, critical freight-dependent industries and their supply chains. Madras includes a small portion of the US 97 and US 26 corridors.[1] These highways, however, are part of the State Highway Freight System and federally designated Truck Routes and therefore are important to the movement of goods in and through central Oregon. The Madras Airport is not identified in the OFP as a freight facility (OFP Table 4-1).

OFP Issues and Strategies include actions that proactively protect and preserve identified strategic corridors. With so little of this system present in Madras, the more relevant implication for the TSP update are local strategies and actions that address capacity constraints, congestion, reliability, geometric deficiencies, and safety in the US 97 and US 26 highway corridors and in the mainline rail corridor (Freight Issues #3 and #4). An important component of the state strategy is the concept of improving "last mile"

[1] See Figure 4.13. "This route is important in terms of connectivity because it connects a major area (Central Oregon) with two major interstates (I-84 and I-5). It also connects the freight-dependent industries in Bend with cities to the east and the I-5 Corridor to the west. Without this facility, businesses located near U.S. 20 in the South East Oregon ACT or Central Oregon ACT might struggle to compete because of high travel times and transportation costs to get goods to market. " OFP p. 118.

connections from inter-modal freight facilities to National Highway System roads.

***Relevance**: Performance of the urban roadway system as it relates to freight movement and connections between freight generation sites and the State Highway Freight System will be evaluated as part of the TSP update. Maintaining and enhancing efficiency of the truck and rail freight system in the study area will be integrated into the updated TSP. The project advisory committee includes representatives from ODOT and local freight interests.*

Oregon Public Transportation Plan (1997)

The Oregon Public Transportation Plan (OPTP) is the modal plan of the OTP that provides guidance for ODOT and public transportation agencies regarding the development of public transportation systems. The vision guiding the OPTP is as follows:

- A comprehensive, interconnected and dependable public transportation system, with stable funding, that provides access and mobility in and between communities of Oregon in a convenient, reliable, and safe manner that encourages people to ride.
- A public transportation system that provides appropriate service in each area of the state, including service in urban areas that is an attractive alternative to the single-occupant vehicle, and high-quality, dependable service in suburban, rural, and frontier (remote) areas.
- A system that enables those who do not drive to meet their daily needs.
- A public transportation system that plays a critical role in improving the livability and economic prosperity for Oregonians.

The OPTP Implementation Plan directs ODOT investments towards commuter and mobility needs in larger communities and urban areas and also in smaller communities where warranted. It also prioritizes investments in intercity connections statewide. Long-term implementation and funding is geared toward both modernization and preservation projects while preservation projects are more the focus for short term implementation and funding.

***Relevance**: Madras currently does not have a transit district providing fixed-route public transit. The Central Oregon Regional Transit Master Plan addresses the needs of the transportation disadvantaged; it is reviewed later in this memorandum along with regional plans related to Transportation Options, Park and Ride, and other transportation alternatives intended to reduce reliance on the automobile. The TSP should reference the unmet transit needs identified in the Central Oregon Regional Transit Master Plan along with the results of related planning* *efforts and, when appropriate, identify specific actions that advance regional solutions consistent with these plans.*

Oregon Aviation Plan (2007 and updates)

The Oregon Aviation Plan (OAP) is a modal plan of the OTP that defines policies and long-range investment strategies for Oregon's public use aviation system. The plan addresses the existing conditions, economic benefits, and jurisdictional responsibilities for the existing aviation infrastructure. It contains policies and recommended actions to be implemented by the Oregon Department of Aviation in coordination with other state and local agencies and the Federal Aviation Administration. The OAP categorizes airports based on functional role and service criteria. The Madras City/County Airport is recognized in the Plan as a Category IV airport – Local General Aviation.

According to the 2007 OAP, Category IV airports "support primarily single-engine general aviation aircraft but are capable of accommodating smaller twin-engine general aviation aircraft". These airports support local air transportation needs and special use aviation activities." Madras completed an update to its Airport Master Plan in 2014, which is reviewed in Section 2.

In 2014 the state undertook an update of the Economic Impact Study that was completed as part of the 2007 OAP. The Economic Impact Study Update ("update") was conducted to determine the value of the Oregon Aviation System. The update included the Madras City/County Airport as one of the fifty-seven Oregon airports listed in the National Plan of Integrated Airport Systems (NPAIS). The analysis measured economic impacts of these airport facilities, within the region and throughout the state. The direct effect of airport activities on the economy for the airport was calculated in terms of jobs, wages and business sales. The economic impact is shown in Table 2.

Table 2 - Madras City/County Airport Economic Impact - 2014

Airport Name	Airport Code	Jobs	Payroll	Business Sales
Madras Municipal	S33	36	$1,114,000	$3,956,000

Relevance: *The TSP update will consider the information in the OAP and its implications for the Madras City/County Airport in the TSP update and especially state policies that effect access and capital improvement projects at the airport.*

Oregon Transportation Safety Action Plan (2011)

An element of the OTP, the Oregon Transportation Safety Action Plan (TSAP) establishes a safety agenda to guide the long-term investments and actions of ODOT and the state. As indicated in the name of the plan, the emphasis of the TSAP is action and implementation. Actions included in the OTSAP are chosen based on crash data and information provided by transportation safety experts.

ODOT is in the process of updating the TSAP. The focus to date has been on plan policies and strategies. The planning team is now considering areas of emphasis, key initiatives, and performance measures, which will be used to target limited resources. The outcome of that work may affect transportation safety initiatives in Madras. A review draft is available at the following link: http://www.oregon.gov/ODOT/TD/TP/TSAP/201511_PrelimReport.pdf
Actions identified in the 2011 TSAP that will guide or be addressed in the Madras TSP update process include:

- Focus on "safety areas of interest" such as intersection crashes and pedestrian/bicycle crashes with improvements such as advance signing, roundabouts, and access management, (Action 23).
- Elevate safety in local system plans by, for example, more widely implementing access management strategies and moving toward compliance with access management standards; and involving engineering, enforcement, and emergency service staff professionals, as well as local transportation safety advocacy groups, in planning (Actions 8 and 9).
- Design improvements for the increased safety of pedestrians, bicyclists, and other non-motorized vehicles, accommodating multiple users on a street and considering the needs of families, seniors, and children using transportation facilities (Action 4).

Relevance: *The TSP update will consider the TSAP's priorities for making state highway system intersections in Madras safer.*

Roadway Departure Plan (2010)

The Roadway Departure Plan (RDP) is an element of the OTSP that provides specific information and identifies areas regarding safety improvements to reduce roadway departure (vehicles running off the road) that are consistent with the current Action Plan. The traditional approach of relying primarily on pursuing major improvements at high-crash roadway departure locations must be complemented with two additional approaches:

- A systematic approach that involves deploying large numbers of relatively low-cost, cost-effective counter-measures at many targeted segments of roadway with a history of roadway departure crashes, and

- A comprehensive approach that coordinates an engineering, education, and enforcement (3E)[2] initiative on corridors and in urban areas with high numbers of severe roadway departure crashes.

The systematic improvement categories to be deployed include the following: sign and marking enhancements on curves, centerline rumble strips on rural two-lane highways, edge line rumble stripes and shoulder rumble strips, alignment delineation, and selective rural tree removal.

The systematic and comprehensive approaches will generate a higher number of roadway departure improvements statewide, and Region personnel will require training as they are asked to take a more active role in identifying the appropriateness of systematic improvements within their Regions.

Low-cost, cost-effective countermeasures should be considered on other types of projects as appropriate (e.g., resurfacing, surface transportation projects) when a crash history exists within the area of the work and the countermeasure can reduce future crash potential. In these cases, safety-specific funding can be used to supplement the project funds when necessary.

The Roadway Departure Plan for Region 4 identifies segments of US 97/26 within and in the vicinity of Madras for safety improvements, including sign and marking enhancements on curves, and edge line, shoulder, and centerline rumble strips.[3] It does not identify any local road network enhancement measures for Jefferson County.

Relevance: *The TSP update will consider the RDP's priorities for making state highways safer from vehicle departures.*

Intersection Safety Plan (2012)

The Intersection Safety Plan is an element of the OTSP that provides specific information and identifies areas regarding intersection safety improvements to implement the current Action Plan. The traditional approach of relying primarily on pursuing major improvements at high-crash intersections must be complemented with an expansion of the systematic approach that involves deploying large numbers of relatively low-cost, cost-effective countermeasures at many targeted high-crash intersections and a comprehensive approach that coordinates an engineering, education, and enforcement (3E) initiative on corridors with high numbers of severe intersection crashes. The plan identifies a number of locations within or in the vicinity of Madras for intersection improvements to address safety concerns. [4]

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[2] "3E" – Engineering, Education, & Enforcement

[3] http://www.oregon.gov/odot/hwy/traffic-roadway/pages/roadway_departure.aspx#Implementation_Plan

[4] ODOT Region 4 Map: http://www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/docs/pdf/Region4IntersectionMap.pdf

These include three urban intersections in Jefferson County on HWY 97 and one urban intersection on the Culver Highway.

Relevance: *The updated TSP will incorporate information from the state highway intersection safety improvement program in the development of policies and capital improvement projects.*

Bicycle and Pedestrian Safety Implementation Plan (2014)

The Bicycle and Pedestrian Safety Implementation Plan is an element of the OTSP that provides a systemic safety planning process to prioritize corridors across all public roads in Oregon. The Plan also identifies corridors with the most potential for reducing frequency and severity of pedestrian and bicycle crashes. The 2014 plan does not identify bicycle or pedestrian high-risk corridors in Madras. [5]

Relevance*: The TSP update process will consider pedestrian and bicycle safety in the selection and prioritization of transportation projects consistent with the state's action plan for bicycle and pedestrian modes of transportation on state highways in Madras.*

Transportation Planning Rule (OAR 660-012) (Updated 2011)

The Transportation Planning Rule (TPR), OAR 660-012, implements Goal 12 (Transportation) of the statewide planning goals. The TPR contains numerous requirements governing transportation planning and project development, including the required elements of a TSP. In addition to plan development, the TPR requires each local government to amend its land use regulations to implement its TSP (-0045). It also requires local government to adopt land use or subdivision ordinance regulations consistent with applicable federal and state requirements: "to protect transportation facilities, corridors and sites for their identified functions."

Exhibit 1 at the end of this memorandum breaks the TPR down into its relevant constituent sections for the Madras TSP Update. The exhibit will be used as a checklist at the end of the process to ensure local compliance with the rule. Compliance may be achieved through a variety of measures, including transportation facility design standards, operating standards to protect road functions, and notice and coordinated review procedures for land use applications. Local development codes also should include a process to apply "conditions of development approval" to development proposals that adversely impact transportation system elements, and regulations ensuring that amendments to land use designations, densities, and design standards are consistent with the functions, capacities, and performance standards of facilities identified in the TSP.

[5] http://www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/docs/pdf/13452_report_final_partsA+B.pdf

The most recent amendments to TPR, effective January 1, 2012, include new language in subsection -0060 that allows a local government to exempt a zone change from the "significant effect" determination if the proposed zoning is consistent with the comprehensive plan map designation and the TSP. Madras anticipates it will include a comprehensive plan zone change amendment as part of the TSP update, but it will not be relying on the exemption clause in subsection -0060 to make the change. An analysis of the effect on the transportation network will be considered as part of the TSP update process.

The 2012 amendments also allow a local government to amend a functional plan, comprehensive plan, or land use regulation without applying mobility standards (V/C, for example) if the subject area is within a designated multi-modal mixed-use area (MMA). This standard likely would not apply in the case of the envisioned zone change.

The TPR does not regulate access management. ODOT adopted OAR 734-051 to address access management and it is expected that ODOT, as part of this project, will coordinate with the City in planning for access management on state roadways consistent with its Access Management Rule. The review of OAR 734-051 in the next section of the memo discusses state access management rules.

Relevance*: The TPR directs local governments to prepare TSPs that include specific transportation elements and to implement the plans using local development ordinances. Local requirements such as access management, coordinated land use review procedures, and transportation facility standards and requirements are meant to protect road operations and safety and to provide multi-modal access and mobility for system users. Implementation measures that will be developed with the TSP update may necessitate amendments to city (and possibly county) land development ordinances to ensure consistency with TPR requirements.*

Access Management Rule (OAR 734-051) (Updated 2012)[6]

Oregon Administrative Rule (OAR) 734-051 defines the State's role in managing access to highway facilities in order to maintain functional use and safety and to preserve public investment. OHP Policy 3A and OAR 734-051 set access spacing standards for driveways and approaches to the state highway system.[7] The standards are based on state highway classification and

[6] Amendments to OAR 734-051 were adopted in early 2012 based on passage of Senate Bill 1024 and Senate Bill 264 in the 2010 and 2011 Oregon Legislature respectively. The amendments were intended to allow more consideration for economic development when developing and implementing access management rules, and involved changes to how ODOT deals with approach road spacing, highway improvements requirements with development, and traffic impact analyses requirements for approach road permits.

[7] ODOT Access Management Standards – OAR 734-051-4020, Tables 4 and 6: http://www.oregon.gov/ODOT/HWY/ACCESSMGT/docs/pdf/734-051_Perm_Rule.pdf

differ depending on posted speed and average daily traffic volume. The standards for highways in Madras are presented in Tables 3 and 4 below.

Table 3 – Spacing Standards for Statewide Highways, ADT > 5000

Posted Speed (mph)	Statewide Highways, Rural Expressway Areas (feet)	Statewide Highways, Urban Expressway Areas (feet)	Statewide Highways, Urban Areas (feet)	Statewide Highways, Unincorporated Communities, Rural Areas (feet)
55 and higher	5280	2640	1,320	1,320
50	5280	2640	1,100	1,100
40-45	5280	2640	800	990
30-35	-	-	500	770
25 and lower	-	-	350	550

Table 4 – Spacing Standards for District Highways, ADT > 5000

Posted Speed (mph)	Statewide Highways, Rural Expressway Areas (feet)	Statewide Highways, Urban Expressway Areas (feet)	Statewide Highways, Urban Areas (feet)	Statewide Highways, Unincorporated Communities, Rural Areas (feet)
55 and higher	5280	2640	700	700
50	5280	2640	550	550
40-45	5280	2640	500	500
30-35	-	-	400	350
25 and lower	-	-	400	250

***Relevance**: OAR 734-051 regulates access to properties that abut state roadways and spacing between access points and intersections on state highways. The analysis for the TSP update and final project recommendations need to reflect state's requirements for access dimensions and spacing. TSP implementation measures in local regulations may necessitate code amendments to ensure that zoning and development regulations are consistent with state access requirements.*

ODOT Highway Design Manual (Updated 2012)

The 2012 Highway Design Manual provides ODOT with uniform standards and procedures for planning studies and project development for the state's roadways. It is intended to provide guidance for the design of new construction; major reconstruction (4R); resurfacing, restoration, and rehabilitation (3R); or resurfacing (1R) projects. It is generally in agreement with the American Association of State Highway and Transportation Officials (AASHTO) document *A Policy on Geometric Design of Highways and Streets - 2011*. A summary of applicable design standards for state roadways in Madras is in Table 5.

Table 5 – Design Standards Selection Matrix, ODOT Highway Design Manual

Project Type	Roadway Jurisdiction				
	State Highways			Local Agency Roads	
	Interstate	Urban State Highways	Rural State Highways	Urban	Rural
Modernization/ Bridge New/Replacement	ODOT 4R/New Freeway	ODOT 4R/New Urban	ODOT 4R/New Rural	AASHTO	
Preservation/ Bridge Rehabilitation	ODOT 3R Freeway	ODOT 3R Urban	ODOT 3R Rural	AASHTO	ODOT 3R Rural
Preventive Maintenance	1R	1R	1R	NA	NA
Safety-Operations-Miscellaneous/ Special Programs	ODOT Freeway	ODOT Urban	ODOT Rural	AASHTO	ODOT 3R Rural

The Highway Design Manual is to be used for all projects that are located on the state highways. National Highway System or Federal-aid projects on roadways that are under the jurisdiction of counties will typically use the 2011 AASHTO design standards or ODOT 3R design standards. State and local planners will also use the manual in determining design requirements as they relate to the state highways in TSPs, Corridor Plans, and Refinement Plans. Sound engineering judgment, however, must continue to be a vital part in the process of applying the design criteria to individual projects. The flexibility contained in the 2012 Highway Design Manual supports the use of Practical Design concepts and Context Sensitive Design practices.

Some projects under ODOT roadway jurisdiction traverse across local agency boundaries. Some local agencies have adopted design standards and guidelines that may differ from the various ODOT design standards. Although the appropriate ODOT design standards are to be applied on ODOT jurisdiction roadway facilities, local agency publications and design practices can also provide additional guidance, concepts, and strategies for design.

Relevance: *The ODOT Highway Design Manual provides design standards on state roadways. The analysis for the TSP update and final project recommendations will need to reflect state requirements for planned improvements to state facilities. State standards and guidelines should be considered for additional guidance, concepts, and strategies for design.*

Oregon Public Transportation Plan (1997)

The Oregon Public Transportation Plan (OPTP) is the modal plan of the OTP that provides guidance for ODOT and public transportation agencies regarding the development of public transportation systems. The vision guiding the Public Transportation Plan is as follows:

- A comprehensive, interconnected and dependable public transportation system, with stable funding, that provides access and mobility in and between communities of Oregon in a convenient, reliable, and safe manner that encourages people to ride
- A public transportation system that provides appropriate service in each area of the state, including service in urban areas that is an attractive alternative to the single-occupant vehicle, and high-quality, dependable service in suburban, rural, and frontier (remote) areas
- A system that enables those who do not drive to meet their daily needs

- A public transportation system that plays a critical role in improving the livability and economic prosperity for Oregonians.

The OPTP Implementation Plan directs ODOT investments towards commuter and mobility needs in larger communities and urban areas and also in smaller communities where warranted. It also prioritizes investments in intercity connections statewide. Long-term implementation and funding is geared toward both modernization and preservation projects while preservation projects are more the focus for short term implementation and funding.

***Relevance**: There is currently no transit district providing fixed-route public transit in Madras. The Central Oregon Regional Transit Master Plan addresses the needs of the transportation disadvantaged; it is reviewed later in this memorandum along with regional plans related to Transportation Options, Park and Ride, and other transportation alternatives intended to reduce reliance on the automobile. The TSP should reference the unmet transit needs identified in the Central Oregon Regional Transit Master Plan along with the results of these related planning efforts and, when appropriate, identify specific implementation actions that advance regional solutions consistent with these plans.*

Section 2 – State, Local, and Regional Transportation Plans and Regulatory Documents

This section reviews state, regional and local transportation plans that include specific project or program recommendations for enhancing, operating, or regulating the Madras' transportation system.

State Transportation Improvement Program (STIP)

The Oregon STIP is published by ODOT every other year. The STIP establishes the capital improvement projects and transportation investments that are programmed for funding over the next four years. Most major state, federal, and tribal funded projects and investments are programmed through the STIP. The process is administered by ODOT with regional advisory review. Work on various aspects of an upcoming STIP cycle occurs on a continuous basis.

The "J" Street project was programmed for funding through the 2015-2018 STIP. With the completion of that project, the only remaining project within the Madras planning area that currently is programmed is a resurfacing and safety project on US 97 from approximately mile-post 106 to mile-post 120. A small segment of this project is in the Madras transportation planning area. Engineering and design is scheduled for 2016 with construction in 2017.

Relevance: *The Madras TSP update will include relevant projects from the 2015-18 STIP in the TSP's capital improvement project list. The team also will need to consider programs that are implemented through the STIP and the need to secure state approval for STIP funded projects. The STIP process is an important financing process that needs to be recognized in the TSP's policies and implementing measures.*

ODOT Region 4 Park and Ride Lot (2014)

The Central Oregon Intergovernmental Council (COIC) prepared the *Region 4 Park and Ride Lot Plan*.[8] It covers central Oregon district counties from Wasco on the Columbia to Klamath on the California border, including Jefferson County. Stakeholder interviews indicated that demand for park and ride services in Jefferson County were medium to low at the time the plan was prepared, but Madras was rated a high priority location for a park and ride facility on the basis of commuter trips between Madras and other ODOT Region 4 destinations, and in particular between Madras and Warm Springs. The Safeway Parking Lot in Madras was one of the highest rated locations analyzed in the plan. Development of a park and ride at this location is one of 9 high priority projects identified in the plan.

[8] See https://newcoic.files.wordpress.com/2012/11/parkride-plan_final.pdf

Relevance: *The ODOT Region 4 Park and Ride Lot Plan includes recommendations for alternative modal investment in Region 4. The Madras TSP update will need to consider these recommendations as part of its capital projects and implementing measures.*

Central Oregon Strategic Transportation Options (2013)

The Central Oregon Transportation Options Plan (COTOP) is a long-range strategic plan to guide local and inter-community public transportation investment in Central Oregon to the year 2030 and beyond. The plan provides guidance for strategic investments in public transportation and transportation options in the region with the aim to reduce traffic on Central Oregon's inter-city roadways. Options considered commuter rail, transit, demand management, car/van pool and other alternative transportation solutions. Highway Segments #3, #6, and #7 are between Madras Redmond, Prineville, and Culver, for which the analysis showed varying levels of success reducing traffic growth.[9]

Relevance: *The COTOP includes findings for cost effective programs that promote the use of alternative transportation modes. The Madras TSP update will need to consider these recommendations as part of its TSP policies and implementing measures.*

Cascades East Regional Transit Master Plan (2013)

The Central Oregon Regional Transit Plan (CORTP) is a five-volume document that reviews existing transit options and future transit needs in Central Oregon. Volume IV presents a service plan for the region; it includes specific recommendations for transit options in Madras and other cities in Crook, Deschutes, and Jefferson counties.[10] The recommended Madras solution, which could replace the existing Dial-a Ride service, includes local and inter-city flex-route service. The existing service model has scheduling and capacity constraints.

Relevance: *The CERPT compares various options and costs for delivering transit services in Central Oregon with specific recommendations for Madras. The Madras TSP update will need to consider these recommendations as part of the plan's transit modal solutions and implementing measures.*

Central Oregon Rail Planning Report (2009)

The Central Oregon Rail Planning Report (CORP) analyzed a variety of questions related to safety, congestion, freight mobility, and economic

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[9] See https://newcoic.files.wordpress.com/2012/10/cotop-final-report_coic.pdf

[10] See https://newcoic.files.wordpress.com/2012/12/coic-rtmp-vol-iv-service-plan-7-2013_final.pdf,

development issues that affect rail service and reliability in Central Oregon. The study area was limited to Crook, Deschutes and Jefferson counties. These issues were studied in the context of at-grade crossings, rail alignments, and passenger rail service. The report includes recommendations for grade separation and at-grade closures. The report's freight mobility recommendations include specific policy language to be added to local comprehensive plans (CORP, page 19, #7) and other recommendations for a regional multi-modal terminal.

Relevance: *The CORP includes analysis and recommendations for improving rail service safety and reliability in Central Oregon. The Madras TSP update will need to consider these recommendations as part of the plan's freight modal solutions.*

Jefferson County Coordinated Human Services Transportation Plan (2007)[11]

The Coordinated Human Services Transportation Plan was prepared for Jefferson County in 2007. The report was updated in 2009. Technical assistance was provided by COIC. The plan address federal requirements that all states adopt coordinated plans that to improve transportation services for people with disabilities, seniors, and individuals with lower incomes by identifying opportunities to coordinate existing resources; providing a strategy to guide the investment of financial resources; and guide the acquisition of future grants. In Oregon, this requirement was met by developing plans that address transportation needs of the federally designated target groups for counties and tribal areas.

The Jefferson County plan includes the following specific recommendations:

- Designate COIC as the Regional Public Transportation Coordinating Organization.
- Develop a Shuttle Connecting Warm Springs and Madras.
- Support, Maintain and Strengthen the Existing Transportation Network.
- Develop a strategic marketing program.
- Focus on Replacing and Expanding (as necessary) the Fleet.

The plan references specific policies in the Jefferson County Transportation System Plan that support the Human Services Transportation Plan. The plan includes a list of public, private, and non-profit providers that serve the county's transportation disadvantaged. It also includes needs and strategies to better serve populations with transportation disadvantages.

[11] See https://newcoic.files.wordpress.com/2012/09/jeffersoncountyplan.pdf

Relevance: *The JC-HSTP includes analysis and recommendations for improving transportation services for elderly, disabled, and low income residents of Jefferson County. The Madras TSP update will need to consider the recommendations as part of its transportation options and implementing measures.*

Jefferson County Transportation System Plan (2007)

The Jefferson County Transportation System Plan (County TSP) was adopted as part of the County Comprehensive Plan in 2007. The plan addresses relevant state planning requirements for county transportation plans per OAR 660-12-0015 et seq. The County's plan covers all unincorporated land outside of urban growth boundaries and tribal lands and county transportation assets that are inside urban growth areas. It is comprised of seven sections and three appendices.

Of particular importance to Madras are the plan elements that address county roads in the Madras Urban Reserve Area (URA), which lies outside the Madras Urban Growth Boundary (UGB) but the comprehensive plan envisions that over time these areas will be urbanized. They have first priority for future expansion of the Madras UGB. The city and county have adopted special land use and growth management policies for this area. In particular, these regulations limit interim development from encroaching into future urban transportation and utility corridors.

Section 4 of the TSP focuses on the Road System. Tables 4.3 lists county road system projects that are intended to support urban growth; they are referenced as Projects 61-76. Some but not all of these projects also are listed in the Madras TSP. These projects include a mix of planned road improvements inside the existing Madras UGB and within the URA. Figures 4.3 and 4.4 both show the location of these urban growth projects. Some of these projects may be important for resolving the jurisdictional transfer of roads from the County to the City at the time of or after city annexation. Table 4.4 and Figure 4.9 include information about alternative routes for a proposed Culver Hwy/US 97 Truck By-pass Route, which also is referenced as Project 13 in Table 4.1.

The County TSP also includes bicycle and pedestrian projects that have relevance to the Madras TSP. Projects B1, B2, and B3 in Table 5.1 – also shown in Figure 5.1 – are intended to provide bike connections from Madras to other destinations in the county. The County TSP also references the Willow Creek Trail, which originates in Madras. The end-points for these county projects need to be integrated with the bike/ped plan in the Madras TSP.

The County TSP discusses air, rail, and pipeline transportation assets in the County. The City and County TSPs should be consistent in their review and treatment of these assets where they overlap.

Finally, Sections 6 and 7 of the County TSP address financing planned system investments and the plan's implementation. Coordination between the City and County regarding these plan elements, which are common to all TSPs, is important.

Relevance: *The County TSP includes analysis and recommendations for transportation system elements in Jefferson County, including the urban growth area between city-limits and the urban growth boundary. The Madras TSP update will need to review these recommendations from the County TSP and make sure they are consistent with the updated City TSP.*

Jefferson County Comprehensive Land Use Plan (2007)

The Jefferson County Comprehensive Land Use Plan was updated in 2013. The plan provides the factual basis and policy framework for regulating all land uses in the County. It addresses all relevant Statewide Land Use Planning Goals, including Goal 12 - Transportation.

As the designated land use planning coordinating entity for the county, the plan includes important policies and procedures that relate to planning by municipalities in Jefferson County and for the mutual adoption of land use plans for urban designated areas, including Madras. Plan policies related to Goal 2 – Land Use Planning, and Goal 14 – Urbanization are especially important in this regard. The County's general land use plan establishes land development rights and a regulatory framework for all unincorporated land in the County. Within the Madras UGB, the City and County have agreed that Madras will conduct development reviews. This agreement is spelled out in an Urban Growth Management Agreement (UGMA) between Madras and the County for unincorporated county land that is inside the Madras UGB and for land that is in the Madras Urban Reserve Area.

County transportation issues are addressed in the County TSP, which in effect is part of the County Comprehensive Plan.

An important land use issue affecting county land that will be addressed by the TSP update is an analysis of a future urban street plan for the Madras Urban Reserve Area (URA). This will provide conceptual guidance for the general location and spacing of higher-order urban roads. Interim development would be reviewed to ensure it does not conflict with the future placement of roads and utilities that support future urban expansion.

Relevance: *The County Comprehensive Land Use Plan establishes important procedural requirements for updating land use plan elements inside urban growth boundaries. The Madras TSP update will need to be developed and adopted in a manner that is consistent with these policies and regulations.*

Warm Springs Reservation Transportation Plan (2014)

The Warm Springs Reservation Transportation Plan (WSTP) provides guidance for planned system improvements within the reservation boundary, and lands outside the reservation boundary that have been acquired by the Tribe. The main objectives of this Plan are:

- To establish a continuous transportation planning process for transportation systems on the reservation;
- To develop a surface transportation plan that is consistent with other modes of transportation and the plans of other transportation agencies;
- To identify and address the transportation needs that support the Tribes' sócio-economic objectives;
- To include in the Plan access to new land parcels acquired by the Tribes; and
- To periodically monitor the TTP Road Inventory for the Warm Springs Reservation to ensure that the CTWS receives its fair share of Highway Trust Funds through the current BIA funding allocation formula.

Project in the plan that require federal assistance are programmed for delivery through the Oregon STIP. Non-federal funded projects are programmed through the Tribe's annual budget process.

Programs and services that have relevance for the Madras TSP involve public transportation services where service connections between the Reservation and Madras are offered. These services are summarized in the WSTP and are detailed in the 2014 *Tribal Transit Plan*. Of special significance are service coordination and collaboration between Warm Springs Tribal Transit Service (WST) and Cascades East Transit (CET). The two agencies coordinate service plans and in particular on service connectivity points in Madras.

Relevance: *The WSTP provides guidance for transportation system investment for Warm Spring Reservation lands and members, including public transportation services linking tribal members with other public transit and serve destinations in Madras. The Madras TSP update needs to consider the WSTP recommendations as part of the Madras TSP planning process and in particular with respect to transit and public transportation services.*

Madras Municipal Airport Master Plan (2014)

The Madras Municipal Airport Plan (MMAP) outlines existing conditions, forecasts future needs, and recommends improvements to address aviation needs at the airport. The 2014 plan update identified the need for additional airside access and storage space (hangers) at the airport. Most of available hanger space along the northwest taxiways have been leased by the museum, fire-fighting aircraft, and private interests. The plan recommends the addition of more airside access hangers and tie-downs southeast of the main terminal on property that previously was designated a future tie-down reserve.

The plan includes recommendations for improvements to runway and taxiways, lighting, and instrumentation on both the primary and secondary runways.

The plan also includes recommendations for managing land that is owned by the city but subject to FAA lease-hold restrictions. These lands include property that is being annexed into the Madras UGB for industrial uses consistent with recommendations in the MMAP.

Relevance: *The Airport Plan provides guidance for demand and necessary improvements to facilities and services at the Madras City/County Airport over the next 20 years. The Madras TSP update will need to consider the plan's recommendations as part of the TSP update in the plan section that addresses air, rail, freight, and pipelines.*

Madras Parks and Open Space Master Plan (2009)

The Open Space Master Plan was prepared in 2004 and updated in 2009. The plan identifies important community destinations for recreation use as well as areas in the city that may not be suitable for development but could provide active and passive open space use and access routes for trails. The Willow Creek Trail and the Madras Loop Trail networks are examples. Some community parks are co-located with public schools. The plan also includes design concepts for public use greenways and pedestrian facilities as components of the street network, such as the North Y Landscape Concept.

Relevance: *The Parks Plan provides guidance for park and recreation improvements for the next 20 years. The Madras TSP update will need to consider the plan's recommendations as part of the transportation system planning process and in particular with respect to proposed trail system improvements (e.g. Willow Creek) and multi-modal connectivity to existing and planned park and recreation facilities.*

Madras Urban Renewal Plan (2006)

The Urban Renewal Plan was initially prepared in2006 but has been updated by the Madras Redevelopment Commission as revenues accumulate and opportunities emerge to use district resources for specific projects. Urban renewal provides the City with an important financing tool for addressing aesthetic, safety, and enhancements to transportation infrastructure, but it is not a significant funding resource for addressing system capacity needs.

Relevance: *The Urban Renewal Plan provides guidance for the use of TIF revenues within the City's designated urban renewal district. The Madras TSP update will need to consider the plan's programmed public improvements with respect to identified system improvement needs and* *as a potential source of funding for future projects. Also see financial summary below.*

Madras Urbanization Report (2007)

The 2007 Urbanization Report analyzed the inventory of residential and employment land in Madras to determine if the UGB included enough land to meet the 20-year forecast population and employment. It also analyzed land needs for public and quasi-public uses, like schools, parks, roads, churches, and other supporting urban land uses.

The Report led to two important changes to the urban planning program for the Madras area. First, the analysis demonstrated the need for a small increase in the UGB to meet housing needs. The analysis indicated there could be a deficiency in employment land inventory but several regional planning efforts delayed decisions related to employment land.[12] Second, the analysis established a basis for designating a large area, mostly to the east of the existing UGB, as an urban reserve area (URA). The land in this area by state rule is highest priority for future urban expansion. The city may prepare conceptual level transportation and utility plans for the URA given that over time it is expected to become part of the UGB.

Relevance: *The Urbanization Report itself combined with the 2012 TSP update addressed anticipated changes in traffic patterns related to the plan amendments adopted in 2008. Since then, many of the fundamental planning assumptions for urban growth in Madras have been updated. Other than consideration for an urban transportation framework in the URA, the 2007 Urbanization Report is not expected to affect the 2016 TSP update.*

Madras Coordinated Population and Employment Forecast (2006)

Madras is in the process of updating the Goal 9 – Economic Development element of the comprehensive plan. In conjunction with this work, the City prepared an Economic Opportunities Analysis (EOA) that, in essence, replaced the 2006 forecast. The Goal 9 update and related EOA are anticipated to be adopted by the end of March 2016. The forecast used in the EOA update is shown in Table 5.

Relevance: *The TSP Update needs to be prepared consistent with the overall population and employment forecasts for the urban growth area.*

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[12] The 2007 urban planning process recommended that the City revisit the question of its employment land inventory after completion of the Airport Master Plan, the Central Oregon Regional Rail Plan, and the Central Oregon Regional Large Lot Industrial Program. Those steps concluded in 2012, which led to an update of the Madras Economic Opportunities Analysis in 2015. The result of that work is in the process of being adopted.

Table 5 - 2015 Madras Population and Employment Forecast

	City of Madras		Jefferson County	
Year	**Population**	**Employment**	**Population**	**Employment**
2015	8519	4808	27,469	N/A
2035	16,465	9292	41,576	N/A
2057	27,997	16,205	58,025	N/A

Source: Madras EOA Update and Jefferson County Comprehensive Plan

Madras Economic Opportunities Analysis (2015)

Madras is in the process of adopting amendments to its Comprehensive Plan related to Goal 9 – Economic Development. The proposed amendments are in response to recommendations in the 2015 Economic Opportunities Analysis (EOA). The recommendations included to expand the city's inventory of small and medium size lots available for light industrial uses. The City and County are accomplishing this by rezoning all commercially zoned land south of Fairgrounds Road to a new Mixed Use Employment zone.

The new zone allows light industrial, business parks, storage and warehousing, and flex-development in addition to the commercial uses allowed in the existing base zones. An analysis of transportation impacts associated with this change concluded that because the traffic generated from light industrial, office, and warehouse uses tends to be less that for retail commercial uses, the zone change likely would result in a broader mix of uses and less traffic than would occur under the existing land use plan. A detailed analysis of specific network impacts and improvements was not conducted. That analysis is expected to occur as part of the TSP update.

Relevance: *The EOA update significantly alters the mix of allowed uses in the south end of Madras. This change will need to be analyzed as part of the TSP update. The EOA also indicated more development at the Madras Airport as a result of the recent federal designation allowing unmanned aerial vehicle testing at the airport. Transportation impacts associated with this change are not expected to be significant but will need to be assessed.*

Madras Comprehensive Land Use Plan (2007)

To be written. In essence the TSP update also will update the Comprehensive Plan. A general review of the Plan's policies and narrative will be necessary to ensure the documents are consistent with each other.

Madras Zoning and Subdivision Ordinances

To be written. These local rules are important for implementing the TSP. The review will assess consistence of the current ordinances with requirements in the TPR that affect street design and connectivity, multi-modal access and connectivity, demand management and other rule requirements.

Madras Public Improvements and Design Standards

In 2012, Madras updated its public works design and construction standards for public improvements, including roads, storm water conveyance systems, and utility installations. The City also is preparing an Industrial Site Readiness Plan that will establish specific public improvements for designated industrial areas. These local documents are not part of the TSP but are an important for implementing the TSP. Updates and modifications to city public works design standards may be done without going through a TSP update and consequently they are not subject to land use review and approval.

Madras School District 509-J Facility Plan (2009)

ORS 195.110 et seq requires all school districts in the state to prepare facility plans that forecast public education facility needs for grades K-12. The planning assumptions for facility plans need to be consistent with the locally adopted land use plans for each district.

In 2009, the Jefferson County School District adopted a facility plan that meets state statutory requirements. The plan identified a series of improvements to existing school facilities as well as the need for building new schools.

Relevance: *The Jefferson County School District Facility Plan provides information about existing and potential new school facilities in Madras and other Jefferson County communities. The TSP update will need to consider these recommendations for bicycle and pedestrian facilities and safety improvements near schools as important community destinations.*

Section 3 - Transportation Funding Summary

This analysis will review the financial resources that Madras relies on to finance its transportation system infrastructure investments and programs. The information will be summarized in tables that convey sources and uses of existing financing resources as well as explore other potential financing tools. Information sources that will be reviewed are listed below.

City of Madras Transportation Funding

Madras approves funding for the transportation system through the annual budget. The City uses a five-year Capital Improvement Plan and a pavement management system to inform the budget process. The primary funds used to finance the transportation system are the Street Fund and the Transportation SDC Fund.

Street Fund

The Street Fund is a special revenue account that includes revenue from several sources. It is primarily used to maintain city streets but sometimes is used to finance capital improvements when the city is able to obtain grant funding for specific projects. For example, the Street Fund currently is backing up the SDC Street Improvement Fund, which was pledged to finance a $1 million local obligation to build the "J" Street project. Local franchise fees, state gas tax, revenue sharing, and liquor allotment (STP) comprise the majority of the fund's revenue. Other revenue sources include grants and service charges.

The following table shows the fund's performance since 2012. Fund outlays exceeded revenues during this time frame because of transfers to the SDC Improvement Fund to cover debt service obligations. Those transfer payments, which have been ~$176k/year, will be reversed when SDC revenues increase. A recent report commissioned by the city found, however, that the amount of revenue needed to maintain the city's transportation assets is expected to increase significantly in the future and repayment of fund transfers is unlikely to cover these costs. The report recommends strategies to stabilize the maintenance funding with a combination of new revenue sources. Reducing the level of maintenance investment is not feasible without further compromising system assets and increasing the cost of necessary improvements.

Table 3.1 – Street Fund Performance: 2012 – 2015 (in 000s)

	2012	2013	2014	2015
Begin Balance	$271.9	$227.2	$226.0	$0.5
Revenues	1,223.7	1,277.7	987.0	858.6
Expenditures	1,278.5	1,278.9	1,158.7	818.1
End Balance	227.2	226.0	0.5	0.9
Net Income(loss)	(44.8)	(1,172.0)	(171.7)	0.4

Source: TUF Report, FCS Group, 2016; differences due to rounding

The implication of this trend is that without additional revenue the Street Fund is not a viable source for capital projects. Potential new sources of revenue could include a local gas tax, an increase in franchise fee rates, and a monthly transportation utility service fee, or a bond measure. These could stabilize funding for maintenance and provide funding for capital projects.

Transportation SDC Funds

System Development Charges (SDCs) are one time fees charged to development projects to address the off-site impacts that the development imposes on public infrastructure systems, including transportation. The Madras Transportation SDC uses a cost per trip generated by new development to pay for the cost to upgrade the transportation system. There are two parts to the fee. A reimbursement fee recovers investment that the city has made in the transportation system with capacity to serve additional development. The second component of the fee is an improvement fee, which is intended to cover the cost of new infrastructure that is needed to serve new development. Residential uses pay a flat amount per dwelling. Other developments pay an amount that varies based on the project's trip generating characteristics. SDC proceeds in general are used to finance growth-related capital improvements. The Transportation System Plan (TSP) informs the selection of projects and establish the percentage of project costs that may be funded with SDCs.

Madras accounts for reimbursement and improvement fee revenue in separate funds per state law. The SDC fee split is 12% reimbursement and 88% improvement. Table 3.2 shows the performance for the Street Improvement Fund since 2012. During that time, SDC income has been below forecasts and has relied on inter-fund transfers to meet debt service payment obligations. This is the result of lingering problems in the local economy. Conditions are improving albeit slowly. It will be some time before the two funds return to a stable condition.

Table 3.2 –SDC Street Improvement Fund: 2012 – 2015 (in 000s)

	2012	2013	2014	2015
Begin Balance	$(12.9)	$1.0.	$10.2	$10.6
Revenue	31.2	89.1	112.8	107.5
Expenditure	179.2	178.0	176.4	175.2
Transfers In (Out)	162.0	98.0	64.0	67.0
End Balance	1.0	10.2	10.6	10.0

Madras Urban Renewal Plan and Investment Program

Madras adopted an urban renewal district in June of 2003 that is overseen by the Madras Redevelopment Commission. The district generates revenue from property taxes that is diverted to the district. The tax revenue is used to finance tax increment bonds, which are used to pay for a variety of public improvements in the district in accordance with an adopted Urban Renewal Plan. Maximum indebtedness for the district is $14.0 million.

The plan's focus on removing blighted conditions in the downtown. Proceeds may be spent in a variety of ways from improvements to business store fronts to street-scape furnishings to business assistance. A number of transportation related improvements are outlined in the plan. While the district is an important source of financing for the city, its focus is on removing blighted conditions and enhancing economic development in the US 97 corridor and especially in downtown. The district is not expected to play a major role in financing transportation system improvements but it will help improve safety and the appearance of streets in the downtown and at key locations in the HWY 97 corridor.

Jefferson County Transportation Funding

The County plays an important role financing transportation improvement related to roads in the city that are under county jurisdiction and ownership, and to the road network that serves the unincorporated portion of the Madras Urban Growth Boundary. The County's primary role is to maintain county roads. When roads have been upgraded to city standards, ownership is transferred to the City.

There are a number of special funds that the County administers that are important for financing transportation infrastructure, including the Road Fund, Footpath and Bicycle Trail Fund, the Special Transportation Fund, and the J Street Bond Fund. The County also has two SDC Funds that relate to transportation: the CRR Roads SDC Fund, and the County Roads SDC Fund. These funds, however, are not used inside the Madras UGB.

Jefferson County may play an important partnership role with the City in implementing various aspects of the TSP. The County's development regulations can be relied on to preserve rights of way for future urban roads and there may be certain programs in which county participation and cooperation is essential. This certainly is true for capital improvements at the Madras Airport. In general, the County's role in financing the TSP capital improvement plan for urban roads and for bicycle and pedestrian infrastructure is limited. The intent is that urban development will occur after annexation to the city.

Transit Funding

Transit service in Madras is provided by Cascade East Transit District with cooperation and partnership from the Warm Springs Tribes. Service is oriented toward inter-city transit connections. There is no fixed-route service in Madras.

The District is financed by various federal and state grants that are used to underwrite capital purchases and operations. Warm Springs and the District coordinate their operations regarding the Tribe's shuttle service from Warm Springs to Madras. There have been regional discussions about augmenting operating revenues with local funds to enhance transit service, the District expects to continue its reliance on federal transfer payments to finance most of its operation.

ODOT STIP

The Oregon Department of Transportation Statewide Transportation Improvement Program (STIP) refers to the document that the Oregon Transportation Commission (OTC) adopts every other year. The STIP commits available state funding to a variety of programs and to specific projects. Information on the STIP is available at https://www.oregon.gov/odot/td/stip/Pages/default.aspx .

STIP programming is very important to Madras. The arterial roads that run through Madras - US 97 and US 26 – and the district highway that links Madras to Culver - OR 361 are vital transportation routes. Funding to improve the capacity, alignment, design features, and operating systems for these roads is programmed through the STIP. All of the major projects identified in the TSP that effect these roads need to secure state approval and funding commitments through the STIP process.

ODOT Region 4 and the other regions in the state follow a project development process for the STIP that involves local communities and citizens. Madras actively participates in this process. Coordination with ODOT on local priorities for state highway system improvements, enhancements, and operations is critical for implementing Madras's TSP.

Madras is just completing the "J" Street/ Highway 97 realignment project. This is the latest in a series of investments that ODOT has made in the US 97 corridor in Madras. With the completion of this project, however, the only projects currently listed in the STIP for the Madras area are pavement resurfacing projects on the Culver Highway (OR 361) and on US 97. Madras has applied to ODOT for a sidewalk improvement project on "H" Street. This project is in the current TSP.

Other Transportation Infrastructure Funding

The Oregon Trunk regional rail line passes through Madras. Union Pacific Railroad (UP) owns the mainline track through Madras, but Burlington Northern Santa Fe Railroad (BNSF) has a hauling agreement with UP to serve the Madras industrial area spur and is responsible for maintaining that section of track.

Appendix - List of Documents Reviewed

Document Name	Type
Oregon Highway Plan (with 2006 amendments)	State Plan
OAR chapter 734 division 051 (Access Management)	State Rule
TRIP97 Draft Report and supporting materials	
Oregon Public Transportation Plan	State Plan
Oregon Rail Plan	State Plan
Oregon Bicycle/Pedestrian Plan	State Plan
Statewide Planning Goals (to include OAR chapter 660 division 012, known as the Transportation Planning Rule (“TPR”) (including amendments adopted in December 2011)	State Rule
Statewide Transportation Improvement Program	State -Budget
ODOT Highway Design Manual	
ODOT Region 4 Park and Ride Lot Plan	Regional Plan
Cascades East Transit Regional Transportation Plan	Regional Plan
Central Oregon Strategic Transportation Options	Regional Plan
Central Oregon Rail Planning Summary Report	Regional Plan
Jefferson County Coordinated Human Services Transportation Plan	County Plan
Jefferson County Parks and Recreation Master Plan	County Plan
Jefferson County Comprehensive Plan	County Plan

Document Name	Type
Jefferson County TSP	County Plan
Warm Springs Reservation Transportation Plan	Tribal Plan
Madras Comprehensive Plan	City Plan
Madras 2012 TSP	City Plan
Madras Airport Master Plan	City/County Plan
City of Madras Parks and Open Space Master Plan, 2009	City Plan
City of Madras Urban Renewal Action Plan, 2006	City Plan
City's Zoning Ordinance, No. 723	City Regulation
City's Subdivision Ordinance, No. 713	City Regulation
City's Public Improvement Design & Construction Standards, 2012	City Regulation
City of Madras Coordinated Population Forecast, 2006	City Plan
City of Madras Urbanization Report, 2007	City Plan
City of Madras Urban Reserve Report, 2008	City Plan
Madras Municipal Budget – current and previous 4 years	City Budget
School District 509 - J Facility Plan	School District Plan
Madras Transportation TSP Methodology and Fee Schedule	City Regulation
Jefferson County Budget – current and previous 4 years	County Budget

Exhibit 1 - TPR Checklist (*to be used to demonstrate compliance with state planning rules)*

Statewide Land Use Planning Goal 12 - Transportation

Item	TPR Requirement	Response
1	Goal Statement	Madras has an adopted TSP that has previously been acknowledged to meet the requirements of OAR 660-12-000 et seq - Transportation Planning Rule (TPR). The rule was specifically written to guide the preparation of Comprehensive Plan Transportation Elements to meet the requirements in Goal 12. The Madras 2015 TSP update work program has been design to meet or exceed requirements of the TPR. It is expected that the updated TSP will comply with Goal 12. No planning work outside of that proscribed by the TPR will be necessary.
2	660-12-0020 - TSP Elements	
	Needs determination	As part of the recently completed technical analysis of employment land needs, the City updated its population and employment forecasts for the Urban Growth Boundary. The relationship between existing and future modal needs closely mirror forecast land use conditions that are based on forecast population and employment growth. The implication of the recent Economic Development analysis is that the City will continue to grow but at a lower rate than previously projected. This change needs to be accounted for the needs analysis that provides the foundation for the TSP update.
	Road element	To be written.

Item	TPR Requirement	Response
	Bike Element	Updated in 2012. Needs review but otherwise the existing TSP is largely current with respect to the bike network inventory. One issue that should be reviewed is what impact does the recently updated Goal 7 element (Natural Hazards) have for planned bike/ped trail facilities in the Willow Creek drainage?
	Pedestrian Element	Updated in 2012. Needs review but otherwise the existing TSP is largely current with respect to the pedestrian network inventory. One issue that should be reviewed is what impact does the recently updated Goal 7 element (Natural Hazards) have for planned bike/ped trail facilities in the Willow Creek drainage?
	Transit Element	To be written.
	Air, rail, water and pipeline element	This element of the plan has not been updated since 1998 and needs to be re-examined. The City completed an update to the Madras Airport Master Plan in 2014. The Madras Airport was recently approved as a testing site for Unmanned Aerial Vehicle (UAV) testing by the federal Aviation Administration (FAA). These and other fundamental aspects of the air, rail, water, and pipeline element of the TSP need to be reviewed.

Item	TPR Requirement	Response
	Implementation (policies and regulations)	Madras Comprehensive Land Use Plan is a compilation of various plan elements, some of which have recently updated, including the Goal 7 - Natural Hazards element and the Goal 9 - Economic Development, while other elements have not been updated since the plan was originally adopted. The formal plan document is at times inconsistent with more recent updates to certain plan elements. This is particularly true for the narrative descriptions of various aspects of the plan. For example, it is not clear what the source of the information in the Transportation System narrative that begins on page 68 of the Comp Plan. This narrative summary should be updated based on an "Executive Summary" from the 2015 TSP Update so that the plan narrative and the TSP are in sync. Plan policies in the Comprehensive Plan document differ from the policies in the 2012 TSP. There appear to be some inconsistencies between the policies in the Comp Plan document and the policies in the TSP document. Since technically both are formally part of the Comp Plan, these inconsistencies could pose problems for the City in the enforcement of policy in land use decisions.
	Finance	To be written.
	Other	Madras is not part of a designated MPO and has a population less than 25000; the city is not required to prepare a parking plan or transportation demand management program.
4	660-12-0035 - Transportation System Alternatives	To be written.
	existing facilities	
	new facilities	
	TSM measures (operational efficiencies)	
	No build alt	

Item	TPR Requirement	Response
	other	Madras is not part of an MPO with 1,000,000 population and, therefore, is not required to prepare an integrated land use/transportation alternative.
5	660-12-0040 - Transportation Finance Element	Update federal funding discussion to reflect recent passage of the federal transportation and highway program. Update narrative to reflect current SDC fees and an analysis of the fee's indexing formula for keeping pace with costs. Status of regional gas tax initiative?
6	660-12-0045 - Policy and Implementation	
	Land Use regulations that implement the TSP	To be written.
	Subdivision and land use regulations that are consistent with state and federal plans for transportation facilities	OHP review; Region 4 Modernization Plan Review; Region 4 Bike/Ped plan review; FAA consistency for airport plan;
7	660-12-0050 - Project Development Coordination	To be written.
	Project coordination with other governments	Review membership for the TAC. Coordination on timing etc. Airport plan drone testing and Warm Springs? ODOT integration into OSHP/STIP?
	Process to design and build projects authorized in the TSP	Policy statement
	TSP projects not subject to further justification	Policy statement

Item	TPR Requirement	Response
	Required justification in the TSP for projects to include need, mode, function, and general location	Policy statement
8	660-12-0060 - Plan and Land Use Regulation Amendments	To be written.
	Requirement for review where proposed plan amendment or regulation could significantly affect a planned transportation system facility	Policy framework and review criteria - review model language in the TPR Guidelines.
	Menu of remedies to restore balance to the transportation system when amendments are proposed	Policy framework and review criteria
9	660-12-0065 - Exemptions	List those that apply to Madras

Appendix 3: Goals & Objectives Memorandum

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TECHNICAL MEMORANDUM

Madras Transportation System Plan Update

Plan Goals, Objectives, and Evaluation Criteria

Date:	August 4, 2016	Project #: 18351
To:	Nick Snead, Community Development Director Jeff Hurd, Public Works Director Michael Duncan, Region 4 Planner	
From:	Matt Kittelson, PE	

This memorandum documents the guiding principles, goals, objectives, and evaluation criteria for the Madras Transportation System Plan (TSP) update. The goals and objectives will guide the TSP update process to ensure key issues are addressed within this process.

This document is organized into three sections:

- Background – An overview of the goals and objectives from the 2012 Madras TSP.
- Goals and Objectives - Desired project outcomes and goals that support the land use and growth vision for Madras. Objectives outline the discrete elements that, taken as a whole, support and promote the goals.
- Evaluation Criteria - Establishes a method for evaluating the transportation alternatives and policies that will be developed to achieve the identified plan goals and objectives.

This document was developed with input from the City and State, and it will be refined to incorporate feedback from the Project Advisory Committee members who represent the communities and other local interests.

BACKGROUND

TSPs provide jurisdictions with guidance for managing, operating, and improving their multimodal transportation system. The TSP focuses on priority projects, policies, and programs for a 20–year period, and provides a vision for longer-term projects that could be implemented should funding become available. The TSP is intended to be flexible to respond to changing community needs and revenue sources over the next 20 years with the intent that it will be continuously monitored and updated on an as-needed basis. The TSP builds consensus between the City, ODOT, and community stakeholders on the transportation needs and priority projects, allowing the local citizens to inform projects that are carried forward for funding from state and federal agencies.

2012 Madras TSP

The existing 2012 Madras TSP (which is a minor update of the 2006 TSP Update) focused on developing a transportation system that enhances the livability of the city. It also worked to accommodate growth and development through careful planning and management of existing and future transportation facilities.

The goals identified in the current TSP are:

- Goal 1: Improve and enhance safety and traffic circulation on the local street system.
- Goal 2: Increase walking and bicycling through improved access, circulation, safety, and convenience.
- Goal 3: Increase the use of transit and transportation demand management measures.
- Goal 4: Identify the 20-year roadway system needs to accommodate developing or underdeveloped areas within Madras.
- Goal 5: Enhance the role of the Madras Airport as an important part of the health, safety and welfare of the area.

The complete goals and objectives of the existing plan are provided as Attachment A.

Since these goals were developed as part of the 2006 TSP Update, much has changed in Madras. The community has weathered the Great Recession, experienced growth in the downtown core, and refocused towards an ever-changing future. As such, the goals and objectives from the 2006 TSP have been revisited and revised in the following sections.

GUIDING PRINCIPLE AND PLAN GOALS

The overall guiding principle of the TSP Update is to provide and encourage a safe, convenient, efficient, and economic transportation system. To achieve this guiding principle, the following plan goals have been developed:

Goal 1: Mobility and Connectivity

Promote a transportation system that provides efficient connections within Madras and meets existing and future mobility needs.

Objectives

- Identify the 20-year roadway system needs to accommodate developing or undeveloped areas without straining limited financial resources. Emphasis should be placed on maintenance, operations, management, and service improvements rather than large capital improvements.

- Promote a city road system that facilitates transportation between various areas of the City and between principal highways.
- Promote a local road system that serves as access to commercial and residential areas.
- Preserve the function, operation, capacity, level of service, and safety of state highways and local roads in a manner consistent with adopted State and local plans.
- Update roadway cross section standards that balance the needs of all users and the primary purpose of the roadway.
- Coordinate with the Oregon Department of Transportation to identify and incorporate priority roadway improvements and maintenance needs.
- Improve traffic circulation within the city, while considering the local character of each area.
- Update roadway performance standards to ensure the efficient movement of people, goods, and commodities.
- Update policies and standards that address street connectivity, spacing, and access management.

Goal 2: Economic Development

Provide a transportation system that supports existing industry and encourages economic development and job creation in the City, especially within key development areas. Improve short and long-term transportation infrastructure to support local and regional travel and livability.

Objectives

- Develop and promote a multi-modal transportation network that supports existing industries and supports economic diversification in the future.
- Identify the 20-year roadway system needs to accommodate developing or undeveloped areas without straining limited financial resources.
- Promote railroad freight service via the BNSF Railway.
- Prioritize improving and maintaining the key freight routes of US 26, US 97 and OR 361 through Madras
- Support truck access to industrial sites, including turn and acceleration/deceleration lanes where appropriate.
- Promote and plan for future industrial, commercial, and residential growth areas.

Goal 3: Safety

Provide a transportation system that improves the safety and accessibility throughout the City and especially within the downtown core.

Objectives

- Promote a transportation system that facilitates safe, livable, and vibrant multimodal corridors in Madras.
- Review existing roadways and roadway standards to ensure that they are designed, constructed, and maintained to an appropriate standard for their expected use, vehicle speeds, and vehicle traffic.
- Reduce incidence and severity of all crashes.
- Evaluate crash trends from available crash records.
- Provide a transportation system that allows for adequate emergency vehicle access to all land uses.

Goal 4: Multimodal Users

Provide a multimodal transportation system that permits the safe and efficient transport of people and goods through active modes.

Objectives

- Support the development of regional public transit opportunities.
- Consider bicycle and pedestrian facility needs during construction of new roads and during upgrades of existing roads.
- Review facilities for compliance with the Americans with Disabilities Act.
- Promote an interconnected network of bicycle, pedestrian, and transit facilities within Madras.
- Examine the need for specific pedestrian crossing locations.
- Support widening shoulders as for bicycle travel as part of roadway preservation and improvement projects or as separate projects.

Goal 5: Environment

Provide a transportation system that balances transportation services with the need to protect the environment.

Objectives

- Develop a multi-modal transportation system that avoids reliance upon one form of transportation as well as minimizes energy consumptions and air quality impacts.
- Promote design standards that support acquiring only the minimum roadway width necessary for the particular facility.
- Develop and upgrade transportation facilities in such a manner consistent with the adopted Oregon Transportation Plan (OTP), the Oregon Highway Plan (OHP), and the Transportation Planning Rule (TPR), and ensure that valuable soil, water, scenic, historic, and cultural resources are not damaged or impaired.
- Comply with all applicable state and federal noise, air, water, and land quality regulations.

Goal 6: Planning and Funding

Maintain the safety, physical integrity, and function of the City's multi-modal transportation network, consistent with Goal 6 of the OTP.

Objectives

- Maintain long-term funding stability for transportation maintenance projects.
- Evaluate new innovative funding sources for transportation improvements.
- Ensure that the existing transportation network is conserved and enhanced through maintenance and preservation.
- Identify areas where refinement plans or interim measures would increase the life of a facility or delay the need for improvements.
- Continue and enhance relationships and improve coordination among Madras, Jefferson County, ODOT, and the Federal Highway Administration (FHWA).
    - Cooperate with ODOT in the implementation of the Statewide Transportation Improvement Program (STIP);
    - Encourage the improvement of state highways;
    - Encourage planning coordination between Madras, the county, and the State by establishing cooperative road improvement programs, funding alternatives, and schedules;
    - Work with applicable jurisdictions in establishing the right-of-way needed for new roads identified in the TSP;
    - Leverage federal and state highway funding programs.

  - Encourage citizen involvement in identifying and solving local transportation issues.

EVALUATION CRITERIA

A qualitative process using the six goals and corresponding objectives above will be used to evaluate the policies and alternatives developed during the TSP update process. The policies and alternatives will be qualitatively scored for each criteria based on the following scale:

- Most Desirable: The concept addresses the criterion and/or makes substantial improvements in this criteria category.
- Moderately Desirable: The concept partially addresses the criterion and/or makes some improvements in this criteria category.
- No Effect: The criterion does not apply to the concept or the concept has no influence on the criteria.
- Least Desirable: This concept does not support the intent of and/or negatively impacts the criteria category.

At this level of screening, the qualitative comparison will be used to inform discussions about the benefits and tradeoffs of each alternative.

ATTACHMENTS

Attachment A: 2012 Madras TSP Goals and Objectives

ATTACHMENT A: 2002 MADRAS TSP GOALS AND OBJECTIVES

GOAL 1: Improve and enhance safety and traffic circulation on the local street system.
Objectives:

- Develop an efficient grid system for the community by improving the local street system.
- Improve and maintain existing roadways.
- Identify truck routes to reduce truck traffic in urban areas.
- Examine the need for speed reduction and improved signalization in specific areas.
- Identify local problem spots and recommend solutions; e.g., the junction of Highways 26 and 97.

GOAL 2: Increase walking and bicycling through improved access, circulation, safety, and convenience.
Objectives:

- Provide sidewalks and safe crossings on arterial, collector, and most local streets.
- Provide shoulders on rural collectors and arterials.
- Provide bikeways along arterials and major collectors and in other locations where high use occurs or may occur.
- Provide bicycle parking facilities as part of new multi-family residential developments of four or more units, new retail, office, and institutional developments, and transit transfer stations and park and ride lots.

GOAL 3: Increase the use of transit and transportation demand management measures.
Objectives:

- Promote alternate modes and carpool programs through community awareness and education.
- Plan for expanded transit service by sustaining funding to local transit efforts and seeking consistent state support.

GOAL 4: Enhance the role of the Madras Airport as an important part of the health, safety and welfare of the area.
Objectives:

- Improve emergency medical air access by providing instrument approach.
- Continue runway improvements.
- Improve access to the airport.
- Continue to seek matching funds for state and federal funds.

Appendix 4: Methodology Memorandum

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Final Methodology Memorandum

Date: July 1, 2016 Project #: 18351

To: Nick Snead, Community Development Director
Jeff Hurd, Public Works Director
Michael Duncan, Region 4 Planner

From: Matt Kittelson, PE

This memorandum documents the methodology and key assumptions to be used in preparation of the existing and future conditions analyses for the Madras Transportation System Plan (TSP) Update. The methodologies included in this memorandum are based on guidance provided in the Oregon Department of Transportation (ODOT) *Transportation System Plan Guidelines (2008)* and the *Analysis Procedures Manual* (APM), Versions 1 and 2 as they relate to Madras.

STUDY INTERSECTIONS

Per the scope of work (SOW), ODOT collected intersection turning movement traffic counts at the intersections listed in Table 1. These counts were collected in May 2015. The locations for these intersection counts were agreed upon by ODOT, the City, and the consultant team during the development of the project scope.

Table 1: Study Intersections (Location of 16 Hour Intersection Classification Count)

ID Number	East-West Name	North-South Name
1	NW Cherry Lane	US26
2	NW Depot St	US 26
3	Jefferson Street	US97
4	US97 Bus/4th St/6th St	US97/US26/5th St
5	D St	US97/US26/4th St
6	D St	US97/US26/5th St
7	J St	OR361
8	Fairgrounds Rd	OR361
9	Fairgrounds Rd	US97/US26
10	Hall Rd	US97/US26

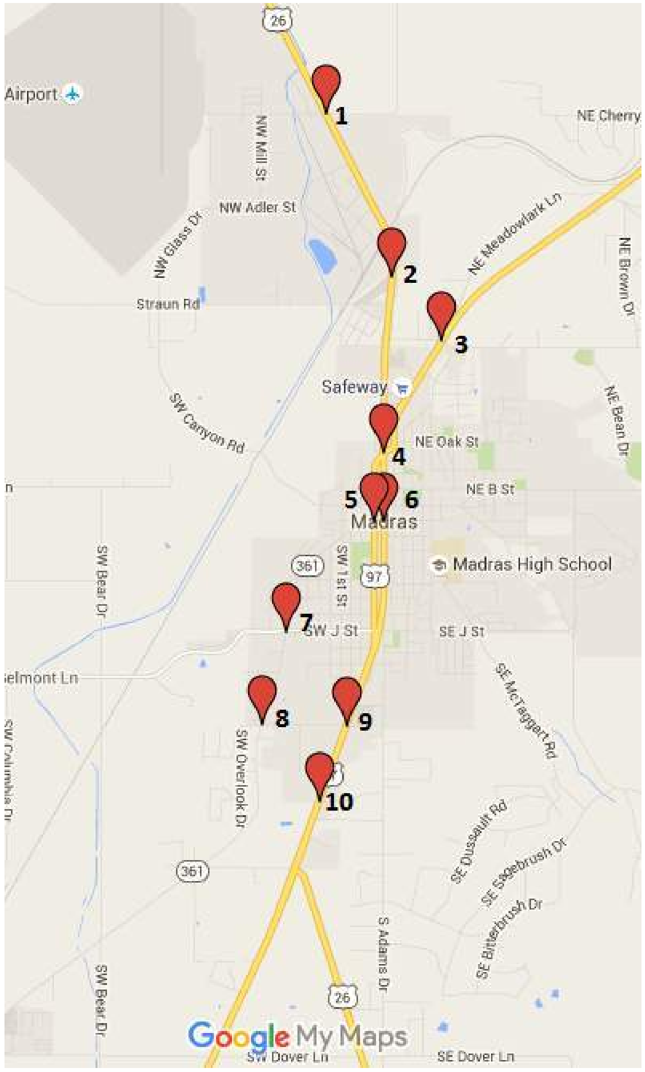


Figure 1: Study Intersections

PEAK HOUR FACTOR (PHF)

The intersections will be analyzed based on the system peak hour, 4:00 pm to 5:00 pm. The turning movement counts for D Street/4th Street and D Street/5th Street were the only counts provided in a 15 minutes interval period, so their weighted average PHF was used as the PHF for the rest of the study intersections.

Table 2 shows the calculation of the PHF for D Street/4th Street and D Street/5th Street and the weighted average.

Table 2: Peak Hour Factor Calculation

Time Period	Volumes	
	D Street/4th	D Street/5th Street
16:00	309	210
16:15	254	205
16:30	**335**	240
16:45	264	**242**
Hourly Total	1162	882
PHF	0.87	0.92
Average PHF	**0.89**	

INTERSECTION OPERATIONAL STANDARDS

Per the project scope, we will present the following performance thresholds for the study intersections, regardless of jurisdictional control:

- Volume-to-capacity (v/c) ratio;
- Level-of-service (LOS);
- Delay;
- 95th Percentile queuing (not-simulation based); and
- Turning movement counts.

This information will be provided in tables, figures, and/or technical appendices, but where possible will be provided in figures to give the general public a more clear and relatable understanding of the analysis results.

ODOT FACILITIES

For reference, this section summarizes the applicable performance thresholds for study intersections that fall within ODOT's jurisdiction.

ODOT assesses intersection operations based on volume-to-capacity (V/C) ratio. Table 5 of the *Oregon Highway Plan* (OHP) provides volume-to-capacity targets for facilities outside the Portland Metro area. The OHP ratios are used to evaluate existing and future no-build conditions, while Table 10-2 of the ODOT 2012 Highway Design Manual (HDM) provides V/C ratios used to assist in identifying future system deficiencies and evaluating future alternatives on state highways.

The mobility targets for the study intersections shown in Table 3 are:

Table 3: ODOT Mobility Target

Intersections On:	Highway Classification	v/c (OHP)	v/c (HDM)
US 97	Statewide Freight Routes	0.80	0.70
US 26	Statewide Freight Routes	0.80	0.70
OR 361	District Highway	0.90	0.75

SEASONAL ADJUSTMENT FACTOR

30th highest hour design volumes will be based on applicable adjustment factors. Version 2 of the APM identifies three methods for identifying seasonal adjustment factors for highway traffic volumes. All three methods utilize information provided by Automatic Traffic Recorders (ATR) located in select locations throughout the State Highway System that collect traffic data 24-hours a day/365 days a year. There are two permanent ATR stations in or near Madras (locations shown in Figure 2):

- ATR 16-006: Located on US26, Warm Springs Highway, 4.54 miles northwest of the Dalles-California Highway
- ATR 16-002: Located on US97/US26, the Dalles-California Highway, 0.18 mile north of Madras-Prineville Highway

Based on the locations of ATR stations the On-Site ATR method will be used to calculate volumes at study intersections.

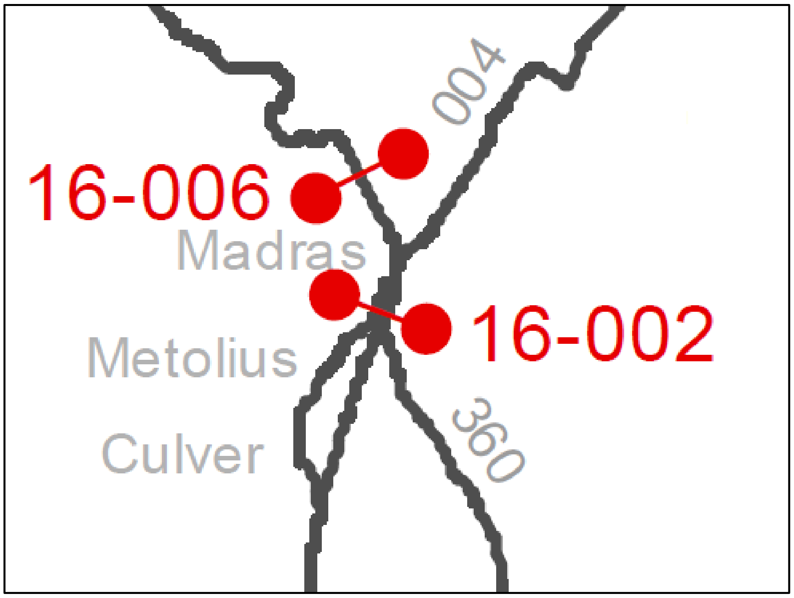


Figure 2: ATR Locations in Madras

On-Site ATR Method

The On-Site ATR Method requires that the ATR be located within or near the project area. If the ATR is located outside the project area, there should be no major intersections between the ATR and the project area, and the Average Annual Daily Traffic (AADT) collected by the ATR must be within 10 percent of the AADT near the project area. *ODOT's Transportation Volume Tables will be used to identify AADT for highway segments*. Based on these requirements, we propose using two ATR station in or near Madras to calculate seasonal adjustment factors for intersections on US 97 and US 26.

- ATR 16-006 can be used for nearby highway segments on US26
- ATR 16-006 can be used for highway segments on US26/US97

The seasonal adjustment factors were calculated following the process outlined in the APM, as summarized in Appendix 1. The recommended seasonal adjustment factors using the On-site ATR method are summarized in Table 4.

Table 4: On-Site ATR Method Seasonal Adjustment Method

ATR Station	Weekly Traffic Trend	Seasonal Adjustment Factor	Roadway Applied To
ATR 16-002	Weekday	1.19	US26/US97
ATR 16-006	Weekday	1.27	US26

Seasonal Trend Table Method

The Seasonal Trend Table Method uses average values from the ATR Characteristic Table for each seasonal traffic trend. Based on a review of the ATRs located near Madras, the Summer seasonal traffic trend value will be used to derive seasonally adjusted volumes at the study intersections on OR361. Additional information related to the seasonal adjustment factors developed for these study intersections is provided in *Appendix 2*

The seasonal adjustment factors applied to all study intersections are summarized in Table 5.

Table 5: Seasonal Adjustment Applied to Study Intersection

ID	East-West Name	North-South Name	Seasonal Adjustment Factor
1	NW Cherry Lane	US26	1.27
2	NW Depot St	US 26	1.27
3	Jefferson Street	US97	1.19
4	US97 Bus/4th	US97/US26/5th St	1.19
5	D St	US97/US26/4th St	1.19
6	D St	US97/US26/5th St	1.19
7	J St	OR361	1.18
8	Fairgrounds Rd	OR361	1.18
9	Fairgrounds Rd	US97/US26	1.19
10	Hall Rd	US97/US26	1.19

STUDY SEGMENTS

ODOT conducted tube counts at the segment locations identified in Table 6. These tube counts will be used to conduct two-lane highway capacity analysis using HCM 2010 methodologies. The tube counts did not contain vehicle classification information and therefore cannot be used to calculate the percentage of heavy vehicles using the roadways.

Table 6: Study Segments (48-Hour Tube Count Locations)

ID Number	Roadway Name
1	NW Alder St West of NW Canal St
2	NW Alder St and NW Mill St
3	NW Birch Ln and NW Alder St
4	NW Mill and NW Cherry Lane
5	S Adams Dr and SW Hall Rd
6	SE J St and SE 10th St
7	SE J St and SE McTaggart Rd
8	NE Oak St and NE 7th
9	NE B St and SE City View
10	NE Oak St and NE 16 St
11	NE Oak St and NE 12 St
12	SE Kinkade Rd and SE E St
13	SE Kinkade Rd and NE B St
14	SE Kinkade Rd and SE Grizzly Rd
15	NE Loucks Rd West of NE Jask St
16	NE Loucks Rd and NE Lakeside Dr

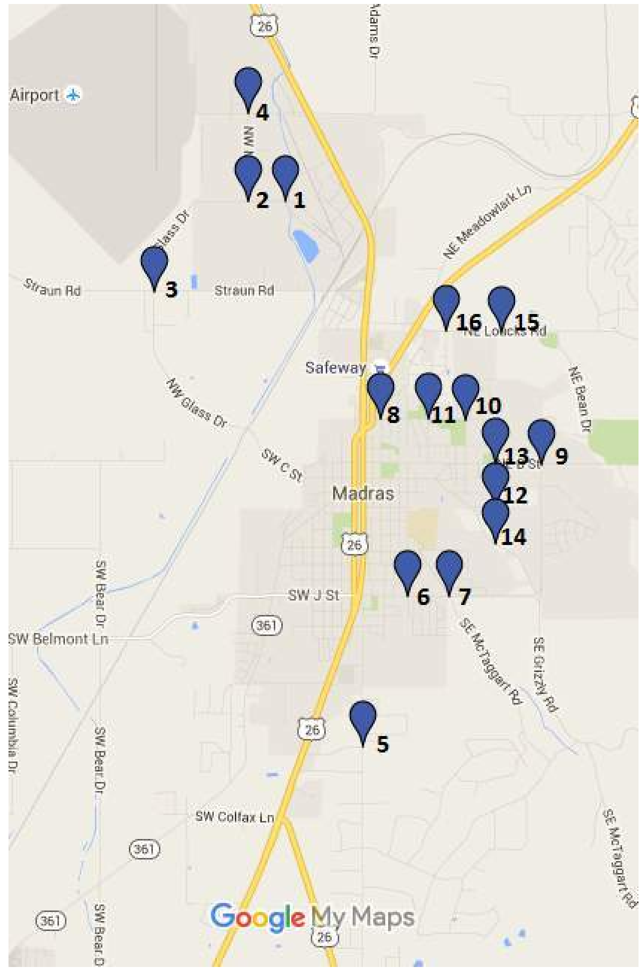


Figure 3: Tube Count Locations

ANALYSIS MODEL PARAMETERS

The bullets below identify the proposed sources of data and methodologies to be used to analyze traffic conditions in Madras. Analyses of all state facilities will be conducted according to the most-recent version of the APM, unless otherwise agreed upon by both ODOT's Transportation Planning and Analysis Unit (TPAU) and the consultant team.

1. *Intersection/Roadway Geometry* (lane numbers and arrangements, cross-section elements, signal phasing, etc.) will be verified for consistency with previous work efforts, reviewed through aerial photography, and confirmed through a site visit. Available as-built data may also be used to verify existing roadway geometry. The analysis models will be built on scaled roadway line work from GIS or aerial photography in Synchro analysis software.

2. *Operational Data* (such as posted speeds, intersection control, parking, right-turn on red, etc.) will be field verified. Data will be reviewed during a site visit and supplemented by available GIS data, aerials, photos, and the ODOT Video Log.

3. *Peak Hour Factors* (PHF) will be calculated for each intersection and applied to the existing conditions analyses. PHFs of 0.95 will be used for the future analysis for high-order facilities (arterials), with 0.90 applied to medium-order facilities (collectors) and 0.85 applied to local roads. If the existing PHF is greater than these default future values, the existing PHF will be applied.

4. Traffic Operations
   a. The 2010 Highway Capacity Manual (HCM) methodology shall be used for intersection analyses of the design hour conditions. The existing and future no-build analysis will utilize Synchro software for all study intersections. Roundabouts (if applicable) will be analyzed using HCM 2010 analysis methods. Level-of-service, delay, and volume-to-capacity ratios will be reported at each of the study intersections regardless of roadway jurisdiction.

   b. Queuing analysis methodology will be based on Synchro 95th percentile queue lengths as appropriate; ODOT's two-way stop-controlled intersection calculator tool will be used to estimate queue lengths for two-way stop-controlled intersections. Microsimulation is not proposed as part of the long-range planning effort.

TRAFFIC ANALYSIS SOFTWARE AND INPUT ASSUMPTIONS

Synchro 9 software will be used for the intersection analysis. The reported results will be the level of service, intersection delay, v/c ratios, and 95th percentile queue lengths generated by the HCM report. ODOT provided the signal timing parameters for the three signalized intersections. Analysis assumptions are listed in Table 7.

Table 7. Operations Parameters/Assumptions

Arterial Intersection Parameters	Existing Conditions
Peak Hour Factor	From traffic counts
Conflicting Bikes and Pedestrian per Hour	From traffic counts, as available
Ideal Saturation Flow Rate (for all movements)	1,750 passenger cars per hour green per lane
Lane Width	12 feet unless field observations suggest otherwise
Percent Heavy Vehicles	From traffic counts by movement, as available
Bus Blockages	None
95th percentile vehicle queues	Synchro HCM summary output

CRASH ANALYSES

The most recent five years (2009 through 2013) of crash data will be reviewed at the study intersections and study segments (where tube count data was collected). Any intersections or roadway segments that are identified as a Safety Priority Index System (SPIS) site will be included in the crash data. The data will be analyzed for a variety of factors to include type, severity, general conditions, and location to identify potential crash patterns or anomalies. Additional details will be provided on countywide crash trends and any issues that are identified through the overall review at the City, corridor/segment, and intersection level, and will include specific details on fatalities and crashes involving pedestrians and bicyclists.

Intersection crash rates will be calculated and compared to statewide crash rate performance thresholds to determine which segments or intersections have crash rates higher than similar facilities. Highway Safety Manual methodologies will be used as applicable to identify a safety performance threshold. Crash patterns and potential countermeasures/safety improvements will be identified and presented based on the applied criteria.

FORECAST YEAR VOLUME DEVELOPMENT

We developed 20-year growth factors using ODOT's historical trends method, which relies on traffic volumes from previous years to develop a growth pattern for use in projected future volumes. ODOT maintains Future Volumes Tables that summarize current and future year traffic volumes for state roadways throughout the State. To calculate the growth rate for Madras, all Madras locations were selected from the Future Volumes Tables. Based on guidance from ODOT's Analysis Procedures Manual (APM), data with an R-squared value (RSQ, a measure of fit) of less than 0.75 was not used. The growth rates of the remaining locations were averaged to develop an annual growth rate of 1.28%. We propose to use 1.30% to project future traffic volumes at all study intersections and segments. Table 8 shows the ODOT Future Volumes Table.

CONCEPT AREA ANALYSIS

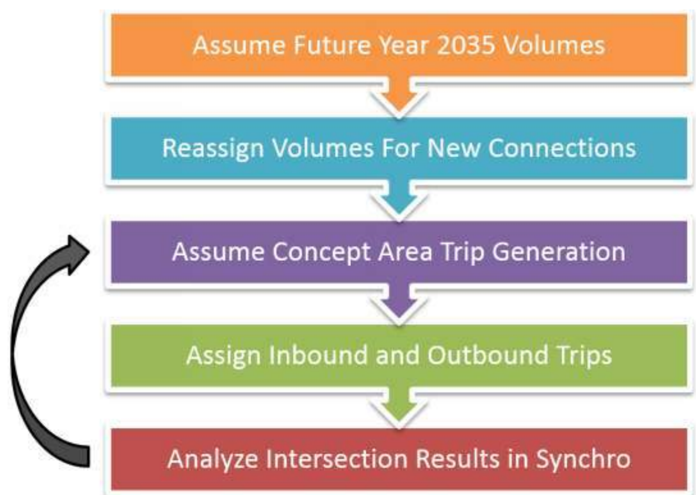
There are three concept areas within the City of Madras that were identified by the project management team with input from the TSP advisory committees. These concept areas have the potential to attract development and are expected to grow at a faster rate compared to the rest of Madras. The three concept areas are the North Industrial, East Madras, and South Madras concept areas. As these concept areas develop, intersection capacity upgrades and additional highway access points may be required to adequately serve concept area trips.

A trip-sensitivity analysis will be conducted at typical access points along the highways serving the concept area to determine the need for and timing of 1) improvements to existing connections and 2) additional access points that will need to be constructed based on concept area trip thresholds. The trip-sensitivity analysis will be conducted by gradually increasing the assumed trip generation of the concept area, and analyzing the operations of the resultant traffic volumes with analysis procedures consistent with the existing conditions analysis (HCM 2000 procedures, with Synchro 9 software package). The need for traffic mitigation for each movement will be identified based on delay, LOS and v/c ratio results. Figure 4 summarizes the analysis procedures of the trip-sensitivity analysis.

The following are some of the assumptions of the trip-sensitivity analysis:

1. Future Year 2035 traffic volumes is assumed as the base conditions for the analysis
2. At locations where there is a planned new connection (i.e. Hall Road extension in the South Madras concept area identified by the project team), the future year traffic volumes will be adjusted to accommodate the new connection.
3. The proportion of trip origin of trips entering and trip destinations of trips leaving the concept areas will be based on turning movement volumes at the existing connection.
4. An equal proportion of in-bound and out-bound trips is assumed.

Figure 4: Analysis Procedures of Trip-Sensitivity Analysis



NON-AUTOMOBILE TRANSPORTATION ANALYSIS

Per the scope, the non-automobile transportation analysis will include a review of collector and arterial roadways to identify deficiencies (availability of sidewalks and bicycle lanes, and gaps in primary routes) based on available GIS data and online mapping.

Quantitative and qualitative analysis of primary non-motorized transportation on collector and arterial roadways will include:

1. Bicycle Level of Traffic Stress as per Agency's *Analysis Procedure Manual v2*
2. Qualitative (multimodal) Assessment for pedestrian and transit modes per Agency's *Analysis Procedure Manual v2*.
3. A qualitative assessment of transit service and identification of underserved areas.
4. Gaps in intermodal connectivity.

NEXT STEPS

Please review the information presented in this memorandum and let us know if you have any questions, comments, or alternative direction. We will separately scope the concept area and TRIP97 analysis approaches when the appropriate advisory groups have been formed.

We look forward to working with you as the TSP Update process moves forward.

Table 8: ODOT Future Volume Table

*RSQ = R-squared value, which describes the fit of the data to a line.
** Rows highlighted in grey = RSQ > 0.75

HWY	MP	Description	2011	2012	2033	RSQ	Calculated Growth Rate
004	91.43	0.03 mile south of N.E. Loucks Road	6200		7700	0.7348	1.10%
004	91.98	0.10 mile north of Warm Springs Highway (US26)	7200		9800	0.9482	1.64%
004	92.13	0.02 mile north of Pine Street	8400		8500	0.3828	0.05%
004	92.44	0.02 mile north of Culver Highway	11900		12000	0.0207	0.04%
004	92.76	0.02 mile north of "G" Street	10500		10600	0.0002	0.04%
004	93.06	0.02 mile south of "J" Street	9900		12300	0.8394	1.10%
004	92.12	0.02 mile north of Pine Street	9800		11600	0.3054	0.83%
004	92.43	0.02 mile north of Culver Highway	12000		14000	0.8101	0.76%
004	92.47	0.02 mile south of Culver Highway	10500		13400	0.8099	1.26%
004	92.73	0.02 mile north of "G" Street	10900		11000	0.0254	0.04%
004	93.06	0.02 mile south of "J" Street	8900		11800	0.7652	1.48%
004	96.46	0.02 mile north of S.W. Fairgrounds Road	17700		23500	0.9150	1.49%
004	97.11	Madras Automatic Traffic Recorder, Sta. 16-002, 0.18 mile north of Madras-Prineville Highway No. 360 (US26)	12200		12500	0.7037	0.11%
004	97.31	0.02 mile south of Madras-Prineville Highway (US26)	9300		13900	0.3994	2.25%
053	115.86	0.05 mile southeast of N.W. Cherry Lane		8100	10300	0.5505	1.29%
053	116.42	0.02 mile southeast of N.W. Earl Street		10800	11400	0.0453	0.26%
053	117.10	0.02 mile north of N.E. Jefferson Street		11800	12300	0.0481	0.20%
053	117.15	0.02 mile north of N.E. Lee Street		11400	11500	0.0145	0.04%
053	117.69	0.02 mile north of The Dalles-California Highway (US97)		12000	12300	0.0020	0.12%
						Average Growth Rate:	1.28%

Appendix 1 ATR Summary Information

ODOT ATR 16-002, US97/US26, THE DALLES-CALIFORNIA HIGHWAY, 0.18 MILE NORTH OF MADRAS-PRINEVILLE HIGHWAY												
Year	15-Jan	15-Feb	15-Mar	15-Apr	15-May	15-Jun	15-Jul	15-Aug	15-Sep	15-Oct	15-Nov	15-Dec
2013	78	86	91	97	103	111	116	116	108	99	92	85
2012	77	86	89	96	104	112	117	116	108	99	91	83
2011	82	84	92	96	102	112	118	116	108	99	90	91
2010	80	88	94	97	103	112	119	117	109	99	87	85
2009	79	85	90	97	105	113	118	117	108	98	90	86
Average	79.0	85.7	91.0	96.7	103.3	112.0	117.7	116.3	108.0	99.0	90.3	85.3
Count Adj.	**1.49**	**1.37**	**1.29**	**1.22**	**1.14**	**1.05**	**1.00**	**1.01**	**1.09**	**1.19**	**1.30**	**1.38**

Peak month
Min/Max removed from average

ODOT ATR 16-006, US26, WARM SPRINGS HIGHWAY, 4.54 MILES NORTHWEST OF THE DALLES-CALIFORNIA HIGHWAY												
Year	15-Jan	15-Feb	15-Mar	15-Apr	15-May	15-Jun	15-Jul	15-Aug	15-Sep	15-Oct	15-Nov	15-Dec
2013	73	79	84	88	99	106	115	116	105	94	91	80
2012	71	82	80	88	100	107	116	118	107	92	84	77
2011	76	77	84	84	95	107	119	115	106	94	84	88
2010	74	82	87	86	95	107	118	118	107	92	80	82
2009	73	79	83	87	101	109	118	117	103	89	84	85
Average	73.3	80.0	83.7	87.0	98.0	107.0	117.3	117.0	106.0	92.7	84.0	82.3
Count Adj.	**1.60**	**1.47**	**1.40**	**1.35**	**1.20**	**1.10**	**1.00**	**1.00**	**1.11**	**1.27**	**1.40**	**1.43**

Peak month
Min/Max removed from average

Appendix 2 Seasonal Trend Background

2015 SEASONAL TREND TABLE (Printed: 09/30/15)

TREND	1-Jan	15-Jan	1-Feb	15-Feb	1-Mar	15-Mar	1-Apr	15-Apr	1-May	15-May	1-Jun	15-Jun	1-Jul	15-Jul	1-Aug	15-Aug	1-Sep	15-Sep	1-Oct	15-Oct	1-Nov	15-Nov	1-Dec	15-Dec	Peak Period Seasonal Factor
INTERSTATE URBANIZED	1.0354	1.0413	1.0201	0.9989	0.9830	0.9672	0.9579	0.9486	0.9527	0.9567	0.9381	0.9195	0.9220	0.9266	0.9215	0.9164	0.9352	0.9539	0.9565	0.9589	0.9775	0.9960	1.0119	1.0277	0.9140
INTERSTATE NONURBANIZED	1.2439	1.3049	1.2574	1.2100	1.1401	1.0701	1.0599	1.0496	1.0241	0.9986	0.9501	0.9016	0.8748	0.8438	0.8431	0.8425	0.8920	0.9416	0.9820	1.0224	1.0449	1.0675	1.1177	1.1679	0.8390
COMMUTER	1.0496	1.0551	1.0313	1.0074	0.9956	0.9838	0.9651	0.9465	0.9434	0.9403	0.9495	0.9586	0.9409	0.9239	0.9194	0.9149	0.9276	0.9402	0.9425	0.9446	0.9731	1.0016	1.0239	1.0463	0.9136
COASTAL DESTINATION	1.2026	1.2084	1.1729	1.1374	1.1039	1.0705	1.0686	1.0668	1.0441	1.0214	0.9840	0.9465	0.8933	0.8286	0.8273	0.8260	0.8771	0.9283	0.9852	1.0421	1.0991	1.1560	1.1766	1.1972	0.8225
COASTAL DESTINATION ROUTE	1.4607	1.4921	1.4221	1.3521	1.2817	1.2114	1.2020	1.1926	1.1319	1.0712	1.0110	0.9509	0.8643	0.7555	0.7552	0.7549	0.8330	0.9111	1.0208	1.1305	1.2110	1.2915	1.3498	1.4080	0.7466
AGRICULTURE	1.2495	1.2659	1.2218	1.1778	1.1386	1.0994	1.0579	1.0165	0.9771	0.9378	0.9092	0.8807	0.8642	0.8445	0.8412	0.8380	0.8419	0.8459	0.8791	0.9123	0.9800	1.0477	1.1405	1.2332	0.8293
RECREATIONAL SUMMER	1.7234	1.7892	1.7314	1.6737	1.5620	1.4504	1.3916	1.3329	1.1751	1.0174	0.9368	0.8563	0.7953	0.7218	0.7327	0.7436	0.8027	0.8618	0.9653	1.0688	1.2301	1.3915	1.5047	1.6180	0.7218
RECREATIONAL SUMMER WINTER	1.1753	1.2460	1.2580	1.2699	1.2940	1.3182	1.4411	1.5640	1.5262	1.4884	1.2854	1.0826	0.9657	0.8120	0.8456	0.8793	1.0312	1.1831	1.4133	1.6219	1.7084	1.7733	1.4489	1.1245	0.8120
RECREATIONAL WINTER	0.9698	0.9363	0.9427	0.9491	0.9747	1.0002	1.2456	1.4910	1.8800	2.2689	1.9669	1.6650	1.4562	1.1365	1.1639	1.1912	1.3347	1.4782	1.7869	2.0956	2.4558	2.8160	1.9444	1.0729	0.7253
SUMMER	1.2080	1.2355	1.1988	1.1622	1.1230	1.0838	1.0548	1.0258	0.9932	0.9607	0.9257	0.8907	0.8658	0.8350	0.8379	0.8407	0.8779	0.9152	0.9494	0.9836	1.0382	1.0929	1.1341	1.1753	0.8335
SUMMER < 2500	1.2981	1.3274	1.2867	1.2461	1.1836	1.1211	1.0715	1.0218	0.9712	0.9206	0.8897	0.8588	0.8385	0.8142	0.8233	0.8324	0.8482	0.8639	0.9022	0.9405	1.0159	1.0913	1.1759	1.2606	0.8131

***Seasonal Trend Table factors are based on previous year ATR data. The table is updated yearly.**
***Grey shading indicates months were seasonal factor is greater than 30%**

	1-Jan	15-Jan	1-Feb	15-Feb	1-Mar	15-Mar	1-Apr	15-Apr	1-May	15-May	1-Jun	15-Jun	1-Jul	15-Jul	1-Aug	15-Aug	1-Sep	15-Sep	1-Oct	15-Oct	1-Nov	15-Nov	1-Dec	15-Dec
Adjustment Factor	1.45	1.48	1.44	1.39	1.35	1.30	1.27	1.23	1.19	1.15	1.11	1.07	1.04	1.00	1.01	1.01	1.05	1.10	1.14	$\boxed{1.18}$	1.25	1.31	1.36	1.41

Appendix 5: Existing Conditions Review

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Final Technical Memorandum

Madras Transportation System Plan Update

Existing Conditions Analysis

Date:	May 13, 2016	Project #: 18351
To:	Nick Snead, Community Development Director Jeff Hurd, Public Works Director Michael Duncan, Region 4 Planner	
From:	Matt Kittelson, PE & Yi-Min Ha, EI	

This memorandum inventories and evaluates the existing City of Madras land use/transportation system. The majority of the inventory and analysis results are presented in figures and tables, with supplemental text provided to explain the illustrated information. The information is organized into the following sections:

Study Area 2
Land Use and Population 4
Street System and Traffic Analysis 9
Historic Crash Analysis 26
Pedestrian System 33
Bicycle System 35
Public Transportation System 40
Truck Freight Routes 40
Rail System 40
Air Transportation System 43
InterModal Connections....................43
Bridge Conditions 43
Marine Transportation System 44
Pipeline transportation system 44
Conclusion 45
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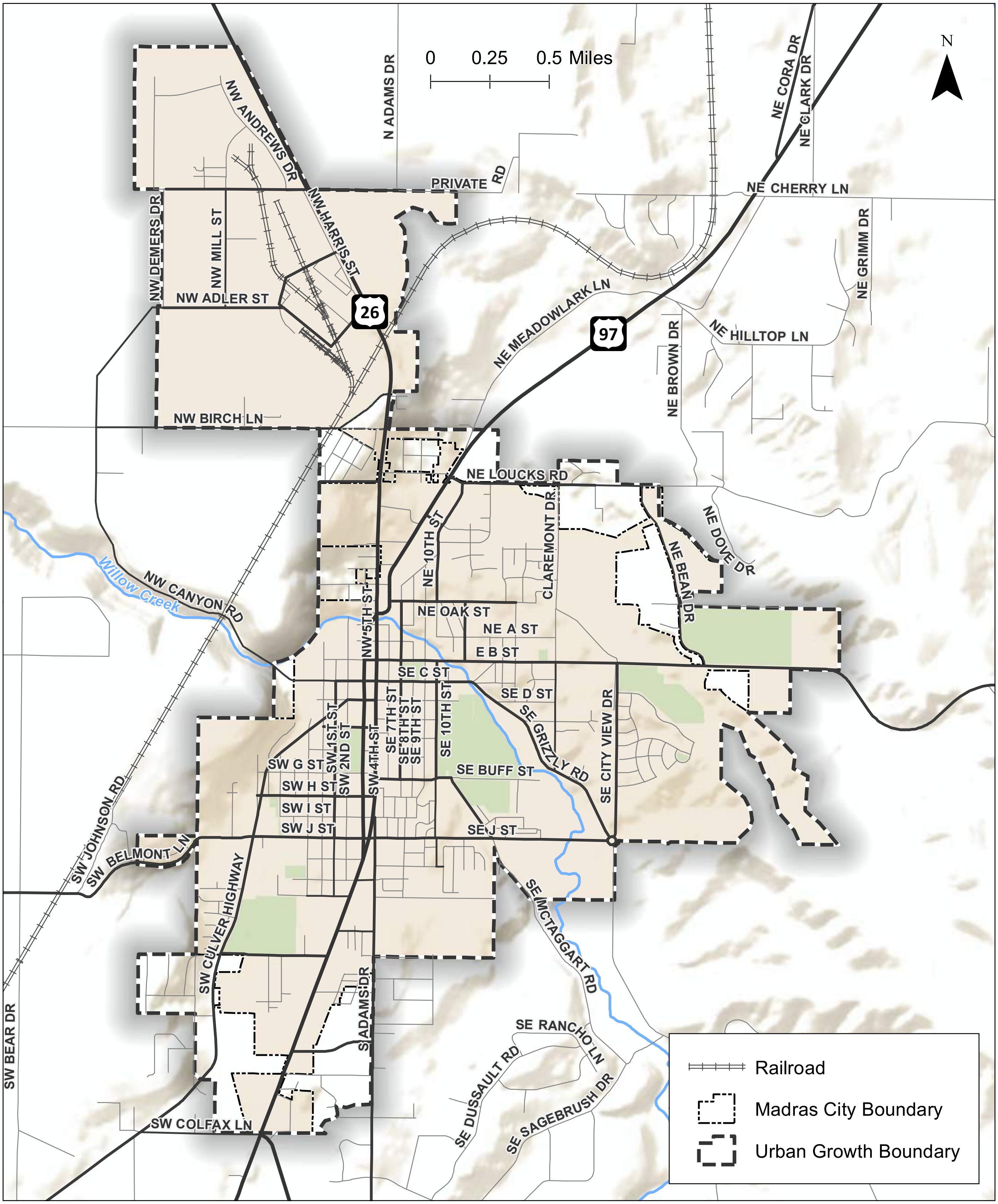
STUDY AREA

The City of Madras Transportation System Plan (TSP) study area includes the City, as well as the area within the City's Urban Growth Boundary, and adjacent areas that are currently developing or that have a strong potential to develop within the 20-year planning period. The study area is shown in Figure 1. Ten study intersections and sixteen roadway segments will be evaluated operationally during the study. These intersections and segments are summarized in Table 1.

Table 1: Study Intersections and Segments

ID Number	East-West Name	North-South Name	Notes
Intersections			
1	NW Cherry Lane	US 26	Offset intersection, four approach legs
2	NW Depot Street	US 26	Four approach legs
3	Jefferson Street	US 97	Four approach legs
4	6th Street	US 97/US 26	Four approach legs
5	D Street	US 97/US 26/4th Street	Four approach legs, one-way southbound
6	D Street	US 97/US 26/5th Street	Four approach legs, one-way northbound
7	J Street	OR 361	Four approach legs
8	Fairgrounds Road	OR 361	Offset intersection, four approach legs
9	Fairgrounds Road	US 97/US 26	Four approach legs, driveway on westbound approach
10	Hall Road	US 97/US 26	Three approach legs
Roadway Segments			
1	NW Alder Street, West of NW Canal Street		Undivided two lane roadway
2	NW Alder Street & NW Mill Street		Undivided two lane roadway on all approaches
3	NW Birch Lane & NW Alder Street		Undivided two lane roadway on all approaches
4	NW Mill & NW Cherry Lane		Undivided two lane roadway on all approaches
5	S Adams Drive & SW Hall Road		Undivided two lane roadway on all approaches
6	SE J Street & SE 10th Street		Undivided two lane roadway with left turn lanes on J St, undivided two lane roadway on SE 10th St
7	SE J Street & SE McTaggart Road		Undivided two lane roadway on all approaches, left turn lane on westbound J Street
8	NE Oak Street & NE 7th Street		Undivided two lane roadway on all approaches
9	NE B Street & SE City View		Undivided two lane roadway with left turn lanes on B St, undivided two lane roadway on SE City View
10	NE Oak Street & NE 16th Street		Undivided two lane roadway on all approaches
11	NE Oak Street & NE 12th Street		Undivided two lane roadway on all approaches
12	SE Kinkade Road & SE E Street		Undivided two lane roadway on all approaches
13	SE Kinkade Road & NE B Street		Undivided two lane roadway on all approaches, two way left turn lane on eastbound B Street.
14	SE Kinkade Road & SE Grizzly Road		Undivided two lane roadway on Grizzly Rd, two-way dirt road on southbound Kinkade Rd
15	NE Loucks Road, West of NE Jask Street		Undivided two lane roadway
16	NE Loucks Road & NE Lakeside Drive		Undivided two lane roadway on all approaches



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Study Area
Madras, Oregon

Figure
1

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: The City of Madras

LAND USE AND POPULATION

The land use and population inventory identifies existing land uses and relevant population projections. The land use and population inventory will inform existing and future conditions analyses, particularly as the project team works with the community to develop future alternative scenarios that address existing deficiencies and capture the City's vision for an enhanced circulation network.

The City's land use zoning plan is shown in Figure 2.

Key activity centers and destinations within the City include:

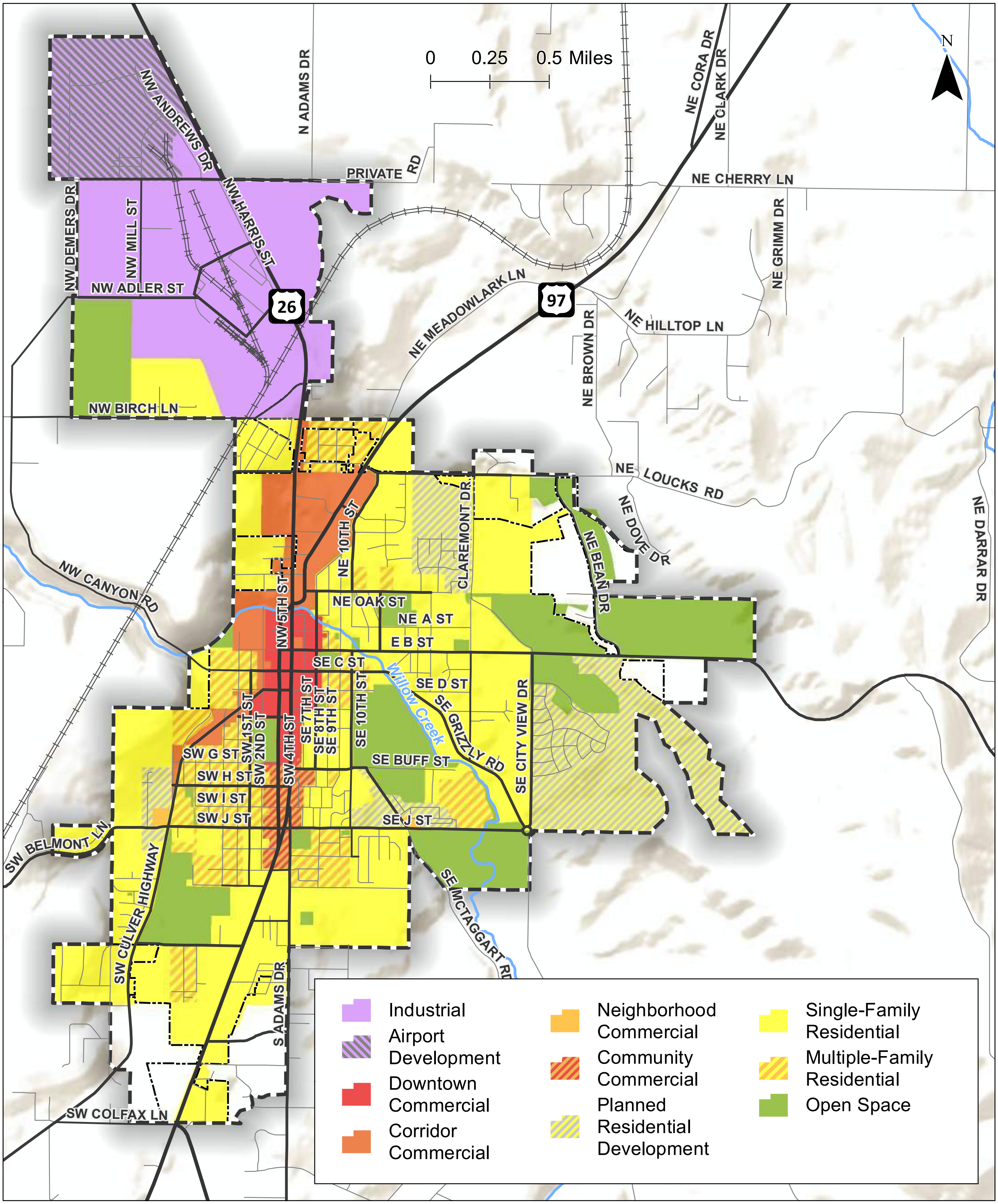
- Area schools (Madras High School, Jefferson County Middle School, Buff Intermediate School, and Madras Primary School.
- Madras City Hall, Jefferson County Courthouse, and Jefferson County-Madras Chamber of Commerce
- Jefferson County Library
- St. Charles Medical Center
- Madras Industrial Area along Highway 26
- Inn at the Cross Keys & Safeway
- Harriman Building & Great Earth (4^{th} and C Street)
- Jefferson Square & Madras Shopping Center (Highway 97 & Bard Lane)
- Jefferson County Fairgrounds (Highway 97 & Fairgrounds Road)

Priority Development Areas

The City of Madras is a growing community with several active development areas and projects. The list below summarizes key subareas of the City that have active or future development potential. Also listed are future development areas or projects that could influence future travel demand in Madras.

- Subareas
    - Madras Airport/Industrial Area
    - Northern Y Development Area
    - South 97 Development Area

Figure 3 shows the activity centers within the Madras UGB.



Zoning
Madras, Oregon

Figure
2

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Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: The City of Madras

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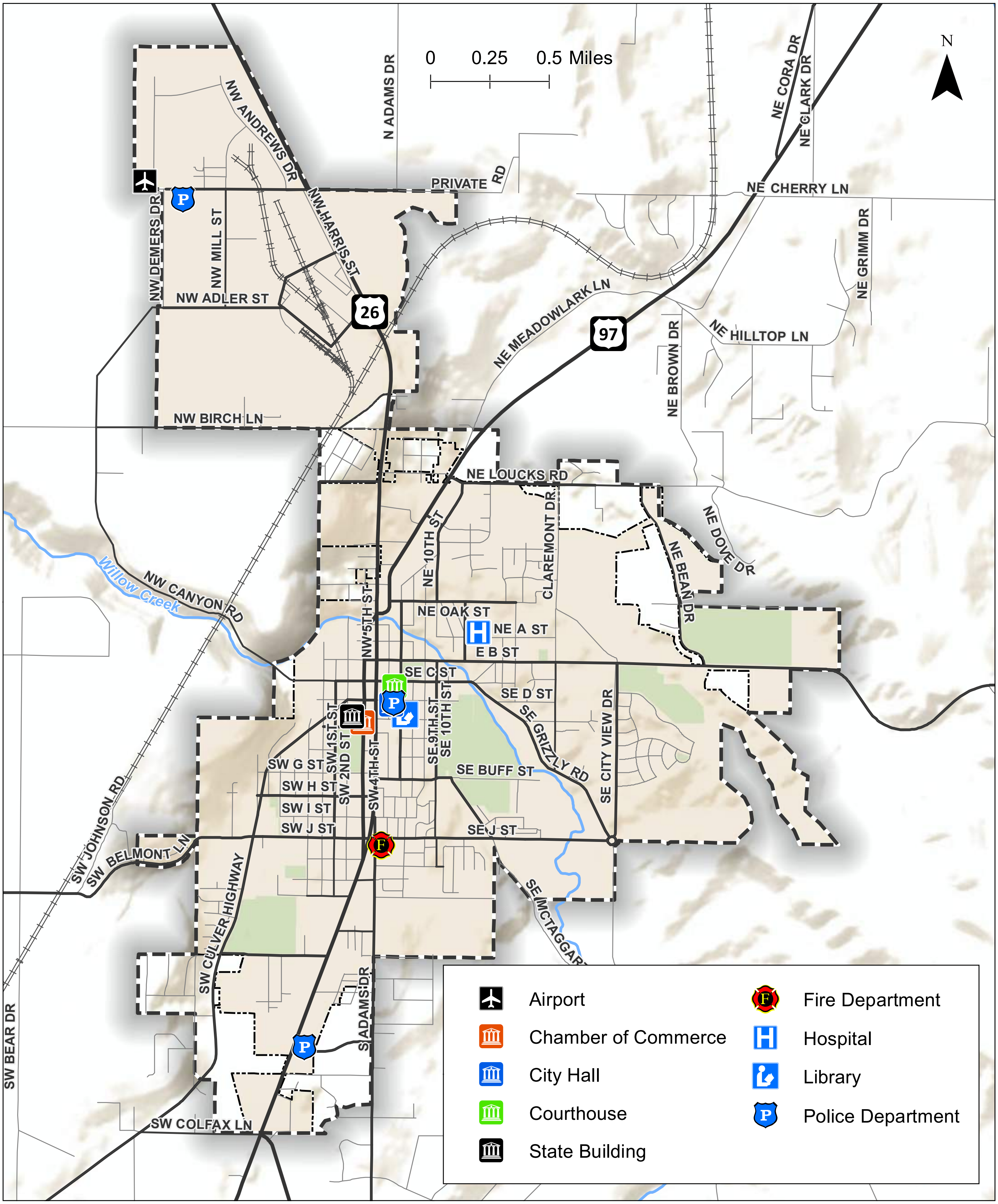

Activity Centers
Madras, Oregon

Figure 3

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Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: The City of Madras

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Population Inventory

According to the Population Research Center at Portland State University (PSU), the 2015 population estimate of the Madras Urban Growth Boundary (UGB) is 7,484 people, which is approximately 33% of Jefferson County's population. The Madras UGB is projected to be the fastest growing region of the county between 2015 through 2020, and is projected to account for the majority of population growth in Jefferson County. Table 2 through Table 5 show the projected population growth. Figure 4 shows the comparison growth rate of all UGBs in Jefferson County.

Table 2: Jefferson County Projected Population

Population	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065
Jefferson County	22,806	24,161	25,669	26,935	27,973	28,961	29,869	30,785	31,735	32,723	33,779
Culver UGB	1,407	1,506	1,731	1,901	2,035	2,171	2,303	2,434	2,564	2,693	2,824
Madras UGB	**7,484**	**8,070**	**8,700**	**9,268**	**9,815**	**10,356**	**10,867**	**11,358**	**11,832**	**12,294**	**12,749**
Metolius UGB	724	734	776	824	869	913	954	994	1,031	1,067	1,102
Outside UGBs	13,191	13,850	14,461	14,942	15,254	15,521	15,744	16,000	16,308	16,668	17,104

Table 3: Jefferson County Projected Population Growth

Population Growth (Annual)	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065
Jefferson County	-	1.16%	1.22%	0.97%	0.76%	0.70%	0.62%	0.61%	0.61%	0.62%	0.64%
Culver UGB	-	1.38%	2.82%	1.89%	1.37%	1.30%	1.19%	1.11%	1.04%	0.99%	0.95%
Madras UGB	**-**	**1.52%**	**1.51%**	**1.27%**	**1.15%**	**1.08%**	**0.97%**	**0.89%**	**0.82%**	**0.77%**	**0.73%**
Metolius UGB	-	0.26%	1.13%	1.19%	1.07%	1.00%	0.89%	0.81%	0.74%	0.69%	0.65%
Outside UGBs	-	0.98%	0.87%	0.66%	0.41%	0.35%	0.29%	0.32%	0.38%	0.44%	0.52%

Table 4: Percent Projected Population of County

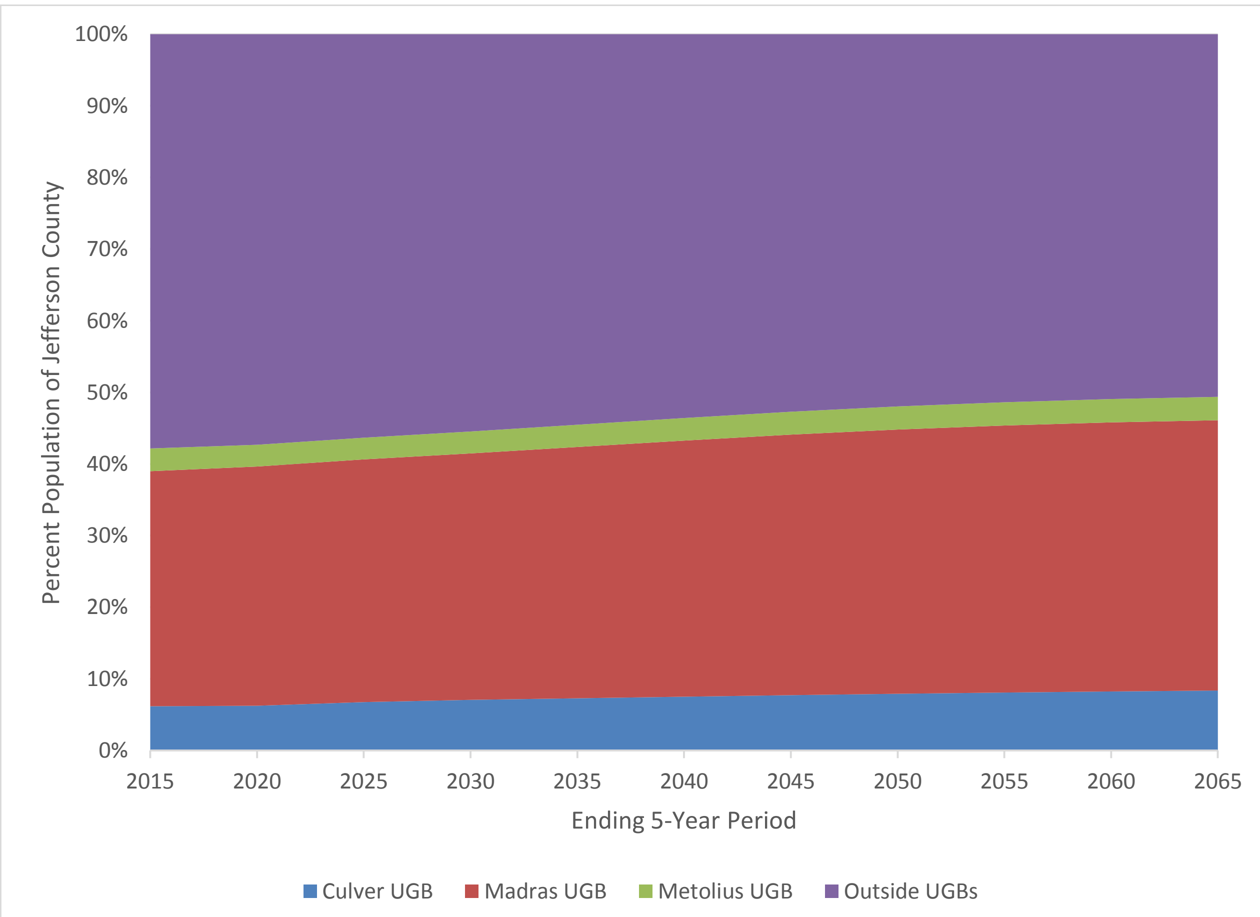
Percent Population of County	2015	2020	2025	2030	-2035	2040	2045	2050	2055	2060	2065
Culver UGB	6%	6%	7%	7%	7%	7%	8%	8%	8%	8%	8%
Madras UGB	**33%**	**33%**	**34%**	**34%**	**35%**	**36%**	**36%**	**37%**	**37%**	**38%**	**38%**
Metolius UGB	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Outside UGBs	58%	57%	56%	55%	55%	54%	53%	52%	51%	51%	51%

Table 5: Percent Projected Growth of County

Percent Growth of County	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065
Culver UGB	-	7%	15%	13%	13%	14%	15%	14%	14%	13%	12%
Madras UGB	**-**	**43%**	**42%**	**45%**	**53%**	**55%**	**56%**	**54%**	**50%**	**47%**	**43%**
Metolius UGB	-	1%	3%	4%	4%	4%	5%	4%	4%	4%	3%
Outside UGBs	-	49%	41%	38%	30%	27%	25%	28%	32%	36%	41%

Note: 2015-2065 populations are projections.
Source: Population Research Center, PSU (https://www.pdx.edu/prc/region-1-documents)

Figure 4: Comparison of Population in Jefferson County



STREET SYSTEM AND TRAFFIC ANALYSIS

Three state roadways and a network of local roads serve the City of Madras. Primary roadway facilities, their characteristics, and existing operational performance are summarized below.

Street System Overview

All major roadways within the Madras UGB fall under the jurisdiction of the state (ODOT), county (Jefferson) or the City of Madras. The following sections describe the characteristics of these roadways.

State Roadways

The state facilities within the City of Madras provide district, statewide, and regional connectivity. These facilities include US Highway 26 (OR 53), US Highway 97 (OR 4), and Oregon Highway 361. OR 361 provides access to Metolius and Culver, US 26 provides access to Warm Springs and the Portland Metro Area, and US 97 provides a continuous connection to US 20 and a link between Bend and Madras.

County Roadways

The County has jurisdiction over 4.5 miles of roadway within the project area. All county roads within the Madras UGB are paved. These roadways include Ashwood Road (CR 111), Adams Drive (CR 148), Grizzly Road (CR 109), McTaggart Road (CR 152), Loucks Road (CR 110), Bean Drive (CR 136), and Glass Drive (CR 157).

City of Madras Roadways

There are currently 18 miles of roads under City ownership and control – 14 miles paved, 2 miles graded and drained, and less than a mile is unimproved but open for travel. The paved streets consists of 2.7 miles of paved roadways are asphalt concrete, whereas the other 11.5 miles are surfaced with an oil mat. Nearly all streets were built on native material without sufficient base to support heavy truck loading. The streets vary in width from 34 feet to 54 feet.

Street System Characteristics

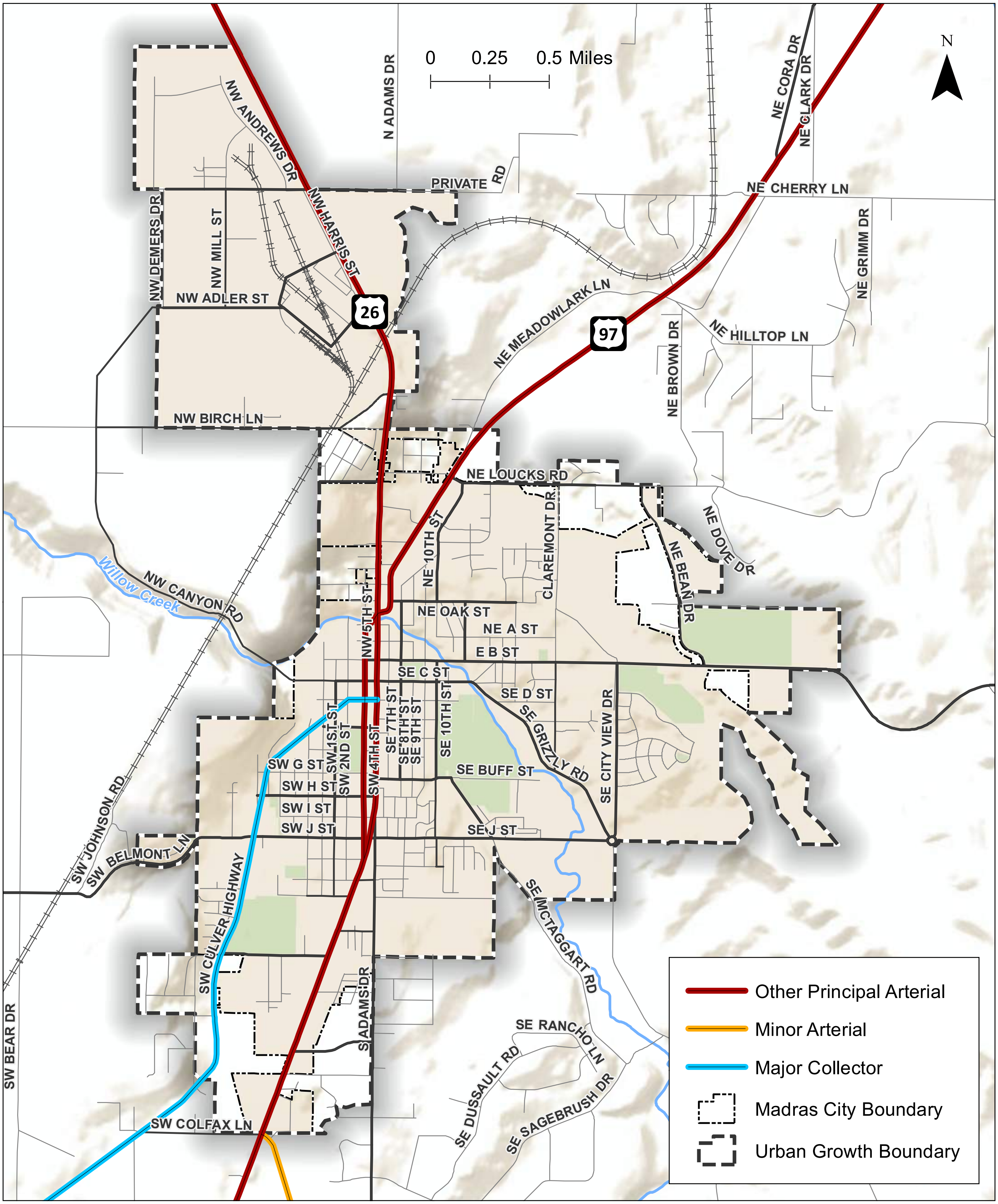
Functional classification levels for roadways are used to establish a hierarchy of roadways based on their primary function – moving people across regions or providing access to local destinations. These classification levels are identified by ODOT for state facilities, the County for County facilities, and local agencies for their own classification levels within their community. The classification levels also determine the recommended roadway cross-section for different facilities. This section describes the function classification standards set by the state, county and the City of Madras.

State Facilities

Figure 5 shows the ODOT Highway Plan functional classification for state facilities in Madras. Table 6 summarizes the roadway characteristics of each of these facilities, including posted speed limit, number of lanes, and current pavement condition. Because the local cities are bisected by state highways that are classified as minor arterials, the highways must balance carrying through traffic and accommodating access to local destinations.

Table 6: State Functional Classification

Route Name	Facility Extents	ODOT Facility Designation	ODOT Functional Classification	Posted Speed Limit (mph)	Number of Lanes	Pavement Condition
US 26	Entire Section within City Limits	Statewide Highway	Other Rural Principal Arterial	35/45/50	2/3	Fair
US 97	Entire Section within City Limits	Statewide Highway	Other Rural Principal Arterial	25/30/35/45	2/3	Fair to Poor
OR 361	West of 5th S/US 97/US 26	District Highway	Rural Major Collector	25/35/45/50	2	Fair



ODOT Functional Roadway Classifications
Madras, Oregon

Figure
5

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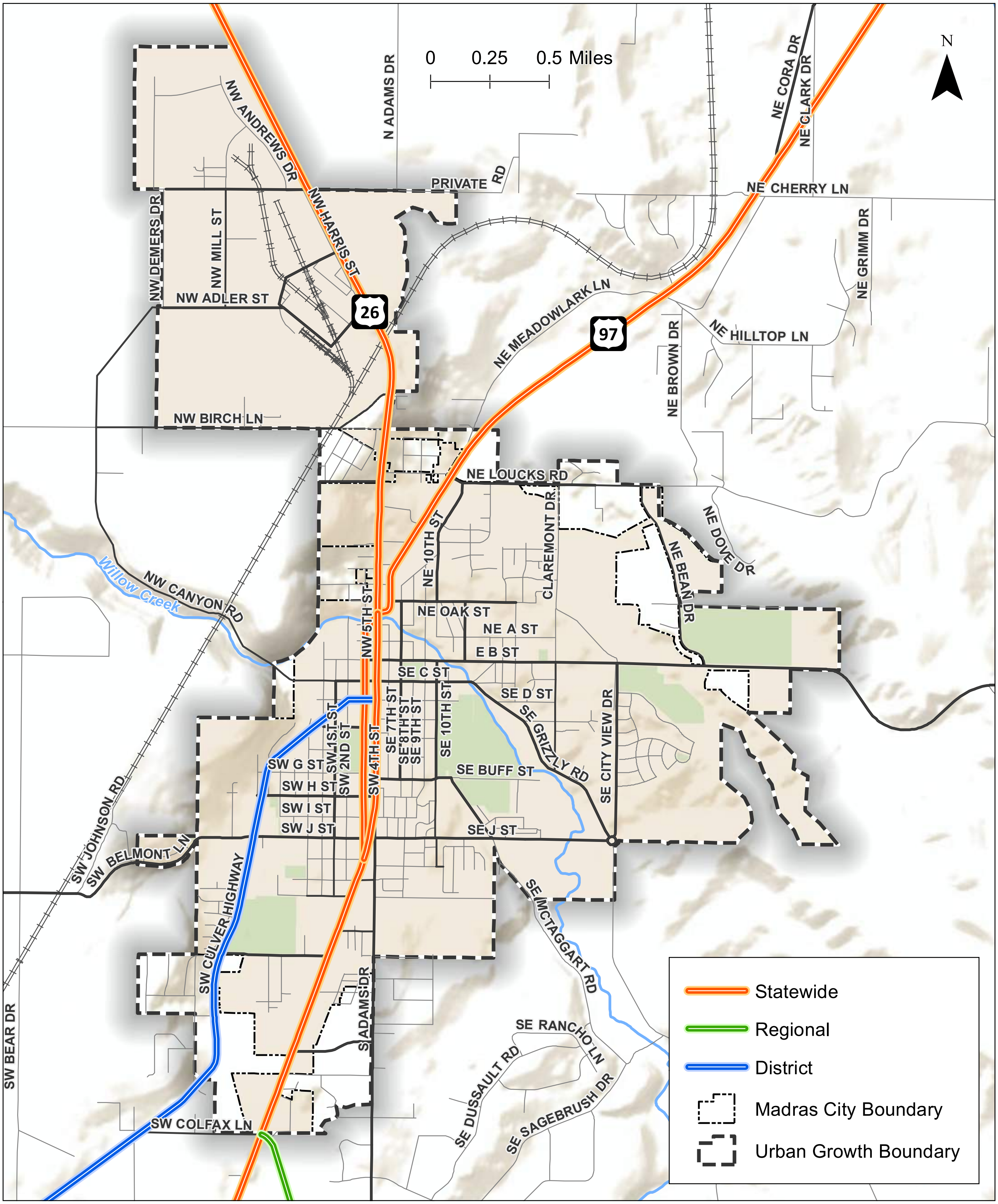
Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Oregon Department of Transportation, The City of Madras



OHP Classifications Madras, Oregon

Figure 6

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Oregon Department of Transportation

County Facilities

Jefferson County classifies roads as either Arterials, Major Collectors, Minor Collectors or Local Roads based on their functional role in the county's transportation system. In general, the functional classifications reflects the roadway's varying degree of its two primary functions – regional mobility and local accessibility. Table 7 describes the functional classifications adopted by Jefferson County and the typical ADT range expected on these facilities.

Table 7: Jefferson County Functional Classification

Functional Classification	Description	Typical ADT Range
Arterial	Arterials are the highest class of road. Their primary function is to carry high levels of regional through vehicular traffic at high speeds, serve interstate movement of freight, and emphasize traffic movement over local land access. Arterials are characterized by full access control, with access limited to interchanges and widely spaced access points. Arterials may have medians. Pedestrian and bicycle traffic is discouraged or prohibited.	5,500 – 7,500
Major Collector	Major collectors are the intermediate road class, carrying lower traffic volumes at slower speeds than arterials. Their primary function is to collect traffic from the local street system and distribute it to the arterial street system. Major collectors provide some access to adjacent properties, but where possible should provide extended continuous stretches of road to facilitate traffic circulation.	2,500 – 6,000
Minor Collector	The primary function of a minor collector is to connect traffic to arterials and major collectors. Minor collectors have slower speeds than major collectors and arterials, and may provide more local land access.	500 – 2,500
Local Road	Local roads are the lowest road class. Their primary function is to provide direct access to adjacent land. Local roads are characterized by low traffic volumes.	0 - 600

Source: Jefferson County Transportation System Plan (September 2007)

City of Madras Facilities

The City of Madras street system consists of five functional classifications: City Expressways, Arterials, Major Collectors, Minor Collectors, and Local Streets. This classification system is not exclusive to city owned roads, and apply to county and state roadways. The following are brief descriptions of the Madras functional classifications:

- **City Expressways** are intended to primarily serve truck traffic and automobile traffic traveling through the City of Madras Urban Growth Area. City Expressways will be access controlled, divided four-lane roadways with separated multi-use paths for pedestrian and bicycle traffic. Full-access points along City Expressways will be limited to designated Major Collector Street or higher classification facilities. All other access (i.e., Minor Collector, local street, and private roadways or driveways) to City Expressways will be limited to right-in/right-out access.

- **Arterials** are roadways that are primarily intended to serve traffic entering and leaving the urban area. Arterials tend to carry significant intra-urban travel between downtown areas and outlying residential areas. While arterials may provide access to adjacent land, that function is subordinate to the travel service provided to major traffic movements. Arterials are the longest-distance, highest-volume roadways within the UGB. Although focused on serving longer distance trips, pedestrian and/or bicycle activities are often associated with the arterial streetscape. Bike facilities are typically provided in the form of a "bike lane"

- **Major Collectors** link arterials with the local street system. As implied by their name, major collectors are intended to collect traffic from local streets and sometimes from direct land access, and channel it to arterial facilities. Major collectors are shorter than arterials and tend to have moderate speeds. Bike facilities are typically provided in the form of a "bike lane" along these roadways.

- **Minor Collectors** are a subset of collectors used to provide direct land access service and traffic circulation to local neighborhoods. These facilities tend to carry lower traffic volumes at slower speeds than major collectors. On-street parking is more prevalent and bike facilities may be provided in the form of a "bike lane" or shared with autos on the roadway.

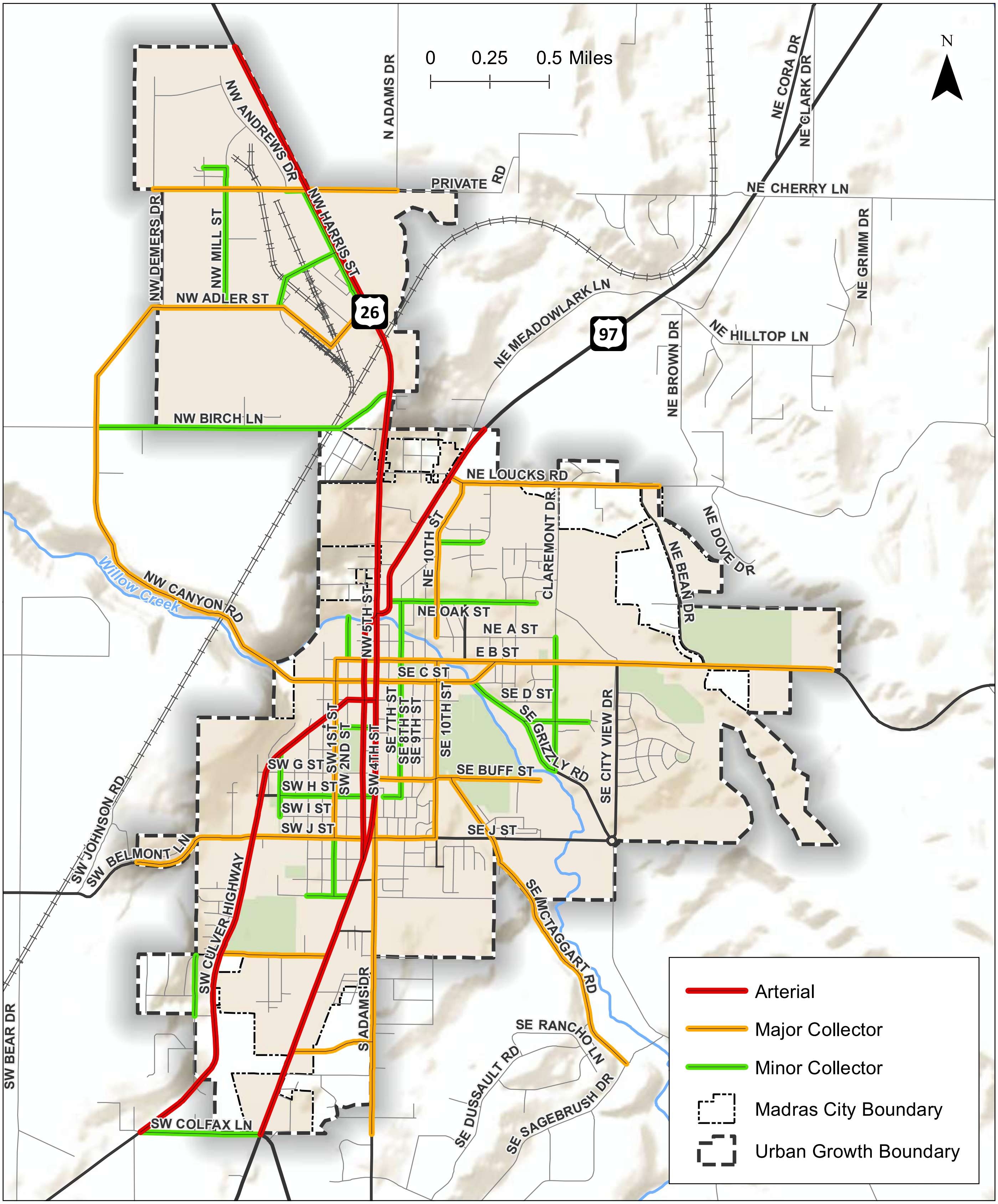
- **Local streets** are primarily intended to provide access to abutting land uses. Local street facilities offer the lowest level of mobility and consequently tend to be short, low-speed facilities. As such, local streets primarily serve passenger cars, pedestrians, and bicyclists; heavy truck traffic should be discouraged. On-street parking is common and sidewalks may be present depending on the volume of traffic on the local road and the density of residential land use and in commercial areas.

Table 8 summarizes the City's functional classifications standards. Figure 7 shows the existing City's functional classifications standards.

Table 8: Madras Functional Classification Standards

Functional Classification	Cross Section	Minimum ROW	Turn Lanes	Travel Lanes	Bike Lane	Sidewalks	On-Street Parking	Landscape Strip
City Expressway	4 lanes	98 feet	Yes[1]	12 feet	No[2]	No[2]	No	Yes
Arterial	2 lanes	80 feet	Optional[1]	12 feet	Yes	Yes	No	Optional
Major Collector	2 lanes	70 feet	Optional[1]	12 feet	Yes	Yes	No	Optional
Minor Collector	2 lanes	60 feet	No	12 feet	No	Yes	Optional	Optional
Local Road	2 lanes	54 feet	No	Not striped (32 feet paved width)	No	Optional	Optional	Optional

ROW = Right-of-way
[1] Minimum width = 14 feet
[2] Bicycle and pedestrian traffic are to be accommodated by a 12-foot multi-use path



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Madras Functional Roadway Classifications
Madras, Oregon

Figure
7

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Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Oregon Department of Transportation, The City of Madras

Access Spacing and Access Management

Providing adequate access to other public roadways, land uses, and destinations is a critical part of an effective transportation system. However, it is necessary to balance access with the need for mobility and safety on the system. Providing access via other public streets and driveways to land uses creates friction from a traffic operations and safety perspective thereby reducing mobility and introducing conflict points that increase the potential for crashes.

Access management measures and implementation require careful consideration to balance access and mobility in a safe and efficient manner. In general, access management is generally more stringent on higher classified roads where mobility is the highest priority.

State Facilities

ODOT specifies access management spacing standards for the state facilities in the Oregon Highway Plan (OHP, Reference 1) and OAR 734-051-4020(8). The corresponding access management spacing standards for state facilities within the Madras UGB are summarized in Table 9. These standards are based on the 2014 AADT (Annual Average Daily Traffic volume), posted speed limit, proximity to urban areas, and functional classification.

Table 9: ODOT Access Management Spacing Standards for Highway Segments

Route Name	Facility Extents	Facility Designation	2012 ADT	Posted Speed Limit (mph)	Access Spacing Standard (feet)
US 26	Entire Section within City Limits	Statewide Highway	>5,000	35/45/50	500/800/1100
US 97	Entire Section within City Limits	Statewide Highway	>5,000	25/30/35/45	350/500/500/800
OR 361	West of 5th S/US 97/US 26	District Highway	<5,000	25/35/45/50	150/250/360/425

AADT = Average Annual Daily Traffic
MPH = miles per hour
Source: Oregon Highway Plan, Appendix C Revisions to Address Senate Bill 264 (2011) Table 13

City of Madras Facilities

The City of Madras has established its own access management spacing standards for all roadway facilities within the city, except for US 26, US 97, and OR 361. These roadways are classified as City Expressway, and should comply with ODOT Access Management Spacing Standards in Table 9. Table 10 show the minimum intersection spacing standards for the Madras Functional Classification.

Table 10: Madras Minimum Intersection Spacing Standards

Functional Classifications	Public Street (feet)[1]	Private Access Drive (feet) [1]
City Expressway	Full-Access shall only be provided at the following locations[2]: US 97, US 26, "C" Street-Canyon Road, "J" Street, Fairgrounds Road, OR 361 and US 26-97 South Junction	No access shall be allowed to properties with alternative access. Properties without alternative access, will be allowed temporary right-in/right-out approaches.[3]
Arterial	600	300[4]
Major Collector	300	100[4]
Minor Collector	200	50
Local	150	30

[1] Access spacing measured from centerline to centerline.

[2] All other public street access points shall be restricted to right-in/right-out access only through the installation of raised longitudinal medians.

[3] All private access roadways or driveways shall be restricted to right-in/right-out access only through the installation of raised longitudinal medians.

[4] Private access to arterials will not be allowed unless no reasonable alternative access exists for a parcel.

In cases where physical constraints or site characteristics limit the ability for the access spacing standards listed in Table 10, the City of Madras retains the right to grant an access spacing variance. County facilities within the Madras UGB should be planned and constructed with these street design standards.

Street System Traffic Analysis

The focus of this section is to report the existing traffic operations for study intersections and roadway segments identified for the TSP update. The sub-sections below present information on the traffic count data used in the evaluation, the analysis methodology applied, the operational standards used to assess the results, and the traffic operations results for the study intersections.

Analysis Methodology and Performance Standards

All operations analysis described in this report were performed in accordance with the procedures in the *2010 Highway Capacity Manual* (Reference 2) and the ODOT *Analysis Procedures Manual (APM)* (Reference 3) for signalized intersections. Additionally, queue lengths at two-way stop control intersections were computed using methodologies provided in Chapter 12 of the ODOT *Analysis Procedures Manual* (APM) (Reference 3).

Per the Methodology Memorandum (see Appendix A), intersection operational evaluations were conducted based on the peak 15-minute flow rate observations. Using the peak 15-minute flow rate ensures this analysis is based on a reasonable worst-case scenario. For this reason, the analysis reflects conditions that are likely to occur for 15 minutes out of each average weekday peak hour. The transportation system will likely operate under conditions better than those described in this report during other typical time periods. A peak hour factor (PHF) was applied to the observed hourly flow rate to obtain the peak 15-minute analysis flow rate. PHF was calculated for D Street & 4th Street and D Street & 5th Street. However, a system-wide PHF was applied to other study intersections based on the weighted average of the PHFs computed at 4th Street and 5th Street.

The operational results for study intersections and segments were compared with their corresponding mobility targets, summarized in Table 11 and Table 12, to assess performance and identify potential areas for improvement. ODOT operational targets are identified in the Oregon Highway Plan (OHP, Reference 1) and are summarized below for the state highways within the County.

Table 11: Volume to Capacity Ratio Targets for Peak Hour Operation Conditions

Route Name	Facility Extents	Facility Designation	Inside UGB			Outside UGB	
			Non-STAs where posted speed <= 35 mph	Non-STAs where speed > 35 mph but <45 mph	Where speed limit >= 45 mph	Unincorporated Communities	Rural Lands
US 26	Entire Section within City Limits	Statewide Highway (Freight Route)	0.85	0.80	0.80	0.70	0.70
US 97	Entire Section within City Limits	Statewide Highway (Freight Route)	0.85	0.80	0.80	0.70	0.70
OR 361	West of 5th S/US 97/US 26	District Highway	0.95	0.90	0.90	0.80	0.75

Source: OHP, Table 5, modified for relevance

Table 12: Existing Intersection Performance Standards

ID	Intersection Name	Jurisdiction	Type of Intersection Control [1]	Target Intersection v/c ratio [2]
1	NW Cherry Lane & US 26	ODOT	TWSC	0.80
2	NW Depot Street & US 26	ODOT	TWSC	0.80
3	Jefferson Street & US 97	ODOT	TWSC	0.80
4	6th Street & US 97/26	ODOT	Signal	0.85
5	D Street & US 97/US 26/4th Street	ODOT	Signal	0.85
6	D Street & US 97/US 26/5th Street	ODOT	Signal	0.85
7	J Street & OR 361	ODOT	TWSC	0.90
8	Fairgrounds Road & OR 361	ODOT	TWSC	0.90
9	Fairgrounds Road & US 97/US 26	ODOT	TWSC	0.85
10	Hall Road & US 97/US 26	ODOT	TWSC	0.80

[1] TWSC = Two-way stop-controlled intersection

[2] v/c = volume-to-capacity ratio

Traffic Volumes

The following sub-sections discuss the weekday peak hour traffic volume development and the seasonal adjustment factor used to adjust the 2014 traffic counts. Traffic count data is provided in Appendix B.

Roadway Segments

51 study segment areas were identified throughout the Madras UGB. Traffic volumes were collected for 48 hours in the fall of 2014. These traffic volumes were used to conduct capacity analysis to determine how the facility operates under peak hour conditions. No vehicle classification information was collected during these counts. Based on these counts, the hour with the highest traffic volume was identified as the peak hour for that facility. A capacity of 750 vehicles/lane was assumed on all roadway segments. Two-lane highway capacity analysis was conducted for each roadway segment based on peak hour traffic volumes. Table 13 summarizes the peak hour, traffic volumes, and volume-to-capacity ratio for each study segment. The peak hour analysis results reveals that all study segments currently operate below the roadway's capacity.

Table 13: Segment Analysis Results

Roadway	ADT from 2014 Traffic Counts	ADT from 2014 Traffic Counts	Seasonally-Adjusted Peak Hour Count	Critical Flow Rate	Calculated V/C Ratio
NW Alder Street, West of NW Canal Street - S Leg	853	3:15 PM - 4:15 PM	119	1,500	0.080
NW Alder Street, West of NW Canal Street - W Leg	673	3:15 PM - 4:15 PM	127	1,500	0.085
NW Alder Street & NW Mill Street - W Leg	531	3:15 PM - 4:15 PM	130	1,500	0.087
NW Alder Street & NW Mill Street - E Leg	656	3:30 PM - 4:30 PM	157	1,500	0.105
NW Alder Street & NW Mill Street - N Leg	609	3:30 PM - 4:30 PM	109	1,500	0.072
NW Birch Lane & NW Alder Street - N Leg	690	3:15 PM - 4:15 PM	153	1,500	0.102
NW Birch Lane & NW Alder Street - E Leg	306	3:15 PM - 4:15 PM	44	1,500	0.030
NW Birch Lane & NW Alder Street - S Leg	886	3:30 PM - 4:30 PM	172	1,500	0.115
NW Birch Lane & NW Alder Street - W Leg	235	5:15 PM - 6:15 PM	32	1,500	0.022
NW Mill & NW Cherry Lane - N Leg	119	6:15 AM - 7:15 AM	20	1,500	0.013
NW Mill & NW Cherry Lane - E Leg	1011	3:30 PM - 4:30 PM	160	1,500	0.106
NW Mill & NW Cherry Lane - S Leg	639	3:30 PM - 4:30 PM	104	1,500	0.070
NW Mill & NW Cherry Lane - W Leg	559	3:15 PM - 4:15 PM	90	1,500	0.060
S Adams Drive & SW Hall Road - S Leg	1708	3:45 PM - 4:45 PM	201	1,500	0.134
S Adams Drive & SW Hall Road - N Leg	1432	4:15 PM - 5:15 PM	169	1,500	0.113
S Adams Drive & SW Hall Road - W Leg	699	3:30 PM - 4:30 PM	95	1,500	0.063
SE J Street & SE 10th Street - N Leg	210	12:00 PM - 1:00 PM	38	1,500	0.026
SE J Street & SE 10th Street - S Leg	566	5:30 PM - 6:30 PM	62	1,500	0.042
SE J Street & SE 10th Street - E Leg	2156	3:00 PM - 4:00 PM	255	1,500	0.170
SE J Street & SE 10th Street - W Leg	2671	5:30 PM - 6:30 PM	313	1,500	0.209
SE J Street & SE McTaggart Road - N Leg	1078	3:15 PM - 4:15 PM	202	1,500	0.135
SE J Street & SE McTaggart Road - S Leg	597	3:00 PM - 4:00 PM	76	1,500	0.050
SE J Street & SE McTaggart Road - E Leg	1375	3:00 PM - 4:00 PM	179	1,500	0.119
SE J Street & SE McTaggart Road - W Leg	1860	3:00 PM - 4:00 PM	238	1,500	0.158
NE Oak Street & NE 7th Street - W Leg	4134	3:15 PM - 4:15 PM	474	1,500	0.316
NE Oak Street & NE 7th Street - S Leg	2074	3:00 PM - 4:00 PM	293	1,500	0.195
NE Oak Street & NE 7th Street - N Leg	514	3:15 PM - 4:15 PM	74	1,500	0.050
NE B Street & SE City View - E Leg	1512	4:45 PM - 5:45 PM	229	1,500	0.153
NE B Street & SE City View - W Leg	2381	3:15 PM - 4:15 PM	266	1,500	0.178
NE Oak Street & NE 16th Street - S Leg	1047	7:15 AM - 8:15 AM	149	1,500	0.099
NE Oak Street & NE 16th Street - W Leg	668	7:30 AM - 8:30 AM	73	1,500	0.048
NE Oak Street & NE 16th Street - E Leg	458	4:45 PM - 5:45 PM	59	1,500	0.040
NE Oak Street & NE 12th Street - W Leg	1759	3:30 PM - 4:30 PM	186	1,500	0.124
NE Oak Street & NE 12th Street - S Leg	252	11:30 AM - 12:30 PM	34	1,500	0.023
NE Oak Street & NE 12th Street - E Leg	1511	4:15 PM - 5:15 PM	154	1,500	0.103
SE Kinkade Road & SE E Street - S Leg	95	4:00 PM - 5:00 PM	14	1,500	0.010
SE Kinkade Road & SE E Street - W Leg	200	2:30 PM - 3:30 PM	29	1,500	0.020
SE Kinkade Road & SE E Street - E Leg	135	2:30 PM - 3:30 PM	26	1,500	0.018
SE Kinkade Road & SE E Street - N Leg	97	1:45 PM - 2:45 PM	20	1,500	0.014
SE Kinkade Road & NE B Street - E Leg	1999	4:00 PM - 5:00 PM	292	1,500	0.194
SE Kinkade Road & NE B Street - S Leg	99	4:00 PM - 5:00 PM	16	1,500	0.011
SE Kinkade Road & NE B Street - W Leg	2037	4:00 PM - 5:00 PM	295	1,500	0.196
SE Kinkade Road & SE Grizzly Road - W Leg	415	3:00 PM - 4:00 PM	49	1,500	0.033
SE Kinkade Road & SE Grizzly Road - E Leg	82	6:30 PM - 7:30 PM	20	1,500	0.013
SE Kinkade Road & SE Grizzly Road - N Leg	439	4:45 PM - 5:45 PM	53	1,500	0.036
NE Loucks Road, West of NE Jask Street - W Leg	660	4:30 PM - 5:30 PM	74	1,500	0.050
NE Loucks Road, West of NE Jask Street - N Leg	79	11:30 AM - 12:30 PM	12	1,500	0.008
NE Loucks Road, West of NE Jask Street - E Leg	627	2:45 PM - 3:45 PM	71	1,500	0.047
NE Loucks Road & NE Lakeside Drive - E Leg	689	3:15 PM - 4:15 PM	79	1,500	0.052
NE Loucks Road & NE Lakeside Drive - S Leg	245	3:30 PM - 4:30 PM	34	1,500	0.022
NE Loucks Road & NE Lakeside Drive - W Leg	738	4:30 PM - 5:30 PM	88	1,500	0.058

Weekday Peak Hour Development for Intersections

Hourly weekday turning movement traffic counts were collected for all study intersections, except at 4th Street and 5th Street at D Street, between Tuesday, October 14, 2014 and Tuesday, October 28, 2014 during the hours of 6:00 AM to 10:00 PM. 24-hour turning movement traffic counts were collected at 15-minute intervals at 4th Street/D Street and 5th Street/D Street on Wednesday, February 6, 2013 and Thursday, February 7, 2013 respectively. Based on these counts, the system peak hour was observed to be between 4:00 to 5:00 PM. The weighted average peak hour factor (PHF) of D Street & 4th Street and D Street & 5th Street were used for the rest of the study intersections, since they were only intersections with counts conducted in 15-minute intervals. Traffic volumes were also adjusted to reflect seasonal fluctuation in traffic patterns as documented in the Methodology Memorandum. Figure 8 summarizes the existing seasonally adjusted peak hour traffic volumes and the peak hour time period for each intersection. Synchro analysis reports and queue length worksheets are provided in Appendix C. Signal timing sheets are provided in Appendix D.

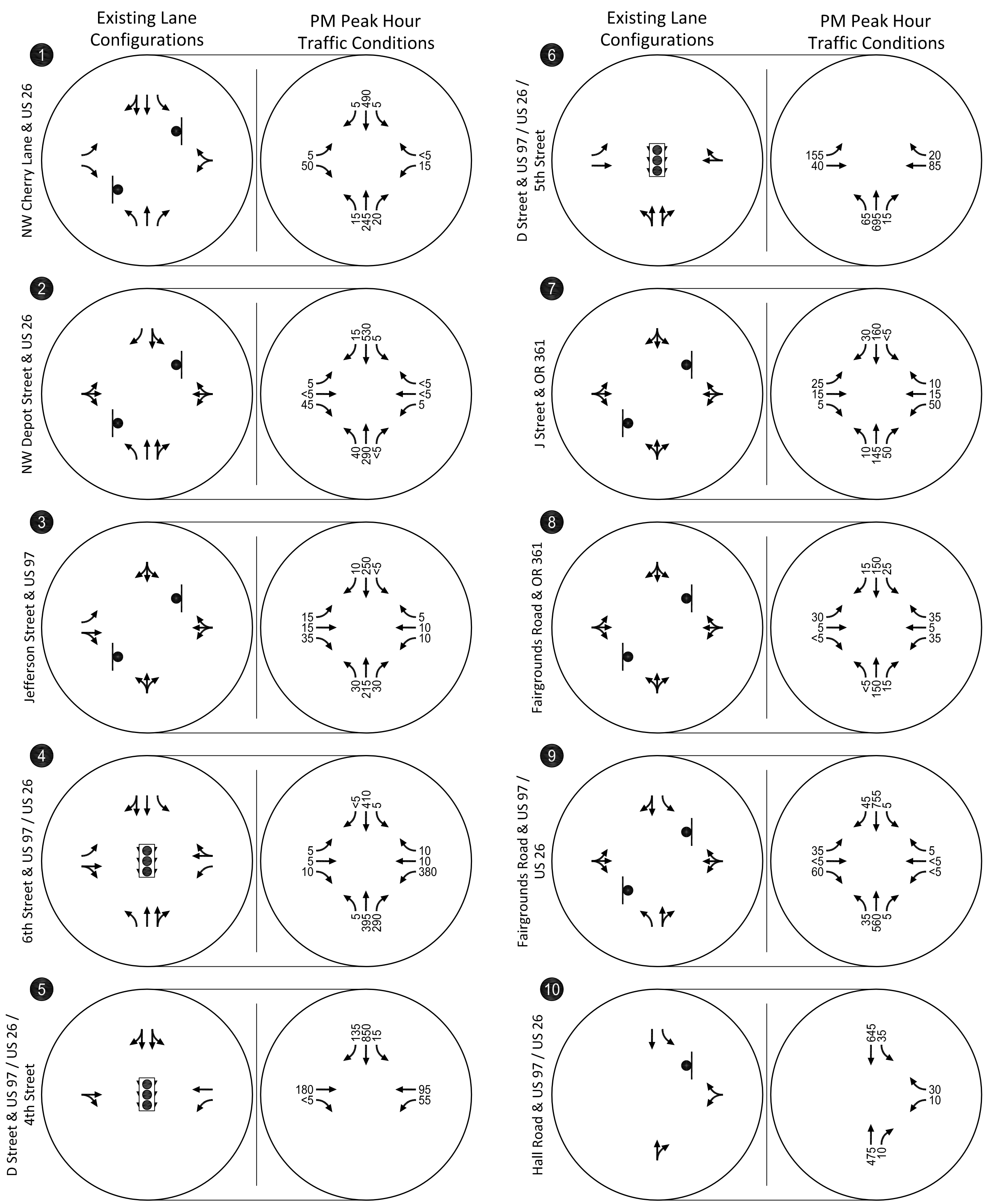
Intersection Traffic Operations Analysis Results

Level-of-service (LOS), volume-to-capacity (v/c) ratios, average delay, and 95th percentile queue lengths were calculated for each study intersection. The analysis was conducted using 2010 HCM methods with Synchro software. Table 14 summarizes the analysis results and if the corresponding operational targets for the study intersections are met. The 95th percentile queue lengths reflect the reasonable worst case queue length expected during the peak 15 minutes. As shown in the table, Fairgrounds Road & US 97/US 26 is currently operating at a v/c ratio approaching the ODOT performance target for the intersection. The ODOT performance target for this intersection is v/c ratio < 0.85. Additionally, Maple Street & US 97/US 26 has a 95th percentile westbound left-turn queue length that exceeds left-turn lane storage capacity. Figure 9 summarizes the existing intersection operations.

Table 14: Existing Conditions Intersection Operational Analysis Results

ID	Name	Critical Movement	v/c Ratio[1]	LOS	Delay (sec)	Critical Movement Queue Length (vehicles)	Performance Target Met
1	NW Cherry Lane & US 26	WBL	0.05	C	15.6	3	Yes
2	NW Depot Street & US 26	EBL	0.03	E	35.1	3	Yes
3	Jefferson Street & US 97	EBL	0.05	C	17.6	2	Yes
4	Maple Street & US 97/26	WBL	0.78	B	18.2	12	Yes
5	D Street & US 97/US 26/4th Street	WBL	0.71	B	15.8	3	Yes
6	D Street & US 97/US 26/5th Street	EBL	0.70	B	14.9	6	Yes
7	J Street & OR 361	EBL	0.10	B	12.3	3	Yes
8	Fairgrounds Road & OR 361	WBL	0.15	B	12.3	3	Yes
9	Fairgrounds Road & US 97/US 26	EBL	0.84	F	106.9	3	Yes
10	Hall Road & US 97/US 26	WBL	0.12	C	15.3	3	Yes

[1] *v/c = volume-to-capacity ratio*



Existing Lane Configurations and PM Peak Hour Traffic Conditions Madras, OR

Figure 8

Figure 9: Existing Traffic Conditions

Summary of Existing Traffic Conditions

Below is a summary of the major findings of the existing conditions operational analysis:

- Fairgrounds Road & US 97/US 26 currently operates at v/c ratio = 0.84, which is approaching the ODOT performance target for the intersection of v/c ratio < 0.85. The eastbound approach also operates at LOS F due to high traffic volumes, approximately 1,300 vehicles during the peak hour, on the mainline.
- Maple Street & US 97/US 26 is approaching the ODOT performance target and has a 95th percentile westbound left-turn queue length that exceeds left-turn lane storage capacity.
- All other study intersections operate within the ODOT performance target.
- The existing demand volume at all study segments is below the two-lane capacity of 750 vehicles/lane, with the highest v/c ratio = 0.361.

HISTORIC CRASH ANALYSIS

Reported crash data was analyzed at all study intersections in effort to identify patterns and trends that may indicate an opportunity to reduce crash potential. The data was obtained from ODOT for the five-year period from January 1, 2010 through December 31, 2014. The data includes information about crash location, type, weather, roadway surface conditions, traffic control, and vehicle information. A summary of reported crashes by study intersection is provided in Appendix E.

Figure 10 shows the crash frequency at the top 10 intersections with the highest crash frequency. Figure 11 illustrates the location of 255 reported crashes within the Madras UGB over the five-year study period. The figure classifies crashes by severity and indicates whether a pedestrian or bicyclist was involved. Crash severity is defined using KABCO injury-severity scale in the ODOT database. This scale was developed by the National Safety Council (NSC) and is frequently used by law enforcement for classifying injuries as:

- K – Fatal;
- A – Incapacitating injury;
- B – Non-incapacitating injury;
- C – Possible injury; and,
- O – No injury.

Table 15 summarizes the reported crashes during the 5-year analysis period from January 1, 2010 through December 31, 2014. During this period, there was 1 fatal crash. The crash occurred at 5th Street & D Street. A left-turning vehicle onto 5th Street collided with a pedestrian. The reported cause was careless driving and a failure to yield to the appropriate right-of-way.

Table 15: Summary of Crashes within the Madras UGB

Crash Severity	Frequency	%	Collision Type	Frequency	%
Property Damage Only	132	51.8%	Angle	64	25.1%
Injury C	80	31.4%	Rear-End	60	23.5%
Injury B	32	12.5%	Turning Movement	47	18.4%
Injury A	10	3.9%	Fixed-Object or Other-Object	40	15.7%
Fatal	1	0.4%	Sideswipe-overtaking	13	5.1%
Road Conditions	**Frequency**	**%**	Backing	8	3.1%
Dry	211	82.7%	Pedestrian	8	3.1%
Ice	18	7.1%	Non-collision	6	2.4%
Wet	18	7.1%	Miscellaneous	4	1.6%
Snow	8	3.1%	Sideswipe-meeting	4	1.6%
Light Conditions	**Frequency**	**%**	**Weather Conditions**	**Frequency**	**%**
Daylight	201	78.8%	Clear	195	76.5%
Darkness – no street lights	37	14.5%	Cloudy	30	11.8%
Darkness – with street lights	7	2.7%	Snow	13	5.1%
Dusk (Twilight)	6	2.4%	Rain	10	3.9%
Dawn (Twilight)	4	1.6%	Sleet	3	1.2%
Others	**Frequency**	**%**	Smoke	2	0.8%
Alcohol Involved	9	3.5%	Fog	1	0.4%
Drugs Involved	1	0.4%	Unknown	1	0.4%
Excessive Speed Involved	33	12.9%			
Hit and Run	7	2.7%			

Crash Frequency, Type and Severity

Analysis of crash patterns is focused at study intersections and intersections where the highest density of crashes exists. Table 16 summarizes the location, type, severity, and number of crashes that were reported at the study intersections. The following is a summary of key observations by locations:

- **US 26 & US 97/Maple Street**
  - This intersection has 10 reported crashes and has the highest number of reported crashes in the Madras UGB.
  - 60% of the reported crashes are rear-end crashes. The intersection is the first signalized intersection entering the city in the southbound direction along US 26.
- **US 97 between Fairgrounds Road and L Street**
  - US 97 & Fairgrounds Road has 10 reported crashes and has the highest number of reported crashes in the Madras UGB. There were a total of 20 crashes reported in the US 97 segment between Fairgrounds Road and L Street.
  - A total of 12 (39.3%) rear-end crashes were reported along this section of US 97. This section of US 97 has a high driveway density.
  - No reported pedestrian crashes in this area. However, there were 4 rear-end crashes reportedly to have involved pedestrians. A potentially large pedestrian generator is the Jefferson County Fairgrounds located west of the segment, along Fairgrounds Road. The surrounding land use consists of a mix of retail, restaurants and gas stations.
  - A pedestrian refuge island with an offset crosswalk was recently constructed in this area to improve pedestrian safety.
- **J Street between 4th Street and Adams Drive**
  - Angle and turning movement crashes consisted of 10 (58.8%) and 5 (29.4%) of the overall number of reported crashes at this location.
  - The ODOT led US 97: J Street (Madras South Y) Project is a recently completed project that extended the one-way couplet south of its currently location to L Street, to improve the intersection of US 97 and J Street. This project is expected to improve crash patterns at this location.
- **D Street at 4th and 5th Street**
  - There are 8 and 6 crashes reported on D Street at 4th Street and 5th Street respectively.
  - There were 2 pedestrian crashes reported – 1 fatal crash at 5th Street and 1 incapacitating injury crash at 4th Street. In both cases, the driver failed to yield to the right-of-way and collided with the pedestrian. There were also 5 (35.7%) rear-end crashes reported at this location.
- **B Street & 5th Street**
  - There were 8 crashes reported at this intersection, consisting of 5 angle crashes, and 3 other crashes.
  - 4 out of 5 of the reported angle crashes were reportedly caused by drivers disregarding the traffic signal display.

90th Percentile Crash Rate Comparisons

A method used to identify intersections with more crashes than should be expected is to compare the crash rate to the statewide 90th percentile rates for similar intersection types, as documented in Table 4-1 of the ODOT APM. The daily total entering vehicles used to determine the crash rate was based on the peak hour intersection turning movement counts, and K-factors calculated from tube counts. A system-wide K-factor of 9.95 was developed based on the weighted average of the 5 segments with the highest volumes, and applied to the turning movement volumes at the study intersections. Table 17 shows the comparison crash rates between the study intersections and the statewide 90th percentile rates.

The comparison shows that US 97 & Jefferson Street has a crash rate that is higher than the statewide average. There were 5 crashes reported – 2 angle crashes, 2 turning movement crashes and 1 rear-end crash. The reported causes were generally due to a failure of yielding to the appropriate right-of-way.

Table 16: Reported Crashes by Study Intersection (1/1/2010 to 12/31/2014)

ID	Intersection Name	Crash Type							Severity			Total
		Rear-End	Turning	Angle	Fixed-Object	Pedestrian / Bicycle	Sideswipe-meeting	Other	Fatal & Severe Injury (K+A)	Moderate & Minor Injury (B+C)	PDO* (O)	
1	NW Cherry Lane & US 26	1			1		1	3		2	4	6
2	NW Depot Street & US 26		1					3		2	2	4
3	Jefferson Street & US 97	1	2	2					1	2	2	5
4	6th Street & US 97/26	6	2					2	1	6	3	10
5	D Street & US 97/US 26/4th Street	1	2	2		1		2	2	3	3	8
6	D Street & US 97/US 26/5th Street	2	1			1		2	1	1	4	6
7	J Street & OR 361		2					1		1	2	3
8	Fairgrounds Road & OR 361	1	1							2		2
9	Fairgrounds Road & US 97/US 26	5	2	1	1	1			1	6	3	10
10	Hall Road & US 97/US 26				1						1	1

** PDO = Property Damage Only*

Table 17: 90th Percentile Crash Rate Comparison

ID	Intersection Name	AADT Entering Intersection*	Total Crashes	Urban Intersection Type	Intersection Crash Rate†	Statewide 90th Percentile Crash Rate	Exceeds Statewide 90th Percentile Crash Rate?
1	NW Cherry Lane & US 26	8,515	6	4-leg Stop	0.386	0.408	No
2	NW Depot Street & US 26	9,360	4	4-leg Stop	0.234	0.408	No
3	**Jefferson Street & US 97**	**6,273**	**5**	**4-leg Stop**	**0.437**	**0.408**	**Yes**
4	6th Street & US 97/26	15,402	10	4-leg Signal	0.356	0.860	No
5	D Street & US 97/US 26/4th Street	13,371	8	4-leg Signal	0.328	0.860	No
6	D Street & US 97/US 26/5th Street	10,838	6	4-leg Signal	0.303	0.860	No
7	J Street & OR 361	5,218	3	4-leg Stop	0.315	0.408	No
8	Fairgrounds Road & OR 361	4,283	2	4-leg Stop	0.256	0.408	No
9	Fairgrounds Road & US 97/US 26	15,181	10	4-leg Stop	0.361	0.408	No
10	Hall Road & US 97/US 26	12,125	1	3-leg Stop	0.045	0.293	No

** AADT calculated based on peak hour turning movement counts and assumed K-factor of 9.95. K-factor was calculated based on the weighted average of tube count data from the top 5 highest volume segments.*

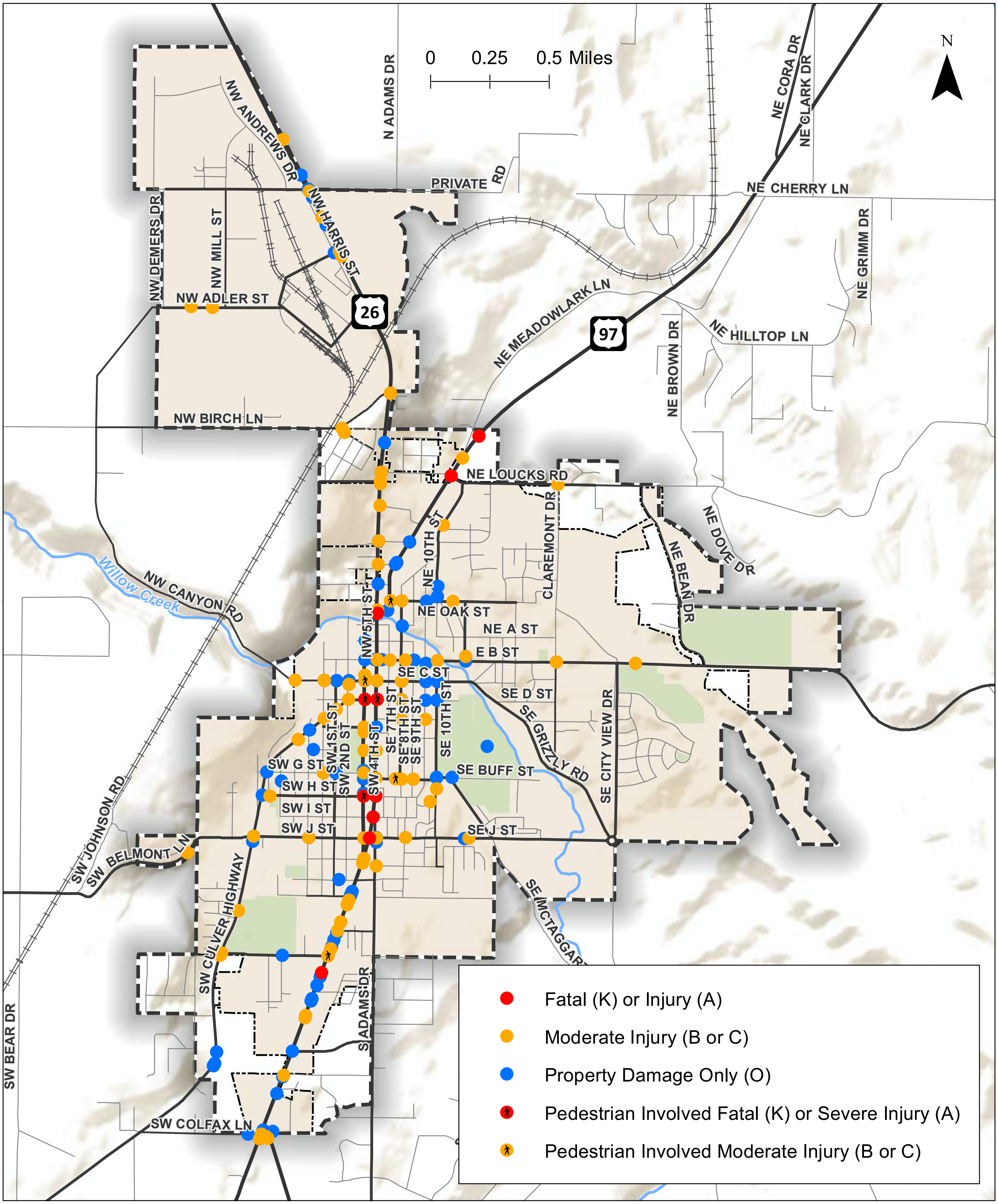
† Crash rates are reported as the number of crashes per million entering vehicles.

Critical Crash Rate Comparisons

A critical crash rate may be used to identify intersections that warrant further investigation and may represent opportunities to reduce crash frequency and severity. The critical crash rate establishes a threshold for comparison among intersections with similar number of approaches and similar traffic control. However, for this method to be statistically valid, there needs to be at least five to ten sites in each reference population. Volume data was not collected at a sufficient number of signalized intersection types. Therefore, the critical crash rate comparison was not conducted for this analysis.

Statewide Safety Priority Index System

The ODOT Statewide Safety Priority Index System (SPIS) identifies sites along state highways where safety issues warrant further investigation. The SPIS is a method developed by ODOT for identifying hazardous locations on state highways through consideration of crash frequency, crash rate, and crash severity. US 97 & Jefferson Street was identified as a SPIS site by ODOT within the 85^{th} to 90^{th} percentile range. The site is listed under the 2014 SPIS based on 2011 through 2013 crash data.



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Reported Crash History
April 7, 2010 to September 26, 2014
Madras, Oregon

Figure
10

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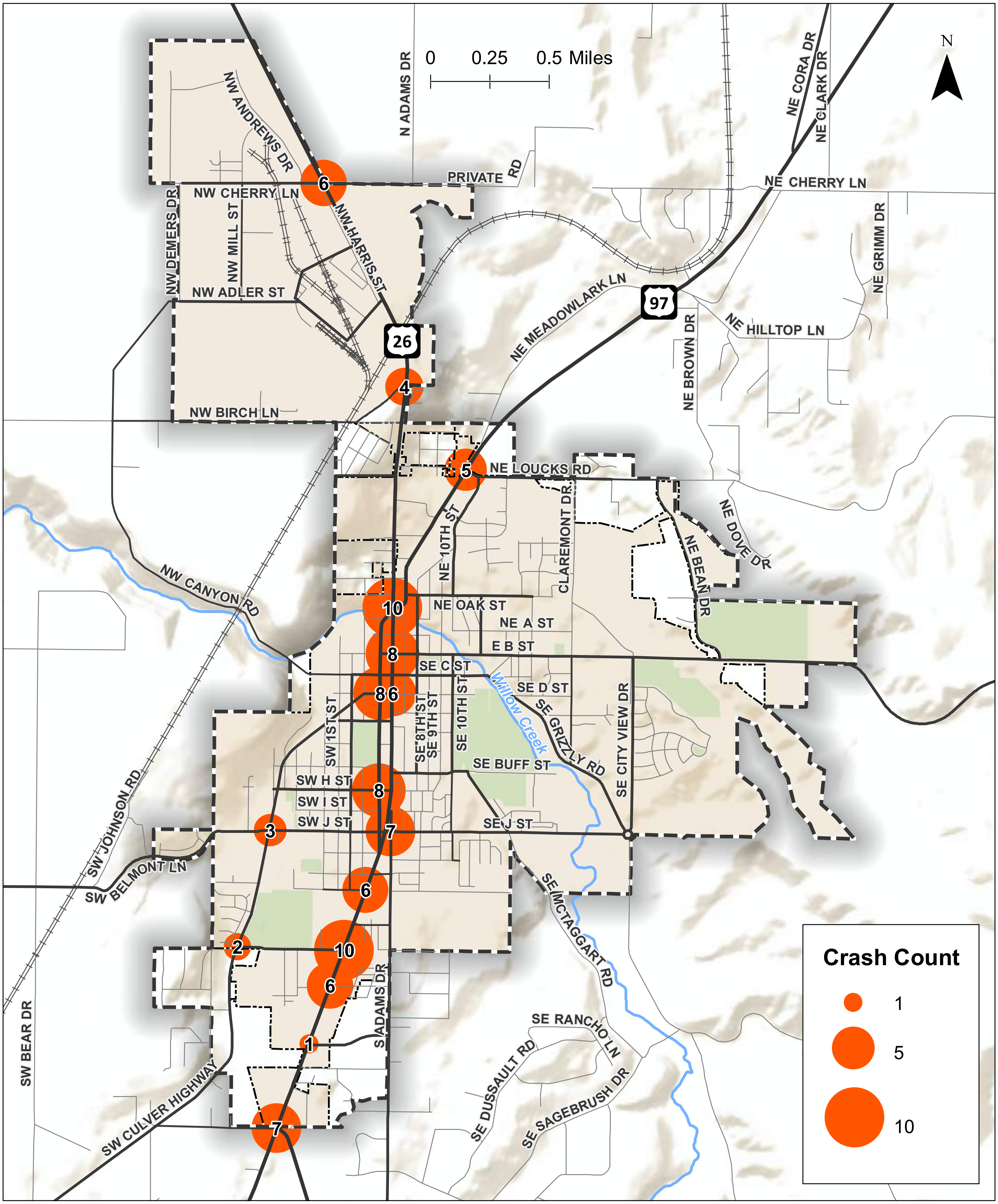
Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: The City of Madras



Crash Frequency by Study Intersection
Madras, Oregon

Figure
11

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Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: The City of Madras

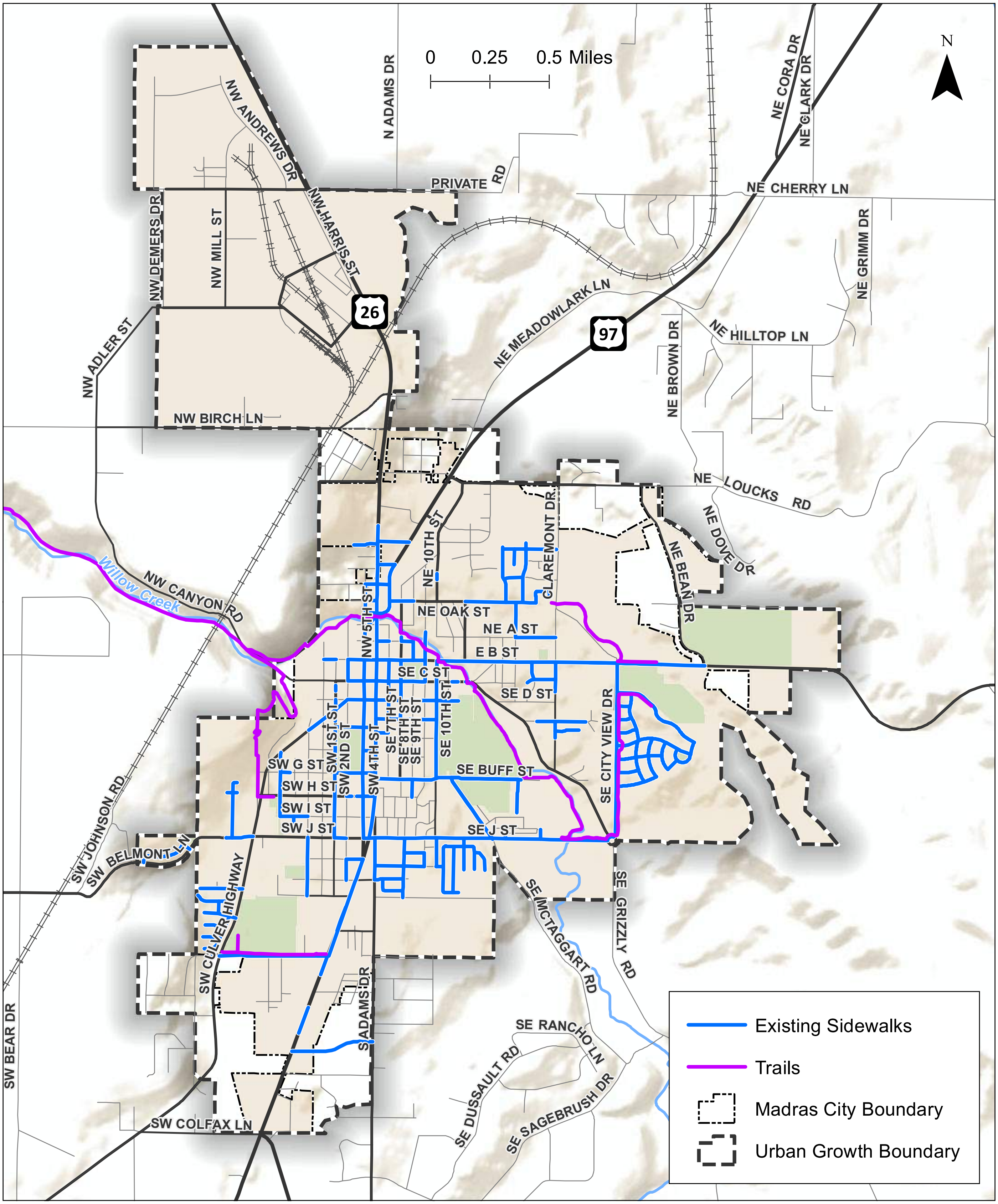
PEDESTRIAN SYSTEM

Walking can be a viable commuting option when support by facilities such as sidewalks, shared-use paths, and trails – or when mixed-use developments give people the option to live near their work.

The *Oregon Bicycle and Pedestrian Design Guide* (Reference 4) identifies two design treatments for accommodating pedestrians on roadways. These include:

- **Sidewalks** – Sidewalks are typically located along roadways, separated with a curb and/or planting strip or swale, and have a hard, smooth surface.
- **Shared-use Paths** – Paths are typically used by pedestrians, cyclists, skaters and joggers. Paths can be constructed with a variety of surface types, though materials that provide a relatively smooth and firm surface are typically required to comply with Americans with Disabilities Act (ADA) requirements.

Figure 12 illustrates the location of pedestrian facilities on Madras roadways. Generally, sidewalks are provided along US 97/US 26, except between K Street and J Street. Sidewalk connectivity is concentrated around the commercial land uses adjacent to US 97 and US 26. Outside the commercial areas, sidewalk connections are provided intermittently, particularly around the residential land uses west of US 97/US 26.



Sidewalks
Madras, Oregon

Figure
12

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BICYCLE SYSTEM

The *Oregon Bicycle and Pedestrian Design Guide* (Reference 4) identifies four design treatments used to accommodate bicycle travel on roadways and one design treatment used to accommodate bicycle travel that is separated from the roadway. These design treatments are described below.

- **Shared Roadway** – On a shared roadway, bicyclists and motorists share the same travel lanes. A motorist will usually have to cross over into the adjacent travel lane to pass a bicyclist. Shared roadways are common on neighborhood streets and on low volume rural roads and highways and may, or may not, include “sharrows” (pavement marking that indicate the shared use of the roadway).

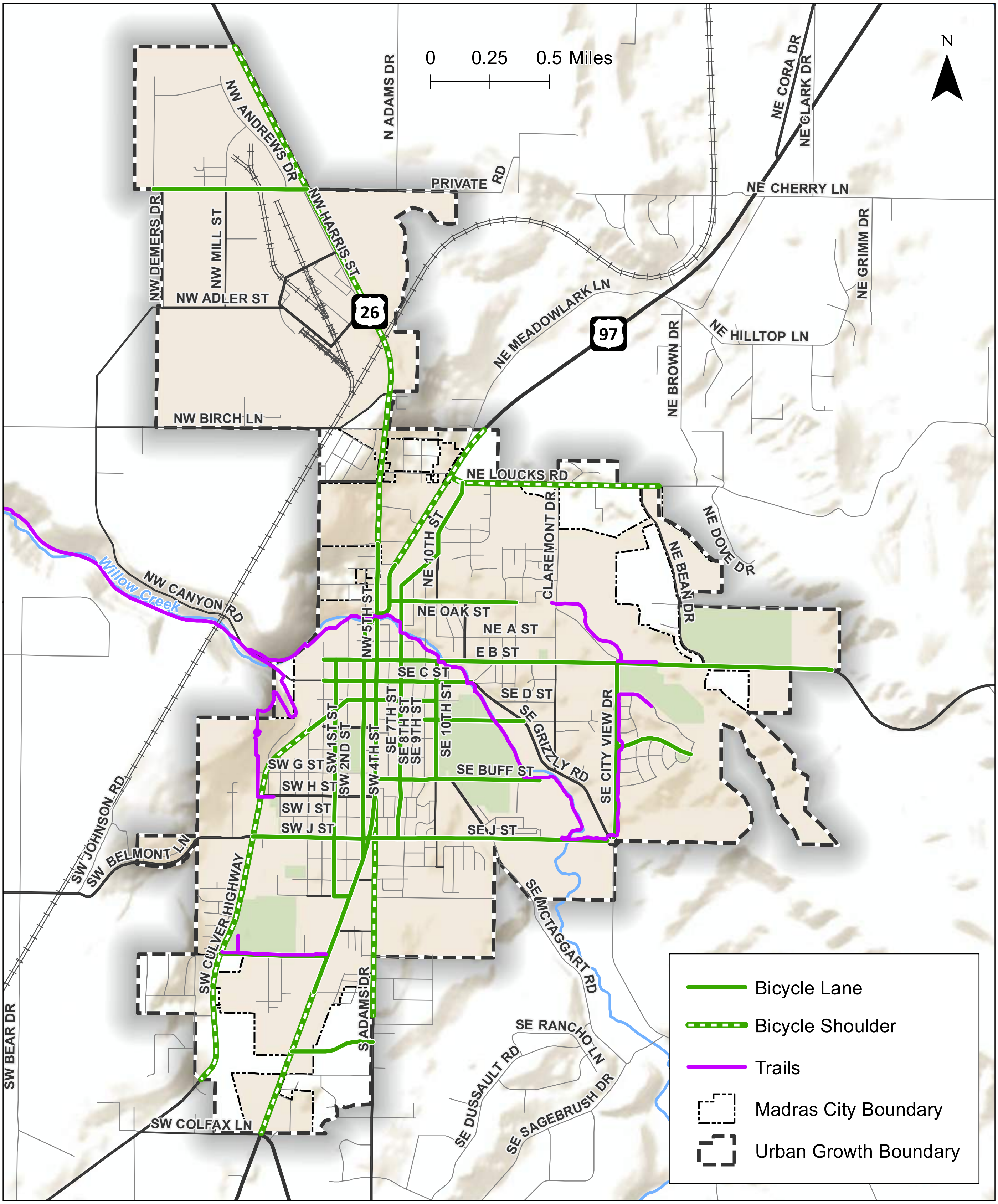
- **Bicycle Boulevard** – The bicycle boulevard is a refinement of the shared roadway treatment. On bicycle boulevards, the typical operation of a local street is modified to function as a through street for bicyclist while maintaining local access for motor vehicles. Traffic calming devices reduce motor vehicle speeds and through trips and traffic controls limit the potential for conflicts between bicyclists and motorists.

- **Shoulder Bikeway** – A shoulder bikeway is a paved shoulder that provides a suitable area for bicycling, reducing the potential for conflicts with motor vehicles.

- **Bike Lane** – Some roadways dedicate a portion of the roadway for preferential use by bicyclists. Bike lanes are generally considered appropriate on urban arterials and major collectors where motor vehicle speeds are significantly higher than bicycle speeds. Bike lanes on local streets are appropriate where bicycle volumes are high, vehicle speeds are higher than 25 miles per hour, and/or poor sight distance exists. Bike lanes must always be well-marked to call attention to their preferential use by bicyclists.

- **Shared-Use Path** – Shared-use paths are separated from the roadway by an open space or barrier. Shared-use paths are typically used by pedestrians and bicyclists as two-way facilities. Shared-use paths are appropriate in corridors with high traffic volumes not well served by the street system. Such paths can also be used to create pedestrian and bicycle short cuts and can serve as elements of a community recreational trail system.

Figure 13 illustrates the location and type of bicycle facilities on Madras roadways.



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Bicycle System
Madras, Oregon

Figure
13

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: The City of Madras

Bicycle Level of Traffic Stress

The ODOT APM provides a methodology for evaluating bicycle facilities within urban and rural environments that quantifies the perceived safety issue of being in close proximity to vehicles. This methodology, Bicycle Level of Service Stress (LTS), is based on the premise that as much as 60 percent of the population of a given city is "interested, but concerned" about cycling as a mode of transportation. The Bicycle LTS methodology seeks to identify road segments and routes that could be improved to remove the "concern" and encourage more bicycling as a mode of transportations.

Existing Collector and Arterial streets were evaluated based on the Bicycle LTS methodology. As applied by ODOT, this methodology classifies four levels of traffic stress that a cyclist can experience on the roadway, ranging from LTS 1 (little traffic stress) to LTS 4 (high traffic stress). A road segment with a Bicycle LTS 1 rating generally has low traffic speeds and low volumes and is suitable for all cyclists, including children. A road segment with a Bicycle LTS 4 generally has high speeds, high volumes and is perceived as unsafe by most adults. Bicycle LTS 2 is considered appealing to a majority of the bike riding population and therefore, is the desired target on most roadways.

Key characteristics that influence the bicycle LTS include:

- Number of lanes per direction
- Width of bike lane
- Separation between travel lane and bike lane (i.e., striped buffer zone or physical barrier such
- as on-street parking)
- On-street parking
- Posted or prevailing travel speed
- Intersection approach design of turn lanes
- Unsignalized intersection crossings

It is important to note the LTS of the whole segment is based on the worst LTS at any point along the segment because it is what will discourage ridership on the segment; therefore, LTS 3 or 4 segments may reflect the score of only a small portion of a given segment.

Figure 14 illustrates the results of the LTS analysis for the Madras UGB. Table 18 summarizes the segments with LTS 3 or 4 and provides a brief summary of the primary characteristics that informed the ratings.

Table 18: Segments with Bicycle LTS 3 or 4 Rating

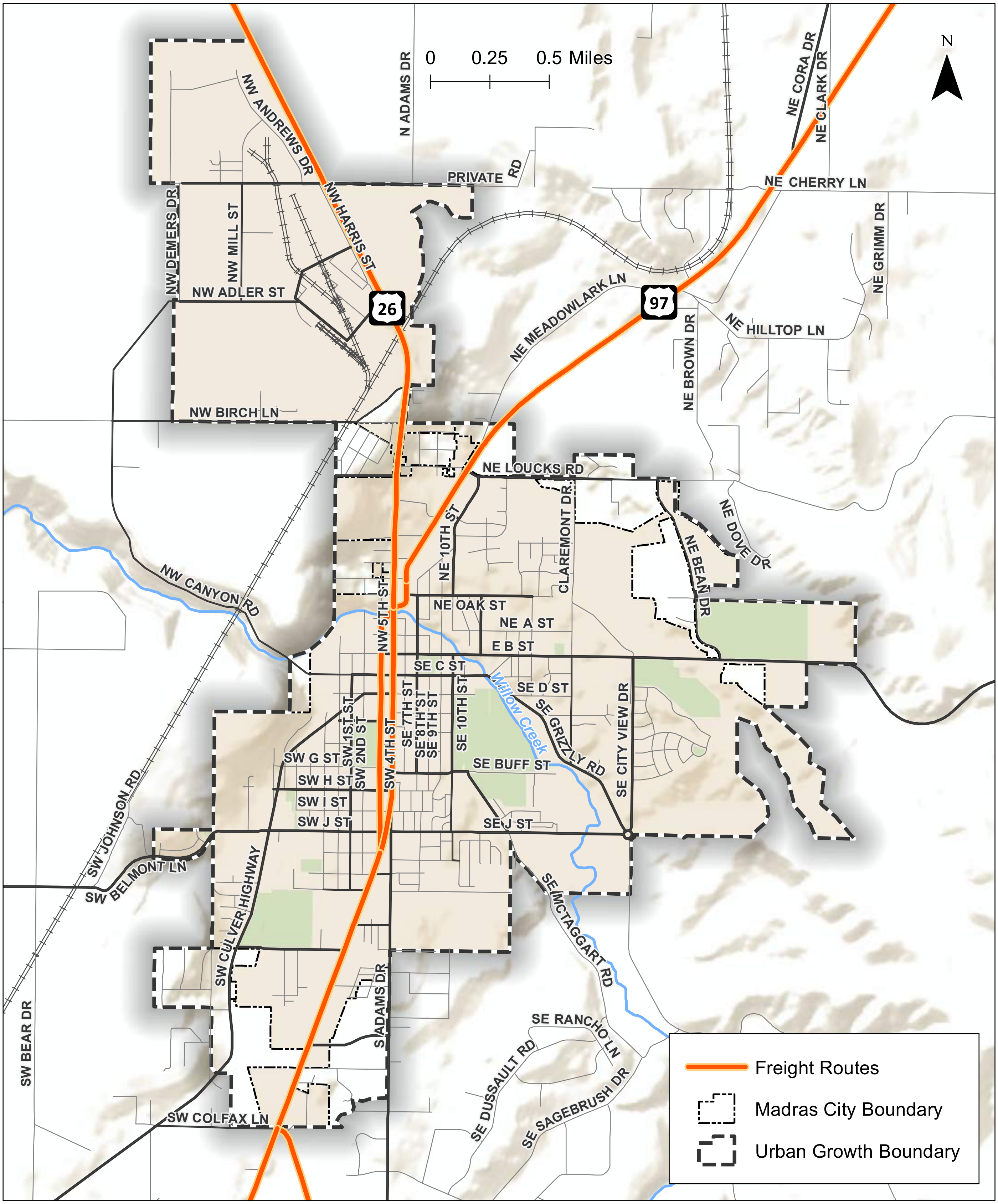
Roadway	LTS Rating	Segment Start-End	Posted Speed (mph)	Presence of Bike Lane
OR361	4	SW Fairgrounds Rd to SW J St	50	None
OR361	4	SW Fairgrounds Rd to SW Madison St	45	None
OR361	4	SW Madison St to 1st St	35	Yes
US26	4	SW Colfax Ln to SW Brush Ln	45	Yes
US26	4	SW Brush Ln to SW K St	35	Yes
US97 SB	4	SW K St to SE I St	30	Yes
US97 NB	4	SE I St to SE Trade St	30	Yes
US97 NB	4	Pine St to 5th St	35	Yes
US97 NB	3	5th St to NE Plum St	30	Yes
US97 NB	4	NE Plum St to NE Loucks Rd	45	None
US26 SB	4	5th St to NE Plum St	35	Yes
US26 SB	4	NE Plum St to NW Cherry Ln	≥45	None
US26 SB	4	NW Cherry Ln to North City boundary	55	None
NW Cherry Lane	3	NW Harris St to East city boundary	25	None
NW Lee St	3	NW Commercial St to US 26	20	None
NE Loucks Rd	4	US 97 to Claremont Dr	45	None
NE 7th St	3	Oak St to SE Buff St	25	Yes
SE City View street	3	SE J St to NE B St	35	Yes
NW B St	3	US 26 to NE 6th St	25	None
B St	3	NE 6th to 12th St	25	Yes
B St	3	NE 12th St to Ne Kinkade Rd	35	Yes

The majority of segments with LTS 3 or 4 have a paved shoulder; however, according to the Bicycle LTS methodology, the bike lane widths are too narrow relative to the posted speeds. The Bicycle LTS methodology indicates that for these segments to be rated LTS 2 or 3 one of the following must occur:

- Provide a 7-foot wide buffered bike lane to give bicyclists a buffer distance between the bike lane and adjacent travel lane,
- Reduce the posted speed limits to 30 miles per hour (mph) or less,
- Provide a paved bike lane where one does not exist today, and/or
- Improve intersection approach design of turn lanes to reduce difficulty for a bicyclist to traverse
  the intersection without having to change multiple lanes on the approach.

Enhanced facilities, such as separated multi-use paths, may also be considered in some areas where traffic volumes and/or travel speeds are high. Bicycle LTS analysis worksheets are included in Appendix F.

Opportunities to improve the bicycle environment along the segments with an LTS 3 or 4, such as providing a buffered bike lane along roadways with posted speeds of 35 mph or higher, will be evaluated as part of the alternatives analysis and considered as part of the TSP update.



Freight Routes
Madras, Oregon

Figure
15

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: The City of Madras

PUBLIC TRANSPORTATION SYSTEM

Public Transportation in Madras consists of a "dial-a-ride" demand response service. This service is funded through Cascades East Transit (CET) This service will pick up and carry citizens to any destination within Madras. Community Connector Service, also provided by CET, is available to Warm Springs, Culver, Metolius, and Redmond and is also available Monday through Friday. Service to additional areas (Bend, Sisters, Prineville, Mt. Bachelor, and La Pine) is available through Community Connector connections in Redmond.

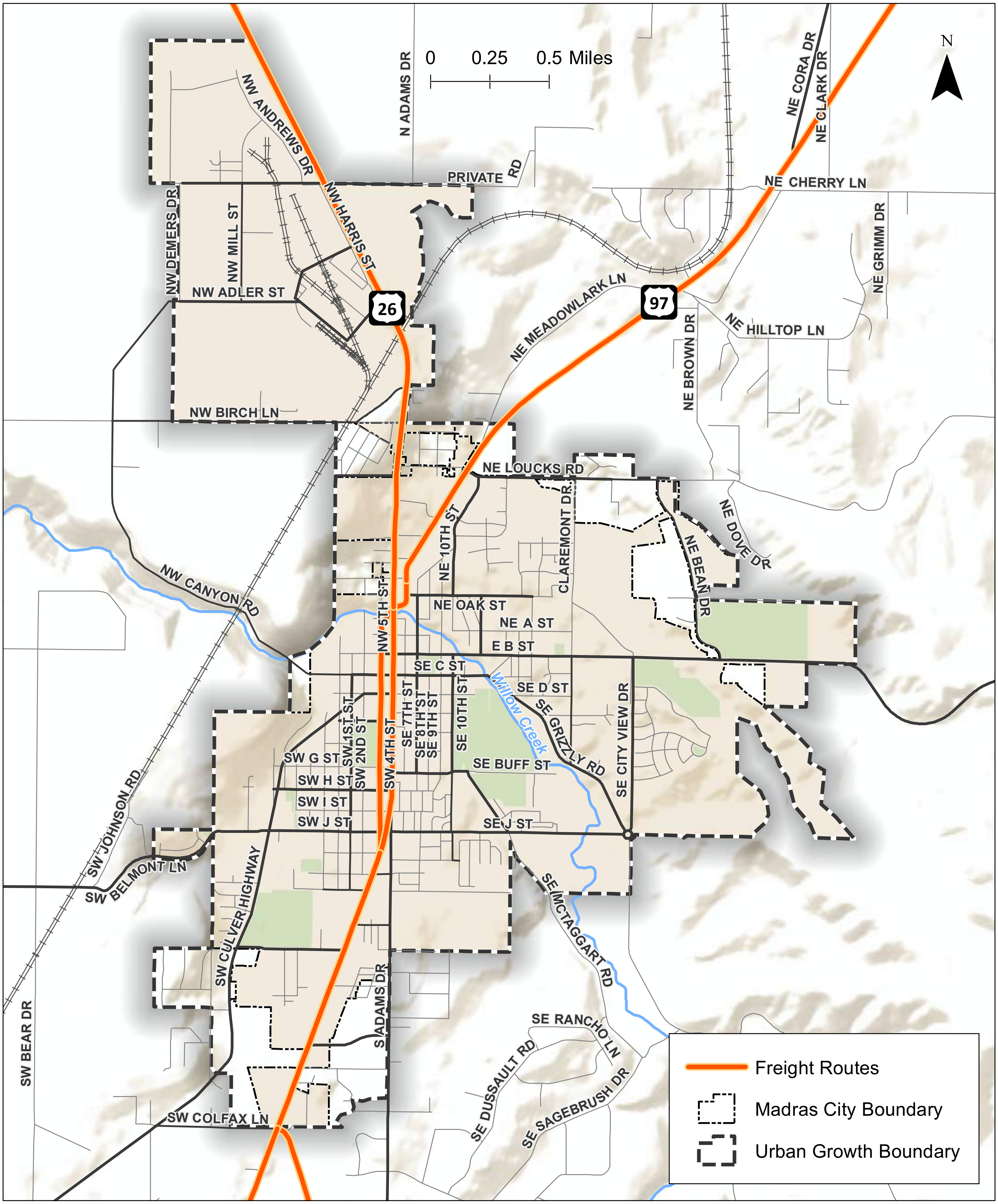
TRUCK FREIGHT ROUTES

Madras contains parts of two freight routes. Figure 15 depicts the freight routes in the city. Both highways, US 97 and US 26, are part of the State Highway Freight System and are federally designated Truck Routes. US 97 is also designated as a strategic corridor in the *Oregon Freight Plan* (Reference 5).

RAIL SYSTEM

The rail system in Madras is a significant driver of economic opportunity for the community. This system interfaces with the Madras community within the industrial area near the airport, which is along US 26 north and west of the Madras city core. This area, including the railroad system, is part of an ongoing industrial readiness plan that will provide a future development plan for the collective system. The findings and recommendation of that detailed analysis will be incorporated into the Madras TSP.

Figure 16 shows the existing railroad facilities in the Madras UGB.



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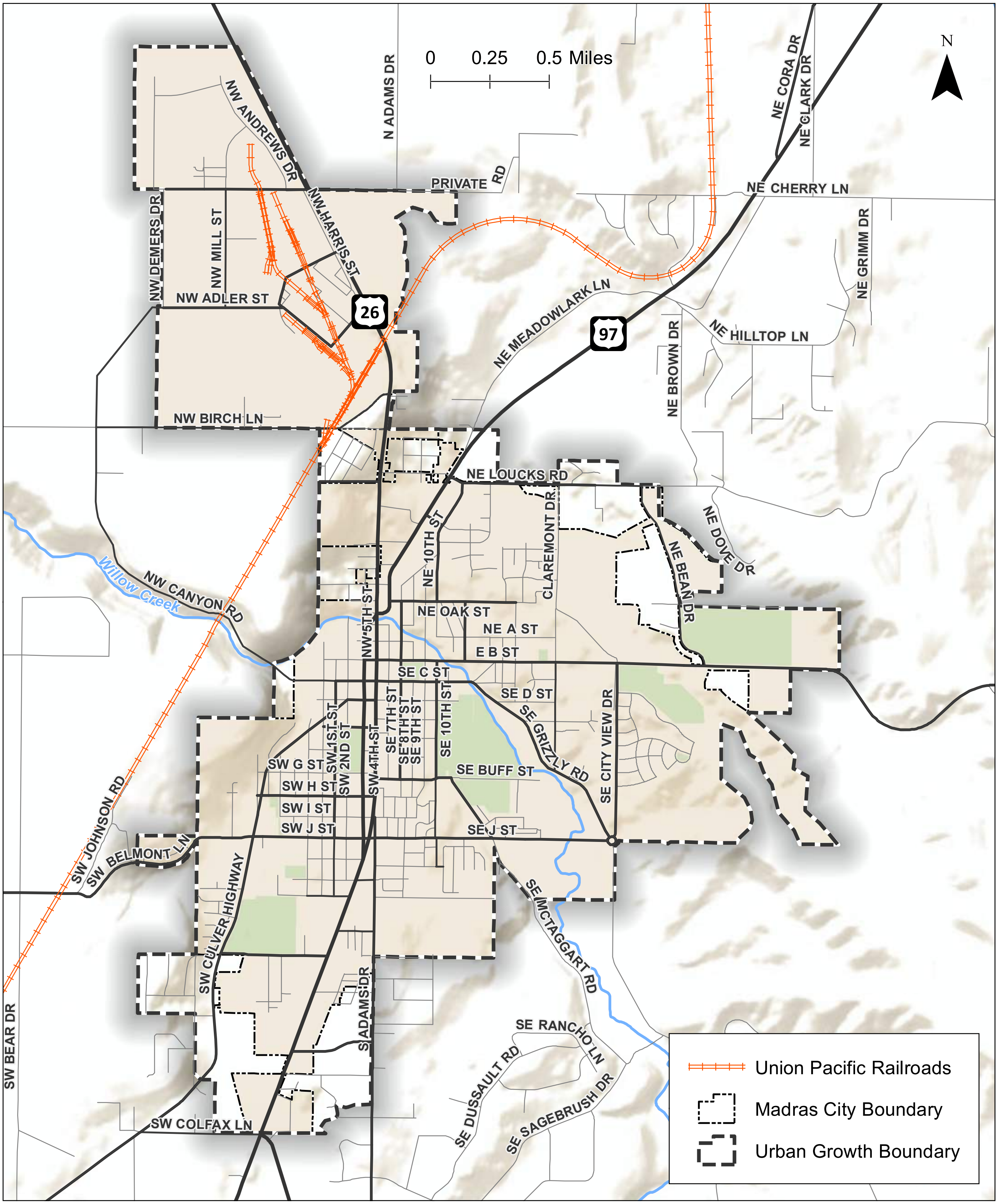
Freight Routes
Madras, Oregon

Figure
15

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: The City of Madras



Railroad Facilities
Madras, Oregon

Figure
16

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AIR TRANSPORTATION SYSTEM

The City of Madras owns and operates Madras Municipal Airport, a general aviation airport located about 5 miles north of the city. The airport has two asphalt paved runways – 5,089 by 75 feet and 2,701 by 50 feet. The facility is designated as a Category VI (Local General Aviation Airport) according to the *Oregon Aviation Plan* (Reference 6). The Oregon Aviation Plan defines category IV airports as an airport that primarily supports single-engine aviation aircraft, but are capable of accommodating smaller twin-engine general aviation aircraft. Category IV airports support local air transportation needs and special use aviation activities. The airport is governed by its own Master Plan. Therefore, recommendations for improvements do not fall into the scope of this TSP. However, the airport is an essential component of the economy in the area, and is recommended to be included when considering future developments in the surrounding area.

INTERMODAL CONNECTIONS

Intermodal connections for passenger service exist in the form of transit, pedestrian and bicycle, and automobile connections. Intermodal connections for freight exist in the form of rail, truck, air, and water transport connections. This section describes those connections.

Freight Transportation

Freight is a key component of the regional economy within Madras. Goods and services are transported via freight routes into, out of, and within the City. As such, access to freight services is critical.

The major freight hub within Madras is the industrial area located in the northwest quadrant of the city near the airport. This area is developing with significant future and existing industrial generators. Also, this area provides an interface with the rail system providing additional needs for freight integration.

Passenger Transportation

ODOT completed a Park and Ride Plan for Region 4 in 2012. As part of this process, the Safeway located on the north end of Madras was identified as a priority location for a Park and Ride facility. This location could serve the Community Connector service in town, particularly service to and from Warm Springs.

BRIDGE CONDITIONS

ODOT maintains an inventory of bridge conditions within the state. This inventory, for District 10 which includes Jefferson County, is provided in Appendix G. This table includes State, County, and City owned facilities.

Sufficiency rating is a measure between 0 and 100 calculated by the Federal Highway Administration (FHWA), based on factors such as condition, materials, load capacity, and geometry (i.e., dimensions). FHWA uses the rating as a tool to prioritize the allocation of funds for bridge repairs. In general, bridges with a sufficiency rating of less than 50 are given priority. The sufficiency rating is used to identify deficiencies, which may include structural issues or functional issues. For example, older bridges may be narrow and not designed to the same width or height clearance of today's standards. Therefore, a sufficiency rating does not necessarily indicate a structural issue.

According to the 2015 *ODOT Bridge Condition Report* (Reference 7), there are no bridges in the Madras UGB that have a sufficiency rating below 50 or classified as "structurally deficient/distressed".

MARINE TRANSPORTATION SYSTEM

Madras is landlocked without access to major waterways. As such, marine transportation is not a component of the city transportation system.

PIPELINE TRANSPORTATION SYSTEM

Major pipelines are not known to traverse through Madras. However, several utilities, including PPL Electric, BendBroadBand, and Century Link, have a series of utilities lines in the community.

CONCLUSION

The assessment of the existing and future land use and transportation system conditions identified the following:

- Madras is connected to the national and statewide highway network via two Statewide Highways (US 26 and US 97) and one District Highway (OR 361).
- Population projections show that Madras UGB will be the fastest growing region between 2015 through 2020 in Jefferson County, and will account for the majority of population growth in Jefferson County between 2015 through 2065.
- All study intersections operate within the ODOT performance target except the following:
  - Fairgrounds Road & US 97/US 26 currently operates at v/c ratio = 0.84, which is approaching the ODOT performance target for the intersection of v/c ratio < 0.85.
  - 6th Street & US 97/US 26 is approach the ODOT performance target and has a 95th percentile westbound left-turn queue length that exceeds left-turn lane storage capacity.
- The existing demand volume at all study segments is below the two-lane capacity of 750 vehicles/lane, with the highest v/c ratio = 0.361.
- 1 fatal crash occurred in the Madras UGB from 2010-2014. The fatal crash involved a pedestrian.
- Jefferson Street & US 97 has a crash rate above the 90^{th} percentile statewide crash rate for similar facilities. The intersection was also identified as a location that warrants further investigation under the ODOT Statewide Safety Priority Index System (SPIS).
- The following are observations based on crash frequency, type and severity:
  - **US 26 & US 97/Maple Street** – 60% of the reported crashes are rear-end. This may be a result of the intersection being the first traffic signal entering the city from the north.
  - **US 97 between Fairgrounds Road and L Street** – There were 20 reported crashes in this segment, with 12 (39.3%) rear-end crashes and 4 rear-end crashes involving pedestrians (but not pedestrian crashes). The segment has a high driveway density with limited crossings across US 97.
  - **J Street between 4th Street and Adams Drive** – Most crashes were reported to be angle and turning movement crashes, 10 (58.8%) and 5 (29.4%) reported crashes respectively. This segment was recently reconstructed as part of the US 97: J Street (Madras South Y) Project.
  - **D Street at 4th and 5th Street** – There were 2 pedestrian crashes reported: 1 fatal crash at 5th Street and 1 incapacitating injury crash at 4th Street. In both cases, the driver failed to yield to the right-of-way and collided with the pedestrian. There were also 5 (35.7%) rear-end crashes reported at this location.
  - **B Street & 5th Street** – 8 crashes were reported at this intersection, consisting of 5 angle crashes, and 3 other crashes. 4 out of 5 of the reported angle crashes were reportedly caused by drivers disregarding the traffic signal display.

- Continuous sidewalks are generally available around the commercial land uses surrounding US 97/US 26, but are provided intermittently outside the commercial areas.
- No bridges in the Madras UGB were identified as having a low sufficiency rating or classified as “structurally deficient/distressed”.

The needs documented in this memorandum will be used to develop project alternatives after input from the Project Advisory Committee has been received.

REFERENCES

1. Oregon Highway Plan
2. 2010 Highway Capacity Manual
3. ODOT Analysis Procedures Manual
4. Oregon Bicycle and Pedestrian Design Guide
5. Oregon Freight Plan
6. Oregon Aviation Plan
7. ODOT Bridge Condition Report

APPENDICES

Appendix A Methodology Memorandum

Appendix B Traffic Count Data

Appendix C Synchro Analysis Reports & Queue Length Worksheets

Appendix D Signal Timing Sheets

Appendix E Crash Data (2010 – 2014)

Appendix F Bicycle LTS Worksheets

Appendix G Bridge Inventory

Appendix A Methodology Memorandum

Appendix B Traffic Count Data

Summary of Traffic Count
Transportation Development Division

Site: 24550
County: Jefferson
City: Madras
Milepoint: 116.79
Count Number: 1.00

Date: 10/14/2014
Hours: 6:00 AM-10:00 PM
Highway #: 053
Location: Warm Springs Hwy 53 (US26) at NW Depot St (South to East movement was
Weather:

	Summary By Movements														Entering Volumes			
Time of Day	N-E	N-S	N-W	E-N	E-S	E-W	S-N	S-E	S-W	W-N	W-E	W-S		TOTAL	North	East	South	West
6:00	0	88	1	1	0	0	247	0	18	5	0	17		377	89	1	265	22
7:00	0	150	5	0	3	0	372	0	22	7	0	43		602	155	3	394	50
8:00	1	223	5	0	3	0	309	0	26	2	0	29		598	229	3	335	31
9:00	0	246	5	1	2	0	271	1	13	1	0	25		565	251	3	285	26
10:00	0	281	3	0	2	0	337	0	24	1	0	30		678	284	2	361	31
11:00	1	407	3	3	0	0	405	0	22	7	0	24		872	411	3	427	31
12:00	2	383	9	0	1	0	421	0	34	5	0	23		878	394	1	455	28
13:00	0	347	9	2	1	0	382	0	18	3	0	23		785	356	3	400	26
14:00	2	424	8	1	5	0	361	0	3	7	0	3		814	434	6	364	10
15:00	1	656	9	2	2	0	361	0	44	10	0	43		1128	666	4	405	53
16:00	3	534	8	1	0	0	306	0	51	3	0	47		953	545	1	357	50
17:00	2	419	11	0	2	0	229	0	32	3	0	34		732	432	2	261	37
18:00	0	232	5	0	2	0	224	0	32	2	0	24		521	237	2	256	26
19:00	0	181	3	0	1	0	162	0	20	0	0	16		383	184	1	182	16
20:00	0	127	0	0	0	0	115	0	19	2	0	11		274	127	0	134	13
21:00	0	115	6	0	0	0	120	0	15	2	0	8		266	121	0	135	10
Total Count	12	4813	90	11	24	0	4622	1	393	60	0	400		10426	4915	35	5016	460
24hr Factor	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1		1.1	1.1	1.1	1.1	1.1
24hr Volume	14	5295	99	13	27	0	5085	2	433	66	0	440		11469	5407	39	5518	506

Summary of Traffic Count
Transportation Development Division

Site: 27995
County: Jefferson
City: Madras
Milepoint: 91.40
Count Number:

Date: 10/20/2014
Hours: 6:00 AM-10:00 PM
Highway #: 004
Location: THE DALLES-CALIFORNIA HIGHWAY NO. 4 (US97) at Jefferson St and NE Loucks
Weather: Cloudy

	Summary By Movements														Entering Volumes			
Time of Day	N-E	N-S	N-W	E-N	E-S	E-W	S-N	S-E	S-W	W-N	W-E	W-S		TOTAL	North	East	South	West
6:00	3	81	8	1	3	2	67	4	2	2	3	4		180	92	6	73	9
7:00	4	144	16	3	16	9	114	10	6	3	9	12		346	164	28	130	24
8:00	3	131	10	4	12	6	141	11	11	7	6	10		352	144	22	163	23
9:00	0	132	8	3	21	6	129	12	10	8	9	13		351	140	30	151	30
10:00	1	150	5	4	15	13	136	21	17	3	6	19		390	156	32	174	28
11:00	3	154	3	4	18	5	164	17	15	6	11	17		417	160	27	196	34
12:00	1	123	12	20	8	3	138	32	17	13	6	19		392	136	31	187	38
13:00	3	247	15	5	9	5	132	15	15	7	7	12		472	265	19	162	26
14:00	0	208	6	4	22	5	163	14	23	12	9	18		484	214	31	200	39
15:00	4	190	9	3	15	14	147	19	26	14	18	20		479	203	32	192	52
16:00	1	223	10	2	26	11	178	20	24	8	14	21		538	234	39	222	43
17:00	0	208	7	4	10	8	182	26	27	11	13	28		524	215	22	235	52
18:00	0	157	6	3	9	11	129	12	24	11	10	17		389	163	23	165	38
19:00	1	118	3	2	5	3	106	8	20	2	4	12		284	122	10	134	18
20:00	1	78	5	0	0	2	53	6	10	7	4	5		171	84	2	69	16
21:00	0	74	2	0	2	5	27	3	8	3	4	3		131	76	7	38	10
Total Count	25	2418	125	62	191	108	2006	230	255	117	133	230		5900	2568	361	2491	480
24hr Factor	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1		1.1	1.1	1.1	1.1	1.1
24hr Volume	28	2660	138	69	211	119	2207	253	281	129	147	253		6490	2825	398	2741	528

Summary of Traffic Count
Transportation Development Division

Site: 27994
County: Jefferson
City: Malin
Milepoint:
Count Number: 1.00

Date: 10/28/2014
Hours: 6:00 AM-10:00 PM
Highway #: 004
Location: THE DALLES-CALIFORNIA HIGHWAY NO. 4 (US97) at Warm Springs Hwy No. 53
Weather: Cloudy

	Summary By Movements														Entering Volumes			
Time of Day	N-E	N-SW	N-W	E-N	E-SW	E-W	S-N	S-E	S-W	W-N	W-E	W-SW		TOTAL	North	East	South	West
6:00	3	86	0	9	87	0	230	64	4	2	2	0		487	89	96	298	4
7:00	3	153	0	6	156	1	364	121	2	1	2	3		812	156	163	487	6
8:00	2	201	0	9	181	3	349	173	6	4	0	4		932	203	193	528	8
9:00	1	179	0	9	213	4	319	139	3	5	2	9		883	180	226	461	16
10:00	1	229	1	8	450	5	350	167	5	4	5	3		1228	231	463	522	12
11:00	3	286	0	11	260	8	428	183	3	9	6	4		1201	289	279	614	19
12:00	4	332	0	7	298	4	477	160	10	9	3	4		1308	336	309	647	16
13:00	3	311	0	7	283	6	406	217	11	9	6	10		1269	314	296	634	25
14:00	5	316	2	7	281	8	439	192	22	11	1	12		1296	323	296	653	24
15:00	2	568	1	7	320	11	468	230	10	9	2	11		1639	571	338	708	22
16:00	6	452	3	1	361	9	376	237	5	4	7	13		1474	461	371	618	24
17:00	3	346	2	9	321	11	331	244	3	4	6	7		1287	351	341	578	17
18:00	5	255	1	3	271	7	285	192	12	10	3	7		1051	261	281	489	20
19:00	2	159	1	1	166	10	183	113	5	3	5	10		658	162	177	301	18
20:00	3	133	0	2	134	5	143	74	4	6	2	1		507	136	141	221	9
21:00	3	93	0	3	100	3	124	78	3	4	2	5		418	96	106	205	11
Total Count	49	4099	11	99	3882	95	5272	2584	108	94	54	103		16450	4159	4076	7964	251
24hr Factor	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1		1.1	1.1	1.1	1.1	1.1
24hr Volume	54	4509	13	109	4271	105	5800	2843	119	104	60	114		18095	4575	4484	8761	277

Summary of Traffic Count
Transportation Development Division

Site: 22303
County: Jefferson
City: Madras
Milepoint: 92.46
Count Number: 1.00

Date: 2/5/2013-2/6/2013
Hours: 2/6/2013 12:00 PM
Highway #: 004
Location: SW 4th St (US-97 SB) @ SW D St (Culver Hwy)
Weather: Cloudy

	Summary By Movements									Entering Volumes		
Time of Day	N-E	N-S	N-W	E-S	E-W	W-E	W-S		TOTAL	North	East	West
0:00	0	52	18	0	2	5	0		77	70	2	5
0:15	0	0	0	0	0	0	0		0	0	0	0
0:30	0	0	0	0	0	0	0		0	0	0	0
0:45	0	0	0	0	0	0	0		0	0	0	0
1:00	1	44	6	1	2	2	0		56	51	3	2
1:15	0	0	0	0	0	0	0		0	0	0	0
1:30	0	0	0	0	0	0	0		0	0	0	0
1:45	0	0	0	0	0	0	0		0	0	0	0
2:00	0	34	3	0	0	2	2		41	37	0	4
2:15	0	0	0	0	0	0	0		0	0	0	0
2:30	0	0	0	0	0	0	0		0	0	0	0
2:45	0	0	0	0	0	0	0		0	0	0	0
3:00	0	11	1	0	0	2	0		14	12	0	2
3:15	0	0	0	0	0	0	0		0	0	0	0
3:30	0	0	0	0	0	0	0		0	0	0	0
3:45	0	0	0	0	0	0	0		0	0	0	0
4:00	0	60	10	1	2	59	1		133	70	3	60
4:15	0	0	0	0	0	0	0		0	0	0	0
4:30	0	0	0	0	0	0	0		0	0	0	0
4:45	0	0	0	0	0	0	0		0	0	0	0
5:00	1	69	6	4	3	67	6		156	76	7	73
5:15	0	0	0	0	0	0	0		0	0	0	0
5:30	0	0	0	0	0	0	0		0	0	0	0
5:45	0	0	0	0	0	0	0		0	0	0	0
6:00	3	132	27	5	8	69	10		254	162	13	79
6:15	0	0	0	0	0	0	0		0	0	0	0
6:30	0	0	0	0	0	0	0		0	0	0	0
6:45	0	0	0	0	0	0	0		0	0	0	0
7:00	0	56	15	1	3	19	3		97	71	4	22
7:15	1	71	13	1	2	23	2		113	85	3	25
7:30	2	65	17	5	5	31	5		130	84	10	36
7:45	3	95	13	11	10	54	6		192	111	21	60
8:00	0	109	18	10	19	43	1		200	127	29	44
8:15	0	84	13	7	2	35	8		149	97	9	43
8:30	2	87	9	10	8	19	7		142	98	18	26
8:45	4	117	18	6	6	16	4		171	139	12	20
9:00	11	447	71	34	22	112	24		721	529	56	136
9:15	0	0	0	0	0	0	0		0	0	0	0
9:30	0	0	0	0	0	0	0		0	0	0	0
9:45	0	0	0	0	0	0	0		0	0	0	0
10:00	5	481	85	49	26	108	36		790	571	75	144
10:15	0	0	0	0	0	0	0		0	0	0	0
10:30	0	0	0	0	0	0	0		0	0	0	0
10:45	0	0	0	0	0	0	0		0	0	0	0
11:00	7	599	89	41	48	118	39		941	695	89	157
11:15	0	0	0	0	0	0	0		0	0	0	0
11:30	0	0	0	0	0	0	0		0	0	0	0
11:45	0	0	0	0	0	0	0		0	0	0	0
12:00	18	504	85	50	44	131	32		864	607	94	163
12:15	0	0	0	0	0	0	0		0	0	0	0
12:30	0	0	0	0	0	0	0		0	0	0	0
12:45	0	0	0	0	0	0	0		0	0	0	0
13:00	19	626	97	40	83	130	43		1038	742	123	173
13:15	0	0	0	0	0	0	0		0	0	0	0
13:30	0	0	0	0	0	0	0		0	0	0	0
13:45	0	0	0	0	0	0	0		0	0	0	0
14:00	23	629	128	41	58	128	33		1040	780	99	161
14:15	0	0	0	0	0	0	0		0	0	0	0
14:30	0	0	0	0	0	0	0		0	0	0	0
14:45	0	0	0	0	0	0	0		0	0	0	0
15:00	11	728	140	57	53	152	41		1182	879	110	193
15:15	0	0	0	0	0	0	0		0	0	0	0
15:30	0	0	0	0	0	0	0		0	0	0	0
15:45	0	0	0	0	0	0	0		0	0	0	0
16:00	2	200	40	13	16	27	11		309	242	29	38
16:15	3	156	23	6	17	40	9		254	182	23	49
16:30	3	221	27	9	18	46	11		335	251	27	57
16:45	4	155	31	15	19	35	5		264	190	34	40
17:00	1	181	34	14	17	30	9		286	216	31	39
17:15	5	180	37	12	19	29	7		289	222	31	36
17:30	2	177	30	12	7	25	3		256	209	19	28
17:45	3	126	22	7	8	25	7		198	151	15	32
18:00	24	406	74	31	26	75	31		667	504	57	106
18:15	0	0	0	0	0	0	0		0	0	0	0
18:30	0	0	0	0	0	0	0		0	0	0	0
18:45	0	0	0	0	0	0	0		0	0	0	0
19:00	8	256	45	13	19	47	11		399	309	32	58
19:15	0	0	0	0	0	0	0		0	0	0	0
19:30	0	0	0	0	0	0	0		0	0	0	0
19:45	0	0	0	0	0	0	0		0	0	0	0
20:00	10	224	36	16	24	45	12		367	270	40	57
20:15	0	0	0	0	0	0	0		0	0	0	0
20:30	0	0	0	0	0	0	0		0	0	0	0
20:45	0	0	0	0	0	0	0		0	0	0	0
21:00	2	129	30	7	14	27	8		217	161	21	35
21:15	0	0	0	0	0	0	0		0	0	0	0
21:30	0	0	0	0	0	0	0		0	0	0	0
21:45	0	0	0	0	0	0	0		0	0	0	0
22:00	3	93	21	1	7	18	3		146	117	8	21
22:15	0	0	0	0	0	0	0		0	0	0	0
22:30	0	0	0	0	0	0	0		0	0	0	0
22:45	0	0	0	0	0	0	0		0	0	0	0
23:00	1	70	14	0	2	12	1		100	85	2	13
23:15	0	0	0	0	0	0	0		0	0	0	0
23:30	0	0	0	0	0	0	0		0	0	0	0
23:45	0	0	0	0	0	0	0		0	0	0	0
Total Count	182	7674	1346	530	619	1806	431		12588	9202	1149	2237
24hr Factor	1	1	1	1	1	1	1		1	1	1	1
24hr Volume	182	7674	1346	530	619	1806	431		12588	9202	1149	2237

Summary of Traffic Count
Transportation Development Division

Site: 22302
County: Jefferson
City: Madras
Milepoint: 92.45
Count Number: 1.00

Date: 2/6/2013-2/8/2013
Hours: 9:00 AM
Highway #: 004
Location: No 4 (5 th Street) @ D Street
Weather: Cloudy

	Summary By Movements									Entering Volumes		
Time of Day	E-N	E-W	S-N	S-E	S-W	W-N	W-E		TOTAL	East	South	West
0:00	0	1	17	0	1	1	1		20	1	18	2
0:15	0	0	0	0	0	0	0		0	0	0	0
0:30	0	0	0	0	0	0	0		0	0	0	0
0:45	0	0	0	0	0	0	0		0	0	0	0
1:00	0	1	26	0	2	1	2		32	1	28	3
1:15	0	0	0	0	0	0	0		0	0	0	0
1:30	0	0	0	0	0	0	0		0	0	0	0
1:45	0	0	0	0	0	0	0		0	0	0	0
2:00	0	1	38	0	1	4	2		44	1	38	6
2:15	0	0	0	0	0	0	0		0	0	0	0
2:30	0	0	0	0	0	0	0		0	0	0	0
2:45	0	0	0	0	0	0	0		0	0	0	0
3:00	1	0	33	0	0	3	1		37	1	33	4
3:15	0	0	0	0	0	0	0		0	0	0	0
3:30	0	0	0	0	0	0	0		0	0	0	0
3:45	0	0	0	0	0	0	0		0	0	0	0
4:00	2	1	83	1	1	25	1		112	2	84	26
4:15	0	0	0	0	0	0	0		0	0	0	0
4:30	0	0	0	0	0	0	0		0	0	0	0
4:45	0	0	0	0	0	0	0		0	0	0	0
5:00	1	3	142	0	3	40	3		190	4	144	43
5:15	0	0	0	0	0	0	0		0	0	0	0
5:30	0	0	0	0	0	0	0		0	0	0	0
5:45	0	0	0	0	0	0	0		0	0	0	0
6:00	2	2	267	7	7	72	9		364	4	280	81
6:15	0	0	0	0	0	0	0		0	0	0	0
6:30	0	0	0	0	0	0	0		0	0	0	0
6:45	0	0	0	0	0	0	0		0	0	0	0
7:00	1	1	67	2	2	19	5		95	2	70	23
7:15	3	2	95	3	5	26	9		141	5	102	35
7:30	3	12	145	11	3	27	17		216	14	159	44
7:45	8	21	120	10	10	35	24		226	28	139	59
8:00	3	8	113	2	6	26	9		166	11	120	35
8:15	1	5	116	3	7	24	6		161	6	125	30
8:30	1	5	100	4	7	25	3		143	5	110	28
8:45	2	7	96	3	6	19	7		138	9	104	26
9:00	7	18	273	9	20	56	13		394	24	302	68
9:15	0	0	0	0	0	0	0		0	0	0	0
9:30	0	0	0	0	0	0	0		0	0	0	0
9:45	0	0	0	0	0	0	0		0	0	0	0
10:00	10	40	534	27	38	99	25		771	50	599	123
10:15	0	0	0	0	0	0	0		0	0	0	0
10:30	0	0	0	0	0	0	0		0	0	0	0
10:45	0	0	0	0	0	0	0		0	0	0	0
11:00	14	39	564	17	55	99	21		808	53	636	120
11:15	0	0	0	0	0	0	0		0	0	0	0
11:30	0	0	0	0	0	0	0		0	0	0	0
11:45	0	0	0	0	0	0	0		0	0	0	0
12:00	13	50	621	33	44	112	35		906	62	697	147
12:15	0	0	0	0	0	0	0		0	0	0	0
12:30	0	0	0	0	0	0	0		0	0	0	0
12:45	0	0	0	0	0	0	0		0	0	0	0
13:00	9	32	570	17	42	107	30		805	41	628	137
13:15	0	0	0	0	0	0	0		0	0	0	0
13:30	0	0	0	0	0	0	0		0	0	0	0
13:45	0	0	0	0	0	0	0		0	0	0	0
14:00	16	49	531	24	49	104	36		807	64	604	140
14:15	0	0	0	0	0	0	0		0	0	0	0
14:30	0	0	0	0	0	0	0		0	0	0	0
14:45	0	0	0	0	0	0	0		0	0	0	0
15:00	26	79	638	24	56	121	51		993	105	717	172
15:15	0	0	0	0	0	0	0		0	0	0	0
15:30	0	0	0	0	0	0	0		0	0	0	0
15:45	0	0	0	0	0	0	0		0	0	0	0
16:00	5	11	140	9	13	39	11		227	16	161	50
16:15	6	15	138	3	12	30	7		210	21	153	37
16:30	3	13	137	3	14	27	11		205	15	153	37
16:45	5	25	152	5	15	33	8		240	29	171	40
17:00	5	21	159	4	15	34	6		242	25	177	40
17:15	4	8	141	2	11	28	9		202	12	154	36
17:30	2	10	117	4	9	23	8		172	12	130	31
17:45	3	6	132	3	7	21	3		173	8	141	24
18:00	12	21	377	12	34	79	21		554	33	423	99
18:15	0	0	0	0	0	0	0		0	0	0	0
18:30	0	0	0	0	0	0	0		0	0	0	0
18:45	0	0	0	0	0	0	0		0	0	0	0
19:00	5	16	258	7	20	54	11		370	21	285	64
19:15	0	0	0	0	0	0	0		0	0	0	0
19:30	0	0	0	0	0	0	0		0	0	0	0
19:45	0	0	0	0	0	0	0		0	0	0	0
20:00	3	7	196	3	16	34	10		267	10	214	44
20:15	0	0	0	0	0	0	0		0	0	0	0
20:30	0	0	0	0	0	0	0		0	0	0	0
20:45	0	0	0	0	0	0	0		0	0	0	0
21:00	3	4	131	2	12	33	9		191	6	144	41
21:15	0	0	0	0	0	0	0		0	0	0	0
21:30	0	0	0	0	0	0	0		0	0	0	0
21:45	0	0	0	0	0	0	0		0	0	0	0
22:00	1	2	72	3	6	21	2		105	2	80	23
22:15	0	0	0	0	0	0	0		0	0	0	0
22:30	0	0	0	0	0	0	0		0	0	0	0
22:45	0	0	0	0	0	0	0		0	0	0	0
23:00	0	1	53	1	3	10	1		68	1	57	11
23:15	0	0	0	0	0	0	0		0	0	0	0
23:30	0	0	0	0	0	0	0		0	0	0	0
23:45	0	0	0	0	0	0	0		0	0	0	0
Total Count	170	527	7382	250	541	1502	417		10787	697	8172	1918.5
24hr Factor	1	1	1	1	1	1	1		1	1	1	1
24hr Volume	170	527	7382	250	541	1502	417		10787	697	8172	1919

Summary of Traffic Count
Transportation Development Division

Site: 3277
County: Jefferson
City: Madras

Milepoint: 0.88
Count Number: 1.00

Date: 10/22/2014
Hours: 6:00 AM-10:00 PM
Highway #: 361

Location: SW Culver Hwy (OR361) at J St
Weather: Cloudy

Time of Day	Summary By Movements														Entering Volumes			
	N-E	N-S	N-W	E-N	E-S	E-W	S-N	S-E	S-W	W-N	W-E	W-S		TOTAL	North	East	South	West
6:00	0	30	15	0	7	9	73	13	5	10	6	3		171	45	16	91	19
7:00	5	77	16	1	22	1	127	37	7	25	27	13		358	98	24	171	65
8:00	6	55	12	2	22	6	132	37	2	20	13	3		310	73	30	171	36
9:00	5	56	6	20	2	7	92	28	5	14	8	2		245	67	29	125	24
10:00	3	72	12	10	23	8	116	38	7	12	5	5		311	87	41	161	22
11:00	7	77	17	1	17	14	97	34	5	12	16	1		298	101	32	136	29
12:00	8	84	19	8	20	8	103	26	5	20	12	5		318	111	36	134	37
13:00	7	95	16	11	23	8	107	40	5	4	8	21		345	118	42	152	33
14:00	6	113	18	8	23	10	121	46	7	18	6	5		381	137	41	174	29
15:00	12	145	24	10	43	12	152	49	8	23	18	5		501	181	65	209	46
16:00	7	163	34	30	6	17	128	51	12	23	13	7		491	204	53	191	43
17:00	6	143	24	9	44	12	122	43	7	23	13	6		452	173	65	172	42
18:00	5	102	21	7	32	30	82	27	7	8	16	3		340	128	69	116	27
19:00	3	56	11	1	11	8	42	26	4	10	6	3		181	70	20	72	19
20:00	6	52	6	5	12	8	74	7	6	5	4	4		189	64	25	87	13
21:00	0	29	13	1	17	5	27	13	2	4	3	0		114	42	23	42	7
Total Count	86	1349	264	124	324	163	1595	515	94	231	174	86		5005	1699	611	2204	491
24hr Factor	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1		1.1	1.1	1.1	1.1	1.1
24hr Volume	95	1484	291	137	357	180	1755	567	104	255	192	95		5506	1869	673	2425	541

Summary of Traffic Count
Transportation Development Division

Site:	27900	Date:	10/14/2014
County:	Jefferson	Hours:	6:00 AM-10:00 PM
City:	Madras	Highway #:	361
Milepoint:		Location:	CULVER HIGHWAY NO. 361 at Fairgrounds Rd
Count Number:	1.00	Weather:	Cloudy

	Summary By Movements														Entering Volumes			
Time of Day	N-E	N-S	N-W	E-N	E-S	E-W	S-N	S-E	S-W	W-N	W-E	W-S		TOTAL	North	East	South	West
6:00	14	39	3	18	5	1	66	8	0	3	8	0		165	56	24	74	11
7:00	19	106	2	20	12	2	166	21	1	10	3	5		367	127	34	188	18
8:00	9	60	4	14	15	5	124	20	1	5	4	2		263	73	34	145	11
9:00	14	45	4	20	12	4	102	16	0	7	7	0		231	63	36	118	14
10:00	9	66	5	24	23	3	101	20	0	4	1	1		257	80	50	121	6
11:00	16	80	3	22	24	7	107	15	1	6	7	1		289	99	53	123	14
12:00	26	98	5	28	29	8	106	20	1	6	4	1		332	129	65	127	11
13:00	19	93	3	26	27	4	103	20	0	3	2	4		304	115	57	123	9
14:00	26	129	4	28	27	5	129	18	4	5	3	2		380	159	60	151	10
15:00	30	167	13	38	31	6	121	21	5	6	6	4		448	210	75	147	16
16:00	21	159	13	42	41	13	114	20	1	7	4	3		438	193	96	135	14
17:00	21	126	12	29	28	6	126	13	2	27	3	2		395	159	63	141	32
18:00	19	86	10	22	25	5	64	19	1	5	2	0		258	115	52	84	7
19:00	14	54	4	13	21	3	31	11	4	0	1	1		157	72	37	46	2
20:00	8	36	7	13	12	8	30	10	1	4	3	0		132	51	33	41	7
21:00	4	24	2	5	3	2	25	0	0	2	0	0		67	30	10	25	2
Total Count	269	1368	94	362	335	82	1515	252	22	100	58	26		4483	1731	779	1789	184
24hr Factor	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1		1.1	1.1	1.1	1.1	1.1
24hr Volume	296	1505	104	399	369	91	1667	278	25	110	64	29		4932	1905	857	1968	203

Summary of Traffic Count
Transportation Development Division

Site: 16032010
County: Jefferson
City: Madras
Milepoint: 96.48
Count Number: 2.00

Date: 10/20/2014
Hours: 6:00 AM-10:00 PM
Highway #: 004
Location: US97 @ SW Fairgrounds Rd. site 617 - north leg volume only
Weather: Rain

	Summary By Movements														Entering Volumes			
Time of Day	N-E	N-S	N-W	E-N	E-S	E-W	S-N	S-E	S-W	W-N	W-E	W-S		TOTAL	North	East	South	West
6:00	0	212	5	1	1	1	283	1	5	14	0	13		536	217	3	289	27
7:00	0	270	20	0	0	0	448	0	15	24	0	18		795	290	0	463	42
8:00	0	341	20	0	0	0	375	0	18	12	0	27		793	361	0	393	39
9:00	2	385	29	2	0	0	471	1	20	32	0	30		972	416	2	492	62
10:00	0	473	32	2	1	0	460	1	21	29	1	42		1062	505	3	482	72
11:00	4	517	39	3	1	0	499	0	34	26	0	52		1175	560	4	533	78
12:00	4	526	29	5	1	1	547	3	27	33	0	43		1219	559	7	577	76
13:00	1	603	47	6	0	2	506	1	55	28	2	46		1297	651	8	562	76
14:00	3	620	42	1	0	0	511	4	33	29	2	45		1290	665	1	548	76
15:00	4	666	45	11	1	1	502	3	25	41	1	45		1345	715	13	530	87
16:00	1	703	48	1	3	0	480	2	24	29	0	61		1352	752	4	506	90
17:00	4	635	37	5	1	0	471	4	31	30	0	50		1268	676	6	506	80
18:00	2	441	40	5	1	0	376	2	34	15	1	36		953	483	6	412	52
19:00	2	326	13	3	1	0	241	0	18	12	0	14		630	341	4	259	26
20:00	0	210	13	4	3	0	178	1	13	12	0	6		440	223	7	192	18
21:00	1	148	7	1	0	1	94	0	3	10	1	4		270	156	2	97	15
Total Count	28	7076	466	50	14	6	6442	23	376	376	8	532		15397	7570	70	6841	916
24hr Factor	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1		1.1	1.1	1.1	1.1	1.1
24hr Volume	31	7784	513	55	16	7	7087	26	414	414	9	586		16937	8327	77	7526	1008

Summary of Traffic Count
Transportation Development Division

Site: 27999
County: Jefferson
City: Madras
Milepoint:
Count Number: 1.00

Date: 10/22/2014
Hours: 6:00 AM-10:00 PM
Highway #: 004
Location: THE DALLES-CALIFORNIA HIGHWAY NO. 4 (US97) at SW
Weather: Cloudy

Time of Day	Summary By Movements								Entering Volumes		
	N-E	N-S	E-N	E-S	S-N	S-E		TOTAL	North	East	South
6:00	5	196	1	2	243	2		449	201	3	245
7:00	4	261	18	9	417	3		712	265	27	420
8:00	10	306	15	6	352	6		695	316	21	358
9:00	22	323	14	6	414	9		788	345	20	423
10:00	25	382	26	6	399	5		843	407	32	404
11:00	18	439	24	5	473	6		965	457	29	479
12:00	21	455	29	5	407	5		922	476	34	412
13:00	32	439	29	8	410	6		924	471	37	416
14:00	22	542	17	12	477	4		1074	564	29	481
15:00	29	625	20	15	425	6		1120	654	35	431
16:00	44	604	40	12	428	19		1147	648	52	447
17:00	28	544	26	9	400	7		1014	572	35	407
18:00	21	339	18	1	338	3		720	360	19	341
19:00	16	272	8	0	159	4		459	288	8	163
20:00	9	180	2	2	116	2		311	189	4	118
21:00	3	180	3	3	92	3		284	183	6	95
Total Count	309	6087	290	101	5550	90		12427	6396	391	5640
24hr Factor	1.1	1.1	1.1	1.1	1.1	1.1		1.1	1.1	1.1	1.1
24hr Volume	340	6696	319	112	6105	99		13670	7036	431	6204

Summary of Traffic Count
Transportation Development Division

Site: 12750
County: Jefferson
City: Madras
Milepoint: 115.86
Count Number: 1.00

Date: 10/20/2014
Hours: 6:00 AM-10:00 PM
Highway #: 053
Location: Warm Springs Hwy 53 (US26) @ NW Cherry Lane
Weather: Cloudy

	Summary By Movements														Entering Volumes			
Time of Day	N-E	N-S	N-W	E-N	E-S	E-W	S-N	S-E	S-W	W-N	W-E	W-S		TOTAL	North	East	South	West
6:00	1	65	0	0	15	4	155	5	48	3	2	12		310	66	19	208	17
7:00	1	135	8	1	13	2	278	10	34	2	0	14		498	144	16	322	16
8:00	0	167	6	0	21	2	233	32	39	1	7	23		531	173	23	304	31
9:00	0	158	4	0	17	2	223	11	29	5	2	35		486	162	19	263	42
10:00	0	192	5	2	12	1	230	13	23	3	2	27		510	197	15	266	32
11:00	0	272	9	0	7	3	268	10	42	6	3	39		659	281	10	320	48
12:00	1	276	6	0	19	2	274	20	33	4	2	44		681	283	21	327	50
13:00	0	266	8	1	18	1	287	13	44	8	2	32		680	274	20	344	42
14:00	0	285	10	0	15	5	205	9	20	4	2	33		588	295	20	234	39
15:00	2	317	4	0	12	4	267	12	13	6	7	79		723	323	16	292	92
16:00	0	376	4	3	20	1	207	21	22	5	1	41		701	380	24	250	47
17:00	2	384	2	0	13	0	194	14	12	4	6	35		666	388	13	220	45
18:00	1	200	1	1	12	0	199	19	10	4	2	9		458	202	13	228	15
19:00	0	142	0	0	2	0	164	5	7	0	0	5		325	142	2	176	5
20:00	0	95	3	1	9	0	113	5	3	0	1	4		234	98	10	121	5
21:00	3	71	4	0	3	0	55	6	3	0	1	3		149	78	3	64	4
Total Count	11	3401	74	9	208	27	3352	205	382	55	40	435		8199	3486	244	3939	530
24hr Factor	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1		1.1	1.1	1.1	1.1	1.1
24hr Volume	13	3742	82	10	229	30	3688	226	421	61	44	479		9019	3835	269	4333	583

Appendix C Synchro Analysis Reports & Queue Length Worksheets

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	5	8	44	17	0	0	15	246	18	3	488	3
Future Vol, veh/h	5	8	44	17	0	0	15	246	18	3	488	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	None	-	-	Yield
Storage Length	75	-	0	-	-	-	25	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	9	49	19	0	0	17	276	20	3	548	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	865	865	274	595	865	276	548	0	0	276	0	0
Stage 1	555	555	-	310	310	-	-	-	-	-	-	-
Stage 2	310	310	-	285	555	-	-	-	-	-	-	-
Critical Hdwy	7.33	6.53	6.93	7.33	6.53	6.23	4.14	-	-	4.12	-	-
Critical Hdwy Stg 1	6.53	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.53	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.519	4.019	3.319	3.519	4.019	3.319	2.22	-	-	2.218	-	-
Pot Cap-1 Maneuver	260	291	724	402	291	762	1018	-	-	1287	-	-
Stage 1	484	512	-	699	658	-	-	-	-	-	-	-
Stage 2	699	658	-	699	512	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	256	285	724	360	285	762	1018	-	-	1287	-	-
Mov Cap-2 Maneuver	256	285	-	360	285	-	-	-	-	-	-	-
Stage 1	476	510	-	687	647	-	-	-	-	-	-	-
Stage 2	687	647	-	638	510	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.2	15.6	0.5	0
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1018	-	-	256	724	360	1287	-	-
HCM Lane V/C Ratio	0.017	-	-	0.022	0.068	0.053	0.003	-	-
HCM Control Delay (s)	8.6	-	-	19.4	10.3	15.6	7.8	0	-
HCM Lane LOS	A	-	-	C	B	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	0.2	0.2	0	-	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	4	0	43	3	0	0	41	291	0	3	532	14
Future Vol, veh/h	4	0	43	3	0	0	41	291	0	3	532	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	280	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	33	0	47	50	0	0	50	47	0	100	37	64
Mvmt Flow	4	0	48	3	0	0	46	327	0	3	598	16

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	860	1023	598	1048	1023	163	598	0	0	327	0	0
Stage 1	604	604	-	419	419	-	-	-	-	-	-	-
Stage 2	256	419	-	629	604	-	-	-	-	-	-	-
Critical Hdwy	7.795	6.5	6.905	8.05	6.5	6.9	4.6	-	-	6.1	-	-
Critical Hdwy Stg 1	6.595	5.5	-	7.25	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.995	5.5	-	6.85	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.8135	4	3.7465	3.975	4	3.3	2.65	-	-	3.2	-	-
Pot Cap-1 Maneuver	223	238	410	147	238	859	782	-	-	745	-	-
Stage 1	423	491	-	487	593	-	-	-	-	-	-	-
Stage 2	655	593	-	380	491	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	212	223	410	123	223	859	782	-	-	745	-	-
Mov Cap-2 Maneuver	212	223	-	123	223	-	-	-	-	-	-	-
Stage 1	398	488	-	458	558	-	-	-	-	-	-	-
Stage 2	616	558	-	333	488	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16	35.1	1.2	0.1
HCM LOS	C	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	782	-	-	380	123	745	-	-
HCM Lane V/C Ratio	0.059	-	-	0.139	0.027	0.005	-	-
HCM Control Delay (s)	9.9	-	-	16	35.1	9.9	0	-
HCM Lane LOS	A	-	-	C	E	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.5	0.1	0	-	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	13	15	33	12	10	5	32	217	31	0	248	8
Future Vol, veh/h	13	15	33	12	10	5	32	217	31	0	248	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	64	46	21	30	50	25	30	52	35	0	61	71
Mvmt Flow	15	17	37	13	11	6	36	244	35	0	279	9

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	625	634	283	643	621	261	288	0	0	279	0	0
Stage 1	283	283	-	333	333	-	-	-	-	-	-	-
Stage 2	342	351	-	310	288	-	-	-	-	-	-	-
Critical Hdwy	7.74	6.96	6.41	7.4	7	6.45	4.4	-	-	4.1	-	-
Critical Hdwy Stg 1	6.74	5.96	-	6.4	6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.74	5.96	-	6.4	6	-	-	-	-	-	-	-
Follow-up Hdwy	4.076	4.414	3.489	3.77	4.45	3.525	2.47	-	-	2.2	-	-
Pot Cap-1 Maneuver	321	344	713	350	346	725	1130	-	-	1295	-	-
Stage 1	608	604	-	626	567	-	-	-	-	-	-	-
Stage 2	562	561	-	644	595	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	301	331	713	310	333	725	1130	-	-	1295	-	-
Mov Cap-2 Maneuver	301	331	-	310	333	-	-	-	-	-	-	-
Stage 1	585	604	-	602	545	-	-	-	-	-	-	-
Stage 2	525	540	-	593	595	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.7	16	0.9	0
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1130	-	-	301	524	357	1295	-	-
HCM Lane V/C Ratio	0.032	-	-	0.049	0.103	0.085	-	-	-
HCM Control Delay (s)	8.3	0	-	17.6	12.7	16	0	-	-
HCM Lane LOS	A	A	-	C	B	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.3	0.3	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	7	8	382	13	11	4	394	290	4	412	2
Future Volume (vph)	5	7	8	382	13	11	4	394	290	4	412	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.92		1.00	0.93		1.00	0.94		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1203	1138		1770	1227		1081	2302		1805	2656	
Flt Permitted	1.00	1.00		0.61	1.00		0.48	1.00		0.32	1.00	
Satd. Flow (perm)	1267	1138		1129	1227		552	2302		617	2656	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	6	8	9	429	15	12	4	443	326	4	463	2
RTOR Reduction (vph)	0	9	0	0	10	0	0	87	0	0	0	0
Lane Group Flow (vph)	6	8	0	429	17	0	4	682	0	4	465	0
Heavy Vehicles (%)	50%	50%	57%	2%	45%	44%	67%	46%	48%	0%	36%	2%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	3	8		7	4			6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	3.2	1.6		16.8	10.2		28.2	28.2		28.2	28.2	
Effective Green, g (s)	3.2	1.6		16.8	10.2		28.2	28.2		28.2	28.2	
Actuated g/C Ratio	0.06	0.03		0.31	0.19		0.51	0.51		0.51	0.51	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.5	2.5		3.0	2.5		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	71	33		463	227		283	1180		316	1361	
v/s Ratio Prot	0.00	0.01		c0.17	0.01			c0.30			0.18	
v/s Ratio Perm	0.00			c0.11			0.01			0.01		
v/c Ratio	0.08	0.25		0.93	0.08		0.01	0.58		0.01	0.34	
Uniform Delay, d1	24.6	26.1		18.0	18.5		6.6	9.3		6.6	7.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	2.9		24.5	0.1		0.0	1.1		0.0	0.3	
Delay (s)	24.9	29.0		42.5	18.6		6.6	10.4		6.6	8.2	
Level of Service	C	C		D	B		A	B		A	A	
Approach Delay (s)		27.9			41.1			10.4			8.2	
Approach LOS		C			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	56.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	180	0	57	95	0	0	0	0	13	848	137
Future Volume (vph)	0	180	0	57	95	0	0	0	0	13	848	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0						5.0	
Lane Util. Factor		1.00		1.00	1.00						0.95	
Frt		1.00		1.00	1.00						0.98	
Flt Protected		1.00		0.95	1.00						1.00	
Satd. Flow (prot)		1508		1504	1319						2488	
Flt Permitted		1.00		0.53	1.00						1.00	
Satd. Flow (perm)		1508		832	1319						2488	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	0	212	0	67	112	0	0	0	0	15	998	161
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	15	0
Lane Group Flow (vph)	0	212	0	67	112	0	0	0	0	0	1159	0
Heavy Vehicles (%)	0%	26%	0%	20%	44%	0%	0%	0%	0%	9%	44%	33%
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		8			4						2	
Permitted Phases				4						2		
Actuated Green, G (s)		14.8		14.8	14.8						45.2	
Effective Green, g (s)		14.8		14.8	14.8						45.2	
Actuated g/C Ratio		0.21		0.21	0.21						0.65	
Clearance Time (s)		5.0		5.0	5.0						5.0	
Vehicle Extension (s)		2.5		2.5	2.5						3.5	
Lane Grp Cap (vph)		318		175	278						1606	
v/s Ratio Prot		c0.14			0.08							
v/s Ratio Perm				0.08							0.47	
v/c Ratio		0.67		0.38	0.40						0.72	
Uniform Delay, d1		25.3		23.7	23.8						8.2	
Progression Factor		1.00		1.23	1.22						1.00	
Incremental Delay, d2		4.7		0.9	0.6						2.8	
Delay (s)		30.0		30.0	29.6						11.1	
Level of Service		C		C	C						B	
Approach Delay (s)		30.0			29.7			0.0			11.1	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	154	39	0	0	86	21	65	696	17	0	0	0
Future Volume (vph)	154	39	0	0	86	21	65	696	17	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0			5.0				
Lane Util. Factor	1.00	1.00			1.00			0.95				
Frt	1.00	1.00			0.97			1.00				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1107	1166			1143			2142				
Flt Permitted	0.68	1.00			1.00			1.00				
Satd. Flow (perm)	795	1166			1143			2142				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	167	42	0	0	93	23	71	757	18	0	0	0
RTOR Reduction (vph)	0	0	0	0	14	0	0	2	0	0	0	0
Lane Group Flow (vph)	167	42	0	0	102	0	0	844	0	0	0	0
Heavy Vehicles (%)	63%	63%	0%	0%	63%	57%	61%	68%	61%	0%	0%	0%
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			6				
Permitted Phases	4						6					
Actuated Green, G (s)	18.3	18.3			18.3			41.7				
Effective Green, g (s)	18.3	18.3			18.3			41.7				
Actuated g/C Ratio	0.26	0.26			0.26			0.60				
Clearance Time (s)	5.0	5.0			5.0			5.0				
Vehicle Extension (s)	2.5	2.5			2.5			3.5				
Lane Grp Cap (vph)	207	304			298			1276				
v/s Ratio Prot		0.04			0.09							
v/s Ratio Perm	c0.21							0.39				
v/c Ratio	0.81	0.14			0.34			0.66				
Uniform Delay, d1	24.2	19.8			21.0			9.4				
Progression Factor	0.40	0.17			1.00			1.00				
Incremental Delay, d2	17.4	0.1			0.5			2.7				
Delay (s)	27.1	3.5			21.5			12.1				
Level of Service	C	A			C			B				
Approach Delay (s)		22.4			21.5			12.1			0.0	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	27	15	7	52	14	11	8	144	51	0	162	28
Future Vol, veh/h	27	15	7	52	14	11	8	144	51	0	162	28
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	30	17	8	58	16	12	9	162	57	0	182	31

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	420	435	198	418	421	190	213	0	0	219	0	0
Stage 1	198	198	-	208	208	-	-	-	-	-	-	-
Stage 2	222	237	-	210	213	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	547	517	848	549	527	857	1369	-	-	1362	-	-
Stage 1	808	741	-	799	734	-	-	-	-	-	-	-
Stage 2	785	713	-	797	730	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	524	513	848	527	523	857	1369	-	-	1362	-	-
Mov Cap-2 Maneuver	524	513	-	527	523	-	-	-	-	-	-	-
Stage 1	802	741	-	793	728	-	-	-	-	-	-	-
Stage 2	751	707	-	772	730	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.3	12.6	0.3	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1369	-	-	550	557	1362	-	-
HCM Lane V/C Ratio	0.007	-	-	0.1	0.155	-	-	-
HCM Control Delay (s)	7.6	0	-	12.3	12.6	0	-	-
HCM Lane LOS	A	A	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.5	0	-	-

Intersection												
Int Delay, s/veh	3.5											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	32	4	2	33	7	34	2	149	15	25	149	14
Future Vol, veh/h	32	4	2	33	7	34	2	149	15	25	149	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	39	2	55	2	35	38	38	32	2
Mvmt Flow	36	4	2	37	8	38	2	167	17	28	167	16

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	434	420	175	415	419	176	183	0	0	184	0	0
Stage 1	231	231	-	180	180	-	-	-	-	-	-	-
Stage 2	203	189	-	235	239	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.49	6.52	6.75	4.12	-	-	4.48	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.49	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.49	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.851	4.018	3.795	2.218	-	-	2.542	-	-
Pot Cap-1 Maneuver	532	525	868	488	525	747	1392	-	-	1201	-	-
Stage 1	772	713	-	743	750	-	-	-	-	-	-	-
Stage 2	799	744	-	692	708	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	488	510	868	473	510	747	1392	-	-	1201	-	-
Mov Cap-2 Maneuver	488	510	-	473	510	-	-	-	-	-	-	-
Stage 1	770	694	-	742	749	-	-	-	-	-	-	-
Stage 2	749	743	-	668	690	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.8	12.3	0.1	1.1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1392	-	-	502	574	1201	-	-
HCM Lane V/C Ratio	0.002	-	-	0.085	0.145	0.023	-	-
HCM Control Delay (s)	7.6	0	-	12.8	12.3	8.1	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.5	0.1	-	-

Intersection	
Int Delay, s/veh	7.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	36	0	60	1	0	6	37	560	5	5	756	44
Future Vol, veh/h	36	0	60	1	0	6	37	560	5	5	756	44
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	37	0	36	0	0	60	32	48	0	50	44	46
Mvmt Flow	40	0	67	1	0	7	42	629	6	6	849	49

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1604	1603	874	1634	1625	632	899	0	0	635	0	0
Stage 1	885	885	-	715	715	-	-	-	-	-	-	-
Stage 2	719	718	-	919	910	-	-	-	-	-	-	-
Critical Hdwy	7.47	6.5	6.56	7.1	6.5	6.8	4.42	-	-	4.6	-	-
Critical Hdwy Stg 1	6.47	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.47	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.833	4	3.624	3.5	4	3.84	2.488	-	-	2.65	-	-
Pot Cap-1 Maneuver	70	107	304	82	103	391	644	-	-	755	-	-
Stage 1	296	366	-	425	438	-	-	-	-	-	-	-
Stage 2	369	436	-	328	356	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	65	99	304	60	96	391	644	-	-	755	-	-
Mov Cap-2 Maneuver	65	99	-	60	96	-	-	-	-	-	-	-
Stage 1	277	363	-	397	409	-	-	-	-	-	-	-
Stage 2	339	408	-	253	353	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	106.9	22.1	0.7	0.1
HCM LOS	F	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	644	-	-	128	219	755	-	-
HCM Lane V/C Ratio	0.065	-	-	0.843	0.036	0.007	-	-
HCM Control Delay (s)	11	-	-	106.9	22.1	9.8	-	-
HCM Lane LOS	B	-	-	F	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	5.2	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	11	31	476	8	33	647
Future Vol, veh/h	11	31	476	8	33	647
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	44	23	45	57	29	55
Mvmt Flow	12	35	535	9	37	727

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1340	539	0	0	544	0
Stage 1	539	-	-	-	-	-
Stage 2	801	-	-	-	-	-
Critical Hdwy	6.84	6.43	-	-	4.39	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.896	3.507	-	-	2.461	-
Pot Cap-1 Maneuver	137	504	-	-	902	-
Stage 1	509	-	-	-	-	-
Stage 2	377	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	131	504	-	-	902	-
Mov Cap-2 Maneuver	250	-	-	-	-	-
Stage 1	509	-	-	-	-	-
Stage 2	362	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.3	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	398	902	-
HCM Lane V/C Ratio	-	-	0.119	0.041	-
HCM Control Delay (s)	-	-	15.3	9.2	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-

Queue Length Estimation at Two-Way STOP Controlled Intersection

Project Information

Analyst:	Yi-Min Ha	Agency/Co.:	KAI
Jurisdiction:	City of Madras	Project ID:	18351
Date Performed:	3/3/2016	Analysis Year:	2015
Analysis Time Period:	PM Peak Hour		

Instructions

Step 1 — Identify Lane Groups and its corresponding code from below

Lane Group Code :

MJL	1	Major street separate left turn lane / TWLT
MNLTR	2	Minor street shared left, through and right lane
MNLR	3	Minor street shared left, and right lane
MNL	4	Minor street separate left turn lane
MNR	5	Minor street separate right turn lane

Step 2 — Calculate Input Parameters

- Calculate Lane Group Volumes, % Heavy Vehicles, and Conflicting Volumes
- Identify the presence of an upstream signal within 1/4 mile on major approches (Signal)
- Identify the presence of a separate LT lane / TWLT on major street approaches (LT)

Step 3 — Verify the input ranges to feed into the models (see QueueLengthsModels sheet)

Step 4 — **Input** the information and obtain queue lengths in feet from **Results** column

Note: ***Round off queue lengths to the next highest 25 feet when reporting***

Input								Results
Intersection	Approach	Lane Group, Code	Volume, veh/hr	% Heavy Vehicles	Conflicting Volume,veh/hr	Signal (0 or 1)	Left Turn Lane (0 or 1)	Queue Length Feet
US 26 & Cherry Lane	EB	MNL	5	50.0%	862	0	1	**49**
US 26 & Cherry Lane	WB	MNL	17	54.0%	915	0	0	**56**
US 26 & NW Depot St	EB	MNLR	47	45.8%	1458	0	1	**53**
US 26 & NW Depot St	WB	MNL	3	50.0%	1048	0	1	**52**
US 97 & Jefferson	EB	MNL	13	64.0%	625	0	0	**48**
US 97 & Jefferson	WB	MNLTR	27	36.5%	1525	0	0	**43**
OR 361 & J St	EB	MNLTR	79	0.0%	1053	0	0	**55**
OR 361 & J St	WB	MNLTR	77	0.0%	1029	0	0	**53**
OR 361 & Fairground Rd	EB	MNLR	38	46.7%	577	0	0	**37**
OR 361 & Fairground Rd	WB	MNLR	74	45.8%	671	0	0	**58**
US 97 & Fairground Rd	EB	MNLR	96	36.4%	2478	0	1	**63**
US 97 & Fairground Rd	WB	MNLR	7	52.5%	2266	0	1	**68**
US 97 & Hall Rd	WB	MNLR	42	28.5%	1879	0	1	**59**

Appendix D Signal Timing Sheets

Regio

Monday, October 19, 2015 14:25

Intersection Name	*5 - US 97 @ US 26*	**Local ID**	*5*
Intersection Telephone Number			
System Name	*169 - Used to be Madras*	**System ID**	*169*
Controller Type	*Voyage - C1-C11*		
Controller Serial Number		**Installation Date**	
Programmed by		**Programmed Date**	

Graphic Map Background	**Phase Rotation Diagram**

Control Data (next/2/2)

Controller Function and Timing (next/2/1, next/2/2)

Security, Sequence, Initialization

Security Code	****	0 = disabled, or 1000-9999
Sequence	*1*	0 = sequential, 1 = quad left turn, 2-6 = special A-E, 7 = lead lag

Lead Lag (next/2/2/3)

Phases 1 - 2	Phases 3 - 4	Phases 5 - 6	Phases 7 - 8

0 = no reversal, 1 = reversal, 2 = by coord plan or clock

Initialization and Flash (next/2/2/5)

	Initialization	Flash Entry	Flash Exit	
Ring 1 Phase	*4*	*2*	*3*	phase 1-8
Ring 2 Phase	*8*	*6*	*7*	phase 1-8
Interval	*0*	*0*	*0*	0 = red, 1 = yellow, 2 = green

Power up Flash	*0.0*	0.0 - 25.5 seconds	**First All Red**	*8.0*	0.0 - 25.5 seconds

Soft Flash (next/2/2/5)

Phase	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**					0 = dark, 1=flash yel WIG, 2 = flash yel WAG, 3 = flash red WIG, 4 = flash red WAG
	3	*4*	*3*	*4*	*3*	*4*	*3*	*4*					
Overlap	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	
	3	*4*	*3*	*4*	*3*	*4*	*3*	*4*	*3*	*4*	*3*	*4*	same as phase
Internal Logic Output	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 = normal, 1 = dark, 2 = flash WIG

Per Phase Functions (next/2/2/3, next/2/2/1)

	1	2	3	4	5	6	7	8	
Phases Used		X	X	X		X	X	X	X = on
Restricted Phases									X = on (Sequence 2, 6, 7 only)
Exclusive Phases									X = on (Sequence 7 only)
Yellow Lock									X = on
Min Recall		X				X			
Max Recall									
Ped Recall									
Red Lock									
Max Out Recall Inhibit									
Soft Recall									
Free Walk Rest									
Conditional Ped									
Disable Inhibit Max Termination									
Call to Non Act 1									
Call to Non Act 2									

Dual Entry (next/2/2/9/3)

Mode 1 — 0 = off, 1 = on, 2 = Not Used, 3 = by coord plan, 4 = by time clock circuit 61

Dual Entry Phase -->	1	2	3	4	5	6	7	8	
Phase	0	0	0	8	0	0	0	4	0 = none, 1-8 = phase 1-8

Conditional Service, Five Section Head

Conditional Service (next/2/2/9/3)

	Mode	CS Max Time
Phase 1	0	0
Phase 3	0	0
Phase 5	0	0
Phase 7	0	0

0 = off, 1 = C.S.On. 2 = C.S. on by TOD circuit 57, 3 = N/A, 4 = C.S. and C.R. On, 5 = C.R. on by TOD circuit 57.

5 Section Head Logic (next/2/2/9/4)

X Omits Y		Anti-Trap			Yellow Blanking LT	
X : Y		Trap Protected Phase		Next Phase	Phase	
6 : 1	0	1		< (5)	1	
8 : 3	0	3		< (7)	3	
2 : 5	0	5		< (1)	5	
4 : 7	0	7		< (3)	7	

0=off, 1=side call, 2=no side call

X = On

Phase Times (next/2/2/2, next/2/2/9/5)									
	1	2	3	4	5	6	7	8	
Movement		*SB*	*EBLT*	*WB*		*NB*	*WBLT*	*EB*	
Minimum Green	*0*	*10*	*10*	*8*	*0*	*10*	*5*	*10*	0 - 255 sec
Passage	*0.0*	*5.0*	*2.5*	*2.5*	*0.0*	*5.0*	*2.5*	*2.5*	0.0 - 25.5 sec
Yellow	*0.0*	*4.0*	*4.0*	*4.0*	*0.0*	*4.0*	*4.0*	*4.0*	0.0 - 25.5 sec
Red Clearance	*0.0*	*1.0*	*1.0*	*1.0*	*0.0*	*1.0*	*1.0*	*1.0*	0.0 - 25.5 sec or 0 - 255 sec
Max 1	*0*	*30*	*30*	*30*	*0*	*30*	*10*	*20*	0 - 255 sec
Max 2	*0*	*30*	*35*	*30*	*0*	*30*	*10*	*10*	0 - 255 sec
Walk	*0*	*7*	*0*	*7*	*0*	*7*	*0*	*7*	0 - 255 sec
Ped Clear	*0*	*20*	*0*	*19*	*0*	*15*	*0*	*19*	0 - 255 sec
Seconds Per Actuation	*0.0*	*1.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec
Time Before Reduction	*0*	*20*	*0*	*0*	*0*	*0*	*5*	*5*	0 - 255 sec
Time to Reduce	*0*	*20*	*0*	*0*	*0*	*0*	*5*	*5*	0 - 255 sec
Minimum Gap	*0.0*	*3.0*	*1.5*	*1.5*	*0.0*	*3.0*	*1.5*	*1.5*	0.0 - 25.5 sec
Max Variable Initial	*0*	*20*	*5*	*8*	*0*	*20*	*5*	*10*	0 - 255 sec
Auto Max Adjust	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec
Auto Max Limit	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec
Inhibit Min Yellow									X = On
Red Decimal Off									X = On
Advance Walk	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec

Other Controller Functions (next/2/2/9)									
Phase -->	1	2	3	4	5	6	7	8	
Inhibit Simultaneous Gap Out			*X*	*X*			*X*	*X*	X = On

Last Car Passage	*2*	0 = recall phase, 1 = last car passage, 2 = NOT recall - Not last car passage
Red Revert (+2 seconds)	*3.0*	0 - 25.5 sec
Auto Ped Clear	*X*	X = On
Flashing Don't Walk Into Yellow		X = On
Soft Recall / Red Rest Delay	*0.0*	0 - 25.5 sec
Ped Pushbutton	*0*	0 - 5 sec, 0 = disable
Advance Flash Rate	*0*	0 = disable, 1 = 120 FPM
Change Sequence		X = On (After a download with a power on - off cycle)

Phase -->	1	2	3	4	5	6	7	8	
Red Clear Extension Detector	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 = none 1 - 32 = detector 1 - 32
Red Clear Extension Red Time	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0 - 25.5 sec.

Local Detectors (next/2/2/4)								
Detector Data								
	Yellow Lock	Detector Inhibit	Call Phase	Extend Phase	Switch Phase	Delay Time	Stretch / Disconnect Time	Delay or Disconnect Mode
Detector 1 - System - I1			*6*	*6*	*0*	*0*	*0.0*	*0*
Detector 2 - I9U			*6*	*6*	*0*	*0*	*0.0*	*0*
Detector 3 - System - I5			*0*	*0*	*0*	*0*	*0.0*	*0*
Detector 4 - I9L			*0*	*0*	*0*	*0*	*0.0*	*0*
Detector 5 - System - J1			*2*	*2*	*0*	*0*	*0.0*	*0*
Detector 6 - J9U			*2*	*2*	*0*	*0*	*0.0*	*0*
Detector 7 - System - J5			*7*	*7*	*0*	*0*	*0.0*	*0*
Detector 8 - J9L			*7*	*7*	*0*	*0*	*0.0*	*0*
Detector 9 - System - I2U			*2*	*2*	*0*	*0*	*0.0*	*0*
Detector 10 - System - I2L			*2*	*2*	*0*	*0*	*0.0*	*0*
Detector 11 - I3U			*2*	*2*	*0*	*0*	*0.0*	*0*
Detector 12 - I3L			*2*	*2*	*0*	*0*	*0.0*	*0*
Detector 13 - I4			*2*	*2*	*0*	*0*	*0.0*	*0*
Detector 14 - System - I6U			*4*	*4*	*0*	*0*	*0.0*	*0*
Detector 15 - I6L			*4*	*4*	*0*	*0*	*0.0*	*0*
Detector 16 - System - I7U			*4*	*4*	*0*	*0*	*0.0*	*0*
Detector 17 - I7L			*4*	*4*	*0*	*0*	*0.0*	*0*
Detector 18 - I8			*4*	*4*	*0*	*0*	*0.0*	*0*
Detector 19 - System - J2U			*6*	*6*	*0*	*0*	*0.0*	*0*
Detector 20 - System - J2L			*6*	*6*	*0*	*0*	*0.0*	*0*
Detector 21 - J3U			*6*	*6*	*0*	*0*	*0.0*	*0*
Detector 22 - J3L			*6*	*6*	*0*	*0*	*0.0*	*0*
Detector 23 - J4			*6*	*6*	*0*	*0*	*0.0*	*0*
Detector 24 - System - J6U			*3*	*3*	*0*	*0*	*0.0*	*0*
Detector 25 - System - J6L			*3*	*3*	*0*	*0*	*0.0*	*0*
Detector 26 - J7U			*8*	*8*	*0*	*0*	*0.0*	*0*
Detector 27 - System - J7L			*8*	*8*	*0*	*0*	*0.0*	*0*
Detector 28 - J8			*8*	*8*	*0*	*0*	*0.0*	*0*
Detector 29 -			*0*	*0*	*0*	*0*	*0.0*	*0*
Detector 30 -			*0*	*0*	*0*	*0*	*0.0*	*0*
Detector 31 -			*0*	*0*	*0*	*0*	*0.0*	*0*
Detector 32 -			*0*	*0*	*0*	*0*	*0.0*	*0*

yellow lock, detector inhibit, - X = On; call, extend, phase - 0 = none 1 - 8 = phase 1 - 8 ; delay time - 0 - 255 sec
stretch / disconnect time - 0.0 - 25.5 sec.; delay or disconnect Mode - 0 -13

Detector Plans (next/2/2/4/5)

	Loop Number									
	Plan Detectors	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 32, 0 = none, 1 -3 2 = detectors 1 - 32
Detector Plan 1	**Call Phase**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 8, 0 = none, 1 - 8 = phase 1 - 8
	Extend Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Switch Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Delay Time	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec
	Stretch/Disconnect Time	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec
	Delay/ Disconnect Mode	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 13
Detector Plan 2	**Call Phase**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 8, 0 = none, 1 - 8 = phase 1 - 8
	Extend Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Switch Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Delay Time	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec
	Stretch/Disconnect Time	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec
	Delay/ Disconnect Mode	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 13
Detector Plan 3	**Call Phase**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 8, 0 = none, 1 - 8 = phase 1 - 8
	Extend Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Switch Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Delay Time	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec
	Stretch/Disconnect Time	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec
	Delay/ Disconnect Mode	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 13

Detector Fail Monitor (next/2/2/4/3)					Detectors 33-64 (next/2/2/4/6)		
	Fail Monitor Enable	Recall Phase	Min Counts	Max Counts		Call Phase	Extend Phase
Detector 1 - System - I1		*0*	*0*	*0*	Detector 33 -	0	0
Detector 2 - I9U		*0*	*0*	*0*	Detector 34 -	0	0
Detector 3 - System - I5		*0*	*0*	*0*	Detector 35 -	0	0
Detector 4 - I9L		*0*	*0*	*0*	Detector 36 -	0	0
Detector 5 - System - J1		*0*	*0*	*0*	Detector 37 -	0	0
Detector 6 - J9U		*0*	*0*	*0*	Detector 38 -	0	0
Detector 7 - System - J5		*0*	*0*	*0*	Detector 39 -	0	0
Detector 8 - J9L		*0*	*0*	*0*	Detector 40 -	0	0
Detector 9 - System - I2U		*0*	*0*	*0*	Detector 41 -	0	0
Detector 10 - System - I2L		*0*	*0*	*0*	Detector 42 -	0	0
Detector 11 - I3U		*0*	*0*	*0*	Detector 43 -	0	0
Detector 12 - I3L		*0*	*0*	*0*	Detector 44 -	0	0
Detector 13 - I4		*0*	*0*	*0*	Detector 45 -	0	0
Detector 14 - System - I6U		*0*	*0*	*0*	Detector 46 -	0	0
Detector 15 - I6L		*0*	*0*	*0*	Detector 47 -	0	0
Detector 16 - System - I7U		*0*	*0*	*0*	Detector 48 -	0	0
Detector 17 - I7L		*0*	*0*	*0*	Detector 49 -	0	0
Detector 18 - I8		*0*	*0*	*0*	Detector 50 -	0	0
Detector 19 - System - J2U		*0*	*0*	*0*	Detector 51 -	0	0
Detector 20 - System - J2L		*0*	*0*	*0*	Detector 52 -	0	0
Detector 21 - J3U		*0*	*0*	*0*	Detector 53 -	0	0
Detector 22 - J3L		*0*	*0*	*0*	Detector 54 -	0	0
Detector 23 - J4		*0*	*0*	*0*	Detector 55 -	0	0
Detector 24 - System - J6U		*0*	*0*	*0*	Detector 56 -	0	0
Detector 25 - System - J6L		*0*	*0*	*0*	Detector 57 -	0	0
Detector 26 - J7U		*0*	*0*	*0*	Detector 58 -	0	0
Detector 27 - System - J7L		*0*	*0*	*0*	Detector 59 -	0	0
Detector 28 - J8		*0*	*0*	*0*	Detector 60 -	0	0
Detector 29 -		*0*	*0*	*0*	Detector 61 -	0	0
Detector 30 -		*0*	*0*	*0*	Detector 62 -	0	0
Detector 31 -		*0*	*0*	*0*	Detector 63 -	0	0
Detector 32 -		*0*	*0*	*0*	Detector 64 -	0	0
fail monitor enable - X = On, recall phase - 0 = none 1 - 8 = phase 1 - 8, min, max					call / extend phase - 0 = none 1 - 8 = phase 1 - 8		

Detector Fail Sample Period (all detectors)	*0*	0 - 255 minutes

Video Fail Inputs (next/2/2/4/3) -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Phase Recalled	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 = none, 1 - 8 = phase 1 - 8

System Detectors (next/2/2/4/4)

System Detectors -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Local Detector	*19*	*1*	*7*	*14*	*5*	*9*	*3*	*24*	0 = none, 1 - 32 = phase 1 - 32

Overlaps / FYLTA (next/2/2/8)

Vehicle Overlaps		Phase or Movement	Phases 1	2	3	4	5	6	7	8	Extension Green	Clearance Yellow	Red	
Overlaps	A		0	0	0	0	0	0	0	0	0.0	0.0	0.0	A - D 0 = none 1 = overlap 2 = 60 FPM 3 = Not ped 4=Comp. Ph. 5=Prevent. Ext. 6=Not Veh. 7=Adv. FF E - L 0 = no Overlap 1 = Overlap Green,Yellow Red
	B		0	0	0	0	0	0	0	0	0.0	0.0	0.0	
	C		0	0	0	0	0	0	0	0	0.0	0.0	0.0	
	D		0	0	0	0	0	0	0	0	0.0	0.0	0.0	
	E		0	0	0	0	0	0	0	0	0.0	0.0	0.0	
	F		0	0	0	0	0	0	0	0	0.0	0.0	0.0	
	G		0	0	0	0	0	0	0	0	0.0	0.0	0.0	
	H		0	0	0	0	0	0	0	0	0.0	0.0	0.0	
	I		0	0	0	0	0	0	0	0	0.0	0.0	0.0	
	J		0	0	0	0	0	0	0	0	0.0	0.0	0.0	
	K		0	0	0	0	0	0	0	0	0.0	0.0	0.0	
	L		0	0	0	0	0	0	0	0	0.0	0.0	0.0	

Not Ped - Ped Overlaps (next/2/2/8/5)

Ped Overlaps ->		A	B	C	D	E	F	G	H	
Overlaps	A									X = Nor Ped Ped Overlap
	B									
	C									
	D									

Advance Warning (next/2/2/8/3)

	E	F	G	H	I	J	K	L	
Enable	0	0	0	0	0	0	0	0	0 = disabled, 1 = enabled
1st Conditional Overlap	0	0	0	0	0	0	0	0	0 = none, 1 - overlap E, 2 = overlap F, etc.
2nd Conditional Overlap	0	0	0	0	0	0	0	0	
Advance Deactivation Delay	0	0	0	0	0	0	0	0	0 - 99 seconds

Ped Overlaps (next/2/2/8/5)

Phase -->		1	2	3	4	5	6	7	8	Walk	Ped Clear	Ped Recall	
Ped Overlap	A									0	0		Phase, Ped Recall: X = on Walk, Ped Clear: 0 - 255 seconds
	B									0	0		
	C									0	0		
	D									0	0		
	E									0	0		
	F									0	0		
	G									0	0		
	H									0	0		

Flashing Yellow Left Turn Arrow (FYLTA) (next/2/2/8/6)

Phase Pairs -->	1 - 2	3 - 4	5 - 6	7 - 8	
Enable	0	4	0	4	0 = off, 3 = 3 outputs, 4 = 4 outputs, 5 = 5 outputs
Even Omits Odd	0	0	0	0	0 = off, 1 = on, 2 = on, place call across barrier
Detector Switch Odd / Even	X	X	X	X	X = on, odd phase must be omitted
Red Transition	2.0	3.0	2.0	3.0	0.0 or 2.0 - 25.5 sec
Red Extension	0.0	0.0	0.0	0.0	0.0 - 25.5 sec
Return to GLTA	0	0	0	0	0 = off, 1 = max out, 2 = yellow lock

Flashing Yellow Left Turn Arrow (FYLTA) - Continued on last page

Service Plans (next/2/2/6)

		1	2	3	4	5	6	7	8	
	Phase -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Service Plan 1	**Call Mode**	0	0	0	0	0	0	0	0	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	0	0	0	0	0	0	0	0	0 - 255 sec.
	Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 or 3.0 - 25.5
	Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Walk	0	0	0	0	0	0	0	0	0 - 255 sec.
	Pedestrian Clearance	0	0	0	0	0	0	0	0	0 - 255 sec.
	Phase -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Service Plan 2	**Call Mode**	0	0	0	0	0	0	0	0	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	0	0	0	0	0	0	0	0	0 - 255 sec.
	Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 or 3.0 - 25.5
	Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Walk	0	0	0	0	0	0	0	0	0 - 255 sec.
	Pedestrian Clearance	0	0	0	0	0	0	0	0	0 - 255 sec.
	Phase -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Service Plan 3	**Call Mode**	0	0	0	0	0	0	0	0	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	0	0	0	0	0	0	0	0	0 - 255 sec.
	Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 or 3.0 - 25.5
	Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Walk	0	0	0	0	0	0	0	0	0 - 255 sec.
	Pedestrian Clearance	0	0	0	0	0	0	0	0	0 - 255 sec.
	Phase -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Service Plan 4	**Call Mode**	0	0	0	0	0	0	0	0	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	0	0	0	0	0	0	0	0	0 - 255 sec.
	Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 or 3.0 - 25.5
	Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Walk	0	0	0	0	0	0	0	0	0 - 255 sec.
	Pedestrian Clearance	0	0	0	0	0	0	0	0	0 - 255 sec.
	Phase -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Service Plan 5	**Call Mode**	0	0	0	0	0	0	0	0	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	0	0	0	0	0	0	0	0	0 - 255 sec.
	Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 or 3.0 - 25.5
	Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Walk	0	0	0	0	0	0	0	0	0 - 255 sec.
	Pedestrian Clearance	0	0	0	0	0	0	0	0	0 - 255 sec.
	Phase -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Service Plan 6	**Call Mode**	0	0	0	0	0	0	0	0	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	0	0	0	0	0	0	0	0	0 - 255 sec.
	Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 or 3.0 - 25.5
	Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Walk	0	0	0	0	0	0	0	0	0 - 255 sec.
	Pedestrian Clearance	0	0	0	0	0	0	0	0	0 - 255 sec.

Service Plans Cont.

	Phase -->	1	2	3	4	5	6	7	8	
Service Plan 7	Call Mode	0	0	0	0	0	0	0	0	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	0	0	0	0	0	0	0	0	0 - 255 sec.
	Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 or 3.0 - 25.5
	Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Walk	0	0	0	0	0	0	0	0	0 - 255 sec.
	Pedestrian Clearance	0	0	0	0	0	0	0	0	0 - 255 sec.

	Phase -->	1	2	3	4	5	6	7	8	
Service Plan 8	Call Mode	0	0	0	0	0	0	0	0	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	0	0	0	0	0	0	0	0	0 - 255 sec.
	Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 or 3.0 - 25.5
	Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Walk	0	0	0	0	0	0	0	0	0 - 255 sec.
	Pedestrian Clearance	0	0	0	0	0	0	0	0	0 - 255 sec.

Max Plans (next/2/2/7)

	Phase -->	1	2	3	4	5	6	7	8	
Max Plan 1	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 2	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 3	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 4	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 5	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 6	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 7	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 8	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec

Coordination Data (next/2/3)

Coordination Modes (next/2/3/1, next/2/3/4/1, next/2/3/4/3)

Flash Mode	33	0=off, 1=on, 33=time clock, 34=comm, 35=hardwire, 36=NWS Set only, 37=AB3418 / NTCIP S
Coordination Plan Mode	33	0=free, 1-32 = coord plan 1-32, 33=time clock, 34=comm, 35=hardwire, 36=NWS Set only, 37=
Offset Seeking Mode	2	0=add only, 1=dwell, 2=fastway
Late Ped	0	0 = off, 1 = on
Coord Walk Rest	0	0 = off, 1 = on, 2 = by TOD circuit 160, 3 = end of walk, 4 = coord ped during perms
Repeated Phase Service	0	0=off, 1=on (no coord ped), 2=on (beginning green coord ped), 3=on (coord ped always)
Zero Mode (TS2 only)	1	0=start of main street, 1=end of main street, 2=by TOD circuit 144

Phase -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Omit Phase During Repeated Phase Service	0	0	0	0	0	0	0	0	0 = service allowed 1 = service prevented
Auto Permissive Min Green	0	0	0	0	0	0	0	0	0 - 255 seconds

Coordination Plans (next/2/3/2)

Coord Plan	**Coordination Phases**		**Cycle Length**	**Offset Time**	**Min Cycle Length Dwell Time**	**Permissive**	**Service Plan**	**Max Plan**
	Ring 1	**Ring 2**						
1 -	0	0	0	0	0	0	0	0
2 -	0	0	0	0	0	0	0	0
3 -	0	0	0	0	0	0	0	0
4 -	0	0	0	0	0	0	0	0
5 -	0	0	0	0	0	0	0	0
6 -	0	0	0	0	0	0	0	0
7 -	0	0	0	0	0	0	0	0
8 -	0	0	0	0	0	0	0	0
9 -	0	0	0	0	0	0	0	0
10 -	0	0	0	0	0	0	0	0
11 -	0	0	0	0	0	0	0	0
12 -	0	0	0	0	0	0	0	0
13 -	0	0	0	0	0	0	0	0
14 -	0	0	0	0	0	0	0	0
15 -	0	0	0	0	0	0	0	0
16 -	0	0	0	0	0	0	0	0
17 -	0	0	0	0	0	0	0	0
18 -	0	0	0	0	0	0	0	0
19 -	0	0	0	0	0	0	0	0
20 -	0	0	0	0	0	0	0	0
21 -	0	0	0	0	0	0	0	0
22 -	0	0	0	0	0	0	0	0
23 -	0	0	0	0	0	0	0	0
24 -	0	0	0	0	0	0	0	0
25 -	0	0	0	0	0	0	0	0
26 -	0	0	0	0	0	0	0	0
27 -	0	0	0	0	0	0	0	0
28 -	0	0	0	0	0	0	0	0
29 -	0	0	0	0	0	0	0	0
30 -	0	0	0	0	0	0	0	0
31 -	0	0	0	0	0	0	0	0
32 -	0	0	0	0	0	0	0	0
	0 - 8		0 - 255 sec.				0 - 8	

Coordination Plans cont.

Coord Plan	* = Force Offs / Split Times (TS2)								* = Yield Points / Actuated Times (TS2)	
	1	2	3	4	5	6	7	8	Ring 1	Ring 2
1 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
2 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
3 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
4 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
5 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
6 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
7 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
8 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
9 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
10 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
11 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
12 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
13 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
14 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
15 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
16 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
17 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
18 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
19 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
20 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
21 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
22 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
23 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
24 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
25 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
26 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
27 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
28 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
29 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
30 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
31 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
32 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0 - 255 sec * = force offs and yield points									

Circuit Mapping (next/2/3/3)

Circuit Map	Coord Plan	Time Clock Circuit		Time Clock Circuit		Time Clock Circuit		Time Clock Circuit		Time Clock Circuit		Time Clock Circuit		Time Clock Circuit		Time Clock Circuit	
1	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
2	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
3	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
4	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
5	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
6	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
7	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
8	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
9	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
10	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
11	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
12	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
13	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
14	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
15	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
16	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
17	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
18	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
19	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
20	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U

coord plan - 0 = free, 1 - 32 = coord plan 1 - 32, 33 = any, 34 none selected
time clock circuits - 0 = not used, or circuits 6 - 196

Dynamic Phase Length (next/2/3/4/4)

	Phase -->	1	2	3	4	5	6	7	8	
Back Detector		0	0	0	0	0	0	0	0	0 = none, 1-32 = detector 1-32
Lane Factor		0	0	0	0	0	0	0	0	0 = none, 1.0 - 5.0
Check Out Detector		0	0	0	0	0	0	0	0	0 = none, 1-32 = detector 1-32
Coord Delta Force Off	Set A	0	0	0	0	0	0	0	0	
	Set B	0	0	0	0	0	0	0	0	
	Set C	0	0	0	0	0	0	0	0	
	Set D	0	0	0	0	0	0	0	0	0 - 255 sec
Free Delta Max	Set A	0	0	0	0	0	0	0	0	
	Set B	0	0	0	0	0	0	0	0	
	Set C	0	0	0	0	0	0	0	0	
	Set D	0	0	0	0	0	0	0	0	

Platoon Progression (next/2/3/4/5)

Entry Local Only			Master Local Only		
Platoon Max	0	0 - 255 sec	Smoothing Factor	0.0	0.0 - 1.0
Min Platoon Green	0	0 - 255 sec			
Entry Detector Gap	0.0	0.0 - 25.5			
Min Platoon Cycle	0	0 - 255 sec			

Inbound				Outbound			
Only for Entry Inbound Local or Master Local				Only for Entry Outbound Local or Master Local			
Entry IB Local also Last OB Local	0	0 - 50		Entry OB Local also Last IB Local	0	0 - 50	
Speed	0	0 - 55 mph		Speed	0	0 - 55 mph	
Distance from Entry Local	0	0 - 65000 feet		Distance from Entry Local	0	0 - 65000 feet	
Entry Local Only				Entry Local Only			
Distance from Entry Local Detector	0	0 - 999 feet		Distance from Entry Local Detector	0	0 - 999 feet	
Entry Local Detector	0	0	0 - 32	Entry Local Detector	0	0	0 - 32
Master Local				Master Local			
Master Mid - System Critical Detectors	0	0	0 - 16	Master Mid - System Critical Detectors	0	0	0 - 16

Force Off Percents

Inbound	1	3	4	5	7	8	Outbound	1	3	4	5	7	8
Split 1	0	0	0	0	0	0	Split 1	0	0	0	0	0	0
Split 2	0	0	0	0	0	0	Split 2	0	0	0	0	0	0
	0 - 100 %							0 - 100 %					

Time of Day Data (next/2/4)

Day Program (next/2/4/1)

	Day Prog.	Time	Coord Plan	Coord Plan or Circuit		State On / Off		Day Prog.	Time	Coord Plan	Coord Plan or Circuit		State On/Off
1							51						
2							52						
3							53						
4							54						
5							55						
6							56						
7							57						
8							58						
9							59						
10							60						
11							61						
12							62						
13							63						
14							64						
15							65						
16							66						
17							67						
18							68						
19							69						
20							70						
21							71						
22							72						
23							73						
24							74						
25							75						
26							76						
27							77						
28							78						
29							79						
30							80						
31							81						
32							82						
33							83						
34							84						
35							85						
36							86						
37							87						
38							88						
39							89						
40							90						
41							91						
42							92						
43							93						
44							94						
45							95						
46							96						
47							97						
48							98						
49							99						
50							100						
	1 - 15	hh : mm	X = on	coord plan 0 - 32 or circuit 1-196		X = on		1 - 15	hh : mm	X = on	coord plan 0 - 32 or circuit 1-196		X = on

Day Program cont.

	Day Prog.	Time	Coord Plan	Coord Plan or Circuit		State On / Off		Day Prog.	Time	Coord Plan	Coord Plan or Circuit		State On / Off
101							**151**						
102							**152**						
103							**153**						
104							**154**						
105							**155**						
106							**156**						
107							**157**						
108							**158**						
109							**159**						
110							**160**						
111							**161**						
112							**162**						
113							**163**						
114							**164**						
115							**165**						
116							**166**						
117							**167**						
118							**168**						
119							**169**						
120							**170**						
121							**171**						
122							**172**						
123							**173**						
124							**174**						
125							**175**						
126							**176**						
127							**177**						
128							**178**						
129							**179**						
130							**180**						
131							**181**						
132							**182**						
133							**183**						
134							**184**						
135							**185**						
136							**186**						
137							**187**						
138							**188**						
139							**189**						
140							**190**						
141							**191**						
142							**192**						
143							**193**						
144							**194**						
145							**195**						
146							**196**						
147							**197**						
148							**198**						
149							**199**						
150							**200**						
	1 - 15	hh : mm	X = on	coord plan 0 - 32 or circuit 1-196		X = on		1 - 15	hh : mm	X = on	coord plan 0 - 32 or circuit 1-196		X = on

Week Program (next/2/4/2)

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	*1*	*1*	*1*	*1*	*1*	*1*	*1*
2	*1*	*1*	*1*	*1*	*1*	*1*	*1*
3	*1*	*1*	*1*	*1*	*1*	*1*	*1*
4	*1*	*1*	*1*	*1*	*1*	*1*	*1*
5	*1*	*1*	*1*	*1*	*1*	*1*	*1*
6	*1*	*1*	*1*	*1*	*1*	*1*	*1*
7	*1*	*1*	*1*	*1*	*1*	*1*	*1*
8	*1*	*1*	*1*	*1*	*1*	*1*	*1*
9	*1*	*1*	*1*	*1*	*1*	*1*	*1*
10	*1*	*1*	*1*	*1*	*1*	*1*	*1*

0 = none, 1 - 15 = day plan

Exception Days (next/2/4/6)

	DOW	WOM	DOM	MOY	Day Prog.
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
	0-10	0 - 5	0-31	0-12	0 - 15

Time Clock References (next/2/4/5)

Synch reference Mode	*0*	0 = timed, 1 = by event
Synch Reference Time	*00:00*	00:00 - 23:59
Daylight Savings Enable	*X*	X = on
Reset Time	*00:00*	00:00 - 23:59

Year Program (next/2/4/3)

From Date	To Date	Week Program
01/01/2015	*12/31/2015*	*1*

New Years Day - Date - January 1st

Martin Luther King Day - DOW WOM - 3rd Monday of January

President's Day - DOW WOM - 3rd Monday February

Memorial Day - DOW WOM - Last Monday May

Fourth of July - Date - July 4th

Labor Day - DOW WOM - 1st Monday September

Columbus Day - DOW WOM - 2nd Monday October

Veteran's Day - Date - November 11th

Thanksgiving - DOW WOM - 4th Thursday November

Christmas - Date - December 25th

Exception day headings - DOW = Day of Week, WOM = Week of Month, DOM = Day of Month, MOY = Month of Year

Circuit Overrides (next/2/4/4)							
1 - Coord Line 1	**CL1**	*TOD*	On / Off / TOD	**51 - Ped Omit 3**	**PO3**	*TOD*	On / Off / TOD
2 - Coord Line 2	**CL2**	*TOD*		**52 - Ped Omit 4**	**PO4**	*TOD*	
3 - Coord Line 4	**CL4**	*TOD*		**53 - Ped Omit 5**	**PO5**	*TOD*	
4 - Coord Line 8	**CL8**	*TOD*		**54 - Ped Omit 6**	**PO6**	*TOD*	
5 - Coord Line 16	**C16**	*TOD*		**55 - Ped Omit 7**	**PO7**	*TOD*	
6 - Coord Operation	**CRD**	*TOD*		**56 - Ped Omit 8**	**PO8**	*TOD*	
7 - Soft Flash	**SFL**	*TOD*		**57 - Conditional Service**	**CVS**	*TOD*	
8 - Enable System Relays	**ESR**	*TOD*		**58 - Inhibit Simultaneous Gap Out**	**ISG**	***On***	
9 - Call to Non Act 1	**CN1**	*TOD*		**59 - Inhibit Hardwire**	**HWI**	*TOD*	
10 - Call to Non Act 2	**CN2**	*TOD*		**60 - Ped Override Mode**	**POM**	*TOD*	
11 - Walk Rest Modifier	**WRM**	*TOD*		**61 - Dual Entry**	**DLE**	***On***	
12 - Min Recall	**MIN**	*TOD*		**62 - Exclusive Ped**	**EPD**	*TOD*	
13 - Max 2 Both Rings	**MX2**	*TOD*		**63 - Call to Time Clock Mode**	**CTC**	*TOD*	
14 - Coord Inhibit Max Ring 1, 2	**IMT**	*TOD*		**64 - Dual Enhanced Ped**	**DEP**	*TOD*	
15 - Enable Service Log	**ESL**	*TOD*		**65 - Service Plan 1**	**SP1**	*TOD*	
16 - Call to Free	**CTF**	*TOD*		**66 - Service Plan 2**	**SP2**	*TOD*	
17 - TOD Output 1	**TO1**	*TOD*		**67 - Service Plan 3**	**SP3**	*TOD*	
18 - TOD Output 2	**TO2**	*TOD*		**68 - Service Plan 4**	**SP4**	*TOD*	
19 - TOD Output 3	**TO3**	*TOD*		**69 - Service Plan 5**	**SP5**	*TOD*	
20 - TOD Output 4	**TO4**	*TOD*		**70 - Service Plan 6**	**SP6**	*TOD*	
21 - TOD Output 5	**TO5**	*TOD*		**71 - Service Plan 7**	**SP7**	*TOD*	
22 - TOD Output 6	**TO6**	*TOD*		**72 - Service Plan 8**	**SP8**	*TOD*	
23 - TOD Output 7	**TO7**	*TOD*		**73 - Max Plan 1**	**MP1**	*TOD*	
24 - TOD Output 8	**TO8**	*TOD*		**74 - Max Plan 2**	**MP2**	*TOD*	
25 - Vehicle Call Phase 1	**VC1**	*TOD*		**75 - Max Plan 3**	**MP3**	*TOD*	
26 - Vehicle Call Phase 2	**VC2**	*TOD*		**76 - Max Plan 4**	**MP4**	*TOD*	
27 - Vehicle Call Phase 3	**VC3**	*TOD*		**77 - Max Plan 5**	**MP5**	*TOD*	
28 - Vehicle Call Phase 4	**VC4**	*TOD*		**78 - Max Plan 6**	**MP6**	*TOD*	
29 - Vehicle Call Phase 5	**VC5**	*TOD*		**79 - Max Plan 7**	**MP7**	*TOD*	
30 - Vehicle Call Phase 6	**VC6**	*TOD*		**80 - Max Plan 8**	**MP8**	*TOD*	
31 - Vehicle Call Phase 7	**VC7**	*TOD*		**81 - Transit Priority Max Group 1**	**TG1**	*TOD*	
32 - Vehicle Call Phase 8	**VC8**	*TOD*		**82 - Transit Priority Max Group 2**	**TG2**	*TOD*	
33 - Ped Call Phase 1	**PC1**	*TOD*		**83 - Transit Priority Max Group 3**	**TG3**	*TOD*	
34 - Ped Call Phase 2	**PC2**	*TOD*		**84 - Transit Priority Max Group 4**	**TG4**	*TOD*	
35 - Ped Call Phase 3	**PC3**	*TOD*		**85 - Transit Priority Max Group 5**	**TG5**	*TOD*	
36 - Ped Call Phase 4	**PC4**	*TOD*		**86 - Transit Priority Max Group 6**	**TG6**	*TOD*	
37 - Ped Call Phase 5	**PC5**	*TOD*		**87 - Transit Priority Max Group 7**	**TG7**	*TOD*	
38 - Ped Call Phase 6	**PC6**	*TOD*		**88 - Transit Priority Max Group 8**	**TG8**	*TOD*	
39 - Ped Call Phase 7	**PC7**	*TOD*		**89 - Inhibit Volume Density 1**	**IV1**	*TOD*	
40 - Ped Call Phase 8	**PC8**	*TOD*		**90 - Inhibit Volume Density 2**	**IV2**	*TOD*	
41 - Vehicle Omit 1	**VO1**	*TOD*		**91 - Inhibit Volume Density 3**	**Iv3**	*TOD*	
42 - Vehicle Omit 2	**VO2**	*TOD*		**92 - Inhibit Volume Density 4**	**IV4**	*TOD*	
43 - Vehicle Omit 3	**VO3**	*TOD*		**93 - Inhibit Volume Density 5**	**IV5**	*TOD*	
44 - Vehicle Omit 4	**VO4**	*TOD*		**94 - Inhibit Volume Density 6**	**IV6**	*TOD*	
45 - Vehicle Omit 5	**VO5**	*TOD*		**95 - Inhibit Volume Density 7**	**IV7**	*TOD*	
46 - Vehicle Omit 6	**VO6**	*TOD*		**96 - Inhibit Volume Density 8**	**IV8**	*TOD*	
47 - Vehicle Omit 7	**VO7**	*TOD*		**97 - Lag 1**	**LG1**	*TOD*	
48 - Vehicle Omit 8	**VO8**	*TOD*		**98 - Lag 3**	**LG3**	*TOD*	
49 - Ped Omit 1	**PO1**	*TOD*		**99 - Lag 5**	**LG5**	*TOD*	
50 - Ped Omit 2	**PO2**	*TOD*		**100 - Lag 7**	**LG7**	*TOD*	

Circuit Overrides cont.							
101 - Inhibit Overlap A	OLA	TOD		151 - Coord Hold 7	HD7	TOD	
102 - Inhibit Overlap B	OLB	TOD		152 - Coord Hold 8	HD8	TOD	
103 - Inhibit Overlap C	OLC	TOD		153 - PE Priority Return B	PRB	TOD	
104 - Inhibit Overlap D	OLD	TOD		154 - PE Priority Return C	PRC	TOD	
105 - Enable Schedule A Phone 1	AT1	TOD		155 - PE Priority Return D	PRD	TOD	
106 - Enable Schedule A Phone 2	AT2	TOD		156 - PE Priority Return E	PRE	TOD	
107 - Enable Schedule B Phone 1	BT1	TOD		157 - Platoon Inbound	PPI	TOD	
108 - Enable Schedule B Phone 2	BT2	TOD		158 - Platoon Outbound	PPO	TOD	
109 - Enable Schedule C Phone 1	CT1	TOD		159 - Platoon Spl 2	PS2	TOD	
110 - Enable Schedule C Phone 2	CT2	TOD		160 - Coord Walk Rest	CWR	TOD	
111 - Enable Volume to Call Phone 1	VT1	TOD		161 - Dynamic Phase Length Short Inhibit 1	SI1	TOD	
112 - Enable Volume to Call Phone 2	VT2	TOD		162 - Dynamic Phase Length Short Inhibit 2	SI2	TOD	
113 - Enable Volume Logging	EVL	On		163 - Dynamic Phase Length Short Inhibit 3	SI3	TOD	
114 - Enable MOE Logging	EML	On		164 - Dynamic Phase Length Short Inhibit 4	SI4	TOD	
115 - Detector Low Threshold Inhibit	DLI	TOD		165 - Dynamic Phase Length Short Inhibit 5	SI5	TOD	
116 - Detector Continue Presence Inhibit	DPI	TOD		166 - Dynamic Phase Length Short Inhibit 6	SI6	TOD	
117 - Inhibit Detector Based on Programming	IND	TOD		167 - Dynamic Phase Length Short Inhibit 7	SI7	TOD	
118 - Inhibit Detector Delay	IDD	TOD		168 - Dynamic Phase Length Short Inhibit 8	SI8	TOD	
119 - Inhibit Conditional Ped	ICP	TOD		169 - Coord Late Left Turn 1	CT1	TOD	
120 - Inhibit Transit Priority	ITP	TOD		170 - Coord Late Left Turn 3	CT3	TOD	
121 - Red Rest Ring 1,2	RRM	TOD		171 - Coord Late Left Turn 5	CT5	TOD	
122 - Enable Transcend	TRA	TOD		172 - Coord Late Left Turn 7	CT7	TOD	
123 - Omit Red Clear Ring 1,2	ORC	TOD		173 - Dynamic Phase Length Enable A	DPA	TOD	
124 - Not Used	N/U	TOD		174 - Dynamic Phase Length Enable B	DPB	TOD	
125 - Ped Recycle Ring 1,2	PCY	TOD	On / Off / TOD	175 - Dynamic Phase Length Enable C	DPC	TOD	On / Off / TOD
126 - Not Used	N/U	TOD		176 - Dynamic Phase Length Enable D	DPD	TOD	
127 - Enable MOE Log to Call Phone 1	MT1	TOD		177 - Proactive Plan Select Average	PSA	TOD	
128 - Enable MOE Log to Call Phone 2	MT2	TOD		178 - Proactive Plan Select Inbound	PSI	TOD	
129 - Transit Inhibit Short Time 1	IS1	TOD		179 - Proactive Plan Select Outbound	PSO	TOD	
130 - Transit Inhibit Short Time 2	IS2	TOD		180 - Split Variant Inbound	SVI	TOD	
131 - Transit Inhibit Short Time 3	IS3	TOD		181 - Split Variant Outbound	SVO	TOD	
132 - Transit Inhibit Short Time 4	IS4	TOD		182 - Disable Coord Walk Rest Ring 1	DW1	TOD	
133 - Transit Inhibit Short Time 5	IS5	TOD		183 - Disable Coord Walk Rest Ring 2	DW2	TOD	
134 - Transit Inhibit Short Time 6	IS6	TOD		184 - Proactive Plan Select New Look	NLK	TOD	
135 - Transit Inhibit Short Time 7	IS7	TOD		185 - Disable Red Clearance Extension	DRX	TOD	
136 - Transit Inhibit Short Time 8	IS8	TOD		186 - Detector Plan Line 1	DL1	TOD	
137 - Enable Transit Priority Logging	ETL	TOD		187 - Detector Plan Line 2	DL2	TOD	
138 - Disable Flashing Yellow Arrow 1	DF1	TOD		188 - Disable LRT 1 Vertical Flashing Bar	DV1	TOD	
139 - Disable Flashing Yellow Arrow 3	DF3	TOD		189 - Disable LRT 2 Vertical Flashing Bar	DV2	TOD	
140 - Disable Flashing Yellow Arrow 5	DF5	TOD		190 - Disable LRT 3 Vertical Flashing Bar	DV3	TOD	
141 - Disable Flashing Yellow Arrow 7	DF7	TOD		191 - Disable LRT 4 Vertical Flashing Bar	DV4	TOD	
142 - Disable Auto Max	DAM	TOD		192 - Datakey Enable	DKE	TOD	
143 - Disable Repeat Phase Service	DRS	TOD		193 - Dynamic Phase Reversal Enable 1	DR1	TOD	
144 - Coord End of Main Street	EMS	TOD		194 - Dynamic Phase Reversal Enable 3	DR3	TOD	
145 - Coord Hold 1	HD1	TOD		195 - Dynamic Phase Reversal Enable 5	DR5	TOD	
146 - Coord Hold 2	HD2	TOD		196 - Dynamic Phase Reversal Enable 7	DR7	TOD	
147 - Coord Hold 3	HD3	TOD		197 - Enable Coord Logging	ECL	On	
148 - Coord Hold 4	HD4	TOD		198 - Disable Gap FYLTA 1,3,5,7	DGF	TOD	
149 - Coord Hold 5	HD5	TOD		199 - Coordination Auto Walk	CAW	TOD	
150 - Coord Hold 6	HD6	TOD		200 - Enable Coordinated Auto Max	ECM	TOD	

Preemption Data (next/2/5)

Sequence (next/2/5/1 - 8)

Sequences /	Intervals	Instruction	Phases Serviced	Interval Time	Hold On Input	Outputs On	Output Mode
1	1	197	2	0	1		0
	2	98		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0
2	1	197	47	0	1		0
	2	98		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0
3	1	197	6	0	1		0
	2	98		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0
4	1	197	38	0	1		0
	2	98		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0
5	1	0		0	0		0
	2	0		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0

Instructions
0 - Service Phases
1-9 = Special Interval 1-9
10 - Preempt Sequence Allows FYLTA
11 - Preempt Interval Disables FYLTA
15 - Alternate Trap Protection
90 - Go to all Red
91 - Soft Flash On
92 - Soft Flash Off
93 - Enable Ped
94 - Disable Peds
95 - Priority Return
96 - Enable Coordination with peds
97 - Enable Coordination without peds
98 - Return with NO Calls
99 - Return with Vehicle Calls
100 - jump to step in Interval Time
101 - Use Interval Time as Resetable Gap Timer
196 - Coord Re-synch with Peds
197 - Coord Re-synch without Peds
200 - Light Rail Train phase without Peds
201 - Light Rail Train phase with Peds
202 - Return to highest queue/delay phase (this uses the Dynamic Phase Length Back Detectors)
216 - Light Rail Train Coord Re-synch with Peds
217 - Light Rail Train Coord Re-synch without Peds

Phases Serviced - phases 1 - 8

Interval Time - 0 - 255 sec or interval 1 - 10

Hold on Input:
0 = Do not hold
1 = Hold
2 = Ped Service to Rest in Walk

Outputs On - output 1 - 8

Output Modes -
0 = all steady on
1 = all flash together
2 = odd flashes WIG, even flashes WAG
3 = 1 - 4 steady on, 5 - 8 all flash together

Sequence cont.							
Sequences / Intervals		Instruction	Phases Serviced	Interval Time	Hold On Input	Outputs On	Output Mode
6	1	0		0	0		0
	2	0		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0
7	1	0		0	0		0
	2	0		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0
8	1	0		0	0		0
	2	0		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0

Sequence Timing (next/2/5/0)										
	Sequence -- >	1	2	3	4	5	6	7	8	
	Input Memory									X = on
	Input Priority	6	6	6	6	0	0	0	0	0 = lowest, - 8 = highest
Entry (Transition) Parameters	Min Green	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec 0.0 would time the normal function time
	Walk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Ped Clear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Overlap Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec
	Overlap Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Delay to Preempt	0	0	0	0	0	0	0	0	0 - 255 sec
	Delay Ped Omit	0	0	0	0	0	0	0	0	
	Delay Phase Omit	0	0	0	0	0	0	0	0	
	Min Reservice	0	0	0	0	0	0	0	0	0 - 255 min
Overlap Inhibits	A									X = inhibit
	B									
	C									
	D									
Exit Parameters	Exit to Coord Plan Offset by X	0	0	0	0	0	0	0	0	0 - 20
	Exit Coord Plan Time	0	0	0	0	0	0	0	0	0 - 60 min
	Exit to Max Plan	0	0	0	0	0	0	0	0	0 - 8
	Exit Free Time	0	0	0	0	0	0	0	0	0 - 60 min
	Override Time	0	0	0	0	0	0	0	0	
	Fail Time	0	0	0	0	0	0	0	0	
	Exit Mode Time	0	0	0	0	0	0	0	0	

Priority Return and Special Intervals (next/2/5/0/6, next/2/5/9)														
Phase / Overlap -->		1	2	3	4	5	6	7	8	A	B	C	D	
Priority Return	Enable	*0*	0 = disabled, 1 = enabled, 2 = enabled, skip preemption phases on exit											
	A (max)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 100% of currently used max				
	B (max)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*					
	C (max)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*					
	D (max)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*					
	E (max)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*					
	Ped Clear	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 100% of currently used ped clearance				
Queue Delay Recovery		*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.				
Special Intervals	1	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 = Dark 1 = green don't walk 2 = green walk 3 = green flashing don't walk 4 = yellow 5 = red 6 = flashing yellow WIG 7 = flashing yellow WAG 8 = flashing red WIG 9 = flashing red WAG 10 = walk only 11=flashing don't walk only
	2	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	3	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	4	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	5	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	6	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	7	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	8	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	9	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	

Light Rail Train (next/2/5/0/7)					
Light Rail Train -->	1	2	3	4	
Associated Preempt	*0*	*0*	*0*	*0*	0 = none, preempt 1 - 8
Time to Green	*0*	*0*	*0*	*0*	0 - 255 sec
Horizontal Bar Flash Time	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec
Vertical Bar Flash Time	*0.0*	*0.0*	*0.0*	*0.0*	
Min Duration	*0*	*0*	*0*	*0*	0 - 255 sec

Communications Data (next/2/6)

1st Central Phone Number		**2nd Central Phone Number**	
Modem Setup String		**Intersection Name**	*US 97 at US 26*
Subnet Mask	*255.255.255.224*		
IP (ethernet) Port	*25000*		
Central Port	*0*		
System Mode	*0*		
System Port	*0*	**Alternate System Port**	*0*

System ID	*169*	**AB3418e Physical Address**	*1*	**IP Address**	*10.12.70.34*
Local ID	*5*	**AB3418e Group Address**	*0*	**Gateway Address**	*10.12.70.32*

Baud Rates		**Flow Control**	**Port Use**
Port 1 (Slot A2 Upper)	*0*	*1*	*Suggested Use - FSK*
Port 2 (Slot A2 Lower)	*2*	*0*	*modem to central*
Port 3 (Slot A1 Upper)	*2*	*0*	*Suggested Use - Modem to Central*
Port 4 (Slot A1 Lower or C50S)	*2*	*N\U*	*Suggested Use - RS232 to Laptop*
0 = 1200, 1 = 2400, 2 = 9600, 3 = 19200 baud		0 = off, 1 = on	

Reports

Volume Log Period	*15*	minutes	**Volume/Occ Log Period**	*0*	second	**MOE Log Period**	*30* minute

0 = disabled, 1,2,3,4,5,6,10,12,15,20,30,60 minutes

Function Schedule Mapping (next/2/6/7)

Alarm 1	*0*		**Soft Flash**	*3*	
Alarm 2	*0*		**Manual Control Enable (MCE)**	*3*	
Alarm 3	*0*		**Emergency or Railroad Preempt**	*1*	
Alarm 4	*0*		**Not Used**	*0*	
Alarm 5	*0*	0 = none	**Cycle Failure**	*3*	0 = none
Not Used	*0*	1 = schedule A	**Coordination Failure**	*2*	1 = schedule A
Not Used	*0*	2 = schedule B	**Keyboard use / Data Changed**	*2*	2 = schedule B
Not Used	*0*	3 = schedule C 4 = schedule R	**Coord Running / Free**	*0*	3 = schedule C 4 = schedule R
Power On / Off	*2*		**Cabinet Door**	*2*	
Checksum Failure	*2*		**Extended Ped Pushbutton**	*0*	
Video / Detector Failure	*2*		**Monitor Status**	*2*	
Master to Local Comm Lost	*0*		**Red Extension**	*0*	

Miscellaneous Data

Transit Priority (next/2/7)

	1	2	3	4	5	6	7	8	
Phases									Phases 1 - 8 (max of 2 compatible phases)
PE Enable (6.25Hz TP call on PE)									X = 6.25 Hz signal will activate TP
Priority	0	0	0	0	0	0	0	0	0 - 8, 8 = highest
Memory									X = on
Delay Time	0	0	0	0	0	0	0	0	0 - 255 sec
Minimum Reservice Time (per input)	0	0	0	0	0	0	0	0	0 - 255 min
Override Time	0	0	0	0	0	0	0	0	0 - 255 sec
Bus Extend	0	0	0	0	0	0	0	0	0 - 255 sec
Minimum Reservice Time (all inputs)	0	0 - 255 min							
Free Operation Mode	0	0 = use shortest of max 1 or 2, 1 - 8 = use max time of group 1 - 8, 9 = use time of day							

Transit Priority Alternate Force Off Plans

Current Coord Plan	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Alternate TP Force Off Plan	0	0	0	0	0	0	0	0	0 = none
Current Coord Plan	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	17 - 32 = coord plan 17 - 32
Alternate TP Force Off Plan	0	0	0	0	0	0	0	0	

Group Timing

	Phase -->	1	2	3	4	5	6	7	8	
Group 1	**Max Times**	0	0	0	0	0	0	0	0	
	Walk Times	0	0	0	0	0	0	0	0	
Group 2	**Max Times**	0	0	0	0	0	0	0	0	
	Walk Times	0	0	0	0	0	0	0	0	
Group 3	**Max Times**	0	0	0	0	0	0	0	0	
	Walk Times	0	0	0	0	0	0	0	0	
Group 4	**Max Times**	0	0	0	0	0	0	0	0	0 - 255 sec
	Walk Times	0	0	0	0	0	0	0	0	0 would time the normal function time
Group 5	**Max Times**	0	0	0	0	0	0	0	0	
	Walk Times	0	0	0	0	0	0	0	0	
Group 6	**Max Times**	0	0	0	0	0	0	0	0	
	Walk Times	0	0	0	0	0	0	0	0	
Group 7	**Max Times**	0	0	0	0	0	0	0	0	
	Walk Times	0	0	0	0	0	0	0	0	
Group 8	**Max Times**	0	0	0	0	0	0	0	0	
	Walk Times	0	0	0	0	0	0	0	0	

Truck Priority (next/2/7/9)

Truck Priority-->	1	2	3	4	
Associated Transit Priority	0	0	0	0	0 = none 1 - 8 = transit priority 1 - 8
Leading Detector	0	0	0	0	0 = none, 1 - 32 = detector 1 - 32
Trailing Detector	0	0	0	0	
Stop Bar Distance	0	0	0	0	0 - 999 feet
Trap Distance	0	0	0	0	0.0 - 99.9 feet
Minimum Speed	0	0	0	0	0 - 100 mph
Minimum Length	0	0	0	0	0 - 255 feet
Downhill Grade	0	0	0	0	0 - 20 %
Uphill Grade	0	0	0	0	
Undersized Vehicle					X = Enabled

Change I/O		X = On (After a download with a power on - off cycle)

Inputs (Non Default I/O is offset to the right) (next/2/8/1)

C1-39	*101*	*VD9*	**C1-55**	*15*	*VD5*	**C1-67**	*22*	*PED2*	**C11-15**	*254*	*N/U*
C1-40	*113*	*VD19*	**C1-56**	*11*	*VD1*	**C1-68**	*26*	*PED6*	**C11-16**	*254*	*N/U*
C1-41	*106*	*VD14*	**C1-57**	*17*	*VD7*	**C1-69**	*24*	*PED4*	**C11-17**	*254*	*N/U*
C1-42	*118*	*VD24*	**C1-58**	*13*	*VD3*	**C1-70**	*28*	*PED8*	**C11-18**	*254*	*N/U*
C1-43	*102*	*VD10*	**C1-59**	*16*	*VD6*	**C1-71**	*151*	*PE1*	**C11-19**	*254*	*N/U*
C1-44	*114*	*VD20*	**C1-60**	*12*	*VD2*	**C1-72**	*152*	*PE2*	**C11-20**	*254*	*N/U*
C1-45	*107*	*VD15*	**C1-61**	*18*	*VD8*	**C1-73**	*153*	*PE3*	**C11-21**	*254*	*N/U*
C1-46	*161*	*VD25*	**C1-62**	*14*	*VD4*	**C1-74**	*154*	*PE4*	**C11-22**	*254*	*N/U*
C1-47	*105*	*VD13*	**C11-10**	*254*	*N/U*	**C1-75**	*254*	*N/U*	**C11-23**	*254*	*N/U*
C1-48	*117*	*VD23*	**C11-11**	*254*	*N/U*	**C1-76**	*104*	*VD12*	**C11-24**	*254*	*N/U*
C1-49	*112*	*VD18*	**C11-12**	*254*	*N/U*	**C1-77**	*116*	*VD22*	**C11-25**	*254*	*N/U*
C1-50	*164*	*VD28*	**C11-13**	*254*	*N/U*	**C1-78**	*111*	*VD17*	**C11-26**	*254*	*N/U*
C1-51	*199*	*PEDI*	**C1-63**	*103*	*VD11*	**C1-79**	*163*	*VD27*	**C11-27**	*254*	*N/U*
C1-52	*155*	*PE5*	**C1-64**	*115*	*VD21*	**C1-80**	*82*	*IADV*	**C11-28**	*254*	*N/U*
C1-53	*85*	*MCE*	**C1-65**	*108*	*VD16*	**C1-81**	*137*	*MONS*	**C11-29**	*254*	*N/U*
C1-54	*254*	*N/U*	**C1-66**	*162*	*VD26*	**C1-82**	*62*	*ST1*	**C11-30**	*254*	*N/U*

Outputs (Non Default I/O is offset to the right) (next/2/8/2)

C1-2	*44*	*4DWK*	**C1-19**	*48*	*8DWK*	**C1-35**	*131*	*TO1*	**C1-91**	*41*	*1DWK*
C1-3	*64*	*4WLK*	**C1-20**	*68*	*8WLK*	**C1-36**	*132*	*TO2*	**C1-93**	*61*	*1WLK*
C1-4	*14*	*4RED*	**C1-21**	*18*	*8RED*	**C1-37**	*216*	*FYA3*	**C1-94**	*106*	*OLBR*
C1-5	*24*	*4YEL*	**C1-22**	*28*	*8YEL*	**C1-38**	*218*	*FYA7*	**C1-95**	*105*	*OLBY*
C1-6	*34*	*4GRN*	**C1-23**	*38*	*8GRN*	**C1-100**	*53*	*3PCL*	**C1-96**	*104*	*OLBG*
C1-7	*13*	*3RED*	**C1-24**	*17*	*7RED*	**C1-101**	*51*	*1PCL*	**C1-97**	*103*	*OLAR*
C1-8	*222*	*FYC3*	**C1-25**	*224*	*FYC7*	**C1-102**	*187*	*SFL*	**C1-98**	*102*	*OLAY*
C1-9	*33*	*3GRN*	**C1-26**	*37*	*7GRN*	**C1-103**	*147*	*WDOG*	**C1-99**	*101*	*OLAG*
C1-10	*42*	*2DWK*	**C1-27**	*46*	*6DWK*	**C1-83**	*43*	*3DWK*	**C11-1**	*254*	*N/U*
C1-11	*62*	*2WLK*	**C1-28**	*66*	*6WLK*	**C1-84**	*63*	*3WLK*	**C11-2**	*254*	*N/U*
C1-12	*12*	*2RED*	**C1-29**	*16*	*6RED*	**C1-85**	*116*	*OLDR*	**C11-3**	*254*	*N/U*
C1-13	*22*	*2YEL*	**C1-30**	*26*	*6YEL*	**C1-86**	*115*	*OLDY*	**C11-4**	*254*	*N/U*
C1-15	*32*	*2GRN*	**C1-31**	*36*	*6GRN*	**C1-87**	*114*	*OLDG*	**C11-5**	*254*	*N/U*
C1-16	*11*	*1RED*	**C1-32**	*15*	*5RED*	**C1-88**	*113*	*OLCR*	**C11-6**	*254*	*N/U*
C1-17	*21*	*1YEL*	**C1-33**	*25*	*5YEL*	**C1-89**	*112*	*OLCY*	**C11-7**	*254*	*N/U*
C1-18	*31*	*1GRN*	**C1-34**	*35*	*5GRN*	**C1-90**	*111*	*OLCG*	**C11-8**	*254*	*N/U*

Internal Logic (next/2/9)			
Step	**Inst.**	**Description**	**Comment**
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Internal Logic cont.			
Step	**Inst.**	**Description**	**Comment**
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Internal Logic cont.			
Step	**Inst.**	**Description**	**Comment**
111			
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Internal Logic cont.			
Step	**Inst.**	**Description**	**Comment**
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Internal Logic cont.			
Step	**Inst.**	**Description**	**Comment**
221			
222			
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256			

FYLTA - Continued (next/2/2/8/6)

	Phase Pairs -->	1 - 2	3 - 4	5 - 6	7 - 8	
Gap-Dependent FYLTA (next/2/2/8/6-A)	Detector Input	*0*	*0*	*0*	*0*	0 = disable, 1 - 64 detectors
	Min Delay	*0*	*0*	*0*	*0*	0 - 255 sec
	Detector Gap	*0.0*	*0.0*	*0.0*	*0.0*	0 - 25.5 sec
	Max Delay	*0*	*0*	*0*	*0*	0 - 255 sec
	Not Ped	*0*	*0*	*0*	*0*	0 - 255 sec

FYLTA Gap-Dependent Plans (next/2/2/8/6)

	Phase Pairs -->	1 - 2	3 - 4	5 - 6	7 - 8	
FYLTA Gap-Dependent Plan A	Detector Input	*0*	*0*	*0*	*0*	0 = disable, 1 - 64 detectors
	Min Delay	*0*	*0*	*0*	*0*	0 - 255 sec
	Detector Gap	*0.0*	*0.0*	*0.0*	*0.0*	0 - 25.5 sec
	Max Delay	*0*	*0*	*0*	*0*	0 - 255 sec
	Not Ped	*0*	*0*	*0*	*0*	0 - 255 sec
FYLTA Gap-Dependent Plan B	Detector Input	*0*	*0*	*0*	*0*	0 = disable, 1 - 64 detectors
	Min Delay	*0*	*0*	*0*	*0*	0 - 255 sec
	Detector Gap	*0.0*	*0.0*	*0.0*	*0.0*	0 - 25.5 sec
	Max Delay	*0*	*0*	*0*	*0*	0 - 255 sec
	Not Ped	*0*	*0*	*0*	*0*	0 - 255 sec
FYLTA Gap-Dependent Plan C	Detector Input	*0*	*0*	*0*	*0*	0 = disable, 1 - 64 detectors
	Min Delay	*0*	*0*	*0*	*0*	0 - 255 sec
	Detector Gap	*0.0*	*0.0*	*0.0*	*0.0*	0 - 25.5 sec
	Max Delay	*0*	*0*	*0*	*0*	0 - 255 sec

	Not Ped	0	0	0	0	0 - 255 sec
FYLTA Gap-Dependent Plan D	Detector Input	0	0	0	0	0 = disable, 1 - 64 detectors
	Min Delay	0	0	0	0	0 - 255 sec
	Detector Gap	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Max Delay	0	0	0	0	0 - 255 sec
	Not Ped	0	0	0	0	0 - 255 sec

Preemption - Continued

Railroad Communications (IEEE 1570) (next/2/5/0/8)

	ATC	Wayside	
Railroad Number	0	0	0 - 999, represents railroad
Railroad Line Number	0	0	0 - 999, represents railroad line
Group Number	0	0	0 - 999, represents physical group of equipment
Subnode Number	0	0	0 - 99, subnode within physical group of equipment
Device Number	0	0	0 - 99, device within physical group of equipment
Associated Preempt	0		0 - 8
Communication Port	0		0 - 4

Reports - Continued

Reports - Service Delay Modes (next/2/6/0)

Phase -->	1	2	3	4	5	6	7	8	
Mode	0	0	0	0	0	0	0	0	0 = disable, 1 = enable, 2 = Ped, 3 = Veh/P
Ped Overlap -->	A	B	C	D	E	F	G	H	
Mode	0	0	0	0	0	0	0	0	0 = disable, 1 = enable

Detector -->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Enable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Detector -->	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Enable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Detector -->	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Enable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Detector -->	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
Enable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Regio

Monday, October 19, 2015 14:24

Intersection Name	2 - 4th @ D Street	**Local ID**	2
Intersection Telephone Number			
System Name	169 - Used to be Madras	**System ID**	169
Controller Type	Voyage - C1-C11		
Controller Serial Number		**Installation Date**	
Programmed by		**Programmed Date**	

Graphic Map Background	**Phase Rotation Diagram**

Control Data (next/2/2)

Controller Function and Timing (next/2/1, next/2/2)

Security, Sequence, Initialization

Security Code	****	0 = disabled, or 1000-9999
Sequence	1	0 = sequential, 1 = quad left turn, 2-6 = special A-E, 7 = lead lag

Lead Lag (next/2/2/3)

Phases 1 - 2	Phases 3 - 4	Phases 5 - 6	Phases 7 - 8

0 = no reversal, 1 = reversal, 2 = by coord plan or clock

Initialization and Flash (next/2/2/5)

	Initialization	Flash Entry	Flash Exit	
Ring 1 Phase	4	2	4	phase 1-8
Ring 2 Phase	8	6	8	phase 1-8
Interval	0	0	0	0 = red, 1 = yellow, 2 = green

Power up Flash	0.0	0.0 - 25.5 seconds		**First All Red**	0.0	0.0 - 25.5 seconds

Soft Flash (next/2/2/5)

Phase	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	0 = dark, 1=flash yel WIG, 2 = flash yel WAG, 3 = flash red WIG, 4 = flash red WAG				
	3	4	3	4	3	4	3	4					
Overlap	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	
	3	4	3	4	3	4	3	4	3	4	3	4	same as phase
Internal Logic Output	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
	0	0	0	0	0	0	0	0	0	0	0	0	0 = normal, 1 = dark, 2 = flash WIG

Per Phase Functions (next/2/2/3, next/2/2/1)

	1	2	3	4	5	6	7	8	
Phases Used		X		X				X	X = on
Restricted Phases									X = on (Sequence 2, 6, 7 only)
Exclusive Phases									X = on (Sequence 7 only)
Yellow Lock									X = on
Min Recall		X							
Max Recall									
Ped Recall									
Red Lock									
Max Out Recall Inhibit									
Soft Recall									
Free Walk Rest									
Conditional Ped		X							
Disable Inhibit Max Termination									
Call to Non Act 1									
Call to Non Act 2									

Dual Entry (next/2/2/9/3)

Mode 1 — 0 = off, 1 = on, 2 = Not Used, 3 = by coord plan, 4 = by time clock circuit 61

Dual Entry Phase -->	1	2	3	4	5	6	7	8	
Phase	0	0	0	8	0	0	0	4	0 = none, 1-8 = phase 1-8

Conditional Service, Five Section Head

Conditional Service (next/2/2/9/3)

	Mode	CS Max Time
Phase 1	0	0
Phase 3	0	0
Phase 5	0	0
Phase 7	0	0

0 = off, 1 = C.S.On. 2 = C.S. on by TOD circuit 57, 3 = N/A, 4 = C.S. and C.R. On, 5 = C.R. on by TOD circuit 57.

5 Section Head Logic (next/2/2/9/4)

X Omits Y		Anti-Trap			Yellow Blanking LT	
X : Y		**Trap Protected Phase**		**Next Phase**	**Phase**	
6 : 1	0	**1**		**< (5)**	**1**	
8 : 3	0	**3**		**< (7)**	**3**	
2 : 5	0	**5**		**< (1)**	**5**	
4 : 7	0	**7**		**< (3)**	**7**	
0=off, 1=side call, 2=no side call		X = On				

Phase Times (next/2/2/2, next/2/2/9/5)									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Movement		*SB*		*WB*				*EB*	
Minimum Green	*0*	*10*	*0*	*10*	*0*	*0*	*0*	*10*	0 - 255 sec
Passage	*0.0*	*3.5*	*0.0*	*2.5*	*0.0*	*0.0*	*0.0*	*2.5*	0.0 - 25.5 sec
Yellow	*0.0*	*4.0*	*0.0*	*4.0*	*0.0*	*0.0*	*0.0*	*4.0*	0.0 - 25.5 sec
Red Clearance	*0.0*	*1.0*	*0.0*	*1.0*	*0.0*	*0.0*	*0.0*	*1.0*	0.0 - 25.5 sec or 0 - 255 sec
Max 1	*0*	*40*	*0*	*25*	*0*	*0*	*0*	*25*	0 - 255 sec
Max 2	*0*	*40*	*0*	*25*	*0*	*0*	*0*	*25*	0 - 255 sec
Walk	*0*	*7*	*0*	*7*	*0*	*0*	*0*	*7*	0 - 255 sec
Ped Clear	*0*	*13*	*0*	*11*	*0*	*0*	*0*	*11*	0 - 255 sec
Seconds Per Actuation	*0.0*	*1.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec
Time Before Reduction	*0*	*20*	*0*	*5*	*0*	*0*	*0*	*5*	0 - 255 sec
Time to Reduce	*0*	*10*	*0*	*5*	*0*	*0*	*0*	*5*	0 - 255 sec
Minimum Gap	*0.0*	*2.5*	*0.0*	*1.5*	*0.0*	*0.0*	*0.0*	*1.5*	0.0 - 25.5 sec
Max Variable Initial	*0*	*22*	*0*	*5*	*0*	*0*	*0*	*5*	0 - 255 sec
Auto Max Adjust	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec
Auto Max Limit	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec
Inhibit Min Yellow									X = On
Red Decimal Off									X = On
Advance Walk	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec

Other Controller Functions (next/2/2/9)									
Phase -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Inhibit Simultaneous Gap Out				*X*				*X*	X = On
Last Car Passage	*2*	0 = recall phase, 1 = last car passage, 2 = NOT recall - Not last car passage							
Red Revert (+2 seconds)	*3.0*	0 - 25.5 sec							
Auto Ped Clear	*X*	X = On							
Flashing Don't Walk Into Yellow		X = On							
Soft Recall / Red Rest Delay	*0.0*	0 - 25.5 sec							
Ped Pushbutton	*0*	0 - 5 sec, 0 = disable							
Advance Flash Rate	*0*	0 = disable, 1 = 120 FPM							
Change Sequence		X = On (After a download with a power on - off cycle)							
Phase -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Red Clear Extension Detector	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 = none 1 - 32 = detector 1 - 32
Red Clear Extension Red Time	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0 - 25.5 sec.

Local Detectors (next/2/2/4)								
Detector Data								
	Yellow Lock	Detector Inhibit	Call Phase	Extend Phase	Switch Phase	Delay Time	Stretch / Disconnect Time	Delay or Disconnect Mode
Detector 1 -			*1*	*1*	*0*	*0*	*0.0*	*0*
Detector 2 -			*1*	*1*	*0*	*0*	*0.0*	*0*
Detector 3 -			*3*	*3*	*0*	*0*	*0.0*	*0*
Detector 4 -			*3*	*3*	*0*	*0*	*0.0*	*0*
Detector 5 -			*5*	*5*	*0*	*0*	*0.0*	*0*
Detector 6 -			*5*	*5*	*0*	*0*	*0.0*	*0*
Detector 7 -			*7*	*7*	*0*	*0*	*0.0*	*0*
Detector 8 -			*7*	*7*	*0*	*0*	*0.0*	*0*
Detector 9 - System -			*2*	*2*	*0*	*0*	*0.0*	*0*
Detector 10 - System -			*2*	*2*	*0*	*0*	*0.0*	*0*
Detector 11 -			*2*	*2*	*0*	*0*	*0.0*	*0*
Detector 12 -			*0*	*2*	*0*	*0*	*0.0*	*0*
Detector 13 -			*2*	*0*	*0*	*0*	*0.0*	*0*
Detector 14 -			*4*	*4*	*0*	*0*	*0.0*	*0*
Detector 15 -			*4*	*4*	*0*	*0*	*0.0*	*0*
Detector 16 - System -			*4*	*4*	*0*	*0*	*0.0*	*0*
Detector 17 -			*0*	*4*	*0*	*0*	*0.0*	*0*
Detector 18 -			*4*	*0*	*0*	*0*	*0.0*	*0*
Detector 19 -			*6*	*6*	*0*	*0*	*0.0*	*0*
Detector 20 -			*6*	*6*	*0*	*0*	*0.0*	*0*
Detector 21 -			*6*	*6*	*0*	*0*	*0.0*	*0*
Detector 22 -			*0*	*6*	*0*	*0*	*0.0*	*0*
Detector 23 -			*6*	*0*	*0*	*0*	*0.0*	*0*
Detector 24 -			*8*	*8*	*0*	*0*	*0.0*	*0*
Detector 25 -			*8*	*8*	*0*	*0*	*0.0*	*0*
Detector 26 -			*4*	*4*	*0*	*0*	*0.0*	*0*
Detector 27 - System -			*0*	*8*	*0*	*0*	*0.0*	*0*
Detector 28 -			*8*	*0*	*0*	*0*	*0.0*	*0*
Detector 29 -			*0*	*0*	*0*	*0*	*0.0*	*0*
Detector 30 -			*0*	*0*	*0*	*0*	*0.0*	*0*
Detector 31 -			*0*	*0*	*0*	*0*	*0.0*	*0*
Detector 32 -			*0*	*0*	*0*	*0*	*0.0*	*0*

yellow lock, detector inhibit, - X = On; call, extend, phase - 0 = none 1 - 8 = phase 1 - 8 ; delay time - 0 - 255 sec
stretch / disconnect time - 0.0 - 25.5 sec.; delay or disconnect Mode - 0 -13

Detector Plans (next/2/2/4/5)

	Loop Number									
	Plan Detectors	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 32, 0 = none, 1 -3 2 = detectors 1 - 32
Detector Plan 1	**Call Phase**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 8, 0 = none, 1 - 8 = phase 1 - 8
	Extend Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Switch Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Delay Time	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec
	Stretch/Disconnect Time	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec
	Delay/ Disconnect Mode	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 13
Detector Plan 2	**Call Phase**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 8, 0 = none, 1 - 8 = phase 1 - 8
	Extend Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Switch Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Delay Time	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec
	Stretch/Disconnect Time	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec
	Delay/ Disconnect Mode	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 13
Detector Plan 3	**Call Phase**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 8, 0 = none, 1 - 8 = phase 1 - 8
	Extend Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Switch Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Delay Time	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec
	Stretch/Disconnect Time	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec
	Delay/ Disconnect Mode	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 13

Detector Fail Monitor (next/2/2/4/3)					Detectors 33-64 (next/2/2/4/6)		
	Fail Monitor Enable	Recall Phase	Min Counts	Max Counts		Call Phase	Extend Phase
Detector 1 -		*0*	*0*	*0*	Detector 33 -	0	0
Detector 2 -		*0*	*0*	*0*	Detector 34 -	0	0
Detector 3 -		*0*	*0*	*0*	Detector 35 -	0	0
Detector 4 -		*0*	*0*	*0*	Detector 36 -	0	0
Detector 5 -		*0*	*0*	*0*	Detector 37 -	0	0
Detector 6 -		*0*	*0*	*0*	Detector 38 -	0	0
Detector 7 -		*0*	*0*	*0*	Detector 39 -	0	0
Detector 8 -		*0*	*0*	*0*	Detector 40 -	0	0
Detector 9 - System -		*0*	*0*	*0*	Detector 41 -	0	0
Detector 10 - System -		*0*	*0*	*0*	Detector 42 -	0	0
Detector 11 -		*0*	*0*	*0*	Detector 43 -	0	0
Detector 12 -		*0*	*0*	*0*	Detector 44 -	0	0
Detector 13 -		*0*	*0*	*0*	Detector 45 -	0	0
Detector 14 -		*0*	*0*	*0*	Detector 46 -	0	0
Detector 15 -		*0*	*0*	*0*	Detector 47 -	0	0
Detector 16 - System -		*0*	*0*	*0*	Detector 48 -	0	0
Detector 17 -		*0*	*0*	*0*	Detector 49 -	0	0
Detector 18 -		*0*	*0*	*0*	Detector 50 -	0	0
Detector 19 -		*0*	*0*	*0*	Detector 51 -	0	0
Detector 20 -		*0*	*0*	*0*	Detector 52 -	0	0
Detector 21 -		*0*	*0*	*0*	Detector 53 -	0	0
Detector 22 -		*0*	*0*	*0*	Detector 54 -	0	0
Detector 23 -		*0*	*0*	*0*	Detector 55 -	0	0
Detector 24 -		*0*	*0*	*0*	Detector 56 -	0	0
Detector 25 -		*0*	*0*	*0*	Detector 57 -	0	0
Detector 26 -		*0*	*0*	*0*	Detector 58 -	0	0
Detector 27 - System -		*0*	*0*	*0*	Detector 59 -	0	0
Detector 28 -		*0*	*0*	*0*	Detector 60 -	0	0
Detector 29 -		*0*	*0*	*0*	Detector 61 -	0	0
Detector 30 -		*0*	*0*	*0*	Detector 62 -	0	0
Detector 31 -		*0*	*0*	*0*	Detector 63 -	0	0
Detector 32 -		*0*	*0*	*0*	Detector 64 -	0	0
fail monitor enable - X = On, recall phase - 0 = none 1 - 8 = phase 1 - 8, min, max					call / extend phase - 0 = none 1 - 8 = phase 1 - 8		
Detector Fail Sample Period (all detectors)			*0*	0 - 255 minutes			

Video Fail Inputs (next/2/2/4/3) -->	1	2	3	4	5	6	7	8	
Phase Recalled	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 = none, 1 - 8 = phase 1 - 8

System Detectors (next/2/2/4/4)

System Detectors -->	1	2	3	4	5	6	7	8	
Local Detector	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 = none, 1 - 32 = phase 1 - 32

Overlaps / FYLTA (next/2/2/8)

Vehicle Overlaps		Phase or Movement	Phases 1	2	3	4	5	6	7	8	Extension Green	Clearance Yellow	Red
Overlaps	A		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	B		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	C		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	D		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	E		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	F		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	G		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	H		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	I		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	J		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	K		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	L		0	0	0	0	0	0	0	0	0.0	0.0	0.0

A - D
0 = none
1 = overlap
2 = 60 FPM
3 = Not ped
4=Comp. Ph.
5=Prevent. Ext.
6=Not Veh.
7=Adv. FF

E - L
0 = no Overlap
1 = Overlap

Green,Yellow Red

Not Ped - Ped Overlaps (next/2/2/8/5)

Ped Overlaps ->		A	B	C	D	E	F	G	H
Overlaps	A								
	B								
	C								
	D								

X = Nor Ped Ped Overlap

Advance Warning (next/2/2/8/3)

	E	F	G	H	I	J	K	L	
Enable	0	0	0	0	0	0	0	0	0 = disabled, 1 = enabled
1st Conditional Overlap	0	0	0	0	0	0	0	0	0 = none, 1 - overlap E, 2 = overlap F, etc.
2nd Conditional Overlap	0	0	0	0	0	0	0	0	
Advance Deactivation Delay	0	0	0	0	0	0	0	0	0 - 99 seconds

Ped Overlaps (next/2/2/8/5)

Phase -->		1	2	3	4	5	6	7	8	Walk	Ped Clear	Ped Recall
Ped Overlap	A									0	0	
	B									0	0	
	C									0	0	
	D									0	0	
	E									0	0	
	F									0	0	
	G									0	0	
	H									0	0	

Phase, Ped Recall: X = on

Walk, Ped Clear: 0 - 255 seconds

Flashing Yellow Left Turn Arrow (FYLTA) (next/2/2/8/6)

Phase Pairs -->	1 - 2	3 - 4	5 - 6	7 - 8	
Enable	0	0	0	0	0 = off, 3 = 3 outputs, 4 = 4 outputs, 5 = 5 outputs
Even Omits Odd	0	0	0	0	0 = off, 1 = on, 2 = on, place call across barrier
Detector Switch Odd / Even	X	X	X	X	X = on, odd phase must be omitted
Red Transition	2.0	2.0	2.0	2.0	0.0 or 2.0 - 25.5 sec
Red Extension	0.0	0.0	0.0	0.0	0.0 - 25.5 sec
Return to GLTA	0	0	0	0	0 = off, 1 = max out, 2 = yellow lock

Flashing Yellow Left Turn Arrow (FYLTA) - Continued on last page

Service Plans (next/2/2/6)

	Phase -->	1	2	3	4	5	6	7	8	
Service Plan 1	**Call Mode**	0	3	0	0	0	0	0	0	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	0	10	0	10	0	0	0	10	0 - 255 sec.
	Passage	0.0	3.5	0.0	3.0	0.0	0.0	0.0	3.0	0.0 - 25.5 sec.
	Yellow	0.0	4.0	0.0	4.0	0.0	0.0	0.0	4.0	0.0 - 25.5 or 3.0 - 25.5
	Red	0.0	1.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0 - 25.5 sec.
	Walk	0	7	0	7	0	0	0	7	0 - 255 sec.
	Pedestrian Clearance	0	13	0	11	0	0	0	11	0 - 255 sec.

	Phase -->	1	2	3	4	5	6	7	8	
Service Plan 2	**Call Mode**	0	0	0	0	0	0	0	0	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	0	0	0	0	0	0	0	0	0 - 255 sec.
	Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 or 3.0 - 25.5
	Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Walk	0	0	0	0	0	0	0	0	0 - 255 sec.
	Pedestrian Clearance	0	0	0	0	0	0	0	0	0 - 255 sec.

	Phase -->	1	2	3	4	5	6	7	8	
Service Plan 3	**Call Mode**	0	0	0	0	0	0	0	0	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	0	0	0	0	0	0	0	0	0 - 255 sec.
	Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 or 3.0 - 25.5
	Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Walk	0	0	0	0	0	0	0	0	0 - 255 sec.
	Pedestrian Clearance	0	0	0	0	0	0	0	0	0 - 255 sec.

	Phase -->	1	2	3	4	5	6	7	8	
Service Plan 4	**Call Mode**	0	0	0	0	0	0	0	0	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	0	0	0	0	0	0	0	0	0 - 255 sec.
	Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 or 3.0 - 25.5
	Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Walk	0	0	0	0	0	0	0	0	0 - 255 sec.
	Pedestrian Clearance	0	0	0	0	0	0	0	0	0 - 255 sec.

	Phase -->	1	2	3	4	5	6	7	8	
Service Plan 5	**Call Mode**	0	0	0	0	0	0	0	0	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	0	0	0	0	0	0	0	0	0 - 255 sec.
	Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 or 3.0 - 25.5
	Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Walk	0	0	0	0	0	0	0	0	0 - 255 sec.
	Pedestrian Clearance	0	0	0	0	0	0	0	0	0 - 255 sec.

	Phase -->	1	2	3	4	5	6	7	8	
Service Plan 6	**Call Mode**	0	0	0	0	0	0	0	0	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	0	0	0	0	0	0	0	0	0 - 255 sec.
	Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 or 3.0 - 25.5
	Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Walk	0	0	0	0	0	0	0	0	0 - 255 sec.
	Pedestrian Clearance	0	0	0	0	0	0	0	0	0 - 255 sec.

Service Plans Cont.

	Phase -->	1	2	3	4	5	6	7	8	
Service Plan 7	Call Mode	0	0	0	0	0	0	0	0	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	0	0	0	0	0	0	0	0	0 - 255 sec.
	Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 or 3.0 - 25.5
	Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Walk	0	0	0	0	0	0	0	0	0 - 255 sec.
	Pedestrian Clearance	0	0	0	0	0	0	0	0	0 - 255 sec.

	Phase -->	1	2	3	4	5	6	7	8	
Service Plan 8	Call Mode	0	0	0	0	0	0	0	0	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	0	0	0	0	0	0	0	0	0 - 255 sec.
	Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 or 3.0 - 25.5
	Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Walk	0	0	0	0	0	0	0	0	0 - 255 sec.
	Pedestrian Clearance	0	0	0	0	0	0	0	0	0 - 255 sec.

Max Plans (next/2/2/7)

	Phase -->	1	2	3	4	5	6	7	8	
Max Plan 1	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 2	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 3	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 4	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 5	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 6	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 7	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 8	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec

Coordination Data (next/2/3)

Coordination Modes (next/2/3/1, next/2/3/4/1, next/2/3/4/3)

Flash Mode	*34*	0=off, 1=on, 33=time clock, 34=comm, 35=hardwire, 36=NWS Set only, 37=AB3418 / NTCIP S
Coordination Plan Mode	*34*	0=free, 1-32 = coord plan 1-32, 33=time clock, 34=comm, 35=hardwire, 36=NWS Set only, 37=
Offset Seeking Mode	*2*	0=add only, 1=dwell, 2=fastway
Late Ped	*1*	0 = off, 1 = on
Coord Walk Rest	*1*	0 = off, 1 = on, 2 = by TOD circuit 160, 3 = end of walk, 4 = coord ped during perms
Repeated Phase Service	*3*	0=off, 1=on (no coord ped), 2=on (beginning green coord ped), 3=on (coord ped always)
Zero Mode (TS2 only)	*0*	0=start of main street, 1=end of main street, 2=by TOD circuit 144

Phase -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	0 = service allowed 1 = service prevented
Omit Phase During Repeated Phase Service	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
Auto Permissive Min Green	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 seconds

Coordination Plans (next/2/3/2)

Coord Plan	**Coordination Phases Ring 1**	**Coordination Phases Ring 2**	**Cycle Length**	**Offset Time**	**Min Cycle Length Dwell Time**	**Permissive**	**Service Plan**	**Max Plan**
1 - 70 AM	*2*	*0*	*70*	*4*	*0*	*0*	*1*	*0*
2 - 80 PM2	*2*	*0*	*80*	*20*	*0*	*0*	*0*	*0*
3 - 70 PM	*2*	*0*	*70*	*16*	*0*	*0*	*1*	*0*
4 - 80	*2*	*0*	*80*	*6*	*0*	*0*	*0*	*0*
5 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
6 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
7 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
8 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
9 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
10 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
11 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
12 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
13 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
14 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
15 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
16 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
17 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
18 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
19 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
20 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
21 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
22 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
23 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
24 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
25 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
26 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
27 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
28 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
29 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
30 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
31 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
32 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0 - 8		0 - 255 sec.				0 - 8	

Coordination Plans cont.

Coord Plan	* = Force Offs / Split Times (TS2)								* = Yield Points / Actuated Times (TS2)	
	1	2	3	4	5	6	7	8	Ring 1	Ring 2
1 - 70 AM	0	43	0	27	0	0	0	27	5	0
2 - 80 PM2	0	49	0	31	0	0	0	31	5	0
3 - 70 PM	0	45	0	25	0	0	0	25	5	0
4 - 80	0	45	0	35	0	0	0	35	0	0
5 -	0	0	0	0	0	0	0	0	0	0
6 -	0	0	0	0	0	0	0	0	0	0
7 -	0	0	0	0	0	0	0	0	0	0
8 -	0	0	0	0	0	0	0	0	0	0
9 -	0	0	0	0	0	0	0	0	0	0
10 -	0	0	0	0	0	0	0	0	0	0
11 -	0	0	0	0	0	0	0	0	0	0
12 -	0	0	0	0	0	0	0	0	0	0
13 -	0	0	0	0	0	0	0	0	0	0
14 -	0	0	0	0	0	0	0	0	0	0
15 -	0	0	0	0	0	0	0	0	0	0
16 -	0	0	0	0	0	0	0	0	0	0
17 -	0	0	0	0	0	0	0	0	0	0
18 -	0	0	0	0	0	0	0	0	0	0
19 -	0	0	0	0	0	0	0	0	0	0
20 -	0	0	0	0	0	0	0	0	0	0
21 -	0	0	0	0	0	0	0	0	0	0
22 -	0	0	0	0	0	0	0	0	0	0
23 -	0	0	0	0	0	0	0	0	0	0
24 -	0	0	0	0	0	0	0	0	0	0
25 -	0	0	0	0	0	0	0	0	0	0
26 -	0	0	0	0	0	0	0	0	0	0
27 -	0	0	0	0	0	0	0	0	0	0
28 -	0	0	0	0	0	0	0	0	0	0
29 -	0	0	0	0	0	0	0	0	0	0
30 -	0	0	0	0	0	0	0	0	0	0
31 -	0	0	0	0	0	0	0	0	0	0
32 -	0	0	0	0	0	0	0	0	0	0
	0 - 255 sec * = force offs and yield points									

Circuit Mapping (next/2/3/3)

Circuit Map	Coord Plan	Time Clock Circuit		Time Clock Circuit		Time Clock Circuit		Time Clock Circuit		Time Clock Circuit		Time Clock Circuit		Time Clock Circuit		Time Clock Circuit	
1	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
2	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
3	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
4	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
5	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
6	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
7	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
8	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
9	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
10	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
11	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
12	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
13	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
14	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
15	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
16	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
17	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
18	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
19	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
20	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U

coord plan - 0 = free, 1 - 32 = coord plan 1 - 32, 33 = any, 34 none selected
time clock circuits - 0 = not used, or circuits 6 - 196

Dynamic Phase Length (next/2/3/4/4)

		1	2	3	4	5	6	7	8	
	Phase -->	1	2	3	4	5	6	7	8	
Back Detector		0	0	0	0	0	0	0	0	0 = none, 1-32 = detector 1-32
Lane Factor		0	0	0	0	0	0	0	0	0 = none, 1.0 - 5.0
Check Out Detector		0	0	0	0	0	0	0	0	0 = none, 1-32 = detector 1-32
Coord Delta Force Off	Set A	0	0	0	0	0	0	0	0	0 - 255 sec
	Set B	0	0	0	0	0	0	0	0	
	Set C	0	0	0	0	0	0	0	0	
	Set D	0	0	0	0	0	0	0	0	
Free Delta Max	Set A	0	0	0	0	0	0	0	0	
	Set B	0	0	0	0	0	0	0	0	
	Set C	0	0	0	0	0	0	0	0	
	Set D	0	0	0	0	0	0	0	0	

Platoon Progression (next/2/3/4/5)

Entry Local Only			Master Local Only		
Platoon Max	0	0 - 255 sec	Smoothing Factor	0.0	0.0 - 1.0
Min Platoon Green	0	0 - 255 sec			
Entry Detector Gap	0.0	0.0 - 25.5			
Min Platoon Cycle	0	0 - 255 sec			

Inbound				Outbound			
Only for Entry Inbound Local or Master Local				Only for Entry Outbound Local or Master Local			
Entry IB Local also Last OB Local	0	0 - 50		Entry OB Local also Last IB Local	0	0 - 50	
Speed	0	0 - 55 mph		Speed	0	0 - 55 mph	
Distance from Entry Local	0	0 - 65000 feet		Distance from Entry Local	0	0 - 65000 feet	
Entry Local Only				Entry Local Only			
Distance from Entry Local Detector	0	0 - 999 feet		Distance from Entry Local Detector	0	0 - 999 feet	
Entry Local Detector	0	0	0 - 32	Entry Local Detector	0	0	0 - 32
Master Local				Master Local			
Master Mid - System Critical Detectors	0	0	0 - 16	Master Mid - System Critical Detectors	0	0	0 - 16

Force Off Percents

Inbound	1	3	4	5	7	8	Outbound	1	3	4	5	7	8
Split 1	0	0	0	0	0	0	Split 1	0	0	0	0	0	0
Split 2	0	0	0	0	0	0	Split 2	0	0	0	0	0	0
	0 - 100 %							0 - 100 %					

Time of Day Data (next/2/4)

Day Program (next/2/4/1)

	Day Prog.	Time	Coord Plan	Coord Plan or Circuit		State On / Off		Day Prog.	Time	Coord Plan	Coord Plan or Circuit		State On/Off
1	*1*	*06:00*	*X*	*1*			**51**						
2	*1*	*11:00*		*0*	N/U		**52**						
3	*1*	*14:00*	*X*	*3*			**53**						
4	*1*	*19:00*	*X*	*0*			**54**						
5	*2*	*08:00*	*X*	*3*			**55**						
6	*2*	*18:30*	*X*	*0*			**56**						
7	*3*	*10:00*	*X*	*3*			**57**						
8	*3*	*18:00*	*X*	*0*			**58**						
9							**59**						
10							**60**						
11							**61**						
12							**62**						
13							**63**						
14							**64**						
15							**65**						
16							**66**						
17							**67**						
18							**68**						
19							**69**						
20							**70**						
21							**71**						
22							**72**						
23							**73**						
24							**74**						
25							**75**						
26							**76**						
27							**77**						
28							**78**						
29							**79**						
30							**80**						
31							**81**						
32							**82**						
33							**83**						
34							**84**						
35							**85**						
36							**86**						
37							**87**						
38							**88**						
39							**89**						
40							**90**						
41							**91**						
42							**92**						
43							**93**						
44							**94**						
45							**95**						
46							**96**						
47							**97**						
48							**98**						
49							**99**						
50							**100**						
	1 - 15	hh : mm	X = on	coord plan 0 - 32 or circuit 1-196		X = on		1 - 15	hh : mm	X = on	coord plan 0 - 32 or circuit 1-196		X = on

Day Program cont.

	Day Prog.	Time	Coord Plan	Coord Plan or Circuit		State On / Off		Day Prog.	Time	Coord Plan	Coord Plan or Circuit		State On / Off
101							151						
102							152						
103							153						
104							154						
105							155						
106							156						
107							157						
108							158						
109							159						
110							160						
111							161						
112							162						
113							163						
114							164						
115							165						
116							166						
117							167						
118							168						
119							169						
120							170						
121							171						
122							172						
123							173						
124							174						
125							175						
126							176						
127							177						
128							178						
129							179						
130							180						
131							181						
132							182						
133							183						
134							184						
135							185						
136							186						
137							187						
138							188						
139							189						
140							190						
141							191						
142							192						
143							193						
144							194						
145							195						
146							196						
147							197						
148							198						
149							199						
150							200						
	1 - 15	hh : mm	X = on	coord plan 0 - 32 or circuit 1-196		X = on		1 - 15	hh : mm	X = on	coord plan 0 - 32 or circuit 1-196		X = on

Week Program (next/2/4/2)

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	3	1	1	1	1	1	2
2	1	1	1	1	1	1	1
3	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1
6	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1
9	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1

0 = none, 1 - 15 = day plan

Exception Days (next/2/4/6)

	DOW	WOM	DOM	MOY	Day Prog.
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
	0-10	0 - 5	0-31	0-12	0 - 15

Year Program (next/2/4/3)

From Date	To Date	Week Program
01/01/2015	12/31/2015	1

New Years Day - Date - January 1st

Martin Luther King Day - DOW WOM - 3rd Monday of January

President's Day - DOW WOM - 3rd Monday February

Memorial Day - DOW WOM - Last Monday May

Fourth of July - Date - July 4th

Labor Day - DOW WOM - 1st Monday September

Columbus Day - DOW WOM - 2nd Monday October

Veteran's Day - Date - November 11th

Thanksgiving - DOW WOM - 4th Thursday November

Christmas - Date - December 25th

Time Clock References (next/2/4/5)

Synch reference Mode	0	0 = timed, 1 = by event
Synch Reference Time	00:00	00:00 - 23:59
Daylight Savings Enable	X	X = on
Reset Time	00:00	00:00 - 23:59

Exception day headings - DOW = Day of Week, WOM = Week of Month, DOM = Day of Month, MOY = Month of Year

Circuit Overrides (next/2/4/4)							
1 - Coord Line 1	CL1	*TOD*	On / Off / TOD	51 - Ped Omit 3	PO3	*TOD*	On / Off / TOD
2 - Coord Line 2	CL2	*TOD*		52 - Ped Omit 4	PO4	*TOD*	
3 - Coord Line 4	CL4	*TOD*		53 - Ped Omit 5	PO5	*TOD*	
4 - Coord Line 8	CL8	*TOD*		54 - Ped Omit 6	PO6	*TOD*	
5 - Coord Line 16	C16	*TOD*		55 - Ped Omit 7	PO7	*TOD*	
6 - Coord Operation	CRD	*TOD*		56 - Ped Omit 8	PO8	*TOD*	
7 - Soft Flash	SFL	*TOD*		57 - Conditional Service	CVS	*TOD*	
8 - Enable System Relays	ESR	*TOD*		58 - Inhibit Simultaneous Gap Out	ISG	***On***	
9 - Call to Non Act 1	CN1	*TOD*		59 - Inhibit Hardwire	HWI	*TOD*	
10 - Call to Non Act 2	CN2	*TOD*		60 - Ped Override Mode	POM	*TOD*	
11 - Walk Rest Modifier	WRM	*TOD*		61 - Dual Entry	DLE	***On***	
12 - Min Recall	MIN	*TOD*		62 - Exclusive Ped	EPD	*TOD*	
13 - Max 2 Both Rings	MX2	*TOD*		63 - Call to Time Clock Mode	CTC	*TOD*	
14 - Coord Inhibit Max Ring 1, 2	IMT	*TOD*		64 - Dual Enhanced Ped	DEP	*TOD*	
15 - Enable Service Log	ESL	*TOD*		65 - Service Plan 1	SP1	*TOD*	
16 - Call to Free	CTF	*TOD*		66 - Service Plan 2	SP2	*TOD*	
17 - TOD Output 1	TO1	*TOD*		67 - Service Plan 3	SP3	*TOD*	
18 - TOD Output 2	TO2	*TOD*		68 - Service Plan 4	SP4	*TOD*	
19 - TOD Output 3	TO3	*TOD*		69 - Service Plan 5	SP5	*TOD*	
20 - TOD Output 4	TO4	*TOD*		70 - Service Plan 6	SP6	*TOD*	
21 - TOD Output 5	TO5	*TOD*		71 - Service Plan 7	SP7	*TOD*	
22 - TOD Output 6	TO6	*TOD*		72 - Service Plan 8	SP8	*TOD*	
23 - TOD Output 7	TO7	*TOD*		73 - Max Plan 1	MP1	*TOD*	
24 - TOD Output 8	TO8	*TOD*		74 - Max Plan 2	MP2	*TOD*	
25 - Vehicle Call Phase 1	VC1	*TOD*		75 - Max Plan 3	MP3	*TOD*	
26 - Vehicle Call Phase 2	VC2	*TOD*		76 - Max Plan 4	MP4	*TOD*	
27 - Vehicle Call Phase 3	VC3	*TOD*		77 - Max Plan 5	MP5	*TOD*	
28 - Vehicle Call Phase 4	VC4	*TOD*		78 - Max Plan 6	MP6	*TOD*	
29 - Vehicle Call Phase 5	VC5	*TOD*		79 - Max Plan 7	MP7	*TOD*	
30 - Vehicle Call Phase 6	VC6	*TOD*		80 - Max Plan 8	MP8	*TOD*	
31 - Vehicle Call Phase 7	VC7	*TOD*		81 - Transit Priority Max Group 1	TG1	*TOD*	
32 - Vehicle Call Phase 8	VC8	*TOD*		82 - Transit Priority Max Group 2	TG2	*TOD*	
33 - Ped Call Phase 1	PC1	*TOD*		83 - Transit Priority Max Group 3	TG3	*TOD*	
34 - Ped Call Phase 2	PC2	*TOD*		84 - Transit Priority Max Group 4	TG4	*TOD*	
35 - Ped Call Phase 3	PC3	*TOD*		85 - Transit Priority Max Group 5	TG5	*TOD*	
36 - Ped Call Phase 4	PC4	*TOD*		86 - Transit Priority Max Group 6	TG6	*TOD*	
37 - Ped Call Phase 5	PC5	*TOD*		87 - Transit Priority Max Group 7	TG7	*TOD*	
38 - Ped Call Phase 6	PC6	*TOD*		88 - Transit Priority Max Group 8	TG8	*TOD*	
39 - Ped Call Phase 7	PC7	*TOD*		89 - Inhibit Volume Density 1	IV1	*TOD*	
40 - Ped Call Phase 8	PC8	*TOD*		90 - Inhibit Volume Density 2	IV2	*TOD*	
41 - Vehicle Omit 1	VO1	*TOD*		91 - Inhibit Volume Density 3	Iv3	*TOD*	
42 - Vehicle Omit 2	VO2	*TOD*		92 - Inhibit Volume Density 4	IV4	*TOD*	
43 - Vehicle Omit 3	VO3	*TOD*		93 - Inhibit Volume Density 5	IV5	*TOD*	
44 - Vehicle Omit 4	VO4	*TOD*		94 - Inhibit Volume Density 6	IV6	*TOD*	
45 - Vehicle Omit 5	VO5	*TOD*		95 - Inhibit Volume Density 7	IV7	*TOD*	
46 - Vehicle Omit 6	VO6	*TOD*		96 - Inhibit Volume Density 8	IV8	*TOD*	
47 - Vehicle Omit 7	VO7	*TOD*		97 - Lag 1	LG1	*TOD*	
48 - Vehicle Omit 8	VO8	*TOD*		98 - Lag 3	LG3	*TOD*	
49 - Ped Omit 1	PO1	*TOD*		99 - Lag 5	LG5	*TOD*	
50 - Ped Omit 2	PO2	*TOD*		100 - Lag 7	LG7	*TOD*	

Circuit Overrides cont.							
101 - Inhibit Overlap A	**OLA**	*TOD*	On / Off / TOD	**151 - Coord Hold 7**	**HD7**	*TOD*	On / Off / TOD
102 - Inhibit Overlap B	**OLB**	*TOD*		**152 - Coord Hold 8**	**HD8**	*TOD*	
103 - Inhibit Overlap C	**OLC**	*TOD*		**153 - PE Priority Return B**	**PRB**	*TOD*	
104 - Inhibit Overlap D	**OLD**	*TOD*		**154 - PE Priority Return C**	**PRC**	*TOD*	
105 - Enable Schedule A Phone 1	**AT1**	*TOD*		**155 - PE Priority Return D**	**PRD**	*TOD*	
106 - Enable Schedule A Phone 2	**AT2**	*TOD*		**156 - PE Priority Return E**	**PRE**	*TOD*	
107 - Enable Schedule B Phone 1	**BT1**	*TOD*		**157 - Platoon Inbound**	**PPI**	*TOD*	
108 - Enable Schedule B Phone 2	**BT2**	*TOD*		**158 - Platoon Outbound**	**PPO**	*TOD*	
109 - Enable Schedule C Phone 1	**CT1**	*TOD*		**159 - Platoon Spl 2**	**PS2**	*TOD*	
110 - Enable Schedule C Phone 2	**CT2**	*TOD*		**160 - Coord Walk Rest**	**CWR**	*TOD*	
111 - Enable Volume to Call Phone 1	**VT1**	*TOD*		**161 - Dynamic Phase Length Short Inhibit 1**	**SI1**	*TOD*	
112 - Enable Volume to Call Phone 2	**VT2**	*TOD*		**162 - Dynamic Phase Length Short Inhibit 2**	**SI2**	*TOD*	
113 - Enable Volume Logging	**EVL**	***On***		**163 - Dynamic Phase Length Short Inhibit 3**	**SI3**	*TOD*	
114 - Enable MOE Logging	**EML**	***On***		**164 - Dynamic Phase Length Short Inhibit 4**	**SI4**	*TOD*	
115 - Detector Low Threshold Inhibit	**DLI**	*TOD*		**165 - Dynamic Phase Length Short Inhibit 5**	**SI5**	*TOD*	
116 - Detector Continue Presence Inhibit	**DPI**	*TOD*		**166 - Dynamic Phase Length Short Inhibit 6**	**SI6**	*TOD*	
117 - Inhibit Detector Based on Programming	**IND**	*TOD*		**167 - Dynamic Phase Length Short Inhibit 7**	**SI7**	*TOD*	
118 - Inhibit Detector Delay	**IDD**	*TOD*		**168 - Dynamic Phase Length Short Inhibit 8**	**SI8**	*TOD*	
119 - Inhibit Conditional Ped	**ICP**	*TOD*		**169 - Coord Late Left Turn 1**	**CT1**	*TOD*	
120 - Inhibit Transit Priority	**ITP**	*TOD*		**170 - Coord Late Left Turn 3**	**CT3**	*TOD*	
121 - Red Rest Ring 1,2	**RRM**	*TOD*		**171 - Coord Late Left Turn 5**	**CT5**	*TOD*	
122 - Enable Transcend	**TRA**	*TOD*		**172 - Coord Late Left Turn 7**	**CT7**	*TOD*	
123 - Omit Red Clear Ring 1,2	**ORC**	*TOD*		**173 - Dynamic Phase Length Enable A**	**DPA**	*TOD*	
124 - Not Used	**N/U**	*TOD*		**174 - Dynamic Phase Length Enable B**	**DPB**	*TOD*	
125 - Ped Recycle Ring 1,2	**PCY**	*TOD*		**175 - Dynamic Phase Length Enable C**	**DPC**	*TOD*	
126 - Not Used	**N/U**	*TOD*		**176 - Dynamic Phase Length Enable D**	**DPD**	*TOD*	
127 - Enable MOE Log to Call Phone 1	**MT1**	*TOD*		**177 - Proactive Plan Select Average**	**PSA**	*TOD*	
128 - Enable MOE Log to Call Phone 2	**MT2**	*TOD*		**178 - Proactive Plan Select Inbound**	**PSI**	*TOD*	
129 - Transit Inhibit Short Time 1	**IS1**	*TOD*		**179 - Proactive Plan Select Outbound**	**PSO**	*TOD*	
130 - Transit Inhibit Short Time 2	**IS2**	*TOD*		**180 - Split Variant Inbound**	**SVI**	*TOD*	
131 - Transit Inhibit Short Time 3	**IS3**	*TOD*		**181 - Split Variant Outbound**	**SVO**	*TOD*	
132 - Transit Inhibit Short Time 4	**IS4**	*TOD*		**182 - Disable Coord Walk Rest Ring 1**	**DW1**	*TOD*	
133 - Transit Inhibit Short Time 5	**IS5**	*TOD*		**183 - Disable Coord Walk Rest Ring 2**	**DW2**	*TOD*	
134 - Transit Inhibit Short Time 6	**IS6**	*TOD*		**184 - Proactive Plan Select New Look**	**NLK**	*TOD*	
135 - Transit Inhibit Short Time 7	**IS7**	*TOD*		**185 - Disable Red Clearance Extension**	**DRX**	*TOD*	
136 - Transit Inhibit Short Time 8	**IS8**	*TOD*		**186 - Detector Plan Line 1**	**DL1**	*TOD*	
137 - Enable Transit Priority Logging	**ETL**	*TOD*		**187 - Detector Plan Line 2**	**DL2**	*TOD*	
138 - Disable Flashing Yellow Arrow 1	**DF1**	*TOD*		**188 - Disable LRT 1 Vertical Flashing Bar**	**DV1**	*TOD*	
139 - Disable Flashing Yellow Arrow 3	**DF3**	*TOD*		**189 - Disable LRT 2 Vertical Flashing Bar**	**DV2**	*TOD*	
140 - Disable Flashing Yellow Arrow 5	**DF5**	*TOD*		**190 - Disable LRT 3 Vertical Flashing Bar**	**DV3**	*TOD*	
141 - Disable Flashing Yellow Arrow 7	**DF7**	*TOD*		**191 - Disable LRT 4 Vertical Flashing Bar**	**DV4**	*TOD*	
142 - Disable Auto Max	**DAM**	*TOD*		**192 - Datakey Enable**	**DKE**	*TOD*	
143 - Disable Repeat Phase Service	**DRS**	*TOD*		**193 - Dynamic Phase Reversal Enable 1**	**DR1**	*TOD*	
144 - Coord End of Main Street	**EMS**	*TOD*		**194 - Dynamic Phase Reversal Enable 3**	**DR3**	*TOD*	
145 - Coord Hold 1	**HD1**	*TOD*		**195 - Dynamic Phase Reversal Enable 5**	**DR5**	*TOD*	
146 - Coord Hold 2	**HD2**	*TOD*		**196 - Dynamic Phase Reversal Enable 7**	**DR7**	*TOD*	
147 - Coord Hold 3	**HD3**	*TOD*		**197 - Enable Coord Logging**	**ECL**	***On***	
148 - Coord Hold 4	**HD4**	*TOD*		**198 - Disable Gap FYLTA 1,3,5,7**	**DGF**	*TOD*	
149 - Coord Hold 5	**HD5**	*TOD*		**199 - Coordination Auto Walk**	**CAW**	*TOD*	
150 - Coord Hold 6	**HD6**	*TOD*		**200 - Enable Coordinated Auto Max**	**ECM**	*TOD*	

Preemption Data (next/2/5)

Sequences / Intervals		Instruction	Phases Serviced	Interval Time	Hold On Input	Outputs On	Output Mode
1	1	197	2	0	1		0
	2	98		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0
2	1	197	4	0	1		0
	2	98		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0
3	1	0		0	0		0
	2	0		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0
4	1	197	8	0	1		0
	2	98		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0
5	1	0		0	0		0
	2	0		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0

Sequence (next/2/5/1 - 8)

Instructions
0 - Service Phases
1-9 = Special Interval 1-9
10 - Preempt Sequence Allows FYLTA
11 - Preempt Interval Disables FYLTA
15 - Alternate Trap Protection
90 - Go to all Red
91 - Soft Flash On
92 - Soft Flash Off
93 - Enable Ped
94 - Disable Peds
95 - Priority Return
96 - Enable Coordination with peds
97 - Enable Coordination without peds
98 - Return with NO Calls
99 - Return with Vehicle Calls
100 - jump to step in Interval Time
101 - Use Interval Time as Resetable Gap Timer
196 - Coord Re-synch with Peds
197 - Coord Re-synch without Peds
200 - Light Rail Train phase without Peds
201 - Light Rail Train phase with Peds
202 - Return to highest queue/delay phase (this uses the Dynamic Phase Length Back Detectors)
216 - Light Rail Train Coord Re-synch with Peds
217 - Light Rail Train Coord Re-synch without Peds

Phases Serviced - phases 1 - 8

Interval Time - 0 - 255 sec or interval 1 - 10

Hold on Input:
0 = Do not hold
1 = Hold
2 = Ped Service to Rest in Walk

Outputs On - output 1 - 8

Output Modes -
0 = all steady on
1 = all flash together
2 = odd flashes WIG, even flashes WAG
3 = 1 - 4 steady on, 5 - 8 all flash together

Sequence cont.							
Sequences / Intervals		Instruction	Phases Serviced	Interval Time	Hold On Input	Outputs On	Output Mode
6	1	0		0	0		0
	2	0		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0
7	1	0		0	0		0
	2	0		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0
8	1	0		0	0		0
	2	0		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0

Sequence Timing (next/2/5/0)										
	Sequence -- >	1	2	3	4	5	6	7	8	
	Input Memory									X = on
	Input Priority	6	6	0	6	0	0	0	0	0 = lowest, - 8 = highest
Entry (Transition) Parameters	Min Green	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec 0.0 would time the normal function time
	Walk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Ped Clear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Overlap Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec
	Overlap Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Delay to Preempt	0	0	0	0	0	0	0	0	0 - 255 sec
	Delay Ped Omit	0	0	0	0	0	0	0	0	
	Delay Phase Omit	0	0	0	0	0	0	0	0	
	Min Reservice	0	0	0	0	0	0	0	0	0 - 255 min
Overlap Inhibits	A									X = inhibit
	B									
	C									
	D									
Exit Parameters	Exit to Coord Plan Offset by X	0	0	0	0	0	0	0	0	0 - 20
	Exit Coord Plan Time	0	0	0	0	0	0	0	0	0 - 60 min
	Exit to Max Plan	0	0	0	0	0	0	0	0	0 - 8
	Exit Free Time	0	0	0	0	0	0	0	0	0 - 60 min
	Override Time	0	0	0	0	0	0	0	0	
	Fail Time	0	0	0	0	0	0	0	0	
	Exit Mode Time	0	0	0	0	0	0	0	0	

Priority Return and Special Intervals (next/2/5/0/6, next/2/5/9)														
Phase / Overlap -->		1	2	3	4	5	6	7	8	A	B	C	D	
Priority Return	Enable	0	0 = disabled, 1 = enabled, 2 = enabled, skip preemption phases on exit											
	A (max)	0	0	0	0	0	0	0	0	0 - 100% of currently used max				
	B (max)	0	0	0	0	0	0	0	0					
	C (max)	0	0	0	0	0	0	0	0					
	D (max)	0	0	0	0	0	0	0	0					
	E (max)	0	0	0	0	0	0	0	0					
	Ped Clear	0	0	0	0	0	0	0	0	0 - 100% of currently used ped clearance				
Queue Delay Recovery		0	0	0	0	0	0	0	0	0 - 255 sec.				
Special Intervals	1	0	0	0	0	0	0	0	0	0	0	0	0	0 = Dark 1 = green don't walk 2 = green walk 3 = green flashing don't walk 4 = yellow 5 = red 6 = flashing yellow WIG 7 = flashing yellow WAG 8 = flashing red WIG 9 = flashing red WAG 10 = walk only 11=flashing don't walk only
	2	0	0	0	0	0	0	0	0	0	0	0	0	
	3	0	0	0	0	0	0	0	0	0	0	0	0	
	4	0	0	0	0	0	0	0	0	0	0	0	0	
	5	0	0	0	0	0	0	0	0	0	0	0	0	
	6	0	0	0	0	0	0	0	0	0	0	0	0	
	7	0	0	0	0	0	0	0	0	0	0	0	0	
	8	0	0	0	0	0	0	0	0	0	0	0	0	
	9	0	0	0	0	0	0	0	0	0	0	0	0	

Light Rail Train (next/2/5/0/7)					
Light Rail Train -->	1	2	3	4	
Associated Preempt	0	0	0	0	0 = none, preempt 1 - 8
Time to Green	0	0	0	0	0 - 255 sec
Horizontal Bar Flash Time	0.0	0.0	0.0	0.0	0.0 - 25.5 sec
Vertical Bar Flash Time	0.0	0.0	0.0	0.0	
Min Duration	0	0	0	0	0 - 255 sec

Communications Data (next/2/6)

1st Central Phone Number		**2nd Central Phone Number**	
Modem Setup String		**Intersection Name**	*4th at D Street*
Subnet Mask	*255.255.255.192*		
IP (ethernet) Port	*0*		
Central Port	*6*		
System Mode	*0*		
System Port	*0*	**Alternate System Port**	*0*

System ID	*169*	**AB3418e Physical Address**	*1*	**IP Address**	*167.131.54.11*
Local ID	*2*	**AB3418e Group Address**	*0*	**Gateway Address**	*167.131.54.10*

Baud Rates		**Flow Control**	**Port Use**
Port 1 (Slot A2 Upper)	*2*	*0*	*Suggested Use - FSK*
Port 2 (Slot A2 Lower)	*2*	*1*	*modem to central*
Port 3 (Slot A1 Upper)	*2*	*0*	*Suggested Use - Modem to Central*
Port 4 (Slot A1 Lower or C50S)	*2*	*N\U*	*Suggested Use - RS232 to Laptop*
0 = 1200, 1 = 2400, 2 = 9600, 3 = 19200 baud		0 = off, 1 = on	

Reports

Volume Log Period	*60*	minutes	**Volume/Occ Log Period**	*0*	second	**MOE Log Period**	*30*	minute

0 = disabled, 1,2,3,4,5,6,10,12,15,20,30,60 minutes

Function Schedule Mapping (next/2/6/7)

Alarm 1	*0*	0 = none 1 = schedule A 2 = schedule B 3 = schedule C 4 = schedule R	**Soft Flash**	*3*	0 = none 1 = schedule A 2 = schedule B 3 = schedule C 4 = schedule R
Alarm 2	*0*		**Manual Control Enable (MCE)**	*3*	
Alarm 3	*0*		**Emergency or Railroad Preempt**	*1*	
Alarm 4	*0*		**Not Used**	*0*	
Alarm 5	*0*		**Cycle Failure**	*2*	
Not Used	*0*		**Coordination Failure**	*2*	
Not Used	*0*		**Keyboard use / Data Changed**	*3*	
Not Used	*0*		**Coord Running / Free**	*0*	
Power On / Off	*2*		**Cabinet Door**	*0*	
Checksum Failure	*2*		**Extended Ped Pushbutton**	*0*	
Video / Detector Failure	*2*		**Monitor Status**	*2*	
Master to Local Comm Lost	*0*		**Red Extension**	*0*	

Miscellaneous Data

Transit Priority (next/2/7)

	1	2	3	4	5	6	7	8	
Phases									Phases 1 - 8 (max of 2 compatible phases)
PE Enable (6.25Hz TP call on PE)									X = 6.25 Hz signal will activate TP
Priority	0	0	0	0	0	0	0	0	0 - 8, 8 = highest
Memory									X = on
Delay Time	0	0	0	0	0	0	0	0	0 - 255 sec
Minimum Reservice Time (per input)	0	0	0	0	0	0	0	0	0 - 255 min
Override Time	0	0	0	0	0	0	0	0	0 - 255 sec
Bus Extend	0	0	0	0	0	0	0	0	0 - 255 sec
Minimum Reservice Time (all inputs)	0	0 - 255 min							
Free Operation Mode	0	0 = use shortest of max 1 or 2, 1 - 8 = use max time of group 1 - 8, 9 = use time of day							

Transit Priority Alternate Force Off Plans

Current Coord Plan	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Alternate TP Force Off Plan	0	0	0	0	0	0	0	0	0 = none
Current Coord Plan	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	17 - 32 = coord plan 17 - 32
Alternate TP Force Off Plan	0	0	0	0	0	0	0	0	

Group Timing

	Phase -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Group 1	**Max Times**	0	0	0	0	0	0	0	0	
	Walk Times	0	0	0	0	0	0	0	0	
Group 2	**Max Times**	0	0	0	0	0	0	0	0	
	Walk Times	0	0	0	0	0	0	0	0	
Group 3	**Max Times**	0	0	0	0	0	0	0	0	
	Walk Times	0	0	0	0	0	0	0	0	
Group 4	**Max Times**	0	0	0	0	0	0	0	0	0 - 255 sec
	Walk Times	0	0	0	0	0	0	0	0	0 would time the normal function time
Group 5	**Max Times**	0	0	0	0	0	0	0	0	
	Walk Times	0	0	0	0	0	0	0	0	
Group 6	**Max Times**	0	0	0	0	0	0	0	0	
	Walk Times	0	0	0	0	0	0	0	0	
Group 7	**Max Times**	0	0	0	0	0	0	0	0	
	Walk Times	0	0	0	0	0	0	0	0	
Group 8	**Max Times**	0	0	0	0	0	0	0	0	
	Walk Times	0	0	0	0	0	0	0	0	

Truck Priority (next/2/7/9)

Truck Priority-->	**1**	**2**	**3**	**4**	
Associated Transit Priority	0	0	0	0	0 = none 1 - 8 = transit priority 1 - 8
Leading Detector	0	0	0	0	0 = none, 1 - 32 = detector 1 - 32
Trailing Detector	0	0	0	0	
Stop Bar Distance	0	0	0	0	0 - 999 feet
Trap Distance	0	0	0	0	0.0 - 99.9 feet
Minimum Speed	0	0	0	0	0 - 100 mph
Minimum Length	0	0	0	0	0 - 255 feet
Downhill Grade	0	0	0	0	0 - 20 %
Uphill Grade	0	0	0	0	
Undersized Vehicle					X = Enabled

Change I/O		X = On (After a download with a power on - off cycle)

Inputs (Non Default I/O is offset to the right) (next/2/8/1)

C1-39	*101*	*VD9*	**C1-55**	*15*	*VD5*	**C1-67**	*22*	*PED2*	**C11-15**	*254*	*N/U*
C1-40	*113*	*VD19*	**C1-56**	*11*	*VD1*	**C1-68**	*26*	*PED6*	**C11-16**	*254*	*N/U*
C1-41	*106*	*VD14*	**C1-57**	*17*	*VD7*	**C1-69**	*24*	*PED4*	**C11-17**	*254*	*N/U*
C1-42	*118*	*VD24*	**C1-58**	*13*	*VD3*	**C1-70**	*28*	*PED8*	**C11-18**	*254*	*N/U*
C1-43	*102*	*VD10*	**C1-59**	*16*	*VD6*	**C1-71**	*151*	*PE1*	**C11-19**	*254*	*N/U*
C1-44	*114*	*VD20*	**C1-60**	*12*	*VD2*	**C1-72**	*152*	*PE2*	**C11-20**	*254*	*N/U*
C1-45	*107*	*VD15*	**C1-61**	*18*	*VD8*	**C1-73**	*153*	*PE3*	**C11-21**	*254*	*N/U*
C1-46	*161*	*VD25*	**C1-62**	*14*	*VD4*	**C1-74**	*154*	*PE4*	**C11-22**	*254*	*N/U*
C1-47	*105*	*VD13*	**C11-10**	*254*	*N/U*	**C1-75**	*254*	*N/U*	**C11-23**	*254*	*N/U*
C1-48	*117*	*VD23*	**C11-11**	*254*	*N/U*	**C1-76**	*104*	*VD12*	**C11-24**	*254*	*N/U*
C1-49	*112*	*VD18*	**C11-12**	*254*	*N/U*	**C1-77**	*116*	*VD22*	**C11-25**	*254*	*N/U*
C1-50	*164*	*VD28*	**C11-13**	*254*	*N/U*	**C1-78**	*111*	*VD17*	**C11-26**	*254*	*N/U*
C1-51	*199*	*PEDI*	**C1-63**	*103*	*VD11*	**C1-79**	*163*	*VD27*	**C11-27**	*254*	*N/U*
C1-52	*155*	*PE5*	**C1-64**	*115*	*VD21*	**C1-80**	*82*	*IADV*	**C11-28**	*254*	*N/U*
C1-53	*85*	*MCE*	**C1-65**	*108*	*VD16*	**C1-81**	*137*	*MONS*	**C11-29**	*254*	*N/U*
C1-54	*254*	*N/U*	**C1-66**	*162*	*VD26*	**C1-82**	*62*	*ST1*	**C11-30**	*254*	*N/U*

Outputs (Non Default I/O is offset to the right) (next/2/8/2)

C1-2	*44*	*4DWK*	**C1-19**	*48*	*8DWK*	**C1-35**	*131*	*TO1*	**C1-91**	*41*	*1DWK*
C1-3	*64*	*4WLK*	**C1-20**	*68*	*8WLK*	**C1-36**	*132*	*TO2*	**C1-93**	*61*	*1WLK*
C1-4	*14*	*4RED*	**C1-21**	*18*	*8RED*	**C1-37**	*133*	*TO3*	**C1-94**	*106*	*OLBR*
C1-5	*24*	*4YEL*	**C1-22**	*28*	*8YEL*	**C1-38**	*134*	*TO4*	**C1-95**	*105*	*OLBY*
C1-6	*34*	*4GRN*	**C1-23**	*38*	*8GRN*	**C1-100**	*53*	*3PCL*	**C1-96**	*104*	*OLBG*
C1-7	*13*	*3RED*	**C1-24**	*17*	*7RED*	**C1-101**	*51*	*1PCL*	**C1-97**	*103*	*OLAR*
C1-8	*23*	*3YEL*	**C1-25**	*27*	*7YEL*	**C1-102**	*187*	*SFL*	**C1-98**	*102*	*OLAY*
C1-9	*33*	*3GRN*	**C1-26**	*37*	*7GRN*	**C1-103**	*147*	*WDOG*	**C1-99**	*101*	*OLAG*
C1-10	*42*	*2DWK*	**C1-27**	*46*	*6DWK*	**C1-83**	*43*	*3DWK*	**C11-1**	*254*	*N/U*
C1-11	*62*	*2WLK*	**C1-28**	*66*	*6WLK*	**C1-84**	*63*	*3WLK*	**C11-2**	*254*	*N/U*
C1-12	*12*	*2RED*	**C1-29**	*16*	*6RED*	**C1-85**	*116*	*OLDR*	**C11-3**	*254*	*N/U*
C1-13	*22*	*2YEL*	**C1-30**	*26*	*6YEL*	**C1-86**	*115*	*OLDY*	**C11-4**	*254*	*N/U*
C1-15	*32*	*2GRN*	**C1-31**	*36*	*6GRN*	**C1-87**	*114*	*OLDG*	**C11-5**	*254*	*N/U*
C1-16	*11*	*1RED*	**C1-32**	*15*	*5RED*	**C1-88**	*113*	*OLCR*	**C11-6**	*254*	*N/U*
C1-17	*21*	*1YEL*	**C1-33**	*25*	*5YEL*	**C1-89**	*112*	*OLCY*	**C11-7**	*254*	*N/U*
C1-18	*31*	*1GRN*	**C1-34**	*35*	*5GRN*	**C1-90**	*111*	*OLCG*	**C11-8**	*254*	*N/U*

Internal Logic (next/2/9)			
Step	**Inst.**	**Description**	**Comment**
1	*207*	No Operation (place holder)	Remove this line to stop command box.
2	*208*	Load one of eight Timers if Test(s) are True	Begin Ph4 delay
3	*1*	Timer Number - 1	
4	*4.0*	Timer Value	5.0 Second delay
5	*28*	Phase 1-8 Next Test (Phase 1-8, or 9=any)	
6	*4*	Phase - 4	For Ph4
7	*221*	Output Off if Test(s) are True	
8	*34*	Phase 4 Green	
9	*27*	Timer 1-8 is Timing or Reset	
10	*1*	Timer Number - 1	
11	*20*	AND - Another Test	
12	*24*	NOT - Invert result of next test	
13	*29*	Preemption Active Test	
14	*9*	Any Preempt	
15	*40*	OR - Another Test	
16	*23*	Output Test - Tested for True	
17	*64*	Phase 4 Walk	
18	*221*	Output Off if Test(s) are True	
19	*38*	Phase 8 Green	
20	*27*	Timer 1-8 is Timing or Reset	
21	*1*	Timer Number - 1	
22	*20*	AND - Another Test	
23	*24*	NOT - Invert result of next test	
24	*29*	Preemption Active Test	
25	*9*	Any Preempt	End Ped 4 delay
26	*40*	OR - Another Test	Start Ped 8 delay
27	*23*	Output Test - Tested for True	
28	*64*	Phase 4 Walk	5.0 seconds
29	*205*	Output on if Test(s) are True	
30	*14*	Phase 4 Red	
31	*27*	Timer 1-8 is Timing or Reset	
32	*1*	Timer Number - 1	
33	*20*	AND - Another Test	
34	*24*	NOT - Invert result of next test	
35	*29*	Preemption Active Test	
36	*9*	Any Preempt	
37	*40*	OR - Another Test	
38	*23*	Output Test - Tested for True	
39	*64*	Phase 4 Walk	
40	*205*	Output on if Test(s) are True	
41	*18*	Phase 8 Red	
42	*27*	Timer 1-8 is Timing or Reset	
43	*1*	Timer Number - 1	
44	*20*	AND - Another Test	
45	*24*	NOT - Invert result of next test	
46	*29*	Preemption Active Test	End Ph 8 delay
47	*9*	Any Preempt	
48	*40*	OR - Another Test	
49	*23*	Output Test - Tested for True	
50	*64*	Phase 4 Walk	
51	*208*	Load one of eight Timers if Test(s) are True	
52	*2*	Timer Number - 2	
53	*4.0*	Timer Value	
54	*28*	Phase 1-8 Next Test (Phase 1-8, or 9=any)	
55	*8*	Phase - 8	

Internal Logic cont.			
Step	**Inst.**	**Description**	**Comment**
56	221	Output Off if Test(s) are True	
57	38	Phase 8 Green	
58	27	Timer 1-8 is Timing or Reset	
59	2	Timer Number - 2	
60	20	AND - Another Test	
61	24	NOT - Invert result of next test	
62	29	Preemption Active Test	
63	9	Any Preempt	
64	40	OR - Another Test	
65	23	Output Test - Tested for True	
66	68	Phase 8 Walk	
67	221	Output Off if Test(s) are True	
68	34	Phase 4 Green	
69	27	Timer 1-8 is Timing or Reset	
70	2	Timer Number - 2	
71	20	AND - Another Test	
72	24	NOT - Invert result of next test	
73	29	Preemption Active Test	
74	9	Any Preempt	
75	40	OR - Another Test	
76	23	Output Test - Tested for True	
77	68	Phase 8 Walk	
78	205	Output on if Test(s) are True	
79	18	Phase 8 Red	
80	27	Timer 1-8 is Timing or Reset	
81	2	Timer Number - 2	
82	20	AND - Another Test	
83	24	NOT - Invert result of next test	
84	29	Preemption Active Test	
85	9	Any Preempt	
86	40	OR - Another Test	
87	23	Output Test - Tested for True	
88	68	Phase 8 Walk	
89	205	Output on if Test(s) are True	
90	14	Phase 4 Red	
91	27	Timer 1-8 is Timing or Reset	
92	2	Timer Number - 2	
93	20	AND - Another Test	
94	24	NOT - Invert result of next test	
95	29	Preemption Active Test	
96	9	Any Preempt	
97	40	OR - Another Test	
98	23	Output Test - Tested for True	
99	68	Phase 8 Walk	
100			
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110			

Internal Logic cont.			
Step	**Inst.**	**Description**	**Comment**
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Internal Logic cont.			
Step	**Inst.**	**Description**	**Comment**
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Internal Logic cont.			
Step	**Inst.**	**Description**	**Comment**
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FYLTA - Continued (next/2/2/8/6)

	Phase Pairs -->	1 - 2	3 - 4	5 - 6	7 - 8	
Gap-Dependent FYLTA (next/2/2/8/6-A)	Detector Input	0	0	0	0	0 = disable, 1 - 64 detectors
	Min Delay	0	0	0	0	0 - 255 sec
	Detector Gap	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Max Delay	0	0	0	0	0 - 255 sec
	Not Ped	0	0	0	0	0 - 255 sec

FYLTA Gap-Dependent Plans (next/2/2/8/6)

	Phase Pairs -->	1 - 2	3 - 4	5 - 6	7 - 8	
FYLTA Gap-Dependent Plan A	Detector Input	0	0	0	0	0 = disable, 1 - 64 detectors
	Min Delay	0	0	0	0	0 - 255 sec
	Detector Gap	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Max Delay	0	0	0	0	0 - 255 sec
	Not Ped	0	0	0	0	0 - 255 sec
FYLTA Gap-Dependent Plan B	Detector Input	0	0	0	0	0 = disable, 1 - 64 detectors
	Min Delay	0	0	0	0	0 - 255 sec
	Detector Gap	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Max Delay	0	0	0	0	0 - 255 sec
	Not Ped	0	0	0	0	0 - 255 sec
FYLTA Gap-Dependent Plan C	Detector Input	0	0	0	0	0 = disable, 1 - 64 detectors
	Min Delay	0	0	0	0	0 - 255 sec
	Detector Gap	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Max Delay	0	0	0	0	0 - 255 sec

	Not Ped	0	0	0	0	0 - 255 sec
FYLTA Gap-Dependent Plan D	Detector Input	0	0	0	0	0 = disable, 1 - 64 detectors
	Min Delay	0	0	0	0	0 - 255 sec
	Detector Gap	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Max Delay	0	0	0	0	0 - 255 sec
	Not Ped	0	0	0	0	0 - 255 sec

Preemption - Continued

Railroad Communications (IEEE 1570) (next/2/5/0/8)

	ATC	Wayside	
Railroad Number	0	0	0 - 999, represents railroad
Railroad Line Number	0	0	0 - 999, represents railroad line
Group Number	0	0	0 - 999, represents physical group of equipment
Subnode Number	0	0	0 - 99, subnode within physical group of equipment
Device Number	0	0	0 - 99, device within physical group of equipment
Associated Preempt	0		0 - 8
Communication Port	0		0 - 4

Reports - Continued

Reports - Service Delay Modes (next/2/6/0)

Phase -->	1	2	3	4	5	6	7	8	
Mode	0	0	0	0	0	0	0	0	0 = disable, 1 = enable, 2 = Ped, 3 = Veh/P
Ped Overlap -->	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	
Mode	0	0	0	0	0	0	0	0	0 = disable, 1 = enable

Detector -->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Enable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Detector -->	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**
Enable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Detector -->	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
Enable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Detector -->	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**	**61**	**62**	**63**	**64**
Enable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Monday, October 19, 2015 14:25

Intersection Name	*4 - 5th @ D Street*	**Local ID**	*4*
Intersection Telephone Number			
System Name	*169 - Used to be Madras*	**System ID**	*169*
Controller Type	*Voyage - C1-C11*		
Controller Serial Number		**Installation Date**	
Programmed by		**Programmed Date**	

Graphic Map Background	**Phase Rotation Diagram**

Control Data (next/2/2)

Controller Function and Timing (next/2/1, next/2/2)

Security, Sequence, Initialization

Security Code	******	0 = disabled, or 1000-9999
Sequence	*1*	0 = sequential, 1 = quad left turn, 2-6 = special A-E, 7 = lead lag

Lead Lag (next/2/2/3)

Phases 1 - 2	Phases 3 - 4	Phases 5 - 6	Phases 7 - 8

0 = no reversal, 1 = reversal, 2 = by coord plan or clock

Initialization and Flash (next/2/2/5)

	Initialization	Flash Entry	Flash Exit	
Ring 1 Phase	*4*	*2*	*4*	phase 1-8
Ring 2 Phase	*8*	*0*	*8*	phase 1-8
Interval	*0*	*0*	*0*	0 = red, 1 = yellow, 2 = green

Power up Flash	*0.0*	0.0 - 25.5 seconds	**First All Red**	*6.0*	0.0 - 25.5 seconds

Soft Flash (next/2/2/5)

Phase	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**					0 = dark, 1=flash yel WIG, 2 = flash yel WAG, 3 = flash red WIG, 4 = flash red WAG
	3	*4*	*3*	*4*	*3*	*4*	*3*	*4*					
Overlap	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	
	3	*4*	*3*	*4*	*3*	*4*	*3*	*4*	*3*	*4*	*3*	*4*	same as phase
Internal Logic Output	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
	0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 = normal, 1 = dark, 2 = flash WIG

Per Phase Functions (next/2/2/3, next/2/2/1)

	1	2	3	4	5	6	7	8	
Phases Used				X		X		X	X = on
Restricted Phases									X = on (Sequence 2, 6, 7 only)
Exclusive Phases									X = on (Sequence 7 only)
Yellow Lock									X = on
Min Recall						X			
Max Recall									
Ped Recall									
Red Lock									
Max Out Recall Inhibit									
Soft Recall									
Free Walk Rest									
Conditional Ped						X			
Disable Inhibit Max Termination									
Call to Non Act 1									
Call to Non Act 2									

Dual Entry (next/2/2/9/3)

Mode	1	0 = off, 1 = on, 2 = Not Used, 3 = by coord plan, 4 = by time clock circuit 61

Dual Entry Phase -->	1	2	3	4	5	6	7	8	
Phase	0	0	0	8	0	0	0	4	0 = none, 1-8 = phase 1-8

Conditional Service, Five Section Head

Conditional Service (next/2/2/9/3)

	Mode	CS Max Time
Phase 1	0	0
Phase 3	0	0
Phase 5	0	0
Phase 7	0	0

0 = off, 1 = C.S.On. 2 = C.S. on by TOD circuit 57, 3 = N/A, 4 = C.S. and C.R. On, 5 = C.R. on by TOD circuit 57.

5 Section Head Logic (next/2/2/9/4)

X Omits Y		Anti-Trap			Yellow Blanking LT	
X : Y		Trap Protected Phase		Next Phase	Phase	
6 : 1	0	1		< (5)	1	
8 : 3	0	3		< (7)	3	
2 : 5	0	5		< (1)	5	
4 : 7	0	7		< (3)	7	

0=off, 1=side call, 2=no side call

X = On

Phase Times (next/2/2/2, next/2/2/9/5)									
	1	2	3	4	5	6	7	8	
Movement				EB		NB		WB	
Minimum Green	0	0	0	10	0	10	0	10	0 - 255 sec
Passage	0.0	0.0	0.0	2.5	0.0	3.5	0.0	2.5	0.0 - 25.5 sec
Yellow	0.0	0.0	0.0	4.0	0.0	4.0	0.0	4.0	0.0 - 25.5 sec
Red Clearance	0.0	0.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0 - 25.5 sec or 0 - 255 sec
Max 1	0	0	0	25	0	40	0	25	0 - 255 sec
Max 2	0	0	0	25	0	40	0	25	0 - 255 sec
Walk	0	0	0	7	0	7	0	7	0 - 255 sec
Ped Clear	0	0	0	11	0	13	0	11	0 - 255 sec
Seconds Per Actuation	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0 - 25.5 sec
Time Before Reduction	0	0	0	5	0	20	0	5	0 - 255 sec
Time to Reduce	0	0	0	5	0	10	0	5	0 - 255 sec
Minimum Gap	0.0	0.0	0.0	1.5	0.0	2.5	0.0	1.5	0.0 - 25.5 sec
Max Variable Initial	0	22	0	5	0	22	0	5	0 - 255 sec
Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec
Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Inhibit Min Yellow									X = On
Red Decimal Off									X = On
Advance Walk	0	0	0	0	0	0	0	0	0 - 255 sec

Other Controller Functions (next/2/2/9)									
Phase -->	1	2	3	4	5	6	7	8	
Inhibit Simultaneous Gap Out				X				X	X = On

Last Car Passage	2	0 = recall phase, 1 = last car passage, 2 = NOT recall - Not last car passage
Red Revert (+2 seconds)	3.0	0 - 25.5 sec
Auto Ped Clear	X	X = On
Flashing Don't Walk Into Yellow		X = On
Soft Recall / Red Rest Delay	0.0	0 - 25.5 sec
Ped Pushbutton	0	0 - 5 sec, 0 = disable
Advance Flash Rate	0	0 = disable, 1 = 120 FPM
Change Sequence		X = On (After a download with a power on - off cycle)

Phase -->	1	2	3	4	5	6	7	8	
Red Clear Extension Detector	0	0	0	0	0	0	0	0	0 = none 1 - 32 = detector 1 - 32
Red Clear Extension Red Time	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec.

Local Detectors (next/2/2/4)

Detector Data

	Yellow Lock	Detector Inhibit	Call Phase	Extend Phase	Switch Phase	Delay Time	Stretch / Disconnect Time	Delay or Disconnect Mode
Detector 1 -			*1*	*1*	*0*	*0*	*0.0*	*0*
Detector 2 -			*1*	*1*	*0*	*0*	*0.0*	*0*
Detector 3 -			*3*	*3*	*0*	*0*	*0.0*	*0*
Detector 4 -			*3*	*3*	*0*	*0*	*0.0*	*0*
Detector 5 -			*5*	*5*	*0*	*0*	*0.0*	*0*
Detector 6 -			*5*	*5*	*0*	*0*	*0.0*	*0*
Detector 7 -			*7*	*7*	*0*	*0*	*0.0*	*0*
Detector 8 -			*7*	*7*	*0*	*0*	*0.0*	*0*
Detector 9 - System -			*2*	*2*	*0*	*0*	*0.0*	*0*
Detector 10 - System -			*2*	*2*	*0*	*0*	*0.0*	*0*
Detector 11 -			*2*	*2*	*0*	*0*	*0.0*	*0*
Detector 12 -			*0*	*2*	*0*	*0*	*0.0*	*0*
Detector 13 -			*2*	*0*	*0*	*0*	*0.0*	*0*
Detector 14 - System -			*4*	*4*	*0*	*0*	*0.0*	*0*
Detector 15 -			*4*	*4*	*0*	*0*	*0.0*	*0*
Detector 16 - System -			*4*	*4*	*0*	*0*	*0.0*	*0*
Detector 17 -			*0*	*4*	*0*	*0*	*0.0*	*0*
Detector 18 -			*4*	*0*	*0*	*0*	*0.0*	*0*
Detector 19 - System -			*6*	*6*	*0*	*0*	*0.0*	*0*
Detector 20 - System -			*6*	*6*	*0*	*0*	*0.0*	*0*
Detector 21 -			*6*	*6*	*0*	*0*	*0.0*	*0*
Detector 22 -			*0*	*6*	*0*	*0*	*0.0*	*0*
Detector 23 -			*6*	*0*	*0*	*0*	*0.0*	*0*
Detector 24 -			*8*	*8*	*0*	*0*	*0.0*	*0*
Detector 25 - System -			*8*	*8*	*0*	*0*	*0.0*	*0*
Detector 26 -			*8*	*8*	*0*	*0*	*0.0*	*0*
Detector 27 - System -			*0*	*8*	*0*	*0*	*0.0*	*0*
Detector 28 -			*8*	*0*	*0*	*0*	*0.0*	*0*
Detector 29 -			*0*	*0*	*0*	*0*	*0.0*	*0*
Detector 30 -			*0*	*0*	*0*	*0*	*0.0*	*0*
Detector 31 -			*0*	*0*	*0*	*0*	*0.0*	*0*
Detector 32 -			*0*	*0*	*0*	*0*	*0.0*	*0*

yellow lock, detector inhibit, - X = On; call, extend, phase - 0 = none 1 - 8 = phase 1 - 8 ; delay time - 0 - 255 sec
stretch / disconnect time - 0.0 - 25.5 sec.; delay or disconnect Mode - 0 -13

Detector Plans (next/2/2/4/5)

	Loop Number									
	Plan Detectors	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 32, 0 = none, 1 -3 2 = detectors 1 - 32
Detector Plan 1	**Call Phase**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 8, 0 = none, 1 - 8 = phase 1 - 8
	Extend Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Switch Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Delay Time	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec
	Stretch/Disconnect Time	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec
	Delay/ Disconnect Mode	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 13
Detector Plan 2	**Call Phase**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 8, 0 = none, 1 - 8 = phase 1 - 8
	Extend Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Switch Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Delay Time	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec
	Stretch/Disconnect Time	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec
	Delay/ Disconnect Mode	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 13
Detector Plan 3	**Call Phase**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 8, 0 = none, 1 - 8 = phase 1 - 8
	Extend Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Switch Phase	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	Delay Time	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec
	Stretch/Disconnect Time	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec
	Delay/ Disconnect Mode	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 13

Detector Fail Monitor (next/2/2/4/3)					Detectors 33-64 (next/2/2/4/6)		
	Fail Monitor Enable	**Recall Phase**	**Min Counts**	**Max Counts**		**Call Phase**	**Extend Phase**
Detector 1 -		*0*	*0*	*0*	Detector 33 -	0	0
Detector 2 -		*0*	*0*	*0*	Detector 34 -	0	0
Detector 3 -		*0*	*0*	*0*	Detector 35 -	0	0
Detector 4 -		*0*	*0*	*0*	Detector 36 -	0	0
Detector 5 -		*0*	*0*	*0*	Detector 37 -	0	0
Detector 6 -		*0*	*0*	*0*	Detector 38 -	0	0
Detector 7 -		*0*	*0*	*0*	Detector 39 -	0	0
Detector 8 -		*0*	*0*	*0*	Detector 40 -	0	0
Detector 9 - System -		*0*	*0*	*0*	Detector 41 -	0	0
Detector 10 - System -		*0*	*0*	*0*	Detector 42 -	0	0
Detector 11 -		*0*	*0*	*0*	Detector 43 -	0	0
Detector 12 -		*0*	*0*	*0*	Detector 44 -	0	0
Detector 13 -		*0*	*0*	*0*	Detector 45 -	0	0
Detector 14 - System -		*0*	*0*	*0*	Detector 46 -	0	0
Detector 15 -		*0*	*0*	*0*	Detector 47 -	0	0
Detector 16 - System -		*0*	*0*	*0*	Detector 48 -	0	0
Detector 17 -		*0*	*0*	*0*	Detector 49 -	0	0
Detector 18 -		*0*	*0*	*0*	Detector 50 -	0	0
Detector 19 - System -		*0*	*0*	*0*	Detector 51 -	0	0
Detector 20 - System -		*0*	*0*	*0*	Detector 52 -	0	0
Detector 21 -		*0*	*0*	*0*	Detector 53 -	0	0
Detector 22 -		*0*	*0*	*0*	Detector 54 -	0	0
Detector 23 -		*0*	*0*	*0*	Detector 55 -	0	0
Detector 24 -		*0*	*0*	*0*	Detector 56 -	0	0
Detector 25 - System -		*0*	*0*	*0*	Detector 57 -	0	0
Detector 26 -		*0*	*0*	*0*	Detector 58 -	0	0
Detector 27 - System -		*0*	*0*	*0*	Detector 59 -	0	0
Detector 28 -		*0*	*0*	*0*	Detector 60 -	0	0
Detector 29 -		*0*	*0*	*0*	Detector 61 -	0	0
Detector 30 -		*0*	*0*	*0*	Detector 62 -	0	0
Detector 31 -		*0*	*0*	*0*	Detector 63 -	0	0
Detector 32 -		*0*	*0*	*0*	Detector 64 -	0	0
fail monitor enable - X = On, recall phase - 0 = none 1 - 8 = phase 1 - 8, min, max					call / extend phase - 0 = none 1 - 8 = phase 1 - 8		

Detector Fail Sample Period (all detectors)	*0*	0 - 255 minutes

Video Fail Inputs (next/2/2/4/3) -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Phase Recalled	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 = none, 1 - 8 = phase 1 - 8

System Detectors (next/2/2/4/4)

System Detectors -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Local Detector	*19*	*20*	*0*	*0*	*0*	*0*	*0*	*0*	0 = none, 1 - 32 = phase 1 - 32

Overlaps / FYLTA (next/2/2/8)

Vehicle Overlaps		Phase or Movement	Phases 1	2	3	4	5	6	7	8	Extension Green	Clearance Yellow	Red
Overlaps	A		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	B		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	C		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	D		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	E		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	F		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	G		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	H		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	I		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	J		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	K		0	0	0	0	0	0	0	0	0.0	0.0	0.0
	L		0	0	0	0	0	0	0	0	0.0	0.0	0.0

A - D
0 = none
1 = overlap
2 = 60 FPM
3 = Not ped
4=Comp. Ph.
5=Prevent. Ext.
6=Not Veh.
7=Adv. FF

E - L
0 = no Overlap
1 = Overlap

Green,Yellow Red

Not Ped - Ped Overlaps (next/2/2/8/5)

Ped Overlaps ->		A	B	C	D	E	F	G	H
Overlaps	A								
	B								
	C								
	D								

X = Nor Ped Ped Overlap

Advance Warning (next/2/2/8/3)

	E	F	G	H	I	J	K	L	
Enable	0	0	0	0	0	0	0	0	0 = disabled, 1 = enabled
1st Conditional Overlap	0	0	0	0	0	0	0	0	0 = none, 1 - overlap E, 2 = overlap F, etc.
2nd Conditional Overlap	0	0	0	0	0	0	0	0	
Advance Deactivation Delay	0	0	0	0	0	0	0	0	0 - 99 seconds

Ped Overlaps (next/2/2/8/5)

	Phase -->	1	2	3	4	5	6	7	8	Walk	Ped Clear	Ped Recall
Ped Overlap	A									0	0	
	B									0	0	
	C									0	0	
	D									0	0	
	E									0	0	
	F									0	0	
	G									0	0	
	H									0	0	

Phase, Ped Recall: X = on

Walk, Ped Clear: 0 - 255 seconds

Flashing Yellow Left Turn Arrow (FYLTA) (next/2/2/8/6)

Phase Pairs -->	1 - 2	3 - 4	5 - 6	7 - 8	
Enable	0	0	0	0	0 = off, 3 = 3 outputs, 4 = 4 outputs, 5 = 5 outputs
Even Omits Odd	0	0	0	0	0 = off, 1 = on, 2 = on, place call across barrier
Detector Switch Odd / Even	X	X	X	X	X = on, odd phase must be omitted
Red Transition	2.0	2.0	2.0	2.0	0.0 or 2.0 - 25.5 sec
Red Extension	0.0	0.0	0.0	0.0	0.0 - 25.5 sec
Return to GLTA	0	0	0	0	0 = off, 1 = max out, 2 = yellow lock

Flashing Yellow Left Turn Arrow (FYLTA) - Continued on last page

Service Plans (next/2/2/6)

	Phase -->	1	2	3	4	5	6	7	8	
Service Plan 1	Call Mode	0	0	0	0	0	3	0	0	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	0	0	0	10	0	10	0	10	0 - 255 sec.
	Passage	0.0	0.0	0.0	3.0	0.0	3.5	0.0	3.0	0.0 - 25.5 sec.
	Yellow	0.0	0.0	0.0	4.0	0.0	4.0	0.0	4.0	0.0 - 25.5 or 3.0 - 25.5
	Red	0.0	0.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0 - 25.5 sec.
	Walk	0	0	0	7	0	7	0	7	0 - 255 sec.
	Pedestrian Clearance	0	0	0	11	0	13	0	11	0 - 255 sec.

	Phase -->	1	2	3	4	5	6	7	8	
Service Plan 2	Call Mode	0	0	0	0	0	0	0	0	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	0	0	0	0	0	0	0	0	0 - 255 sec.
	Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 or 3.0 - 25.5
	Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Walk	0	0	0	0	0	0	0	0	0 - 255 sec.
	Pedestrian Clearance	0	0	0	0	0	0	0	0	0 - 255 sec.

	Phase -->	1	2	3	4	5	6	7	8	
Service Plan 3	Call Mode	0	0	0	0	0	0	0	0	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	0	0	0	0	0	0	0	0	0 - 255 sec.
	Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 or 3.0 - 25.5
	Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Walk	0	0	0	0	0	0	0	0	0 - 255 sec.
	Pedestrian Clearance	0	0	0	0	0	0	0	0	0 - 255 sec.

	Phase -->	1	2	3	4	5	6	7	8	
Service Plan 4	Call Mode	0	0	0	0	0	0	0	0	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	0	0	0	0	0	0	0	0	0 - 255 sec.
	Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 or 3.0 - 25.5
	Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Walk	0	0	0	0	0	0	0	0	0 - 255 sec.
	Pedestrian Clearance	0	0	0	0	0	0	0	0	0 - 255 sec.

	Phase -->	1	2	3	4	5	6	7	8	
Service Plan 5	Call Mode	0	0	0	0	0	0	0	0	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	0	0	0	0	0	0	0	0	0 - 255 sec.
	Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 or 3.0 - 25.5
	Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Walk	0	0	0	0	0	0	0	0	0 - 255 sec.
	Pedestrian Clearance	0	0	0	0	0	0	0	0	0 - 255 sec.

	Phase -->	1	2	3	4	5	6	7	8	
Service Plan 6	Call Mode	0	0	0	0	0	0	0	0	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	0	0	0	0	0	0	0	0	0 - 255 sec.
	Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 or 3.0 - 25.5
	Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Walk	0	0	0	0	0	0	0	0	0 - 255 sec.
	Pedestrian Clearance	0	0	0	0	0	0	0	0	0 - 255 sec.

Service Plans Cont.

	Phase -->	1	2	3	4	5	6	7	8	
Service Plan 7	Call Mode	0	0	0	0	0	0	0	0	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	0	0	0	0	0	0	0	0	0 - 255 sec.
	Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 or 3.0 - 25.5
	Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Walk	0	0	0	0	0	0	0	0	0 - 255 sec.
	Pedestrian Clearance	0	0	0	0	0	0	0	0	0 - 255 sec.

	Phase -->	1	2	3	4	5	6	7	8	
Service Plan 8	Call Mode	0	0	0	0	0	0	0	0	
	0 = actuated, 1 = omit, 2 = CNA, 3 = min recall, 4 = max recall, 5 = soft recall, 6 = ped recall, 7 = omit ped, 8 = red rest									
	Minimum Green	0	0	0	0	0	0	0	0	0 - 255 sec.
	Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 or 3.0 - 25.5
	Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec.
	Walk	0	0	0	0	0	0	0	0	0 - 255 sec.
	Pedestrian Clearance	0	0	0	0	0	0	0	0	0 - 255 sec.

Max Plans (next/2/2/7)

	Phase -->	1	2	3	4	5	6	7	8	
Max Plan 1	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 2	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 3	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 4	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 5	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 6	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 7	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec
Max Plan 8	Normal Max	0	0	0	0	0	0	0	0	0 - 255 sec
	Fail Max	0	0	0	0	0	0	0	0	
	Auto Max Adjust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Auto Max Limit	0	0	0	0	0	0	0	0	0 - 255 sec

Coordination Data (next/2/3)

Coordination Modes (next/2/3/1, next/2/3/4/1, next/2/3/4/3)

Flash Mode	34	0=off, 1=on, 33=time clock, 34=comm, 35=hardwire, 36=NWS Set only, 37=AB3418 / NTCIP S
Coordination Plan Mode	34	0=free, 1-32 = coord plan 1-32, 33=time clock, 34=comm, 35=hardwire, 36=NWS Set only, 37=
Offset Seeking Mode	2	0=add only, 1=dwell, 2=fastway
Late Ped	1	0 = off, 1 = on
Coord Walk Rest	1	0 = off, 1 = on, 2 = by TOD circuit 160, 3 = end of walk, 4 = coord ped during perms
Repeated Phase Service	3	0=off, 1=on (no coord ped), 2=on (beginning green coord ped), 3=on (coord ped always)
Zero Mode (TS2 only)	0	0=start of main street, 1=end of main street, 2=by TOD circuit 144

Phase -->	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	0 = service allowed 1 = service prevented
Omit Phase During Repeated Phase Service	0	0	0	0	0	1	0	0	
Auto Permissive Min Green	0	0	0	0	0	0	0	0	0 - 255 seconds

Coordination Plans (next/2/3/2)

	Coordination Phases							
Coord Plan	**Ring 1**	**Ring 2**	**Cycle Length**	**Offset Time**	**Min Cycle Length Dwell Time**	**Permissive**	**Service Plan**	**Max Plan**
1 - 70 AM	0	6	70	0	0	0	1	0
2 - 80 PM2	0	6	80	0	0	0	0	0
3 - 70 PM	0	6	70	25	0	0	1	0
4 - 80 sec side street	0	6	80	46	0	0	0	0
5 - 80 sec Main line	0	6	0	0	0	0	0	0
6 -	0	0	0	0	0	0	0	0
7 -	0	0	0	0	0	0	0	0
8 -	0	0	0	0	0	0	0	0
9 -	0	0	0	0	0	0	0	0
10 -	0	0	0	0	0	0	0	0
11 -	0	0	0	0	0	0	0	0
12 -	0	0	0	0	0	0	0	0
13 -	0	0	0	0	0	0	0	0
14 -	0	0	0	0	0	0	0	0
15 -	0	0	0	0	0	0	0	0
16 -	0	0	0	0	0	0	0	0
17 -	0	0	0	0	0	0	0	0
18 -	0	0	0	0	0	0	0	0
19 -	0	0	0	0	0	0	0	0
20 -	0	0	0	0	0	0	0	0
21 -	0	0	0	0	0	0	0	0
22 -	0	0	0	0	0	0	0	0
23 -	0	0	0	0	0	0	0	0
24 -	0	0	0	0	0	0	0	0
25 -	0	0	0	0	0	0	0	0
26 -	0	0	0	0	0	0	0	0
27 -	0	0	0	0	0	0	0	0
28 -	0	0	0	0	0	0	0	0
29 -	0	0	0	0	0	0	0	0
30 -	0	0	0	0	0	0	0	0
31 -	0	0	0	0	0	0	0	0
32 -	0	0	0	0	0	0	0	0
	0 - 8		0 - 255 sec.				0 - 8	

Coordination Plans cont.

Coord Plan	* = Force Offs / Split Times (TS2)								* = Yield Points / Actuated Times (TS2)	
	1	2	3	4	5	6	7	8	Ring 1	Ring 2
1 - 70 AM	*0*	*0*	*0*	*27*	*0*	*43*	*0*	*27*	*0*	*5*
2 - 80 PM2	*0*	*0*	*0*	*32*	*0*	*48*	*0*	*32*	*0*	*5*
3 - 70 PM	*0*	*0*	*0*	*28*	*0*	*42*	*0*	*28*	*0*	*5*
4 - 80 sec side street	*0*	*0*	*0*	*35*	*0*	*45*	*0*	*35*	*0*	*0*
5 - 80 sec Main line	*0*	*0*	*0*	*29*	*0*	*51*	*0*	*29*	*0*	*0*
6 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
7 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
8 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
9 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
10 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
11 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
12 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
13 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
14 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
15 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
16 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
17 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
18 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
19 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
20 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
21 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
22 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
23 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
24 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
25 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
26 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
27 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
28 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
29 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
30 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
31 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
32 -	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	0 - 255 sec * = force offs and yield points									

Circuit Mapping (next/2/3/3)

Circuit Map	Coord Plan	Time Clock Circuit		Time Clock Circuit		Time Clock Circuit		Time Clock Circuit		Time Clock Circuit		Time Clock Circuit		Time Clock Circuit		Time Clock Circuit	
1	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
2	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
3	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
4	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
5	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
6	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
7	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
8	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
9	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
10	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
11	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
12	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
13	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
14	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
15	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
16	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
17	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
18	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
19	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U
20	34	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U	0	N/U

coord plan - 0 = free, 1 - 32 = coord plan 1 - 32, 33 = any, 34 none selected
time clock circuits - 0 = not used, or circuits 6 - 196

Dynamic Phase Length (next/2/3/4/4)

	Phase -->	1	2	3	4	5	6	7	8	
	Back Detector	0	0	0	0	0	0	0	0	0 = none, 1-32 = detector 1-32
	Lane Factor	0	0	0	0	0	0	0	0	0 = none, 1.0 - 5.0
	Check Out Detector	0	0	0	0	0	0	0	0	0 = none, 1-32 = detector 1-32
Coord Delta Force Off	Set A	0	0	0	0	0	0	0	0	0 - 255 sec
	Set B	0	0	0	0	0	0	0	0	
	Set C	0	0	0	0	0	0	0	0	
	Set D	0	0	0	0	0	0	0	0	
Free Delta Max	Set A	0	0	0	0	0	0	0	0	
	Set B	0	0	0	0	0	0	0	0	
	Set C	0	0	0	0	0	0	0	0	
	Set D	0	0	0	0	0	0	0	0	

Platoon Progression (next/2/3/4/5)

Entry Local Only			Master Local Only		
Platoon Max	0	0 - 255 sec	Smoothing Factor	0.0	0.0 - 1.0
Min Platoon Green	0	0 - 255 sec			
Entry Detector Gap	0.0	0.0 - 25.5			
Min Platoon Cycle	0	0 - 255 sec			

Inbound				Outbound			
Only for Entry Inbound Local or Master Local				Only for Entry Outbound Local or Master Local			
Entry IB Local also Last OB Local	0	0 - 50		Entry OB Local also Last IB Local	0	0 - 50	
Speed	0	0 - 55 mph		Speed	0	0 - 55 mph	
Distance from Entry Local	0	0 - 65000 feet		Distance from Entry Local	0	0 - 65000 feet	
Entry Local Only				Entry Local Only			
Distance from Entry Local Detector	0	0 - 999 feet		Distance from Entry Local Detector	0	0 - 999 feet	
Entry Local Detector	0	0	0 - 32	Entry Local Detector	0	0	0 - 32
Master Local				Master Local			
Master Mid - System Critical Detectors	0	0	0 - 16	Master Mid - System Critical Detectors	0	0	0 - 16

Force Off Percents

Inbound	1	3	4	5	7	8	Outbound	1	3	4	5	7	8
Split 1	0	0	0	0	0	0	Split 1	0	0	0	0	0	0
Split 2	0	0	0	0	0	0	Split 2	0	0	0	0	0	0
	0 - 100 %							0 - 100 %					

Time of Day Data (next/2/4)

Day Program (next/2/4/1)

	Day Prog.	Time	Coord Plan	Coord Plan or Circuit		State On / Off		Day Prog.	Time	Coord Plan	Coord Plan or Circuit		State On/Off
1	*1*	*06:00*	*X*	*1*			51						
2	*1*	*11:00*		*0*	N/U		52						
3	*1*	*14:00*	*X*	*3*			53						
4	*1*	*19:00*	*X*	*0*			54						
5	*2*	*08:00*	*X*	*3*			55						
6	*2*	*18:30*	*X*	*0*			56						
7	*3*	*10:00*	*X*	*3*			57						
8	*3*	*18:00*	*X*	*0*			58						
9							59						
10							60						
11							61						
12							62						
13							63						
14							64						
15							65						
16							66						
17							67						
18							68						
19							69						
20							70						
21							71						
22							72						
23							73						
24							74						
25							75						
26							76						
27							77						
28							78						
29							79						
30							80						
31							81						
32							82						
33							83						
34							84						
35							85						
36							86						
37							87						
38							88						
39							89						
40							90						
41							91						
42							92						
43							93						
44							94						
45							95						
46							96						
47							97						
48							98						
49							99						
50							100						
	1 - 15	hh : mm	X = on	coord plan 0 - 32 or circuit 1-196		X = on		1 - 15	hh : mm	X = on	coord plan 0 - 32 or circuit 1-196		X = on

Day Program cont.

	Day Prog.	Time	Coord Plan	Coord Plan or Circuit		State On / Off		Day Prog.	Time	Coord Plan	Coord Plan or Circuit		State On / Off
101							**151**						
102							**152**						
103							**153**						
104							**154**						
105							**155**						
106							**156**						
107							**157**						
108							**158**						
109							**159**						
110							**160**						
111							**161**						
112							**162**						
113							**163**						
114							**164**						
115							**165**						
116							**166**						
117							**167**						
118							**168**						
119							**169**						
120							**170**						
121							**171**						
122							**172**						
123							**173**						
124							**174**						
125							**175**						
126							**176**						
127							**177**						
128							**178**						
129							**179**						
130							**180**						
131							**181**						
132							**182**						
133							**183**						
134							**184**						
135							**185**						
136							**186**						
137							**187**						
138							**188**						
139							**189**						
140							**190**						
141							**191**						
142							**192**						
143							**193**						
144							**194**						
145							**195**						
146							**196**						
147							**197**						
148							**198**						
149							**199**						
150							**200**						
	1 - 15	hh : mm	X = on	coord plan 0 - 32 or circuit 1-196		X = on		1 - 15	hh : mm	X = on	coord plan 0 - 32 or circuit 1-196		X = on

Week Program (next/2/4/2)

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	3	1	1	1	1	1	2
2	1	1	1	1	1	1	1
3	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1
6	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1
9	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1

0 = none, 1 - 15 = day plan

Exception Days (next/2/4/6)

	DOW	WOM	DOM	MOY	Day Prog.
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
	0-10	0 - 5	0-31	0-12	0 - 15

Time Clock References (next/2/4/5)

Synch reference Mode	0	0 = timed, 1 = by event
Synch Reference Time	00:00	00:00 - 23:59
Daylight Savings Enable	X	X = on
Reset Time	00:00	00:00 - 23:59

Year Program (next/2/4/3)

From Date	To Date	Week Program
01/01/2015	12/31/2015	1

New Years Day - Date - January 1st

Martin Luther King Day - DOW WOM - 3rd Monday of January

President's Day - DOW WOM - 3rd Monday February

Memorial Day - DOW WOM - Last Monday May

Fourth of July - Date - July 4th

Labor Day - DOW WOM - 1st Monday September

Columbus Day - DOW WOM - 2nd Monday October

Veteran's Day - Date - November 11th

Thanksgiving - DOW WOM - 4th Thursday November

Christmas - Date - December 25th

Exception day headings - DOW = Day of Week, WOM = Week of Month, DOM = Day of Month, MOY = Month of Year

Circuit Overrides (next/2/4/4)							
1 - Coord Line 1	CL1	*TOD*	On / Off / TOD	51 - Ped Omit 3	PO3	*TOD*	On / Off / TOD
2 - Coord Line 2	CL2	*TOD*		52 - Ped Omit 4	PO4	*TOD*	
3 - Coord Line 4	CL4	*TOD*		53 - Ped Omit 5	PO5	*TOD*	
4 - Coord Line 8	CL8	*TOD*		54 - Ped Omit 6	PO6	*TOD*	
5 - Coord Line 16	C16	*TOD*		55 - Ped Omit 7	PO7	*TOD*	
6 - Coord Operation	CRD	*TOD*		56 - Ped Omit 8	PO8	*TOD*	
7 - Soft Flash	SFL	*TOD*		57 - Conditional Service	CVS	*TOD*	
8 - Enable System Relays	ESR	*TOD*		58 - Inhibit Simultaneous Gap Out	ISG	***On***	
9 - Call to Non Act 1	CN1	*TOD*		59 - Inhibit Hardwire	HWI	*TOD*	
10 - Call to Non Act 2	CN2	*TOD*		60 - Ped Override Mode	POM	***On***	
11 - Walk Rest Modifier	WRM	*TOD*		61 - Dual Entry	DLE	***On***	
12 - Min Recall	MIN	*TOD*		62 - Exclusive Ped	EPD	*TOD*	
13 - Max 2 Both Rings	MX2	*TOD*		63 - Call to Time Clock Mode	CTC	*TOD*	
14 - Coord Inhibit Max Ring 1, 2	IMT	*TOD*		64 - Dual Enhanced Ped	DEP	*TOD*	
15 - Enable Service Log	ESL	*TOD*		65 - Service Plan 1	SP1	*TOD*	
16 - Call to Free	CTF	*TOD*		66 - Service Plan 2	SP2	*TOD*	
17 - TOD Output 1	TO1	*TOD*		67 - Service Plan 3	SP3	*TOD*	
18 - TOD Output 2	TO2	*TOD*		68 - Service Plan 4	SP4	*TOD*	
19 - TOD Output 3	TO3	*TOD*		69 - Service Plan 5	SP5	*TOD*	
20 - TOD Output 4	TO4	*TOD*		70 - Service Plan 6	SP6	*TOD*	
21 - TOD Output 5	TO5	*TOD*		71 - Service Plan 7	SP7	*TOD*	
22 - TOD Output 6	TO6	*TOD*		72 - Service Plan 8	SP8	*TOD*	
23 - TOD Output 7	TO7	*TOD*		73 - Max Plan 1	MP1	*TOD*	
24 - TOD Output 8	TO8	*TOD*		74 - Max Plan 2	MP2	*TOD*	
25 - Vehicle Call Phase 1	VC1	*TOD*		75 - Max Plan 3	MP3	*TOD*	
26 - Vehicle Call Phase 2	VC2	*TOD*		76 - Max Plan 4	MP4	*TOD*	
27 - Vehicle Call Phase 3	VC3	*TOD*		77 - Max Plan 5	MP5	*TOD*	
28 - Vehicle Call Phase 4	VC4	*TOD*		78 - Max Plan 6	MP6	*TOD*	
29 - Vehicle Call Phase 5	VC5	*TOD*		79 - Max Plan 7	MP7	*TOD*	
30 - Vehicle Call Phase 6	VC6	*TOD*		80 - Max Plan 8	MP8	*TOD*	
31 - Vehicle Call Phase 7	VC7	*TOD*		81 - Transit Priority Max Group 1	TG1	*TOD*	
32 - Vehicle Call Phase 8	VC8	*TOD*		82 - Transit Priority Max Group 2	TG2	*TOD*	
33 - Ped Call Phase 1	PC1	*TOD*		83 - Transit Priority Max Group 3	TG3	*TOD*	
34 - Ped Call Phase 2	PC2	*TOD*		84 - Transit Priority Max Group 4	TG4	*TOD*	
35 - Ped Call Phase 3	PC3	*TOD*		85 - Transit Priority Max Group 5	TG5	*TOD*	
36 - Ped Call Phase 4	PC4	*TOD*		86 - Transit Priority Max Group 6	TG6	*TOD*	
37 - Ped Call Phase 5	PC5	*TOD*		87 - Transit Priority Max Group 7	TG7	*TOD*	
38 - Ped Call Phase 6	PC6	*TOD*		88 - Transit Priority Max Group 8	TG8	*TOD*	
39 - Ped Call Phase 7	PC7	*TOD*		89 - Inhibit Volume Density 1	IV1	*TOD*	
40 - Ped Call Phase 8	PC8	*TOD*		90 - Inhibit Volume Density 2	IV2	*TOD*	
41 - Vehicle Omit 1	VO1	*TOD*		91 - Inhibit Volume Density 3	Iv3	*TOD*	
42 - Vehicle Omit 2	VO2	*TOD*		92 - Inhibit Volume Density 4	IV4	*TOD*	
43 - Vehicle Omit 3	VO3	*TOD*		93 - Inhibit Volume Density 5	IV5	*TOD*	
44 - Vehicle Omit 4	VO4	*TOD*		94 - Inhibit Volume Density 6	IV6	*TOD*	
45 - Vehicle Omit 5	VO5	*TOD*		95 - Inhibit Volume Density 7	IV7	*TOD*	
46 - Vehicle Omit 6	VO6	*TOD*		96 - Inhibit Volume Density 8	IV8	*TOD*	
47 - Vehicle Omit 7	VO7	*TOD*		97 - Lag 1	LG1	*TOD*	
48 - Vehicle Omit 8	VO8	*TOD*		98 - Lag 3	LG3	*TOD*	
49 - Ped Omit 1	PO1	*TOD*		99 - Lag 5	LG5	*TOD*	
50 - Ped Omit 2	PO2	*TOD*		100 - Lag 7	LG7	*TOD*	

Circuit Overrides cont.

101 - Inhibit Overlap A	OLA	TOD		151 - Coord Hold 7	HD7	TOD	
102 - Inhibit Overlap B	OLB	TOD		152 - Coord Hold 8	HD8	TOD	
103 - Inhibit Overlap C	OLC	TOD		153 - PE Priority Return B	PRB	TOD	
104 - Inhibit Overlap D	OLD	TOD		154 - PE Priority Return C	PRC	TOD	
105 - Enable Schedule A Phone 1	AT1	TOD		155 - PE Priority Return D	PRD	TOD	
106 - Enable Schedule A Phone 2	AT2	TOD		156 - PE Priority Return E	PRE	TOD	
107 - Enable Schedule B Phone 1	BT1	TOD		157 - Platoon Inbound	PPI	TOD	
108 - Enable Schedule B Phone 2	BT2	TOD		158 - Platoon Outbound	PPO	TOD	
109 - Enable Schedule C Phone 1	CT1	TOD		159 - Platoon Spl 2	PS2	TOD	
110 - Enable Schedule C Phone 2	CT2	TOD		160 - Coord Walk Rest	CWR	TOD	
111 - Enable Volume to Call Phone 1	VT1	TOD		161 - Dynamic Phase Length Short Inhibit 1	SI1	TOD	
112 - Enable Volume to Call Phone 2	VT2	TOD		162 - Dynamic Phase Length Short Inhibit 2	SI2	TOD	
113 - Enable Volume Logging	EVL	On		163 - Dynamic Phase Length Short Inhibit 3	SI3	TOD	
114 - Enable MOE Logging	EML	On		164 - Dynamic Phase Length Short Inhibit 4	SI4	TOD	
115 - Detector Low Threshold Inhibit	DLI	TOD		165 - Dynamic Phase Length Short Inhibit 5	SI5	TOD	
116 - Detector Continue Presence Inhibit	DPI	TOD		166 - Dynamic Phase Length Short Inhibit 6	SI6	TOD	
117 - Inhibit Detector Based on Programming	IND	TOD		167 - Dynamic Phase Length Short Inhibit 7	SI7	TOD	
118 - Inhibit Detector Delay	IDD	TOD		168 - Dynamic Phase Length Short Inhibit 8	SI8	TOD	
119 - Inhibit Conditional Ped	ICP	TOD		169 - Coord Late Left Turn 1	CT1	TOD	
120 - Inhibit Transit Priority	ITP	TOD		170 - Coord Late Left Turn 3	CT3	TOD	
121 - Red Rest Ring 1,2	RRM	TOD		171 - Coord Late Left Turn 5	CT5	TOD	
122 - Enable Transcend	TRA	TOD		172 - Coord Late Left Turn 7	CT7	TOD	
123 - Omit Red Clear Ring 1,2	ORC	TOD		173 - Dynamic Phase Length Enable A	DPA	TOD	
124 - Not Used	N/U	TOD		174 - Dynamic Phase Length Enable B	DPB	TOD	
125 - Ped Recycle Ring 1,2	PCY	TOD	On / Off / TOD	175 - Dynamic Phase Length Enable C	DPC	TOD	On / Off / TOD
126 - Not Used	N/U	TOD		176 - Dynamic Phase Length Enable D	DPD	TOD	
127 - Enable MOE Log to Call Phone 1	MT1	TOD		177 - Proactive Plan Select Average	PSA	TOD	
128 - Enable MOE Log to Call Phone 2	MT2	TOD		178 - Proactive Plan Select Inbound	PSI	TOD	
129 - Transit Inhibit Short Time 1	IS1	TOD		179 - Proactive Plan Select Outbound	PSO	TOD	
130 - Transit Inhibit Short Time 2	IS2	TOD		180 - Split Variant Inbound	SVI	TOD	
131 - Transit Inhibit Short Time 3	IS3	TOD		181 - Split Variant Outbound	SVO	TOD	
132 - Transit Inhibit Short Time 4	IS4	TOD		182 - Disable Coord Walk Rest Ring 1	DW1	TOD	
133 - Transit Inhibit Short Time 5	IS5	TOD		183 - Disable Coord Walk Rest Ring 2	DW2	TOD	
134 - Transit Inhibit Short Time 6	IS6	TOD		184 - Proactive Plan Select New Look	NLK	TOD	
135 - Transit Inhibit Short Time 7	IS7	TOD		185 - Disable Red Clearance Extension	DRX	TOD	
136 - Transit Inhibit Short Time 8	IS8	TOD		186 - Detector Plan Line 1	DL1	TOD	
137 - Enable Transit Priority Logging	ETL	TOD		187 - Detector Plan Line 2	DL2	TOD	
138 - Disable Flashing Yellow Arrow 1	DF1	TOD		188 - Disable LRT 1 Vertical Flashing Bar	DV1	TOD	
139 - Disable Flashing Yellow Arrow 3	DF3	TOD		189 - Disable LRT 2 Vertical Flashing Bar	DV2	TOD	
140 - Disable Flashing Yellow Arrow 5	DF5	TOD		190 - Disable LRT 3 Vertical Flashing Bar	DV3	TOD	
141 - Disable Flashing Yellow Arrow 7	DF7	TOD		191 - Disable LRT 4 Vertical Flashing Bar	DV4	TOD	
142 - Disable Auto Max	DAM	TOD		192 - Datakey Enable	DKE	TOD	
143 - Disable Repeat Phase Service	DRS	TOD		193 - Dynamic Phase Reversal Enable 1	DR1	TOD	
144 - Coord End of Main Street	EMS	TOD		194 - Dynamic Phase Reversal Enable 3	DR3	TOD	
145 - Coord Hold 1	HD1	TOD		195 - Dynamic Phase Reversal Enable 5	DR5	TOD	
146 - Coord Hold 2	HD2	TOD		196 - Dynamic Phase Reversal Enable 7	DR7	TOD	
147 - Coord Hold 3	HD3	TOD		197 - Enable Coord Logging	ECL	On	
148 - Coord Hold 4	HD4	TOD		198 - Disable Gap FYLTA 1,3,5,7	DGF	TOD	
149 - Coord Hold 5	HD5	TOD		199 - Coordination Auto Walk	CAW	TOD	
150 - Coord Hold 6	HD6	TOD		200 - Enable Coordinated Auto Max	ECM	TOD	

Preemption Data (next/2/5)

Sequence (next/2/5/1 - 8)

Sequences / Intervals		Instruction	Phases Serviced	Interval Time	Hold On Input	Outputs On	Output Mode
1	1	0		0	0		0
	2	0		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0
2	1	197	4	0	1		0
	2	98		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0
3	1	197	6	0	1		0
	2	98		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0
4	1	197	8	0	1		0
	2	98		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0
5	1	0		0	0		0
	2	0		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0

Instructions
0 - Service Phases
1-9 = Special Interval 1-9
10 - Preempt Sequence Allows FYLTA
11 - Preempt Interval Disables FYLTA
15 - Alternate Trap Protection
90 - Go to all Red
91 - Soft Flash On
92 - Soft Flash Off
93 - Enable Ped
94 - Disable Peds
95 - Priority Return
96 - Enable Coordination with peds
97 - Enable Coordination without peds
98 - Return with NO Calls
99 - Return with Vehicle Calls
100 - jump to step in Interval Time
101 - Use Interval Time as Resetable Gap Timer
196 - Coord Re-synch with Peds
197 - Coord Re-synch without Peds
200 - Light Rail Train phase without Peds
201 - Light Rail Train phase with Peds
202 - Return to highest queue/delay phase (this uses the Dynamic Phase Length Back Detectors)
216 - Light Rail Train Coord Re-synch with Peds
217 - Light Rail Train Coord Re-synch without Peds

Phases Serviced - phases 1 - 8

Interval Time - 0 - 255 sec or interval 1 - 10

Hold on Input:
0 = Do not hold
1 = Hold
2 = Ped Service to Rest in Walk

Outputs On - output 1 - 8

Output Modes -
0 = all steady on
1 = all flash together
2 = odd flashes WIG, even flashes WAG
3 = 1 - 4 steady on, 5 - 8 all flash together

Sequence cont.							
Sequences / Intervals		**Instruction**	**Phases Serviced**	**Interval Time**	**Hold On Input**	**Outputs On**	**Output Mode**
6	1	0		0	0		0
	2	0		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0
7	1	0		0	0		0
	2	0		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0
8	1	0		0	0		0
	2	0		0	0		0
	3	0		0	0		0
	4	0		0	0		0
	5	0		0	0		0
	6	0		0	0		0
	7	0		0	0		0
	8	0		0	0		0
	9	0		0	0		0
	10	0		0	0		0

Sequence Timing (next/2/5/0)										
	Sequence -- >	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
	Input Memory									X = on
	Input Priority	0	6	6	6	0	0	0	0	0 = lowest, - 8 = highest
Entry (Transition) Parameters	**Min Green**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec
	Walk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 would time the normal function time
	Ped Clear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Overlap Yellow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 - 25.5 sec
	Overlap Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Delay to Preempt	0	0	0	0	0	0	0	0	0 - 255 sec
	Delay Ped Omit	0	0	0	0	0	0	0	0	
	Delay Phase Omit	0	0	0	0	0	0	0	0	
	Min Reservice	0	0	0	0	0	0	0	0	0 - 255 min
Overlap Inhibits	**A**									X = inhibit
	B									
	C									
	D									
Exit Parameters	**Exit to Coord Plan Offset by X**	0	0	0	0	0	0	0	0	0 - 20
	Exit Coord Plan Time	0	0	0	0	0	0	0	0	0 - 60 min
	Exit to Max Plan	0	0	0	0	0	0	0	0	0 - 8
	Exit Free Time	0	0	0	0	0	0	0	0	0 - 60 min
	Override Time	0	0	0	0	0	0	0	0	
	Fail Time	0	0	0	0	0	0	0	0	
	Exit Mode Time	0	0	0	0	0	0	0	0	

Priority Return and Special Intervals (next/2/5/0/6, next/2/5/9)														
Phase / Overlap -->		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**A**	**B**	**C**	**D**	
Priority Return	**Enable**	*0*	0 = disabled, 1 = enabled, 2 = enabled, skip preemption phases on exit											
	A (max)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 100% of currently used max				
	B (max)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*					
	C (max)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*					
	D (max)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*					
	E (max)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*					
	Ped Clear	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 100% of currently used ped clearance				
Queue Delay Recovery		*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 - 255 sec.				
Special Intervals	**1**	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0 = Dark 1 = green don't walk 2 = green walk 3 = green flashing don't walk 4 = yellow 5 = red 6 = flashing yellow WIG 7 = flashing yellow WAG 8 = flashing red WIG 9 = flashing red WAG 10 = walk only 11=flashing don't walk only
	2	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	3	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	4	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	5	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	6	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	7	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	8	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	
	9	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	

Light Rail Train (next/2/5/0/7)					
Light Rail Train -->	**1**	**2**	**3**	**4**	
Associated Preempt	*0*	*0*	*0*	*0*	0 = none, preempt 1 - 8
Time to Green	*0*	*0*	*0*	*0*	0 - 255 sec
Horizontal Bar Flash Time	*0.0*	*0.0*	*0.0*	*0.0*	0.0 - 25.5 sec
Vertical Bar Flash Time	*0.0*	*0.0*	*0.0*	*0.0*	
Min Duration	*0*	*0*	*0*	*0*	0 - 255 sec

Communications Data (next/2/6)

1st Central Phone Number		**2nd Central Phone Number**	
Modem Setup String		**Intersection Name**	*5th at D Street*
Subnet Mask	*255.255.255.192*		
IP (ethernet) Port	*0*		
Central Port	*6*		
System Mode	*0*		
System Port	*0*	**Alternate System Port**	*0*

System ID	*169*	**AB3418e Physical Address**	*1*	**IP Address**	*167.131.54.11*
Local ID	*4*	**AB3418e Group Address**	*0*	**Gateway Address**	*167.131.54.10*

Baud Rates		**Flow Control**	**Port Use**
Port 1 (Slot A2 Upper)	*2*	*0*	*Suggested Use - FSK*
Port 2 (Slot A2 Lower)	*2*	*1*	*modem to central*
Port 3 (Slot A1 Upper)	*2*	*0*	*Suggested Use - Modem to Central*
Port 4 (Slot A1 Lower or C50S)	*2*	*N\U*	*Suggested Use - RS232 to Laptop*
0 = 1200, 1 = 2400, 2 = 9600, 3 = 19200 baud		0 = off, 1 = on	

Reports

Volume Log Period	*15*	minutes	**Volume/Occ Log Period**	*0*	seconds	**MOE Log Period**	*30*	minute

0 = disabled, 1,2,3,4,5,6,10,12,15,20,30,60 minutes

Function Schedule Mapping (next/2/6/7)

Alarm 1	*0*		**Soft Flash**	*3*	
Alarm 2	*0*		**Manual Control Enable (MCE)**	*3*	
Alarm 3	*0*		**Emergency or Railroad Preempt**	*1*	
Alarm 4	*0*		**Not Used**	*0*	
Alarm 5	*0*	0 = none	**Cycle Failure**	*2*	0 = none
Not Used	*0*	1 = schedule A	**Coordination Failure**	*2*	1 = schedule A
Not Used	*0*	2 = schedule B	**Keyboard use / Data Changed**	*3*	2 = schedule B
Not Used	*0*	3 = schedule C	**Coord Running / Free**	*3*	3 = schedule C
Power On / Off	*2*	4 = schedule R	**Cabinet Door**	*3*	4 = schedule R
Checksum Failure	*2*		**Extended Ped Pushbutton**	*0*	
Video / Detector Failure	*2*		**Monitor Status**	*2*	
Master to Local Comm Lost	*0*		**Red Extension**	*0*	

Miscellaneous Data

Transit Priority (next/2/7)

	1	2	3	4	5	6	7	8	
Phases									Phases 1 - 8 (max of 2 compatible phases)
PE Enable (6.25Hz TP call on PE)									X = 6.25 Hz signal will activate TP
Priority	0	0	0	0	0	0	0	0	0 - 8, 8 = highest
Memory									X = on
Delay Time	0	0	0	0	0	0	0	0	0 - 255 sec
Minimum Reservice Time (per input)	0	0	0	0	0	0	0	0	0 - 255 min
Override Time	0	0	0	0	0	0	0	0	0 - 255 sec
Bus Extend	0	0	0	0	0	0	0	0	0 - 255 sec
Minimum Reservice Time (all inputs)	0	0 - 255 min							
Free Operation Mode	0	0 = use shortest of max 1 or 2, 1 - 8 = use max time of group 1 - 8, 9 = use time of day							

Transit Priority Alternate Force Off Plans

Current Coord Plan	1	2	3	4	5	6	7	8	
Alternate TP Force Off Plan	0	0	0	0	0	0	0	0	0 = none 17 - 32 = coord plan 17 - 32
Current Coord Plan	9	10	11	12	13	14	15	16	
Alternate TP Force Off Plan	0	0	0	0	0	0	0	0	

Group Timing

	Phase -->	1	2	3	4	5	6	7	8	
Group 1	**Max Times**	0	0	0	0	0	0	0	0	
	Walk Times	0	0	0	0	0	0	0	0	
Group 2	**Max Times**	0	0	0	0	0	0	0	0	
	Walk Times	0	0	0	0	0	0	0	0	
Group 3	**Max Times**	0	0	0	0	0	0	0	0	
	Walk Times	0	0	0	0	0	0	0	0	
Group 4	**Max Times**	0	0	0	0	0	0	0	0	0 - 255 sec 0 would time the normal function time
	Walk Times	0	0	0	0	0	0	0	0	
Group 5	**Max Times**	0	0	0	0	0	0	0	0	
	Walk Times	0	0	0	0	0	0	0	0	
Group 6	**Max Times**	0	0	0	0	0	0	0	0	
	Walk Times	0	0	0	0	0	0	0	0	
Group 7	**Max Times**	0	0	0	0	0	0	0	0	
	Walk Times	0	0	0	0	0	0	0	0	
Group 8	**Max Times**	0	0	0	0	0	0	0	0	
	Walk Times	0	0	0	0	0	0	0	0	

Truck Priority (next/2/7/9)

Truck Priority-->	1	2	3	4	
Associated Transit Priority	0	0	0	0	0 = none 1 - 8 = transit priority 1 - 8
Leading Detector	0	0	0	0	0 = none, 1 - 32 = detector 1 - 32
Trailing Detector	0	0	0	0	
Stop Bar Distance	0	0	0	0	0 - 999 feet
Trap Distance	0	0	0	0	0.0 - 99.9 feet
Minimum Speed	0	0	0	0	0 - 100 mph
Minimum Length	0	0	0	0	0 - 255 feet
Downhill Grade	0	0	0	0	0 - 20 %
Uphill Grade	0	0	0	0	
Undersized Vehicle					X = Enabled

Change I/O		X = On (After a download with a power on - off cycle)

Inputs (Non Default I/O is offset to the right) (next/2/8/1)

C1-39	*101*	*VD9*	**C1-55**	*15*	*VD5*	**C1-67**	*22*	*PED2*	**C11-15**	*254*	*N/U*
C1-40	*113*	*VD19*	**C1-56**	*11*	*VD1*	**C1-68**	*26*	*PED6*	**C11-16**	*254*	*N/U*
C1-41	*106*	*VD14*	**C1-57**	*17*	*VD7*	**C1-69**	*24*	*PED4*	**C11-17**	*254*	*N/U*
C1-42	*118*	*VD24*	**C1-58**	*13*	*VD3*	**C1-70**	*28*	*PED8*	**C11-18**	*254*	*N/U*
C1-43	*102*	*VD10*	**C1-59**	*16*	*VD6*	**C1-71**	*151*	*PE1*	**C11-19**	*254*	*N/U*
C1-44	*114*	*VD20*	**C1-60**	*12*	*VD2*	**C1-72**	*152*	*PE2*	**C11-20**	*254*	*N/U*
C1-45	*107*	*VD15*	**C1-61**	*18*	*VD8*	**C1-73**	*153*	*PE3*	**C11-21**	*254*	*N/U*
C1-46	*161*	*VD25*	**C1-62**	*14*	*VD4*	**C1-74**	*154*	*PE4*	**C11-22**	*254*	*N/U*
C1-47	*105*	*VD13*	**C11-10**	*254*	*N/U*	**C1-75**	*254*	*N/U*	**C11-23**	*254*	*N/U*
C1-48	*117*	*VD23*	**C11-11**	*254*	*N/U*	**C1-76**	*104*	*VD12*	**C11-24**	*254*	*N/U*
C1-49	*112*	*VD18*	**C11-12**	*254*	*N/U*	**C1-77**	*116*	*VD22*	**C11-25**	*254*	*N/U*
C1-50	*164*	*VD28*	**C11-13**	*254*	*N/U*	**C1-78**	*111*	*VD17*	**C11-26**	*254*	*N/U*
C1-51	*199*	*PEDI*	**C1-63**	*103*	*VD11*	**C1-79**	*163*	*VD27*	**C11-27**	*254*	*N/U*
C1-52	*155*	*PE5*	**C1-64**	*115*	*VD21*	**C1-80**	*82*	*IADV*	**C11-28**	*254*	*N/U*
C1-53	*85*	*MCE*	**C1-65**	*108*	*VD16*	**C1-81**	*137*	*MONS*	**C11-29**	*254*	*N/U*
C1-54	*254*	*N/U*	**C1-66**	*162*	*VD26*	**C1-82**	*62*	*ST1*	**C11-30**	*254*	*N/U*

Outputs (Non Default I/O is offset to the right) (next/2/8/2)

C1-2	*44*	*4DWK*	**C1-19**	*48*	*8DWK*	**C1-35**	*131*	*TO1*	**C1-91**	*41*	*1DWK*
C1-3	*64*	*4WLK*	**C1-20**	*68*	*8WLK*	**C1-36**	*132*	*TO2*	**C1-93**	*61*	*1WLK*
C1-4	*14*	*4RED*	**C1-21**	*18*	*8RED*	**C1-37**	*133*	*TO3*	**C1-94**	*106*	*OLBR*
C1-5	*24*	*4YEL*	**C1-22**	*28*	*8YEL*	**C1-38**	*134*	*TO4*	**C1-95**	*105*	*OLBY*
C1-6	*34*	*4GRN*	**C1-23**	*38*	*8GRN*	**C1-100**	*53*	*3PCL*	**C1-96**	*104*	*OLBG*
C1-7	*13*	*3RED*	**C1-24**	*17*	*7RED*	**C1-101**	*51*	*1PCL*	**C1-97**	*103*	*OLAR*
C1-8	*23*	*3YEL*	**C1-25**	*27*	*7YEL*	**C1-102**	*187*	*SFL*	**C1-98**	*102*	*OLAY*
C1-9	*33*	*3GRN*	**C1-26**	*37*	*7GRN*	**C1-103**	*147*	*WDOG*	**C1-99**	*101*	*OLAG*
C1-10	*42*	*2DWK*	**C1-27**	*46*	*6DWK*	**C1-83**	*43*	*3DWK*	**C11-1**	*254*	*N/U*
C1-11	*62*	*2WLK*	**C1-28**	*66*	*6WLK*	**C1-84**	*63*	*3WLK*	**C11-2**	*254*	*N/U*
C1-12	*12*	*2RED*	**C1-29**	*16*	*6RED*	**C1-85**	*116*	*OLDR*	**C11-3**	*254*	*N/U*
C1-13	*22*	*2YEL*	**C1-30**	*26*	*6YEL*	**C1-86**	*115*	*OLDY*	**C11-4**	*254*	*N/U*
C1-15	*32*	*2GRN*	**C1-31**	*36*	*6GRN*	**C1-87**	*114*	*OLDG*	**C11-5**	*254*	*N/U*
C1-16	*11*	*1RED*	**C1-32**	*15*	*5RED*	**C1-88**	*113*	*OLCR*	**C11-6**	*254*	*N/U*
C1-17	*21*	*1YEL*	**C1-33**	*25*	*5YEL*	**C1-89**	*112*	*OLCY*	**C11-7**	*254*	*N/U*
C1-18	*31*	*1GRN*	**C1-34**	*35*	*5GRN*	**C1-90**	*111*	*OLCG*	**C11-8**	*254*	*N/U*

Internal Logic (next/2/9)			
Step	**Inst.**	**Description**	**Comment**
1	207	No Operation (place holder)	If this is removed the logic will not run
2	208	Load one of eight Timers if Test(s) are True	Start of Ph4 WALK delay
3	1	Timer Number - 1	Phase 4 uses timer 1
4	4.0	Timer Value	for 5.0 seconds of delay
5	28	Phase 1-8 Next Test (Phase 1-8, or 9=any)	
6	4	Phase - 4	
7	221	Output Off if Test(s) are True	Turns off Ph 4 green
8	34	Phase 4 Green	
9	27	Timer 1-8 is Timing or Reset	
10	1	Timer Number - 1	
11	20	AND - Another Test	
12	24	NOT - Invert result of next test	
13	29	Preemption Active Test	
14	9	Any Preempt	
15	40	OR - Another Test	
16	23	Output Test - Tested for True	
17	64	Phase 4 Walk	
18	221	Output Off if Test(s) are True	
19	38	Phase 8 Green	
20	27	Timer 1-8 is Timing or Reset	
21	1	Timer Number - 1	
22	20	AND - Another Test	
23	24	NOT - Invert result of next test	
24	29	Preemption Active Test	
25	9	Any Preempt	End of Ph 4 WALK delay
26	40	OR - Another Test	Begin of Ph 8 WALK delay
27	23	Output Test - Tested for True	Phase 8 uses timer 2
28	64	Phase 4 Walk	for 5.0 seconds
29	205	Output on if Test(s) are True	
30	14	Phase 4 Red	
31	27	Timer 1-8 is Timing or Reset	
32	1	Timer Number - 1	
33	20	AND - Another Test	
34	24	NOT - Invert result of next test	
35	29	Preemption Active Test	
36	9	Any Preempt	
37	40	OR - Another Test	
38	23	Output Test - Tested for True	
39	64	Phase 4 Walk	
40	205	Output on if Test(s) are True	
41	18	Phase 8 Red	
42	27	Timer 1-8 is Timing or Reset	
43	1	Timer Number - 1	
44	20	AND - Another Test	
45	24	NOT - Invert result of next test	
46	29	Preemption Active Test	End of Ph 8 WALk delay
47	9	Any Preempt	
48	40	OR - Another Test	
49	23	Output Test - Tested for True	
50	64	Phase 4 Walk	
51	208	Load one of eight Timers if Test(s) are True	
52	2	Timer Number - 2	
53	4.0	Timer Value	
54	28	Phase 1-8 Next Test (Phase 1-8, or 9=any)	
55	8	Phase - 8	

Internal Logic cont.			
Step	**Inst.**	**Description**	**Comment**
56	221	Output Off if Test(s) are True	
57	38	Phase 8 Green	
58	27	Timer 1-8 is Timing or Reset	
59	2	Timer Number - 2	
60	20	AND - Another Test	
61	24	NOT - Invert result of next test	
62	29	Preemption Active Test	
63	9	Any Preempt	
64	40	OR - Another Test	
65	23	Output Test - Tested for True	
66	68	Phase 8 Walk	
67	221	Output Off if Test(s) are True	
68	34	Phase 4 Green	
69	27	Timer 1-8 is Timing or Reset	
70	2	Timer Number - 2	
71	20	AND - Another Test	
72	24	NOT - Invert result of next test	
73	29	Preemption Active Test	
74	9	Any Preempt	
75	40	OR - Another Test	
76	23	Output Test - Tested for True	
77	68	Phase 8 Walk	
78	205	Output on if Test(s) are True	
79	18	Phase 8 Red	
80	27	Timer 1-8 is Timing or Reset	
81	2	Timer Number - 2	
82	20	AND - Another Test	
83	24	NOT - Invert result of next test	
84	29	Preemption Active Test	
85	9	Any Preempt	
86	40	OR - Another Test	
87	23	Output Test - Tested for True	
88	68	Phase 8 Walk	
89	205	Output on if Test(s) are True	
90	14	Phase 4 Red	
91	27	Timer 1-8 is Timing or Reset	
92	2	Timer Number - 2	
93	20	AND - Another Test	
94	24	NOT - Invert result of next test	
95	29	Preemption Active Test	
96	9	Any Preempt	
97	40	OR - Another Test	
98	23	Output Test - Tested for True	
99	68	Phase 8 Walk	
100			
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102			
103			
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Internal Logic cont.			
Step	**Inst.**	**Description**	**Comment**
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Internal Logic cont.			
Step	**Inst.**	**Description**	**Comment**
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Internal Logic cont.			
Step	Inst.	Description	Comment
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256			

FYLTA - Continued (next/2/2/8/6)

	Phase Pairs -->	1 - 2	3 - 4	5 - 6	7 - 8	
Gap-Dependent FYLTA (next/2/2/8/6-A)	Detector Input	0	0	0	0	0 = disable, 1 - 64 detectors
	Min Delay	0	0	0	0	0 - 255 sec
	Detector Gap	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Max Delay	0	0	0	0	0 - 255 sec
	Not Ped	0	0	0	0	0 - 255 sec

FYLTA Gap-Dependent Plans (next/2/2/8/6)

	Phase Pairs -->	1 - 2	3 - 4	5 - 6	7 - 8	
FYLTA Gap-Dependent Plan A	Detector Input	0	0	0	0	0 = disable, 1 - 64 detectors
	Min Delay	0	0	0	0	0 - 255 sec
	Detector Gap	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Max Delay	0	0	0	0	0 - 255 sec
	Not Ped	0	0	0	0	0 - 255 sec
FYLTA Gap-Dependent Plan B	Detector Input	0	0	0	0	0 = disable, 1 - 64 detectors
	Min Delay	0	0	0	0	0 - 255 sec
	Detector Gap	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Max Delay	0	0	0	0	0 - 255 sec
	Not Ped	0	0	0	0	0 - 255 sec
FYLTA Gap-Dependent Plan C	Detector Input	0	0	0	0	0 = disable, 1 - 64 detectors
	Min Delay	0	0	0	0	0 - 255 sec
	Detector Gap	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Max Delay	0	0	0	0	0 - 255 sec

	Not Ped	0	0	0	0	0 - 255 sec
FYLTA Gap-Dependent Plan D	Detector Input	0	0	0	0	0 = disable, 1 - 64 detectors
	Min Delay	0	0	0	0	0 - 255 sec
	Detector Gap	0.0	0.0	0.0	0.0	0 - 25.5 sec
	Max Delay	0	0	0	0	0 - 255 sec
	Not Ped	0	0	0	0	0 - 255 sec

Preemption - Continued

Railroad Communications (IEEE 1570) (next/2/5/0/8)

	ATC	Wayside	
Railroad Number	0	0	0 - 999, represents railroad
Railroad Line Number	0	0	0 - 999, represents railroad line
Group Number	0	0	0 - 999, represents physical group of equipment
Subnode Number	0	0	0 - 99, subnode within physical group of equipment
Device Number	0	0	0 - 99, device within physical group of equipment

Associated Preempt	0	0 - 8
Communication Port	0	0 - 4

Reports - Continued

Reports - Service Delay Modes (next/2/6/0)

Phase -->	1	2	3	4	5	6	7	8	
Mode	0	0	0	0	0	0	0	0	0 = disable, 1 = enable, 2 = Ped, 3 = Veh/P

Ped Overlap -->	A	B	C	D	E	F	G	H	
Mode	0	0	0	0	0	0	0	0	0 = disable, 1 = enable

Detector -->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Enable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Detector -->	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Enable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Detector -->	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Enable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Detector -->	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
Enable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix E Crash Data (2010 – 2014)

Appendix F Bicycle LTS Worksheets

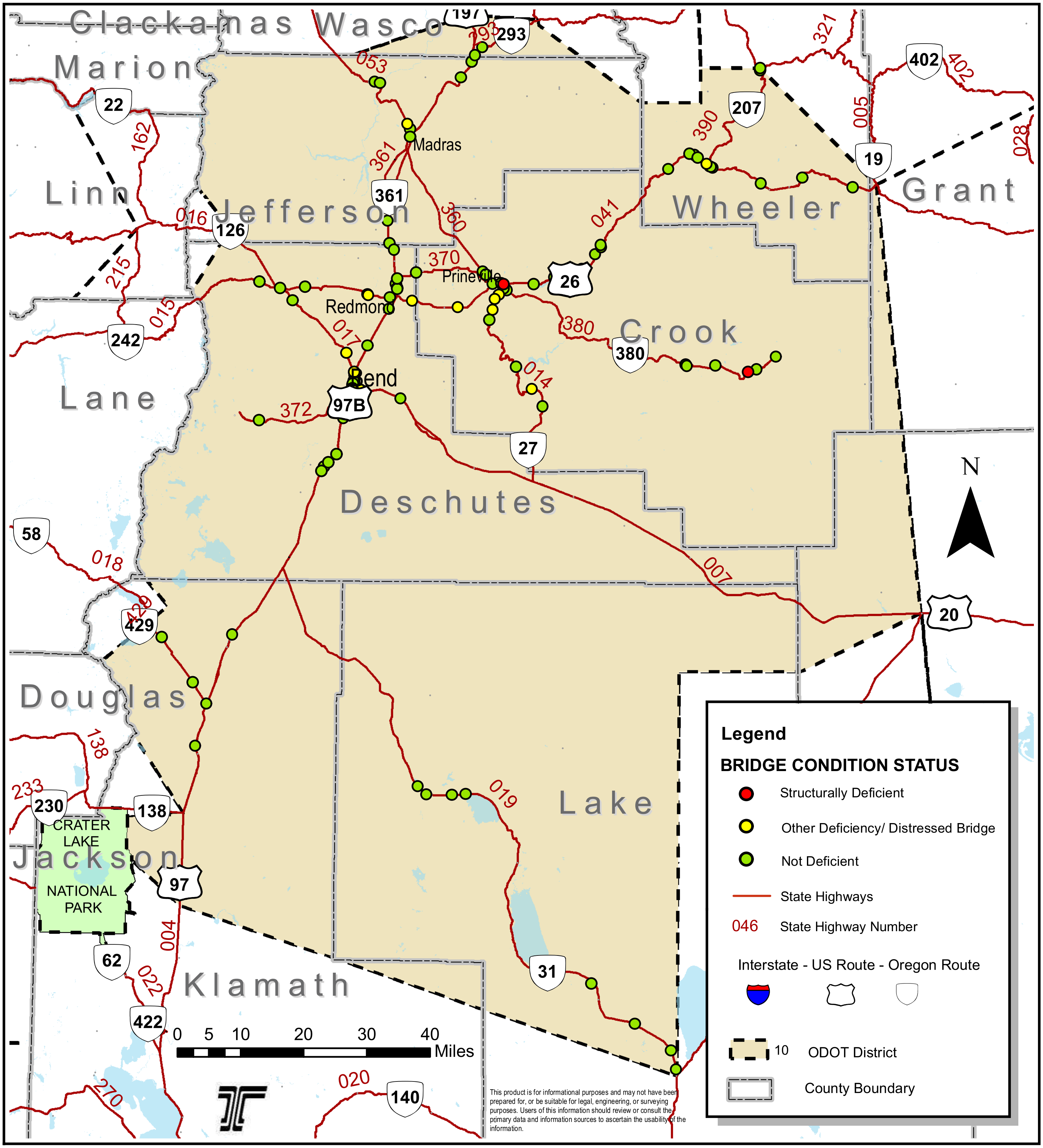
Description	Functional Class	Class	*Bike lane width (ft)	One-way	Speed (mph)	# of Lanes**	Lane width (ft)	Turn Length (ft)	LTS	Notes	Sidewalk	Transit
OR361 from SW Fairgrounds Rd to SW J St	State - Urban Collector	Mixed traffic			50	2	11		4		N	
OR361 from SW Fairgrounds Rd to SW Madison St	State - Urban Collector	Mixed traffic			45	2			4			
OR361 from SW Madison St to 1st St	State - Urban Collector	Bike lane without parking	5.5		35	2	11		4	TWLTL (Applying the left-turn criteria)	Y	
OR361 from 1st St to 3rd St	State - Urban Collector	Bike lane without parking	5.5		25	2	11.5		2	TWLTL, 20 mph during school	Y	
SW D St from 3rd St to US26	State - Urban Collector	Bike lane without parking	5.5		25	2	11.5		2	TWLTL	Y	
SW D St from US26 to US97	State - Urban Collector	Mixed traffic				3	11.5		2	TWLTL	Y	
US26 from SW Colfax Ln to SW Brush Ln	State - Urban Principal Arterial	Bike lane without parking	6		45	2	12		4	TWLTL	N	
US26 from SW Brush Ln to SW K St	State - Urban Principal Arterial	Bike lane without parking	8		35	2	12		4	TWLTL (Applying the left-turn criteria)	N	
US26 NB from 5th St to K St	State - Urban Principal Arterial	Bike lane with parking	15	Yes	25	2	11.5		2	20 mph during school	Y	
US97 SB from SW K St to SE I St	State - Urban Principal Arterial	Bike lane without parking	7.5	Yes	30	2	12.5		4	LTS1 without left turn criteria	Y	
US97 NB from SE I St to SE Trade St	State - Urban Principal Arterial	Mixed traffic	7.5	Yes	30	2	12.5		4		Y	
US97 NB from SE Trade St to Pine St	State - Urban Principal Arterial	Bike lane with parking	15	Yes	25	2	11.5		2	20 mph during school	Y	
US97 NB from Pine St to 5th St	State - Urban Principal Arterial	Bike lane without parking	5.5	Yes	35	3	11.5		4	LTS3 without left turn criteria	Y	
US97 NB from 5th St to NE Plum St	State - Urban Principal Arterial	Bike lane without parking	5		30	2	12		3		Y	
US97 NB from NE Plum St to NE Loucks Rd	State - Urban Principal Arterial	Mixed traffic			45	2	20		4		N	
US26 SB from 5th St to NE Plum St	State - Urban Principal Arterial	Bike lane without parking	6		35	2	12		4	LTS3 without left turn criteria	Y	
US26 SB from NE Plum St to NW Cherry Ln	State - Urban Principal Arterial	Mixed traffic			≥45	4	10		4		N	
US26 SB from NW Cherry Ln to North City boundary	State - Urban Principal Arterial	Mixed traffic			55	2	12		4		N	
NW Cherry Lane from NW Harris St to East city boundary	Non-State - Urban Collector	Mixed traffic			25	2	10		3	Crossing US26	N	
NW Cherry Lane from NW Berg Dr to NW Harris St	Non-State - Urban Collector	Mixed traffic			25	2	10		2		Y	
NW Industrial District - NW Hess Rd											N	
NW Industrial District - NW Alder St											N	
NW Industrial District - NW Conroy											N	
NW Industrial District - NW Earl St											N	
NW Lee St	Non-State - Urban Collector	Mixed traffic			20	2	12		3	Unmarked center line, LTS3 because of gravel surface	N	
NE Loucks Rd from US97 to Claremont Dr	Non-State - Urban Collector	Mixed traffic			45	2	10		4		N	
NE 10th St from NE Loucks Rd to NE Henry St	Non-State - Urban Collector	Mixed traffic			25	2			2		N	
NE 10th St from NE Henry St to NE Oak St	Non-State - Urban Collector	Mixed traffic			25	2			1	Unmarked center line	N	
NE Oak St from US 97 to 7th	Non-State - Urban Collector	Bike lane without parking	5		25	1			2		Y	
SE JSt from White Pine Way to OR 361											Y	
NE 7th St from Oak St to SE Buff St	Non-State - Urban Collector	Bike lane with parking	13		25	1			3		Y	
NE B St from 3rd St to SE Grizzly Rd											Y	
NE Oak St from 7th St to East city boundary	Non-State - Urban Collector	Mixed traffic			25	2			1	Unmarked center line	N	
NE 12th St											Y	
Se 10th St from SE Buff St to NE B St											Y	
Grizzly Rd from C ST to J St											N	
SE McTarggart Rd	Non-State - Urban Collector	Mixed traffic			25	2			2		Y	
SW 5th St from US97 to SE terrace Ln											Y	
SE City View street	Non-State - Urban Collector	Bike lane without parking	5		35	1			3		N	
SE J St from City View St to SE White Pine Way											Y	
SE J St from OR361 to	Non-State - Urban Collector	Mixed traffic			≤ 25	2			2		N	
SE Buff St											Y	
SW H St from US97 to SW 3rd St	Non-State - Urban Collector	Mixed traffic			25	2			2	Crossing US26, Unmarked center line	Y	
SW H St fromSW 3rd St to OR361	Non-State - Urban Collector	Mixed traffic			25	2			1		Y	
SW E St	Non-State - Urban Collector	Mixed traffic			25	2			1	Unmarked center line	Y	
SW 2nd St from SW B St to SW J St	Non-State - Urban Collector	Bike lane with parking	14		25	1			2		Y	
NW B St from US26 to NE 6th St	Non-State - Urban Collector	Mixed traffic			25	4			3		Y	
B St from NE 6th to 12th St	Non-State - Urban Collector	Bike lane without parking	6		25	2			3	TWLTL	Y	
B St from NE 12th St to Ne Kinkade Rd	Non-State - Urban Collector	Bike lane without parking	6		35	2			3	TWLTL	Y	
B St from NE Kinkade Rd to East city boundary	Non-State - Urban Collector	Bike lane without parking	6		35	1			2		Y	

* includes width of parking if there is street parking

** for lanes, counts both direction if mixed traffic, one direction if bike lane

Appendix G Bridge Inventory

OREGON STATE HIGHWAY SYSTEM
2015 BRIDGE CONDITION
DISTRICT 10
APRIL 2015



2015 CONDITION REPORT - DISTRICT 10

REG	DIS	HWY	MP	BR	Structure Name	YEAR	MATERIAL	DECK AREA (SFT)	DECK RATING	SUPER RATING	SUB RATING	CULV RATING	STRUC COND	SD/OD	OTHER DEFICIENCIES
4	10	004	1.65	22316	Pedestrian Crossing, Hwy 007 at MP 1.65	2014	Concrete	-	N	N	N	8	VG	OD	DG
4	10	004	75.04	00815A	Trout Creek, Hwy 4	1954	Concrete	6,486	5	6	6	N	FR	ND	
4	10	004	78.17	20426	Hay Creek Culvert Hwy 4 at MP 78.17	2007	Steel	-	N	N	N	8	VG	ND	
4	10	004	92.11	20008	Willow Creek, Hwy 4 NB	2006	P/S Concrete	3,240	7	8	8	N	GD	ND	
4	10	004	92.13	00971B	Willow Creek, Hwy 4 SB	1966	P/S Concrete	2,891	7	6	7	N	FR	ND	
4	10	004	105.44	19960	North Unit Main Canal, Hwy 4 at MP 105.44	2005	P/S Concrete	3,120	7	8	8	N	GD	ND	
4	10	004	108.99	19961	North Unit Main Canal, Hwy 4 at MP 108.99	2005	P/S Concrete	3,120	7	8	8	N	GD	ND	
4	10	004	112.63	18211	Crooked R Gorge, Hwy 4 (Rex T Barber VeteransMem)	2000	Concrete	42,529	7	7	7	N	GD	ND	
4	10	004	113.94	19962	Hwy 4 over BNSF (Terrebonne)	2005	P/S Concrete	8,000	7	7	8	N	GD	ND	
4	10	004	123.6	16561	Hwy 4 over Yew Ave (Airport Way)	1992	P/S Concrete	5,600	7	7	6	N	FR	ND	
4	10	004	136.31	17327	Hwy 4 (Bend Parkway) over Butler Market Rd (Bend)	1997	P/S Concrete	15,735	7	8	8	N	GD	ND	
4	10	004	136.48	17328	Hwy 4 (Bend Parkway) over Hwy 17	1997	P/S Concrete	14,144	6	7	8	N	FR	ND	
4	10	004	136.62	08887B	Hwy 17 over BNSF	1962	Steel	18,999	6	6	6	N	FR	ND	
4	10	004	136.92	17329	Hwy 4 (Bend Pkwy) over Division St (Bend)	1997	P/S Concrete	30,838	6	7	8	N	FR	ND	
4	10	004	137.13	17330	Hwy 4 (Bend Pkwy) over Revere Ave (Bend)	1997	P/S Concrete	12,959	7	7	8	N	GD	ND	
4	10	004	137.33	17331	Hwy 4 (Bend Pkwy) over Olney Ave (Bend)	1997	P/S Concrete	8,720	6	8	8	N	FR	ND	
4	10	004	137.65	16532N	Hwy 4 (Bend Pkwy) NB over Greenwood Ave	2001	P/S Concrete	3,500	6	8	8	N	FR	ND	
4	10	004	137.66	16532	Hwy 4 (Bend Pkwy) SB over Greenwood Ave	1985	P/S Concrete	4,200	7	7	7	N	GD	OD	LC
4	10	004	137.94	17324	Hwy 4 (Bend Pkwy) SB over Franklin Ave (Bend)	1979	P/S Concrete	2,376	7	7	7	N	GD	ND	
4	10	004	137.98	17324N	Hwy 4 (Bend Pkwy) NB over Franklin Ave (Bend)	2000	P/S Concrete	1,660	7	8	8	N	GD	OD	DG
4	10	004	138.25	17332	Hwy 4 over Colorado Ave (Bend) & BNSF	1998	P/S Concrete	17,136	7	8	8	N	GD	ND	
4	10	004	138.34	18173	Hwy 4 over BNSF Spur & Access Rd	1998	P/S Concrete	11,709	8	8	8	N	VG	ND	
4	10	004	139.5	17333	Central Oregon Canal, Hwy 4 at MP 139.48	2001	Concrete	-	N	N	N	7	GD	ND	
4	10	004	149.55	21015	HWY 004 SB OXING Cottonwood Road at MP 149.55	2010	P/S Concrete	4,928	7	8	8	N	GD	ND	
4	10	004	149.56	21016	HWY 004 NB OXING Cottonwood Road at MP 149.56	2009	P/S Concrete	5,016	7	8	8	N	GD	ND	
4	10	004	151.3	20552	HWY 004 NB OXING Cottonwood Rd Con. at MP 151.30	2009	P/S Concrete	2,860	7	8	8	N	GD	ND	
4	10	004	151.3	16712	HWY 004 SB OXING Cottonwood Rd Con at MP 151.30	1984	P/S Concrete	2,146	8	7	7	N	GD	ND	
4	10	004	152	21014	HWY 004 SB OXING (Wildlife Passage) at MP 152.00	2011	P/S Concrete	2,288	7	8	8	N	GD	ND	
4	10	004	152	21017	HWY 004 NB OXING (Wildlife Passage) at MP 152.00	2010	P/S Concrete	2,288	7	8	8	N	GD	ND	
4	10	004	153.05	20206	South Century Bridge (NB)	2006	P/S Concrete	4,128	7	8	8	N	GD	ND	
4	10	004	153.08	20207	SOUTH CENTURY BRIDGE (SB)	2005	P/S Concrete	4,128	7	8	8	N	GD	ND	
4	10	004	183.16	19964	Hwy 4 over Crescent Conn	2005	P/S Concrete	4,246	6	8	7	N	FR	ND	
4	10	004	202.09	19965	Hwy 4 over UPRR	2006	P/S Concrete	8,696	7	7	8	N	GD	ND	
4	10	004BK	135.5	17323	Hwy 4 NB Conn to Hwy 17 EB over Hwy4 (Sisters Int)	2001	P/S Concrete	6,750	6	7	7	N	FR	ND	
4	10	004BM	135.46	17325	Empire Ave over Hwy 4 (Bend Parkway)	1997	P/S Concrete	12,672	7	7	8	N	GD	ND	

2015 CONDITION REPORT - DISTRICT 10

REG	DIS	HWY	MP	BR	Structure Name	YEAR	MATERIAL	DECK AREA (SFT)	DECK RATING	SUPER RATING	SUB RATING	CULV RATING	STRUC COND	SD/OD	OTHER DEFICIENCIES
4	10	007	8.39	01421A	Central Oregon Canal, Hwy 7	1988	P/S Concrete	2,160	7	8	7	N	GD	ND	
4	10	014	1.9	13598	Irrigation Ditch, Hwy 14 at MP 1.90	1961	Timber	726	7	5	8	N	FR	OD	TS LC
4	10	014	2.88	13599	Irrigation Ditch, Hwy 14 at MP 2.88	1961	Timber	1,389	6	6	7	N	FR	OD	LC
4	10	014	4.62	13600	Irrigation Ditch, Hwy 14 at MP 4.59	1961	Timber	823	6	6	7	N	FR	OD	LC
4	10	014	6.32	00537B	Dry Creek, Hwy 14 at MP 6.32	1988	P/S Concrete	3,412	8	8	7	N	GD	ND	
4	10	014	19.62	13597	Crooked River Dam Spillway, Hwy 14	1961	Concrete	528	7	7	7	N	GD	ND	
4	10	014	27.23	08964	Bear Creek, Hwy 14 at MP 27.23	1961	Timber	1,365	6	5	5	N	FR	OD	LC
4	10	014	28.67	00990A	Bear Creek, Hwy 14 at MP 28.67	1961	Steel	780	7	5	7	N	FR	ND	
4	10	015	89.4	03372A	Trout Creek, Hwy 15	1981	Concrete	849	7	6	6	N	FR	ND	
4	10	015	93	00806A	Wychus Creek, Hwy 15	1957	P/S Concrete	5,439	7	6	6	N	FR	ND	
4	10	015	97.01	00807A	Whychus Creek Canal, Hwy 15	1961	P/S Concrete	840	7	7	7	N	GD	ND	
4	10	015	107.65	03373A	Deschutes River, Hwy 15	1957	Concrete	11,868	6	6	6	N	FR	OD	LSL
4	10	015	111.11	20023	Glacier Highland Couplet, HWY 015 at MP 111.11	2004	Concrete	-	N	N	N	7	GD	ND	
4	10	015AJ	107.48	18283	Cline Falls Rd over Hwy 15	1997	P/S Concrete	3,744	7	7	7	N	GD	ND	
4	10	017	2.89	03376A	Whychus Creek Canal, Hwy 17	1969	P/S Concrete	968	7	7	6	N	FR	ND	
4	10	017	15.09	17251	Deschutes River, Hwy 17	1993	P/S Concrete	9,025	7	8	7	N	GD	OD	LC
4	10	017	18.41	08829	Hwy17 WB over Hwy4 SB Conn to Hwy17 (Sisters Int)	1961	Steel	4,643	6	6	6	N	FR	OD	DG VC
4	10	017	19.82	17390	U.S.B.R. Canal, Hwy 017 MP 19.81	1993	Steel	-	N	N	N	7	GD	ND	
4	10	018	73.4	20156	Crescent Creek, Hwy 18	2006	P/S Concrete	5,520	7	7	7	N	GD	ND	
4	10	018	82.2	17447	Little Deschutes River, Hwy 18	1995	P/S Concrete	2,880	8	8	8	N	VG	ND	
4	10	018	86.3	20394	Hwy 18 WB over Hwy 4 SB	2008	P/S Concrete	4,217	6	8	8	N	FR	ND	
4	10	019	44.76	03907A	South Branch Buck Creek, Hwy 19	1986	P/S Concrete	1,260	8	8	8	N	VG	ND	
4	10	019	46.75	19782	Silver Creek, Hwy 19	2006	P/S Concrete	3,091	8	8	8	N	VG	ND	
4	10	019	50.74	03909A	Murdock Creek, Hwy 19	1986	P/S Concrete	1,260	8	8	8	N	VG	ND	
4	10	019	52.96	01552A	Paulina Marsh, Hwy 19	1985	P/S Concrete	3,240	7	7	7	N	GD	ND	
4	10	019	98.23	00572A	Chewaucan River, Hwy 19 (Paisley)	1966	P/S Concrete	9,416	7	7	6	N	FR	ND	
4	10	019	109.27	18787	Chewaucan River, Hwy 19 (The Narrows)	2001	Steel	8,840	7	8	7	N	GD	ND	
4	10	019	116.5	00571A	Chewaucan River, Hwy 19 (Gravelley Ford)	1965	P/S Concrete	5,700	7	7	6	N	FR	ND	
4	10	019	119.6	18789	Crooked Creek, Hwy 19 at MP 119.60	2000	P/S Concrete	2,828	8	8	8	N	VG	ND	
4	10	041	3.04	02769	Ochoco North Main Canal, Hwy 41	1945	Concrete	1,536	6	6	6	N	FR	OD	DG
4	10	041	10.54	02741	Central Oregon Canal, Hwy 41	1940	Concrete	768	N	N	N	5	FR	OD	DG
4	10	041	17.97	19889	Crooked River, Hwy 41	2006	P/S Concrete	11,310	7	8	7	N	GD	ND	
4	10	041	19.4	20649	Ochoco Creek, Hwy 41	2008	P/S Concrete	3,712	7	8	8	N	GD	ND	
4	10	041	24.51	00781	Ochoco Irrigation Canal, Hwy 41	1966	P/S Concrete	1,067	8	8	7	N	GD	ND	
4	10	041	28.18	18551	Mill Creek, Hwy 41	1999	P/S Concrete	3,036	7	8	8	N	GD	ND	

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REG	DIS	HWY	MP	BR	Structure Name	YEAR	MATERIAL	DECK AREA (SFT)	DECK RATING	SUPER RATING	SUB RATING	CULV RATING	STRUC COND	SD/OD	OTHER DEFICIENCIES
4	10	041	33.99	20326	Marks Creek, Hwy 41 at MP 33.99	2008	P/S Concrete	3,584	8	8	8	N	VG	ND	
4	10	041	37.44	20327	Marks Creek, Hwy 41 at MP 37.44	2009	P/S Concrete	3,584	7	8	8	N	GD	ND	
4	10	041	39.08	07650A	Marks Creek, Hwy 41 at MP 39.08	1965	P/S Concrete	2,262	7	7	8	N	GD	ND	
4	10	041	39.43	07651A	Marks Creek, Hwy 41 at MP 39.43	1966	P/S Concrete	2,280	7	7	7	N	GD	ND	
4	10	041	57.49	07507A	Hwy 41 Frtg Rd over Access Rd Rt	1984	P/S Concrete	832	7	7	7	N	GD	ND	
4	10	041	61.71	07486	West Branch Bridge Creek, Hwy 41	1953	Concrete	2,750	5	6	7	N	FR	ND	
4	10	041	62.54	07372	Bridge Creek, Hwy 41 at MP 62.54	1951	Concrete	3,701	5	5	7	N	FR	ND	
4	10	041	63.22	07487	Bridge Creek, Hwy 41 at MP 63.22	1953	Concrete	2,511	6	6	7	N	FR	ND	
4	10	041	65.03	07489	Bridge Creek, Hwy 41 at MP 65.03	1953	Concrete	2,790	5	5	5	N	FR	OD	LSL
4	10	041	65.63	20051	Bridge Creek, Hwy 41 at MP 65.63	2008	P/S Concrete	5,760	7	8	8	N	GD	ND	
4	10	041	65.85	20052	Bridge Creek, Hwy 41 at MP 65.85	2006	P/S Concrete	4,523	7	8	8	N	GD	ND	
4	10	041	66.19	21397	Bridge Creek, Hwy 41 R/W Right (Mitchell Access)	2012	Concrete	3,456	8	8	8	N	VG	ND	
4	10	041	75.84	18432	Mountain Creek, Hwy 41 at MP 75.84	1998	P/S Concrete	2,156	7	7	8	N	GD	ND	
4	10	041	83.52	01457A	Mountain Creek, Hwy 41 at MP 83.52	1978	Steel	-	N	N	N	8	VG	ND	
4	10	041	94.04	01469	Rock Creek, Hwy 41	1930	Concrete	4,110	6	6	7	N	FR	ND	
4	10	053	104.36	01987A	Shitike Creek, Hwy 53	1966	Concrete	5,834	6	6	6	N	FR	ND	
4	10	053	105.24	01910	Deschutes River, Hwy 53	1934	Steel	25,807	6	7	5	N	FR	ND	
4	10	053	115.58	07074	North Unit Canal, Hwy 53	1948	Concrete	1,512	6	6	7	N	FR	OD	Rail
4	10	053	116.57	19959	Hwy 53 over BNSF	2005	P/S Concrete	8,277	7	8	8	N	GD	ND	
4	10	293	0.99	19822	Antelope Creek, Hwy 293 at MP 0.99	2005	P/S Concrete	1,472	8	8	8	N	VG	ND	
4	10	293	3.1	09452	Antelope Creek, Hwy 293 at MP 3.10	1966	Concrete	2,925	7	7	7	N	GD	ND	
4	10	360	23.71	02745A	McKay Creek, Hwy 360	1985	P/S Concrete	2,800	8	8	8	N	VG	ND	
4	10	360	24.42	02746A	Ochoco Creek, Hwy 360	1985	P/S Concrete	2,800	7	7	8	N	GD	ND	
4	10	361	11.25	06827A	North Unit Ochoco Main Canal, Hwy 361	1971	P/S Concrete	3,224	7	7	6	N	FR	ND	
4	10	370	0.21	03379	Pilot Butte Canal, Hwy 370	1961	P/S Concrete	644	7	7	6	N	FR	ND	
4	10	370	3.85	02770	North Unit Ochoco Main Canal, Hwy 370	1945	Concrete	1,405	6	7	7	N	FR	ND	
4	10	372	18.28	17202	Hwy 372 over Snow Trail	1991	P/S Concrete	2,800	8	7	8	N	GD	ND	
4	10	380	0.11	07282	Ochoco Creek, Hwy 380	1954	Concrete	1,343	6	4	5	N	PR	SD	SD LSL
4	10	380	0.75	18717	Flood Control Channel, Hwy 380 at MP 0.75	1987	Steel	-	N	N	N	7	GD	ND	
4	10	380	1.37	18716	Flood Control Channel, Hwy 380 at MP 1.37	1987	Steel	-	N	N	N	5	FR	ND	
4	10	380	38.48	08701	North Fork Crooked River, Hwy 380	1961	Concrete	3,660	5	6	7	N	FR	ND	
4	10	380	38.73	08702	South Fork Crooked River, Hwy 380 at MP 38.73	1961	Concrete	3,660	5	6	7	N	FR	ND	
4	10	380	43.61	03323A	Camp Creek, Hwy 380	1961	Concrete	2,684	6	6	6	N	FR	ND	
4	10	380	50.56	03325A	South Fork Crooked River, Hwy 380 at MP 50.56	1956	Concrete	3,355	4	6	7	N	PR	SD	SD
4	10	380	52.09	03326A	Beaver Creek, Hwy 380 at MP 52.09	1956	Concrete	3,355	5	6	7	N	FR	ND	

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REG	DIS	HWY	MP	BR	Structure Name	YEAR	MATERIAL	DECK AREA (SFT)	DECK RATING	SUPER RATING	SUB RATING	CULV RATING	STRUC COND	SD/OD	OTHER DEFICIENCIES
4	10	380	55.91	08052	Beaver Creek, Hwy 380 at MP 55.91	1956	Concrete	3,050	6	6	5	N	FR	ND	
4	10	390	0.02	05017A	Service Creek, Hwy 390	1966	P/S Concrete	3,010	7	7	7	N	GD	ND	
4	10	390	0.46	05018A	John Day River, Hwy 390	1957	Concrete	10,457	6	5	6	N	FR	ND	
4	10	390	9.07	02457A	Shoofly Creek, Hwy 390	1975	P/S Concrete	1,036	7	7	7	N	GD	ND	
4	10	3rd St	0	22021	US 97 (HWY 004) at U XING MURPHY BR	2014	Concrete	4,432	8	8	8	N	VG	ND	
4	10	3rd St	140.87	22019	US 97 (HWY 004) at U XING 3RD ST BR	2014	Concrete	4,432	8	8	8	N	VG	OD	DG
4	10	C0000	0	20416	NORTH CANAL AVE OVER HWY 4	2008	P/S Concrete	9,704	7	8	8	N	GD	ND	
4	10	C0000	0	17281	Baker Road over Hwy 4	1994	P/S Concrete	5,488	7	7	8	N	GD	ND	
4	10	C0000	0	18208	Deschutes Market Rd over Hwy 4	1998	P/S Concrete	5,488	7	8	8	N	GD	ND	
4	10	C0000	0	18552	Wilson Ave over Hwy 4	1999	P/S Concrete	6,900	7	7	7	N	GD	ND	
4	10	C0000	0	19838	COI Canal & Canal Blvd, Maple/Negus Ave	2006	P/S Concrete	7,959	8	8	8	N	VG	ND	
4	10	C0000	0	20417	LARCH AVE OVER C.O.I.D. CANAL	2008	P/S Concrete	1,714	8	8	8	N	VG	ND	
4	10	C0000	4.11	19837	Maple/Negus Ave Over US97 & BNSF	2005	P/S Concrete	13,298	8	8	7	N	GD	ND	
4	10	C0000	139.17	18816	Reed Market Road (Bend) over Hwy 4	2001	P/S Concrete	14,577	7	7	7	N	GD	ND	
4	10	C0000	143.27	17437	Arnold Ditch, Hwy 4 Conn	1994	P/S Concrete	743	8	8	8	N	VG	ND	

Appendix 6: Future Conditions Review

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Final Technical Memorandum

Madras Transportation System Plan Update

Future Systems Conditions

Date: November 1, 2016 Project #: 18351

To: Nick Snead, Community Development Director
Jeff Hurd, Public Works Director
Michael Duncan, Region 4 Planner

From: Matt Kittelson, PE & Yi-Min Ha, EI

This memorandum summarizes the draft transportation system needs anticipated for the City of Madras over a 20 year period from 2015 through 2035. These needs include existing deficiencies identified in the Existing Conditions Analysis Technical Memorandum (and supplemental feedback from citizens and residents and forecast needs associated with traffic growth through 2035. The analyses and findings contained in this memorandum will inform the identification and evaluation of future multimodal transportation. Also included in this memorandum is an initial evaluation of the three concept areas within Madras. These analyses will be refined as future assumptions along US 97 an US 26 are better understood.

The information is organized into the following sections:

Development of Year 2035 Traffic Forecasts 2
Future Traffic Conditions (2035) and Needs 4
Concept Area Analysis 17
Summary and Next Steps 22
Appendices 24

DEVELOPMENT OF YEAR 2035 TRAFFIC FORECASTS

Estimates of future traffic demand are based on population and employment forecasts in the year 2035, existing travel patterns, and transportation infrastructure (existing system and planned/funded improvements). The following section summarizes key aspects of the City of Madras 2035 estimate.

Land Use and Population Projections

According to the Population Research Center at Portland State University (PSU), the 2015 population estimate of the Madras Urban Growth Boundary (UGB) is 7,484 people, which is approximately 33% of Jefferson County's population. The Madras UGB is projected to be the fastest growing region of the county between 2015 through 2020, and is projected to account for the majority of population growth in Jefferson County. Table 1 through Table 4 show the projected population growth. Exhibit 1 shows the comparison growth rate of all UGBs in Jefferson County.

Table 1: Jefferson County Projected Population

Population	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065
Jefferson County	22,806	24,161	25,669	26,935	27,973	28,961	29,869	30,785	31,735	32,723	33,779
Culver UGB	1,407	1,506	1,731	1,901	2,035	2,171	2,303	2,434	2,564	2,693	2,824
Madras UGB	**7,484**	**8,070**	**8,700**	**9,268**	**9,815**	**10,356**	**10,867**	**11,358**	**11,832**	**12,294**	**12,749**
Metolius UGB	724	734	776	824	869	913	954	994	1,031	1,067	1,102
Outside UGBs	13,191	13,850	14,461	14,942	15,254	15,521	15,744	16,000	16,308	16,668	17,104

Table 2: Jefferson County Projected Population Growth

Population Growth (Annual)	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065
Jefferson County	-	1.16%	1.22%	0.97%	0.76%	0.70%	0.62%	0.61%	0.61%	0.62%	0.64%
Culver UGB	-	1.38%	2.82%	1.89%	1.37%	1.30%	1.19%	1.11%	1.04%	0.99%	0.95%
Madras UGB	**-**	**1.52%**	**1.51%**	**1.27%**	**1.15%**	**1.08%**	**0.97%**	**0.89%**	**0.82%**	**0.77%**	**0.73%**
Metolius UGB	-	0.26%	1.13%	1.19%	1.07%	1.00%	0.89%	0.81%	0.74%	0.69%	0.65%
Outside UGBs	-	0.98%	0.87%	0.66%	0.41%	0.35%	0.29%	0.32%	0.38%	0.44%	0.52%

Table 3: Percent Projected Population of County

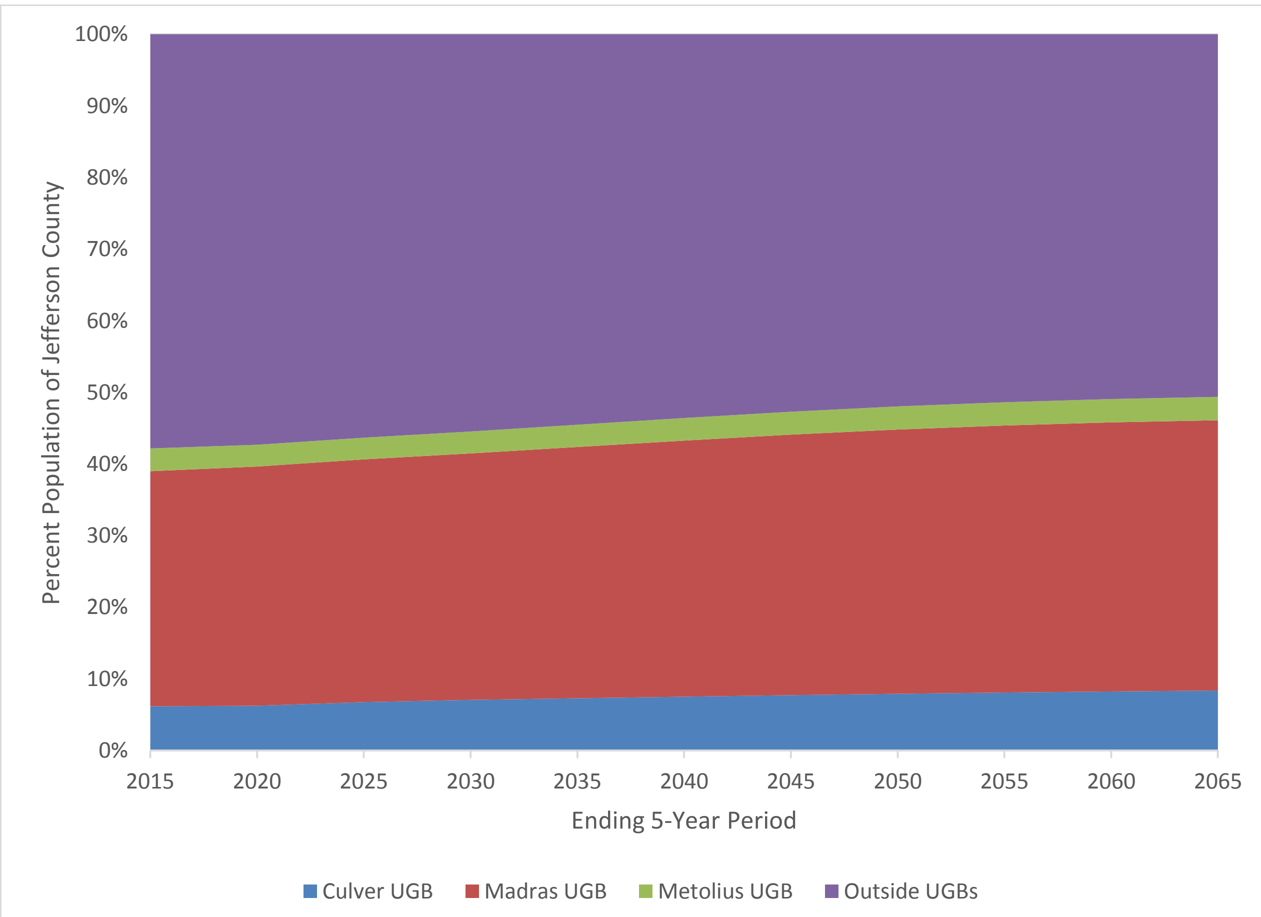
Percent Population of County	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065
Culver UGB	6%	6%	7%	7%	7%	7%	8%	8%	8%	8%	8%
Madras UGB	**33%**	**33%**	**34%**	**34%**	**35%**	**36%**	**36%**	**37%**	**37%**	**38%**	**38%**
Metolius UGB	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Outside UGBs	58%	57%	56%	55%	55%	54%	53%	52%	51%	51%	51%

Table 4: Percent Projected Growth of County

Percent Growth of County	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065
Culver UGB	-	7%	15%	13%	13%	14%	15%	14%	14%	13%	12%
Madras UGB	**-**	**43%**	**42%**	**45%**	**53%**	**55%**	**56%**	**54%**	**50%**	**47%**	**43%**
Metolius UGB	-	1%	3%	4%	4%	4%	5%	4%	4%	4%	3%
Outside UGBs	-	49%	41%	38%	30%	27%	25%	28%	32%	36%	41%

Note: 2015-2065 populations are projections.
Source: Population Research Center, PSU (https://www.pdx.edu/prc/region-1-documents)

Exhibit 1: Comparison of Population in Jefferson County



Growth Projections

20-year growth factors were developed using ODOT's historical trends method, which relies on traffic volumes from previous years to develop a growth pattern for use in projected future volumes. ODOT maintains Future Volumes Tables that summarize current and future year traffic volumes for state roadways throughout the State. To calculate the growth rate for Madras, all Madras locations were selected from the Future Volumes Tables. Based on guidance from ODOT's Analysis Procedures

Manual (APM), data with an R-squared value (RSQ, a measure of fit) of less than 0.75 was not used. The growth rates of the remaining locations were averaged to develop an annual growth rate of 1.28%. Per the Methodology Memorandum, an annual growth rate of 1.30% was used to project future traffic volumes at all study intersections and segments. Further background information is included in the Methodology Memorandum.

FUTURE TRAFFIC CONDITIONS (2035) AND NEEDS

Year 2035 Forecast Operations

Segment Analysis

Segment operational analysis was conducted at 51 study segment areas. A capacity of 750 vehicles/lane was assumed on all roadway segments. A two-lane highway capacity analysis was conducted for each roadway segment based on Year 2035 Peak Hour Forecast volumes. Table 5 shows the volume to capacity ratio targets for the study segments. Table 6 shows the Year 2035 Forecast Segment Analysis results.

Table 5: Volume to Capacity Ratio Targets for Peak Hour Operation Conditions

			Inside UGB			Outside UGB	
Route Name	Facility Extents	Facility Designation	Non-STAs (posted speed <= 35 mph)	Non-STAs (speed > 35 mph but <45 mph)	speed limit >= 45 mph	Unincorporated Communities	Rural Lands
US 26	Entire Section within City Limits	Statewide Highway (Freight Route)	0.85	0.80	0.80	0.70	0.70
US 97	Entire Section within City Limits	Statewide Highway (Freight Route)	0.85	0.80	0.80	0.70	0.70
OR 361	West of 5th S/US 97/US 26	District Highway	0.95	0.90	0.90	0.80	0.75

Source: OHP, Table 5, modified for relevance

Table 6: Year 2035 Forecast Segment Analysis Results

Roadway	2035 ADT	2035 Peak Hour	Peak Hour Volumes	Critical Flow Rate	Calculated V/C Ratio
NW Alder Street, West of NW Canal Street - S Leg	1075	3:15 PM - 4:15 PM	150	1500	0.100
NW Alder Street, West of NW Canal Street - W Leg	848	3:15 PM - 4:15 PM	160	1500	0.107
NW Alder Street & NW Mill Street - W Leg	669	3:15 PM - 4:15 PM	164	1500	0.109
NW Alder Street & NW Mill Street - E Leg	827	3:30 PM - 4:30 PM	198	1500	0.132
NW Alder Street & NW Mill Street - N Leg	767	3:30 PM - 4:30 PM	137	1500	0.091
NW Birch Lane & NW Alder Street - N Leg	869	3:15 PM - 4:15 PM	193	1500	0.129
NW Birch Lane & NW Alder Street - E Leg	386	3:15 PM - 4:15 PM	56	1500	0.037
NW Birch Lane & NW Alder Street - S Leg	1116	3:30 PM - 4:30 PM	217	1500	0.145
NW Birch Lane & NW Alder Street - W Leg	296	5:15 PM - 6:15 PM	41	1500	0.027
NW Mill & NW Cherry Lane - N Leg	150	6:15 AM - 7:15 AM	25	1500	0.017
NW Mill & NW Cherry Lane - E Leg	1273	3:30 PM - 4:30 PM	201	1500	0.134
NW Mill & NW Cherry Lane - S Leg	806	3:30 PM - 4:30 PM	132	1500	0.088
NW Mill & NW Cherry Lane - W Leg	704	3:15 PM - 4:15 PM	113	1500	0.076
S Adams Drive & SW Hall Road - S Leg	2153	3:45 PM - 4:45 PM	253	1500	0.169
S Adams Drive & SW Hall Road - N Leg	1804	4:15 PM - 5:15 PM	213	1500	0.142
S Adams Drive & SW Hall Road - W Leg	880	3:30 PM - 4:30 PM	119	1500	0.080
SE J Street & SE 10th Street - N Leg	265	12:00 PM - 1:00 PM	48	1500	0.032
SE J Street & SE 10th Street - S Leg	714	5:30 PM - 6:30 PM	79	1500	0.052
SE J Street & SE 10th Street - E Leg	2717	3:00 PM - 4:00 PM	321	1500	0.214
SE J Street & SE 10th Street - W Leg	3366	5:30 PM - 6:30 PM	395	1500	0.263
SE J Street & SE McTaggart Road - N Leg	1358	3:15 PM - 4:15 PM	255	1500	0.170
SE J Street & SE McTaggart Road - S Leg	752	3:00 PM - 4:00 PM	95	1500	0.064
SE J Street & SE McTaggart Road - E Leg	1732	3:00 PM - 4:00 PM	225	1500	0.150
SE J Street & SE McTaggart Road - W Leg	2344	3:00 PM - 4:00 PM	299	1500	0.200
NE Oak Street & NE 7th Street - W Leg	5209	3:15 PM - 4:15 PM	597	1500	0.398
NE Oak Street & NE 7th Street - S Leg	2613	3:00 PM - 4:00 PM	369	1500	0.246
NE Oak Street & NE 7th Street - N Leg	647	3:15 PM - 4:15 PM	94	1500	0.062
NE B Street & SE City View - E Leg	1904	4:45 PM - 5:45 PM	289	1500	0.193
NE B Street & SE City View - W Leg	3000	3:15 PM - 4:15 PM	336	1500	0.224
NE Oak Street & NE 16th Street - S Leg	1319	7:15 AM - 8:15 AM	187	1500	0.125
NE Oak Street & NE 16th Street - W Leg	841	7:30 AM - 8:30 AM	91	1500	0.061
NE Oak Street & NE 16th Street - E Leg	576	4:45 PM - 5:45 PM	75	1500	0.050
NE Oak Street & NE 12th Street - W Leg	2217	3:30 PM - 4:30 PM	234	1500	0.156
NE Oak Street & NE 12th Street - S Leg	318	11:30 AM - 12:30 PM	43	1500	0.029
NE Oak Street & NE 12th Street - E Leg	1904	4:15 PM - 5:15 PM	194	1500	0.130
SE Kinkade Road & SE E Street - S Leg	120	4:00 PM - 5:00 PM	18	1500	0.012
SE Kinkade Road & SE E Street - W Leg	252	2:30 PM - 3:30 PM	37	1500	0.025
SE Kinkade Road & SE E Street - E Leg	170	2:30 PM - 3:30 PM	33	1500	0.022
SE Kinkade Road & SE E Street - N Leg	122	1:45 PM - 2:45 PM	26	1500	0.017
SE Kinkade Road & NE B Street - E Leg	2518	4:00 PM - 5:00 PM	367	1500	0.245
SE Kinkade Road & NE B Street - S Leg	124	4:00 PM - 5:00 PM	20	1500	0.014
SE Kinkade Road & NE B Street - W Leg	2566	4:00 PM - 5:00 PM	371	1500	0.247
SE Kinkade Road & SE Grizzly Road - W Leg	523	3:00 PM - 4:00 PM	62	1500	0.041
SE Kinkade Road & SE Grizzly Road - E Leg	103	6:30 PM - 7:30 PM	25	1500	0.017
SE Kinkade Road & SE Grizzly Road - N Leg	553	4:45 PM - 5:45 PM	67	1500	0.045
NE Loucks Road, West of NE Jask Street - W Leg	831	4:30 PM - 5:30 PM	94	1500	0.062
NE Loucks Road, West of NE Jask Street - N Leg	99	11:30 AM - 12:30 PM	15	1500	0.010
NE Loucks Road, West of NE Jask Street - E Leg	790	2:45 PM - 3:45 PM	89	1500	0.059
NE Loucks Road & NE Lakeside Drive - E Leg	869	3:15 PM - 4:15 PM	99	1500	0.066
NE Loucks Road & NE Lakeside Drive - S Leg	309	3:30 PM - 4:30 PM	42	1500	0.028
NE Loucks Road & NE Lakeside Drive - W Leg	930	4:30 PM - 5:30 PM	110	1500	0.074

Intersection Analysis

Intersection operational analysis was conducted at study intersections. All intersection delay, level of service and volume-to-capacity ratio results were reported based on HCM 2000 methodologies using Synchro 9 analysis software. A queuing analysis was also performed at signalized intersections using Synchro 9 and HCM 2000 analysis methodologies, and at two-way stop controlled intersections using methodologies provided in Chapter 12 of the ODOT Analysis Procedures Manual (APM).

Figure 1 illustrates the 2035 intersection operations results at the study intersections during the weekday p.m. peak hour. Table 7 and Table 8 show the applicable ODOT mobility and forecast future conditions intersection operations, respectively.

Table 7: Intersection Performance Standards

ID	Intersection Name	Jurisdiction	Type of Intersection Control [1]	Target Intersection v/c ratio [2]
1	NW Cherry Lane & US 26	ODOT	TWSC	0.80
2	NW Depot Street & US 26	ODOT	TWSC	0.80
3	Jefferson Street & US 97	ODOT	TWSC	0.80
4	6th Street & US 97/26	ODOT	Signal	0.85
5	D Street & US 97/US 26/4th Street	ODOT	Signal	0.85
6	D Street & US 97/US 26/5th Street	ODOT	Signal	0.85
7	J Street & OR 361	ODOT	TWSC	0.90
8	Fairgrounds Road & OR 361	ODOT	TWSC	0.90
9	Fairgrounds Road & US 97/US 26	ODOT	TWSC	0.85
10	Hall Road & US 97/US 26	ODOT	TWSC	0.80

[1] TWSC = Two-way stop-controlled intersection
[2] v/c = volume-to-capacity ratio

Table 8: Year 2035 Forecast Intersection Analysis Results

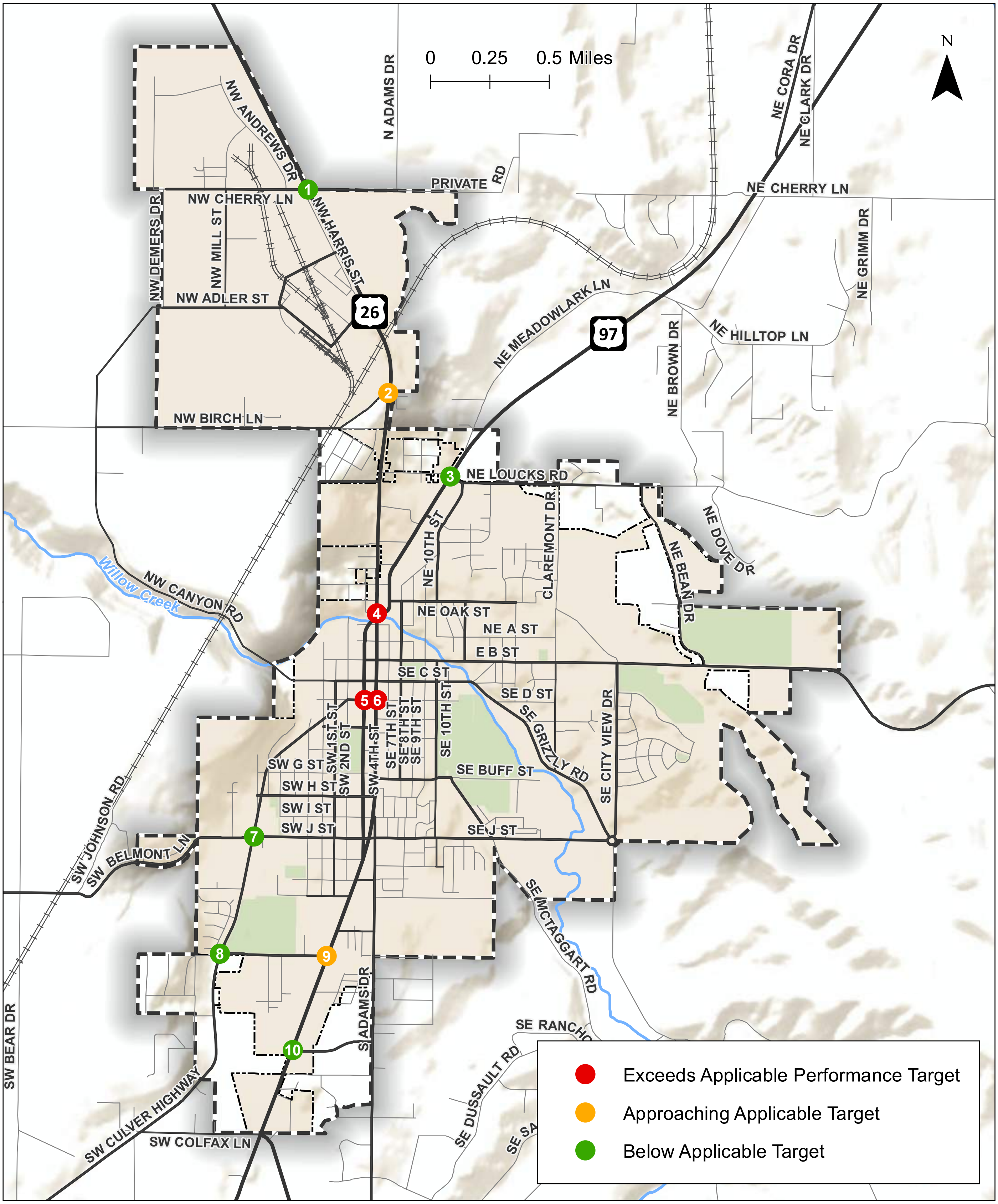
ID	Name	Critical Movement	v/c Ratio[1]	LOS	Delay (sec)	Critical Movement Queue Length (vehicles)	Performance Target Met
1	NW Cherry Lane & US 26	EBL	0.03	C	18.9	3	Yes
2	NW Depot Street & US 26	WBL	0.08	F	81.6	3	Yes
3	Jefferson Street & US 97	EBL	0.08	C	22.5	3	Yes
4	**6th Street & US 97/26[2]**	**WBL**	**1.08**	**D**	**49.4**	**19**	**No**
5	**D Street & US 97/US 26/4th Street[2]**	**WBL**	**0.88**	**C**	**23.5**	**2**	**No**
6	**D Street & US 97/US 26/5th Street[2]**	**EBL**	**0.89**	**C**	**23.6**	**6**	**No**
7	J Street & OR 361	WBL	0.24	C	15.1	3	Yes
8	Fairgrounds Road & OR 361	WBL	0.16	C	17.3	3	Yes
9	Fairgrounds Road & US 97/US 26	EBL	0.71	F	59.6	2	Yes
10	Hall Road & US 97/US 26	WBL	0.17	C	17.5	3	Yes

[1] v/c = volume-to-capacity ratio
[2] Optimization of signal timing assumed in intersection operations analysis

Summary of Year 2035 Forecast Traffic Conditions

Below is a summary of major findings from the Year 2035 Forecast traffic operational analysis:

- The following intersections do not meet the ODOT intersection performance target of v/c ratio < 0.85:
    - 6th Street & US 97/26 (North Y)
    - D Street & US 97/US 26/4th Street
    - D Street & US 97/US 26/5th Street
- NW Depot Street & US 26 and Fairgrounds Road & US 97/US 26 is expected to operate with a v/c ratio (0.08 and 0.71 respectively) that meets ODOT's intersection performance target. However, these two-way stop controlled intersections are also expected to operate with high delays for the critical movement.
- 6th Street & US 97/US 26 has a 95th percentile westbound left-turn queue length that exceeds the left-turn lane storage capacity.
- All other intersections operate within ODOT performance target.
- The existing demand volume at all study segments is below the two-lane capacity of 750 vehicles/lane, with the highest v/c ratio = 0.398.



Future Traffic Conditions
Madras, Oregon

Figure
1

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Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl

Roadway Connectivity

Mobility for all users is improved when the overall connectivity of the roadway system is enhanced. While connectivity improvements should be considered whenever possible, the following subsections highlight key areas of Madras where an improved roadway system would provide significant value to users.

Each of these areas is identified on Figure 2.

Industrial Readiness Plan Area

This area is subject to an ongoing planning effort and generally comprises the land west of US 26 in the vicinity of the Madras Airport. As a key economic engine for the City, improved connections into and within this area will make industrial development more viable. The recommendations from this planning effort are expected to include roadway system improvements that should be incorporated into the Madras TSP.

Connectivity Area A

This area is generally the northeast section of the current Madras city limits. Many of the roadways in the area are stubbed today in anticipation of future development to the east. This roadway network should be extended into this area as development occurs with a particular emphasis on north/south travel since few continuous north/south facilities exist in the area.

Connectivity Area B

This area is generally the land in the vicinity of the Yarrow Development. Yarrow Avenue represents a significant future east/west connection from this developing area to the developed section of Madras to the west and future development to the east. The area also includes Jefferson County Middle School, which suggests safe pedestrian and bicycle access should also be considered.

Connectivity Area C

This area is the land east of Bluff Street, south of Claremont Drive, and north of J Street. The roadway system in the vicinity has significant gaps that should be filled as future development or opportunity allow. This will become increasingly important as land on the east side of Madras developments in the future.

West of US 26

US 26 currently serves as the main north/south connection for roadway users north of downtown Madras. A parallel north/south connection is beginning to develop west of US 26 that will provide an alternative for roadway system users. This facility will reduce reliance on the state highway and provide a lower speed alterative for non-auto users.

Truck Route

The need for and concept of a truck route around Madras has been extensively studied through prior planning efforts. The outcome of those studies is a preferred alignment for such a route on the west side of the Madras city limits. This alignment would construct a new road from the existing US 97 & Colfax Road intersection and provide a more direct north/south connection to the existing Culver Highway Alignment. The route would following the Culver Highway Alignment until just north of G Street where a new road would be constructed that would connect to US 26 and US 97 north of the North Y.

The need for this truck route is acknowledged by this TSP Update and the preferred alignment will be incorporated in the final plan. The general location of this route is shown on Figure 2.

Roadway Safety Needs & Considerations

A safety analysis was conducted as part of the Existing Conditions analysis for this TSP update. The following summaries the needs identified as part of that analysis. Specific projects, policies, or studies to address these issues will be considered as part of the forthcoming Alternatives Analysis.

- US 26 & US 97/6th Street (North Y)
    - This intersection has 10 reported crashes during the period evaluated.
    - 60% of the reported crashes are rear-end crashes. The intersection is the first signalized intersection entering the city in the southbound direction along US 26. It is possible that significantly higher proportion of rear-end crashes may be a result of the drivers being unaware that the intersection, being the first traffic signal entering the city, is ahead and may engage in aggressive deceleration, increasing the likelihood of a rear-end crash.
- US 97 between Fairgrounds Road and L Street
    - US 97 & Fairgrounds Road has 10 reported There were a total of 20 crashes reported in the US 97 segment between Fairgrounds Road and L Street.
    - A total of 12 (39.3%) rear-end crashes were reported along this section of US 97. The section also includes several driveway access points. These
    - Although there were no reported pedestrian crashes in this area, there were 4 rear-end crashes reportedly to have involved pedestrians. A potentially large pedestrian generator is the Jefferson County Fairgrounds located west of the segment, along Fairgrounds Road. The surrounding land use consists of a mix of retail, restaurants and gas stations.

   - A pedestrian refuge island with an offset crosswalk was recently constructed in this area to address pedestrian safety issues.

- J Street between 4th Street and 5th Street
   - A recent project was constructed to address the crashes that occurred in this vicinity. A future phase is planned that will construct traffic signals at the intersection of J Street & 4th Street and J Street & 5th Street.
- D Street at 4th and 5th Street
   - There are 8 and 6 crashes reported on D Street at 4th Street and 5th Street respectively.
   - There were 2 pedestrian crashes reported – 1 fatal crash at 5th Street and 1 incapacitating injury crash at 4th Street. In both cases, the driver failed to yield to the right-of-way and collided with the pedestrian. There were also 5 (35.7%) rear-end crashes reported at this location.
   - These crashes may suggest a need to investigate traffic signal and pedestrian safety improvements.
- B Street & 5th Street
   - There were 8 crashes reported at this intersection, consisting of 5 angle crashes, and 3 other crashes.
   - 4 out of 5 of the reported angle crashes were reportedly caused by drivers disregarding the traffic signal display.
   - These crashes may suggest a need to investigate potential traffic signal or signing improvements.

Intersection Needs

The intersections shown in Table 13 have been identified for enhancements due to existing or future capacity needs, crash history, geometric considerations, and/or future connectivity needs. Specific improvements for each intersection will be considered as part of the forthcoming Alternatives Analysis.

Table 13: Future Intersection Needs

Intersection	Capacity	Safety	Geometry
US 26/Cherry Lane	X		X
US 26/Depot Road	X		
US 97/Oak Street	X	X	
US 26 & US 97/ 6th Street (North Y)	X	X	
D Street & 4th Street	X	X	
D Street & 5th Street	X	X	
B Street & 4th Street		X	
B Street & 5th Street		X	
J Street & 4th Street		X	
J Street & 5th Street		X	
US 97 & Fairgrounds	X	X	
Culver Highway & Fairgrounds			X
Buff Street & McTaggart Road			X
J Street & McTaggart Road			X
US 97 & Hall Road	X		X

Additional intersection needs may be identified based on feedback received during advisory committee meetings and/or public outreach events.

Also to be considered as part of this TSP update is the need for intersection improvement protocols to provide a consistent process that meets the values of the community.

Transit

Public Transportation in Madras consists of a “dial-a-ride” demand response service. This service is funded through Cascades East Transit (CET) This service will pick up and carry citizens to any destination within Madras. Community Connector Service, also provided by CET, is available to Warm Springs, Culver, Metolius, and Redmond and is also available Monday through Friday. Service to additional areas (Bend, Sisters, Prineville, Mt. Bachelor, and La Pine) is available through Community Connector connections in Redmond.

Transit enhancements that may improve overall mobility for users within Madras include increased frequency of the Community Connector Service, including increased frequency, additional time of day service, or additional route stops within the community. These improvements should be considered and prioritized in coordination with CET.

Downtown Area

The area along 4th Street and 5th Street generally between J Street in the south and B Street in the north makes up the Madras downtown area. Many local businesses, municipal services, and other attractions exist along the corridor. The activity that results from this environment conflicts with the high traffic volumes on 4th Street and 5th Street, which serve as the shared US 97 and US 26 alignment through Madras. As noted, future plans will provide an alternate route for trucks around the downtown area. Even so, the downtown area will remain and area the needs to balance highway mobility with local access for all users.

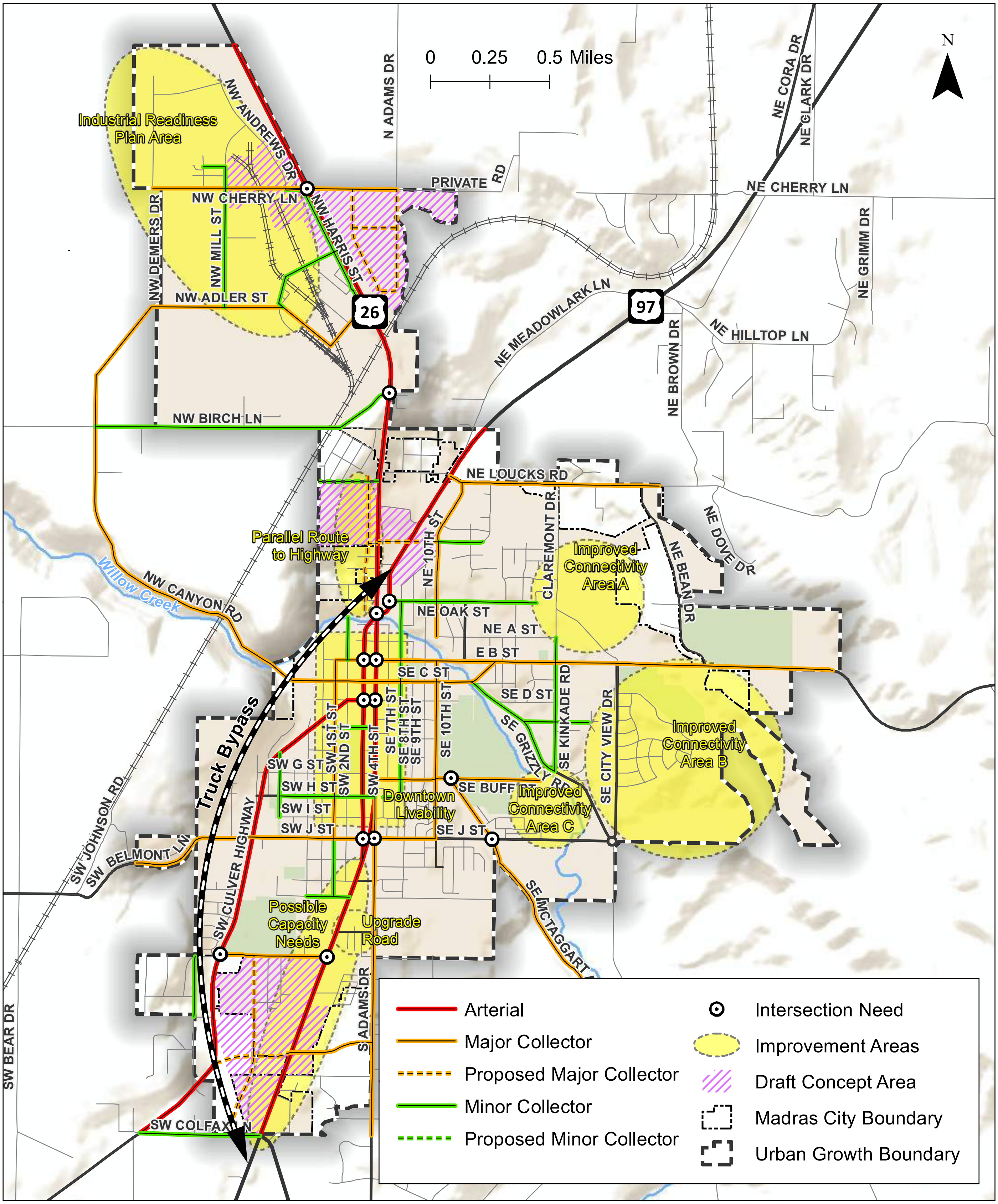
Key considerations for the downtown area include:

- Highway mobility
- East-west connections
- Access to and from the downtown area for all modes
- Pedestrian crossings of 4th Street and 5th Street
- Parallel routes to 4th Street and 5th Street for all modes
- Economic opportunities for the City and local businesses

Pedestrian and Bicycle Needs

The Pedestrian and Bicycle elements of the Madras TSP were extensively studied as part of a 2012 TSP Update. That effort went to great lengths to document existing deficiencies in each system and to identify projects to fill those gaps. The outcomes of that effort are shown in Figure 6 and Figure 7.

These improvements will serve as the starting place for pedestrian and bicycle system improvements considered as part of this TSP update. Feedback received from the TSP advisory committee and/or from public outreach events will further inform these plans.



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Roadway Needs
Madras, Oregon

Figure
2

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl

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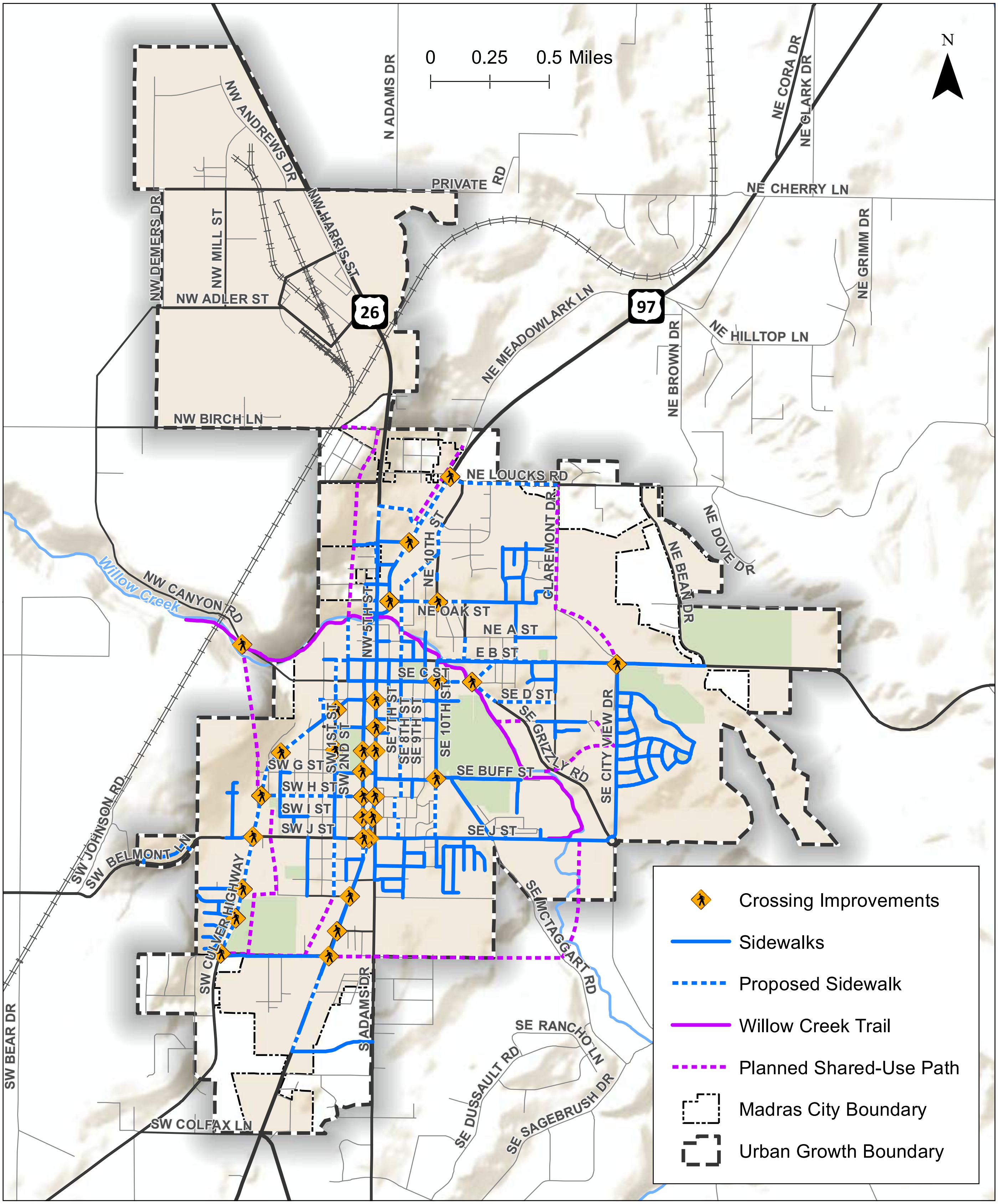

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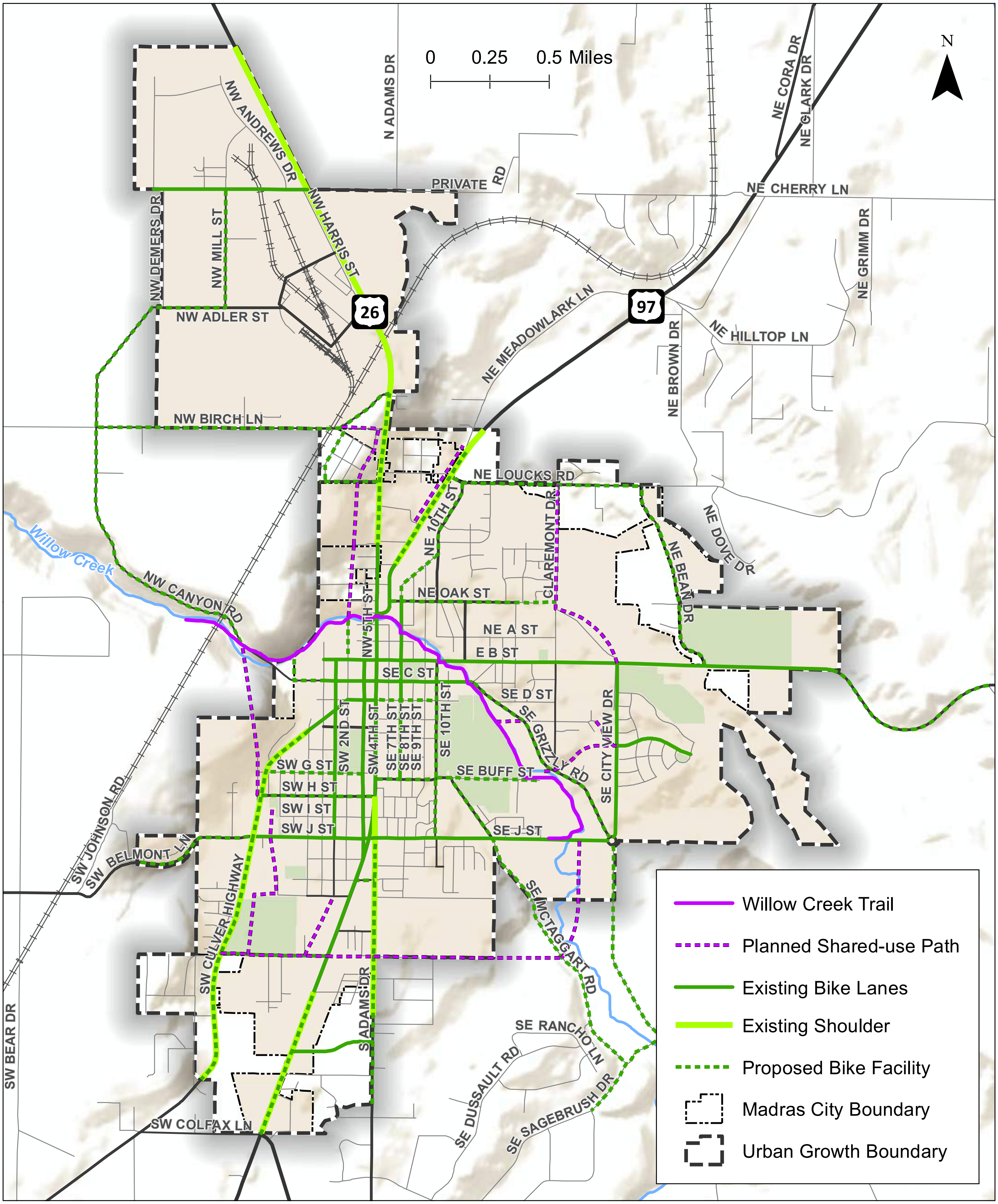
Pedestrian Facilities
Madras, Oregon

Figure
3

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: The City of Madras



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Bike Facilities
Madras, Oregon

Figure
4

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: The City of Madras

CONCEPT AREA ANALYSIS

There are three concept areas within the City of Madras that were identified by the project management team with input from the TSP advisory committees. These concept areas have the potential to attract development and grow at a faster rate compared to the rest of Madras. The three concept areas are shown in Figure 3, Figure 4, and Figure 5.

As these concept areas develop, intersection capacity upgrades and additional access points may be needed to adequately serve the concept area trips. A trip-sensitivity analysis was conducted along major highways serving the concept areas to identify when potential mitigations were needed. The analysis assumes a base “no-build” condition with Year 2035 forecast volumes. Concept area peak hour trips are gradually added into the analysis to determine when the need for traffic improvements are triggered.

The trip-sensitivity analysis was conducted at typical unsignalized access points along the highway to determine the need for and timing of 1) improvements to existing connections and 2) additional access points that will need to be constructed based on concept area trip thresholds. The analysis assumes uniform development access the entire concept area. The trip-sensitivity analysis was conducted for the following intersections:

- **North Industrial Concept Area**
    - Cherry Lane & US 26
- **Central Madras Concept Area**
    - Cedar Street & US 26
- **South Madras Concept Area**
    - Fairgrounds Road & US 97
    - Hall Road & US 97

Tables 9 through 12 summarize the results of the trip-sensitivity analysis. The need for traffic mitigation for each movement is identified with results highlighted in **red**.

Table 9: Trip-Sensitivity Analysis Results at Cherry Lane & US 26 (serves North Industrial Concept Area)

Assumed Trips	Delay (s)				LOS				v/c ratio			
	EBR	WBR	NBL	SBL	EBR	WBR	NBL	SBL	EBR	WBR	NBL	SBL
0	13.4	9.9	9.0	8.8	B	A	A	A	0.07	0.09	0.03	0.14
200	15.2	10.4	9.3	9.2	C	B	A	A	0.20	0.16	0.07	0.17
400	17.7	11.1	9.7	9.6	C	B	A	A	0.33	0.24	0.10	0.21
600	21.9	11.9	10.1	10.1	C	B	B	B	0.48	0.31	0.14	0.25
800	29.4	12.9	10.7	10.6	D	B	B	B	0.64	0.39	0.18	0.29
1000	45.4	14.3	11.3	11.3	E	B	B	B	0.81	0.47	0.23	0.34
1200	**82.4**	16.2	12.0	12.1	**F**	C	B	B	**1.00**	0.56	0.28	0.38
1400	-[1]	19.1	12.9	13.1	F	C	B	B	>1.00	0.65	0.33	0.44

Table 10: Trip-Sensitivity Analysis Results at Cedar Street & US 26 (serves Central Madras Concept Area)

Assumed Trips	Delay (s)				LOS				v/c ratio			
	EBL	WBR	NBL	SBL	EBL	WBL	NBL	SBL	EBL	WBL	NBL	SBL
0	18.9	14.8	16.4	0.2	C	B	C	B	0.03	0.17	0.07	0.00
200	23.3	16.6	25.6	1.8	C	C	D	B	0.05	0.29	0.32	0.06
400	29.5	19.7	**84.5**	3.2	D	C	**F**	B	0.10	0.42	**0.82**	0.11
600	**39.2**	25.4	-[1]	4.4	**E**	D	F	B	**0.16**	0.57	>1.00	0.17
800	55.6	38.0	-[1]	5.6	F	E	F	B	0.25	0.75	>1.00	0.22
1000	90.0	**84.1**	-[1]	6.7	F	**F**	F	B	0.41	**1.00**	>1.00	0.28

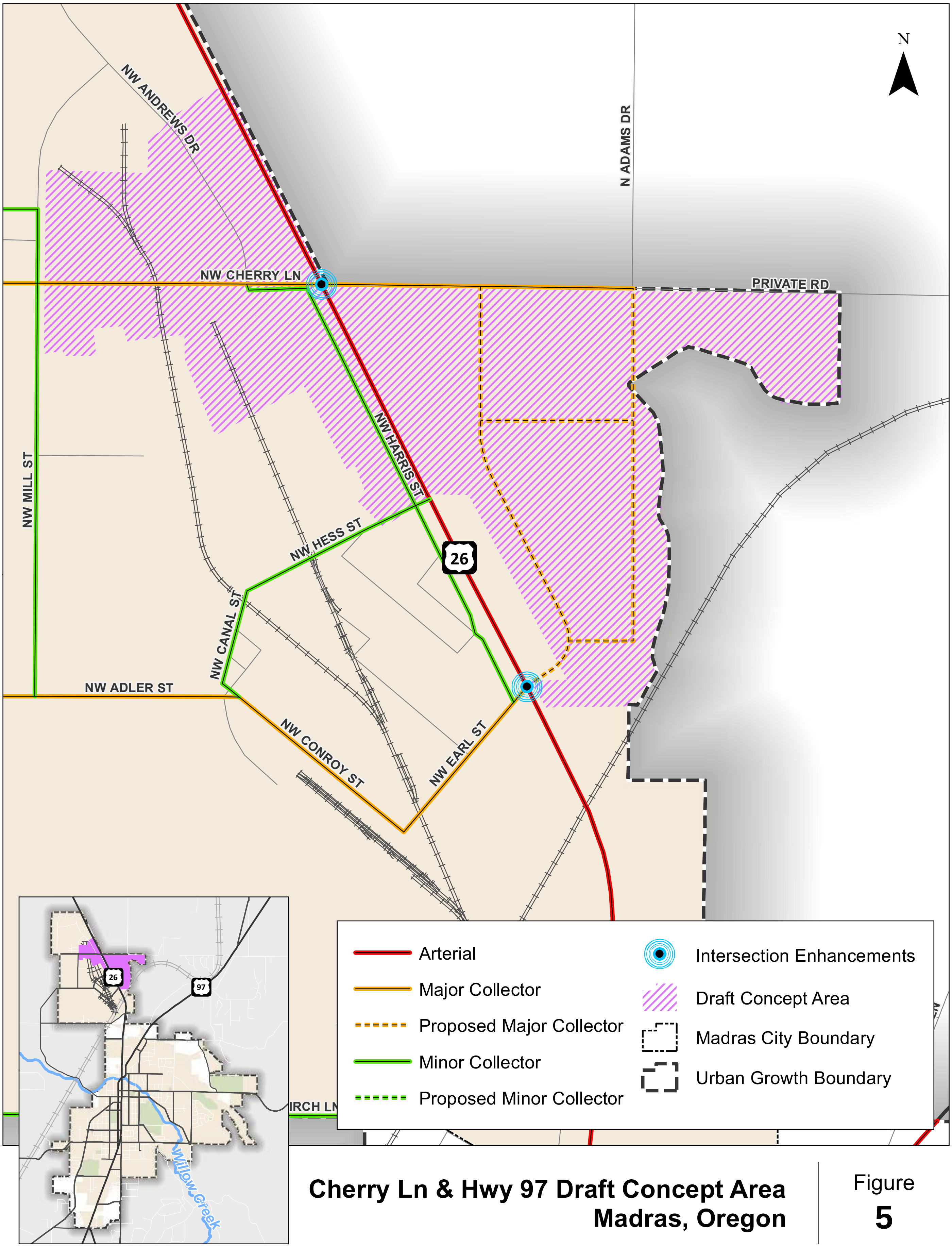
Table 11: Trip-Sensitivity Analysis Results at Fairgrounds Road & US 97 (serves South Madras Concept Area)

Assumed Trips	Delay (s)				LOS				v/c ratio			
	EBL	WBL	NBL	SBL	EBL	WBL	NBL	SBL	EBL	WBL	NBL	SBL
0	**36.1**	19.6	13.2	10.6	**E**	C	B	0	**0.38**	0.04	0.15	0.01
200	71.5	29.4	14.3	10.7	F	D	B	0	0.74	0.06	0.21	0.01
400	-[1]	**74.4**	15.8	10.9	F	**F**	C	0	>1.00	**0.16**	0.28	0.01
600	-[1]	274.8	17.6	11.0	F	F	C	0	>1.00	0.47	0.35	0.01
800	-[1]	-[1]	20.3	11.1	F	F	C	0	>1.00	>1.00	0.44	0.01
1000	-[1]	-[1]	24.1	11.2	F	F	C	0	>1.00	>1.00	0.53	0.01

Table 12: Trip-Sensitivity Analysis at Hall Road & US 97 (serves South Madras Concept Area)

Assumed Trips	Delay (s)				LOS				v/c ratio			
	EBL	WBL	NBL	SBL	EBL	WBL	NBL	SBL	EBL	WBL	NBL	SBL
0	22.3	20.7	9.9	9.8	C	C	A	0	0.24	0.21	0.03	0.06
200	32.3	26.8	10.4	9.9	D	D	B	0	0.48	0.27	0.07	0.06
400	**60.7**	**58.1**	11.0	10.1	**F**	**F**	B	0	**0.78**	**0.48**	0.11	0.06
600	-[1]	-[1]	11.7	10.2	F	F	B	0	>1.00	>1.00	0.16	0.06
800	-[1]	-[1]	12.5	10.3	F	F	B	0	>1.00	>1.00	0.21	0.06
1000	-[1]	-[1]	13.6	10.4	F	F	B	0	>1.00	>1.00	0.26	0.07

[1] Delay results not reported if v/c ratio > 1.00.



Cherry Ln & Hwy 97 Draft Concept Area
Madras, Oregon

Figure
5

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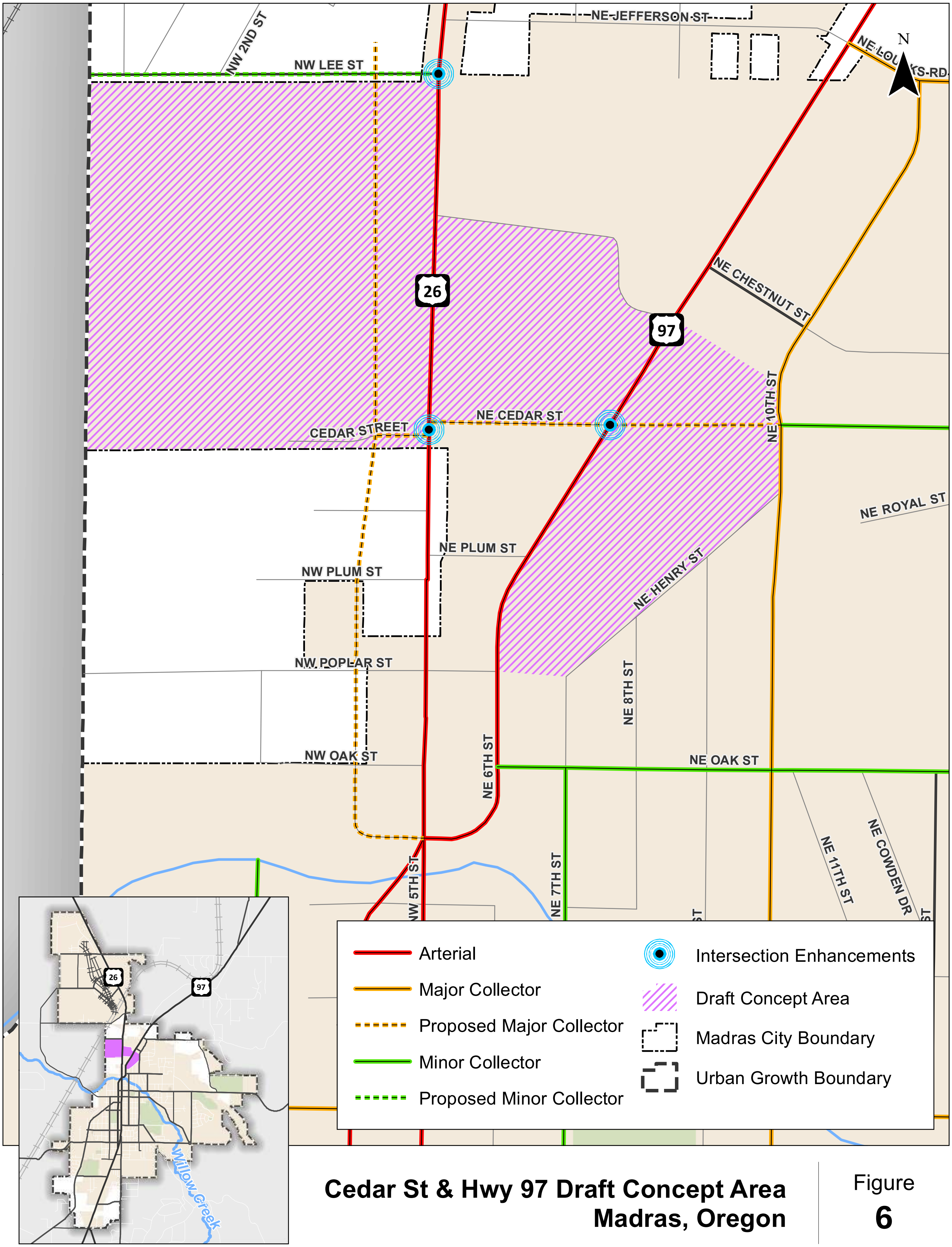
Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl



Cedar St & Hwy 97 Draft Concept Area
Madras, Oregon

Figure
6

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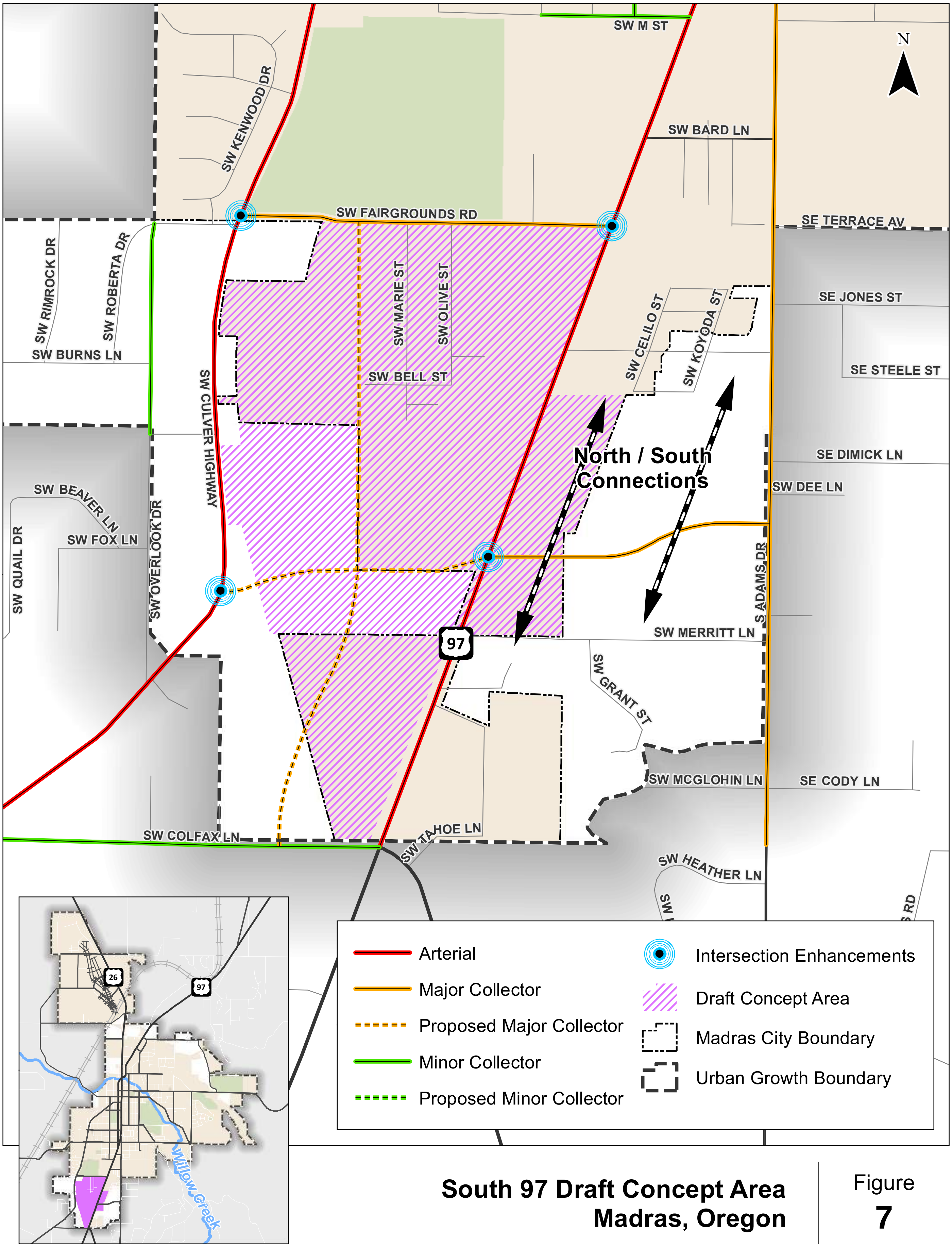

South 97 Draft Concept Area
Madras, Oregon

Figure
7

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Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl

SUMMARY AND NEXT STEPS

Key findings from the future needs analysis include:

- Madras is expected to grow by about 2,400 residents through the horizon year (2035) of this planning effort. The City will continue to serve as the major population and economic center for surrounding areas and Jefferson County as a whole.
- Demand along the highways through Madras is expected to increase. Potential future capacity constraints have been identified at the following intersections:
  - 6th Street & US 97/26 (North Y)
  - D Street & 4th Street
  - D Street & 5th Street
- NW Depot Street & US 26 and Fairgrounds Road & US 97/US 26 is expected to operate with a v/c ratio (0.08 and 0.71 respectively) that meets ODOT's intersection performance target. However, these two-way stop controlled intersections are also expected to operate with high delays for the critical movement.
- The local roadway system is not expected to experience significant future congestion. Needs for the local system are focused on improving connectivity for all users to provide more direct routes and less reliance on state highways.
- The following intersections or segments had identified safety trends that should be further investigated:
  - US 26 & US 97/6th Street (North Y)
  - US 97 between Fairgrounds Road and L Street
  - J Street between 4th Street and 5th Street
  - D Street at 4th and 5th Street
  - B Street & 5th Street
- The downtown core of Madras is a key destination and economic engine within Madras. This area should balance highway mobility with multimodal access to, from, and within the downtown core, especially pedestrian crossings of 4th Street and 5th Street.
- The Madras Truck Route was studied at length during a previous planning effort and a preferred alignment was development. This alignment should be incorporated into this TSP update.
- A 2012 update to the Madras TSP focused on the bicycle and pedestrian plans. These plans should be incorporated into this TSP update and modified as necessary based on data or input received through this update process.

- An initial analysis of the Madras Concept Areas found varying levels of capacity available at highway access points based on the future condition analysis. These concept area plans will continue to be revised based on analysis updates, future alternatives analysis, and public feedback.

APPENDICES

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	6	10	55	21	0	0	19	310	23	4	615	4
Future Volume (vph)	6	10	55	21	0	0	19	310	23	4	615	4
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	50%	100%	51%	54%	0%	0%	58%	41%	50%	50%	34%	50%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	7	11	62	24	0	0	21	348	26	4	691	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	11	62	0	24	0	21	348	26	0	699	0

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis
1: US26 & NW Cherry Lane

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	10	55	21	0	0	19	310	23	4	615	4
Future Volume (Veh/h)	6	10	55	21	0	0	19	310	23	4	615	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	7	11	62	24	0	0	21	348	26	4	691	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1091	1117	348	749	1089	348	691			374		
vC1, stage 1 conf vol	701	701		390	390							
vC2, stage 2 conf vol	390	416		359	699							
vCu, unblocked vol	1091	1117	348	749	1089	348	691			374		
tC, single (s)	8.5	8.5	7.9	8.6	6.5	6.9	5.3			5.1		
tC, 2 stage (s)	7.5	7.5		7.6	5.5							
tF (s)	4.0	5.0	3.8	4.0	4.0	3.3	2.8			2.7		
p0 queue free %	97	95	88	93	100	100	97			100		
cM capacity (veh/h)	265	227	526	341	377	654	609			900		

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	7	73	24	21	348	26	350	350
Volume Left	7	0	24	21	0	0	4	0
Volume Right	0	62	0	0	0	26	0	4
cSH	265	438	341	609	1700	1700	900	1700
Volume to Capacity	0.03	0.17	0.07	0.03	0.20	0.02	0.00	0.21
Queue Length 95th (ft)	2	15	6	3	0	0	0	0
Control Delay (s)	18.9	14.8	16.4	11.1	0.0	0.0	0.2	0.0
Lane LOS	C	B	C	B			A	
Approach Delay (s)	15.2		16.4	0.6			0.1	
Approach LOS	C		C					

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	5	0	54	4	0	0	52	367	0	4	670	18
Future Volume (vph)	5	0	54	4	0	0	52	367	0	4	670	18
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	33%	0%	47%	50%	0%	0%	50%	47%	0%	100%	37%	64%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	6	0	61	4	0	0	58	412	0	4	753	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	67	0	0	4	0	58	412	0	0	757	20

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	54	4	0	0	52	367	0	4	670	18
Future Volume (Veh/h)	5	0	54	4	0	0	52	367	0	4	670	18
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	6	0	61	4	0	0	58	412	0	4	753	20
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1083	1289	753	1350	1309	206	773			412		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1083	1289	753	1350	1309	206	773			412		
tC, single (s)	8.2	6.5	7.8	8.5	6.5	6.9	5.1			6.1		
tC, 2 stage (s)												
tF (s)	3.8	4.0	3.8	4.0	4.0	3.3	2.7			3.2		
p0 queue free %	95	100	77	92	100	100	90			99		
cM capacity (veh/h)	125	148	268	51	144	807	588			668		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	67	4	58	275	137	757	20
Volume Left	6	4	58	0	0	4	0
Volume Right	61	0	0	0	0	0	20
cSH	243	51	588	1700	1700	668	1700
Volume to Capacity	0.28	0.08	0.10	0.16	0.08	0.01	0.01
Queue Length 95th (ft)	27	6	8	0	0	0	0
Control Delay (s)	25.4	81.6	11.8	0.0	0.0	0.2	0.0
Lane LOS	D	F	B			A	
Approach Delay (s)	25.4	81.6	1.5			0.2	
Approach LOS	D	F					

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	16	19	42	15	13	6	40	273	39	0	312	10
Future Volume (vph)	16	19	42	15	13	6	40	273	39	0	312	10
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	64%	46%	21%	30%	50%	25%	30%	52%	35%	0%	61%	71%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	18	21	47	17	15	7	45	307	44	0	351	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	18	68	0	0	39	0	0	396	0	0	362	0

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	19	42	15	13	6	40	273	39	0	312	10
Future Volume (Veh/h)	16	19	42	15	13	6	40	273	39	0	312	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	18	21	47	17	15	7	45	307	44	0	351	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	790	798	356	833	781	329	362			351		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	790	798	356	833	781	329	362			351		
tC, single (s)	7.7	7.0	6.4	7.4	7.0	6.5	4.4			4.1		
tC, 2 stage (s)												
tF (s)	4.1	4.4	3.5	3.8	4.5	3.5	2.5			2.2		
p0 queue free %	92	92	93	92	94	99	96			100		
cM capacity (veh/h)	224	262	647	218	265	663	1057			1219		

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	18	68	39	396	362
Volume Left	18	0	17	45	0
Volume Right	0	47	7	44	11
cSH	224	445	268	1057	1219
Volume to Capacity	0.08	0.15	0.15	0.04	0.00
Queue Length 95th (ft)	6	13	13	3	0
Control Delay (s)	22.5	14.5	20.7	1.4	0.0
Lane LOS	C	B	C	A	
Approach Delay (s)	16.2		20.7	1.4	0.0
Approach LOS	C		C		

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	54.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	6	9	10	481	16	14	5	496	365	5	519	3
Future Volume (vph)	6	9	10	481	16	14	5	496	365	5	519	3
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	50%	50%	57%	46%	45%	44%	67%	46%	48%	0%	36%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	7	10	11	540	18	16	6	557	410	6	583	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	21	0	540	34	0	6	967	0	6	586	0

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	9	10	481	16	14	5	496	365	5	519	3
Future Volume (vph)	6	9	10	481	16	14	5	496	365	5	519	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.92		1.00	0.93		1.00	0.94		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1203	1139		1236	1222		1081	2302		1805	2656	
Flt Permitted	0.89	1.00		0.42	1.00		0.38	1.00		0.20	1.00	
Satd. Flow (perm)	1126	1139		548	1222		433	2302		371	2656	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	7	10	11	540	18	16	6	557	410	6	583	3
RTOR Reduction (vph)	0	10	0	0	10	0	0	108	0	0	1	0
Lane Group Flow (vph)	7	11	0	540	24	0	6	859	0	6	585	0
Heavy Vehicles (%)	50%	50%	57%	46%	45%	44%	67%	46%	48%	0%	36%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	3	8		7	4			6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	6.3	4.5		35.7	28.9		38.3	38.3		38.3	38.3	
Effective Green, g (s)	6.3	4.5		35.7	28.9		38.3	38.3		38.3	38.3	
Actuated g/C Ratio	0.07	0.05		0.43	0.34		0.46	0.46		0.46	0.46	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.5	2.5		3.0	2.5		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	86	61		447	420		197	1049		169	1211	
v/s Ratio Prot	0.00	0.01		c0.38	0.02			c0.37			0.22	
v/s Ratio Perm	0.00			c0.14			0.01			0.02		
v/c Ratio	0.08	0.17		1.21	0.06		0.03	0.82		0.04	0.48	
Uniform Delay, d1	36.1	38.0		22.2	18.4		12.6	19.8		12.6	15.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	1.0		113.0	0.0		0.1	5.7		0.2	0.6	
Delay (s)	36.4	39.0		135.2	18.5		12.7	25.6		12.8	16.6	
Level of Service	D	D		F	B		B	C		B	B	
Approach Delay (s)		38.3			128.3			25.5			16.5	
Approach LOS		D			F			C			B	

Intersection Summary			
HCM 2000 Control Delay	50.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	84.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	227	0	72	120	0	0	0	0	16	1068	173
Future Volume (vph)	0	227	0	72	120	0	0	0	0	16	1068	173
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	26%	0%	20%	44%	0%	0%	0%	0%	9%	44%	33%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	267	0	85	141	0	0	0	0	19	1256	204
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	267	0	85	141	0	0	0	0	0	1479	0
Intersection Summary												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	227	0	72	120	0	0	0	0	16	1068	173
Future Volume (vph)	0	227	0	72	120	0	0	0	0	16	1068	173
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0						5.0	
Lane Util. Factor		1.00		1.00	1.00						0.95	
Frt		1.00		1.00	1.00						0.98	
Flt Protected		1.00		0.95	1.00						1.00	
Satd. Flow (prot)		1508		1504	1319						2487	
Flt Permitted		1.00		0.40	1.00						1.00	
Satd. Flow (perm)		1508		637	1319						2487	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	0	267	0	85	141	0	0	0	0	19	1256	204
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	16	0
Lane Group Flow (vph)	0	267	0	85	141	0	0	0	0	0	1463	0
Heavy Vehicles (%)	0%	26%	0%	20%	44%	0%	0%	0%	0%	9%	44%	33%
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		8			4						2	
Permitted Phases				4						2		
Actuated Green, G (s)		16.2		16.2	16.2						48.8	
Effective Green, g (s)		16.2		16.2	16.2						48.8	
Actuated g/C Ratio		0.22		0.22	0.22						0.65	
Clearance Time (s)		5.0		5.0	5.0						5.0	
Vehicle Extension (s)		2.5		2.5	2.5						3.5	
Lane Grp Cap (vph)		325		137	284						1618	
v/s Ratio Prot		c0.18			0.11							
v/s Ratio Perm				0.13							0.59	
v/c Ratio		0.82		0.62	0.50						0.90	
Uniform Delay, d1		28.0		26.6	25.8						11.1	
Progression Factor		1.00		0.72	0.75						1.00	
Incremental Delay, d2		15.0		6.3	0.8						8.7	
Delay (s)		43.0		25.5	20.2						19.8	
Level of Service		D		C	C						B	
Approach Delay (s)		43.0			22.2			0.0			19.8	
Approach LOS		D			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	23.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	194	49	0	0	108	26	82	877	21	0	0	0
Future Volume (vph)	194	49	0	0	108	26	82	877	21	0	0	0
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	63%	63%	0%	0%	63%	57%	61%	68%	61%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	211	53	0	0	117	28	89	953	23	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	211	53	0	0	145	0	0	1065	0	0	0	0

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑			↑			↰↑↱				
Traffic Volume (vph)	194	49	0	0	108	26	82	877	21	0	0	0
Future Volume (vph)	194	49	0	0	108	26	82	877	21	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0			5.0				
Lane Util. Factor	1.00	1.00			1.00			0.95				
Frt	1.00	1.00			0.97			1.00				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1107	1166			1143			2142				
Flt Permitted	0.66	1.00			1.00			1.00				
Satd. Flow (perm)	775	1166			1143			2142				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	211	53	0	0	117	28	89	953	23	0	0	0
RTOR Reduction (vph)	0	0	0	0	12	0	0	2	0	0	0	0
Lane Group Flow (vph)	211	53	0	0	133	0	0	1063	0	0	0	0
Heavy Vehicles (%)	63%	63%	0%	0%	63%	57%	61%	68%	61%	0%	0%	0%
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			6				
Permitted Phases	4						6					
Actuated Green, G (s)	22.3	22.3			22.3			42.7				
Effective Green, g (s)	22.3	22.3			22.3			42.7				
Actuated g/C Ratio	0.30	0.30			0.30			0.57				
Clearance Time (s)	5.0	5.0			5.0			5.0				
Vehicle Extension (s)	2.5	2.5			2.5			3.5				
Lane Grp Cap (vph)	230	346			339			1219				
v/s Ratio Prot		0.05			0.12							
v/s Ratio Perm	c0.27							0.50				
v/c Ratio	0.92	0.15			0.39			0.87				
Uniform Delay, d1	25.5	19.4			21.0			13.8				
Progression Factor	0.50	0.19			1.00			1.00				
Incremental Delay, d2	27.5	0.1			0.5			8.7				
Delay (s)	40.3	3.8			21.5			22.5				
Level of Service	D	A			C			C				
Approach Delay (s)		33.0			21.5			22.5			0.0	
Approach LOS		C			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	34	19	9	66	18	14	10	181	64	0	213	35
Future Volume (vph)	34	19	9	66	18	14	10	181	64	0	213	35
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	38	21	10	74	20	16	11	203	72	0	239	39
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	69	0	0	110	0	0	286	0	0	278	0

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	19	9	66	18	14	10	181	64	0	213	35
Future Volume (Veh/h)	34	19	9	66	18	14	10	181	64	0	213	35
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	38	21	10	74	20	16	11	203	72	0	239	39
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	546	556	258	540	539	239	278			275		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	546	556	258	540	539	239	278			275		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	91	95	99	83	96	98	99			100		
cM capacity (veh/h)	425	439	785	431	448	805	1296			1300		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	69	110	286	278
Volume Left	38	74	11	0
Volume Right	10	16	72	39
cSH	460	465	1296	1300
Volume to Capacity	0.15	0.24	0.01	0.00
Queue Length 95th (ft)	13	23	1	0
Control Delay (s)	14.2	15.1	0.4	0.0
Lane LOS	B	C	A	
Approach Delay (s)	14.2	15.1	0.4	0.0
Approach LOS	B	C		

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	35.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	40	5	3	42	9	43	3	188	19	32	188	18
Future Volume (vph)	40	5	3	42	9	43	3	188	19	32	188	18
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	44%	67%	50%	39%	33%	55%	0%	35%	38%	38%	32%	8%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	45	6	3	47	10	48	3	211	21	36	211	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	54	0	0	105	0	0	235	0	0	267	0

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	5	3	42	9	43	3	188	19	32	188	18
Future Volume (Veh/h)	40	5	3	42	9	43	3	188	19	32	188	18
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	45	6	3	47	10	48	3	211	21	36	211	20
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	574	531	221	526	530	222	231			232		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	574	531	221	526	530	222	231			232		
tC, single (s)	7.5	7.2	6.7	7.5	6.8	6.8	4.1			4.5		
tC, 2 stage (s)												
tF (s)	3.9	4.6	3.8	3.9	4.3	3.8	2.2			2.5		
p0 queue free %	86	98	100	88	97	93	100			97		
cM capacity (veh/h)	332	362	712	392	400	702	1349			1150		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	54	105	235	267
Volume Left	45	47	3	36
Volume Right	3	48	21	20
cSH	346	492	1349	1150
Volume to Capacity	0.16	0.21	0.00	0.03
Queue Length 95th (ft)	14	20	0	2
Control Delay (s)	17.3	14.3	0.1	1.4
Lane LOS	C	B	A	A
Approach Delay (s)	17.3	14.3	0.1	1.4
Approach LOS	C	B		

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	39.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	45	0	76	1	0	8	47	706	6	6	953	55
Future Volume (vph)	45	0	76	1	0	8	47	706	6	6	953	55
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	37%	0%	36%	0%	0%	60%	32%	48%	0%	50%	44%	46%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	51	0	85	1	0	9	53	793	7	7	1071	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	136	0	0	10	0	53	800	0	7	1133	0

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	0	76	1	0	8	47	706	6	6	953	55
Future Volume (Veh/h)	45	0	76	1	0	8	47	706	6	6	953	55
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	51	0	85	1	0	9	53	793	7	7	1071	62
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			TWLTL	
Median storage veh)											2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2024	2022	1102	2072	2050	796	1133			800		
vC1, stage 1 conf vol	1116	1116		902	902							
vC2, stage 2 conf vol	908	906		1170	1147							
vCu, unblocked vol	2024	2022	1102	2072	2050	796	1133			800		
tC, single (s)	7.5	6.5	6.6	7.1	6.5	6.8	4.4			4.6		
tC, 2 stage (s)	6.5	5.5		6.1	5.5							
tF (s)	3.8	4.0	3.6	3.5	4.0	3.8	2.5			2.7		
p0 queue free %	68	100	61	99	100	97	90			99		
cM capacity (veh/h)	158	210	221	86	183	309	519			647		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	136	10	53	800	7	1133
Volume Left	51	1	53	0	7	0
Volume Right	85	9	0	7	0	62
cSH	192	245	519	1700	647	1700
Volume to Capacity	0.71	0.04	0.10	0.47	0.01	0.67
Queue Length 95th (ft)	111	3	8	0	1	0
Control Delay (s)	59.6	20.3	12.7	0.0	10.6	0.0
Lane LOS	F	C	B		B	
Approach Delay (s)	59.6	20.3	0.8		0.1	
Approach LOS	F	C				

Intersection Summary			
Average Delay	4.2		
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	14	39	600	10	42	815
Future Volume (vph)	14	39	600	10	42	815
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	44%	23%	45%	57%	29%	55%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	16	44	674	11	47	916
Shared Lane Traffic (%)						
Lane Group Flow (vph)	60	0	685	0	47	916

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	14	39	600	10	42	815
Future Volume (Veh/h)	14	39	600	10	42	815
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	16	44	674	11	47	916
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1690	680			685	
vC1, stage 1 conf vol	680					
vC2, stage 2 conf vol	1010					
vCu, unblocked vol	1690	680			685	
tC, single (s)	6.8	6.4			4.4	
tC, 2 stage (s)	5.8					
tF (s)	3.9	3.5			2.5	
p0 queue free %	93	89			94	
cM capacity (veh/h)	238	417			795	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	60	685	47	916
Volume Left	16	0	47	0
Volume Right	44	11	0	0
cSH	347	1700	795	1700
Volume to Capacity	0.17	0.40	0.06	0.54
Queue Length 95th (ft)	15	0	5	0
Control Delay (s)	17.5	0.0	9.8	0.0
Lane LOS	C		A	
Approach Delay (s)	17.5	0.0	0.5	
Approach LOS	C			

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	0	155	40	0	31	109	822	35	61	1095	130
Future Volume (Veh/h)	93	0	155	40	0	31	109	822	35	61	1095	130
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	104	0	174	45	0	35	122	924	39	69	1230	146
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2644	2648	1303	2730	2702	944	1376			963		
vC1, stage 1 conf vol	1441	1441		1188	1188							
vC2, stage 2 conf vol	1203	1207		1542	1514							
vCu, unblocked vol	2644	2648	1303	2730	2702	944	1376			963		
tC, single (s)	7.5	6.5	6.6	7.1	6.5	6.8	4.4			4.6		
tC, 2 stage (s)	6.5	5.5		6.1	5.5							
tF (s)	3.8	4.0	3.6	3.5	4.0	3.8	2.5			2.7		
p0 queue free %	0	100	0	0	100	86	71			88		
cM capacity (veh/h)	43	92	166	0	38	250	414			554		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	278	80	122	963	69	1376
Volume Left	104	45	122	0	69	0
Volume Right	174	35	0	39	0	146
cSH	80	0	414	1700	554	1700
Volume to Capacity	3.48	Err	0.29	0.57	0.12	0.81
Queue Length 95th (ft)	Err	Err	30	0	11	0
Control Delay (s)	Err	Err	17.3	0.0	12.4	0.0
Lane LOS	F	F	C		B	
Approach Delay (s)	Err	Err	1.9		0.6	
Approach LOS	F	F				

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	97.6%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	0	155	53	0	62	109	691	39	55	934	130
Future Volume (Veh/h)	93	0	155	53	0	62	109	691	39	55	934	130
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.89	0.92	0.89	0.92	0.89	0.89	0.89	0.89	0.92
Hourly flow rate (vph)	101	0	168	60	0	70	118	776	44	62	1049	141
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2326	2300	1120	2375	2348	798	1190			820		
vC1, stage 1 conf vol	1244	1244		1034	1034							
vC2, stage 2 conf vol	1082	1056		1341	1314							
vCu, unblocked vol	2326	2300	1120	2375	2348	798	1190			820		
tC, single (s)	7.1	6.5	6.2	7.5	6.5	6.4	4.1			4.4		
tC, 2 stage (s)	6.1	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.9	4.0	3.5	2.2			2.5		
p0 queue free %	0	100	33	0	100	80	80			91		
cM capacity (veh/h)	92	138	251	5	84	355	587			703		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	269	130	118	820	62	1190
Volume Left	101	60	118	0	62	0
Volume Right	168	70	0	44	0	141
cSH	152	10	587	1700	703	1700
Volume to Capacity	1.77	13.07	0.20	0.48	0.09	0.70
Queue Length 95th (ft)	494	Err	19	0	7	0
Control Delay (s)	423.8	Err	12.7	0.0	10.6	0.0
Lane LOS	F	F	B		B	
Approach Delay (s)	423.8	Err	1.6		0.5	
Approach LOS	F	F				

Intersection Summary			
Average Delay	546.9		
Intersection Capacity Utilization	90.5%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	0	155	40	0	31	109	822	35	61	1095	130
Future Volume (vph)	93	0	155	40	0	31	109	822	35	61	1095	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.92			0.94		1.00	0.99		1.00	0.98	
Flt Protected		0.98			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1252			1377		1367	2457		1203	2463	
Flt Permitted		0.86			0.70		0.15	1.00		0.26	1.00	
Satd. Flow (perm)		1101			988		210	2457		335	2463	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	104	0	174	45	0	35	122	924	39	69	1230	146
RTOR Reduction (vph)	0	73	0	0	27	0	0	4	0	0	12	0
Lane Group Flow (vph)	0	205	0	0	53	0	122	959	0	69	1364	0
Heavy Vehicles (%)	37%	0%	36%	0%	0%	60%	32%	48%	0%	50%	44%	46%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		16.5			16.5		49.4	49.4		49.4	49.4	
Effective Green, g (s)		16.5			16.5		49.4	49.4		49.4	49.4	
Actuated g/C Ratio		0.22			0.22		0.66	0.66		0.66	0.66	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		242			217		138	1620		220	1624	
v/s Ratio Prot								0.39			0.55	
v/s Ratio Perm		c0.19			0.05		c0.58			0.21		
v/c Ratio		0.85			0.24		0.88	0.59		0.31	0.84	
Uniform Delay, d1		28.0			24.1		10.4	7.1		5.5	9.7	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		23.2			0.6		43.7	0.6		0.8	4.1	
Delay (s)		51.2			24.6		54.1	7.7		6.3	13.8	
Level of Service		D			C		D	A		A	B	
Approach Delay (s)		51.2			24.6			12.9			13.5	
Approach LOS		D			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	74.9	Sum of lost time (s)	9.0
Intersection Capacity Utilization	67.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	0	155	53	0	62	109	691	39	55	934	130
Future Volume (vph)	93	0	155	53	0	62	109	691	39	55	934	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.92			0.93		1.00	0.99		1.00	0.98	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1674			1298		1770	2459		1399	2384	
Flt Permitted		0.70			0.98		0.15	1.00		0.28	1.00	
Satd. Flow (perm)		1189			1298		281	2459		415	2384	
Peak-hour factor, PHF	0.92	0.92	0.92	0.89	0.92	0.89	0.92	0.89	0.89	0.89	0.89	0.92
Adj. Flow (vph)	101	0	168	60	0	70	118	776	44	62	1049	141
RTOR Reduction (vph)	0	59	0	0	58	0	0	4	0	0	10	0
Lane Group Flow (vph)	0	210	0	0	72	0	118	816	0	62	1180	0
Heavy Vehicles (%)	2%	2%	2%	44%	2%	23%	2%	45%	57%	29%	55%	2%
Turn Type	Perm	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases		4		8	8			2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		18.1			10.5		49.4	49.4		49.4	49.4	
Effective Green, g (s)		18.1			10.5		49.4	49.4		49.4	49.4	
Actuated g/C Ratio		0.20			0.11		0.54	0.54		0.54	0.54	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		235			148		151	1327		224	1287	
v/s Ratio Prot					c0.06			0.33			c0.50	
v/s Ratio Perm		c0.18					0.42			0.15		
v/c Ratio		0.90			0.49		0.78	0.62		0.28	0.92	
Uniform Delay, d1		35.8			38.0		16.8	14.5		11.4	19.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		32.1			2.5		22.6	0.9		0.7	10.4	
Delay (s)		67.9			40.5		39.4	15.4		12.1	29.6	
Level of Service		E			D		D	B		B	C	
Approach Delay (s)		67.9			40.5			18.4			28.7	
Approach LOS		E			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	29.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	91.5	Sum of lost time (s)	13.5
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	93	155	40	109	0	0	0	0	61	1095	130
Future Volume (vph)	0	93	155	40	109	0	0	0	0	61	1095	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5						4.5	
Lane Util. Factor		1.00			1.00						0.95	
Frt		0.92			1.00						0.98	
Flt Protected		1.00			0.99						1.00	
Satd. Flow (prot)		1420			1875						2455	
Flt Permitted		1.00			0.59						1.00	
Satd. Flow (perm)		1420			1124						2455	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	0	104	174	45	122	0	0	0	0	69	1230	146
RTOR Reduction (vph)	0	67	0	0	0	0	0	0	0	0	10	0
Lane Group Flow (vph)	0	211	0	0	167	0	0	0	0	0	1435	0
Heavy Vehicles (%)	37%	0%	36%	0%	0%	60%	32%	48%	0%	50%	44%	46%
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		14.8			14.8						51.2	
Effective Green, g (s)		14.8			14.8						51.2	
Actuated g/C Ratio		0.20			0.20						0.68	
Clearance Time (s)		4.5			4.5						4.5	
Vehicle Extension (s)		3.0			3.0						3.0	
Lane Grp Cap (vph)		280			221						1675	
v/s Ratio Prot		c0.15										
v/s Ratio Perm					0.15						0.58	
v/c Ratio		0.75			0.76						0.86	
Uniform Delay, d1		28.4			28.4						9.1	
Progression Factor		1.00			1.10						1.00	
Incremental Delay, d2		11.0			13.0						5.9	
Delay (s)		39.4			44.3						15.0	
Level of Service		D			D						B	
Approach Delay (s)		39.4			44.3			0.0			15.0	
Approach LOS		D			D			A			B	

Intersection Summary			
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	93	155	53	109	0	0	0	0	55	934	130
Future Volume (vph)	0	93	155	53	109	0	0	0	0	55	934	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5						4.5	
Lane Util. Factor		1.00			1.00						0.95	
Frt		0.92			1.00						0.98	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		1706			1609						2396	
Flt Permitted		1.00			0.98						1.00	
Satd. Flow (perm)		1706			1609						2396	
Peak-hour factor, PHF	0.92	0.92	0.92	0.89	0.92	0.89	0.92	0.89	0.89	0.89	0.89	0.92
Adj. Flow (vph)	0	101	168	60	118	0	0	0	0	62	1049	141
RTOR Reduction (vph)	0	62	0	0	0	0	0	0	0	0	9	0
Lane Group Flow (vph)	0	207	0	0	178	0	0	0	0	0	1243	0
Heavy Vehicles (%)	2%	2%	2%	44%	2%	23%	2%	45%	57%	29%	55%	2%
Turn Type		NA		Split	NA					Perm	NA	
Protected Phases		4		8	8						6	
Permitted Phases										6		
Actuated Green, G (s)		15.6			15.3						55.6	
Effective Green, g (s)		15.6			15.3						55.6	
Actuated g/C Ratio		0.16			0.15						0.56	
Clearance Time (s)		4.5			4.5						4.5	
Vehicle Extension (s)		3.0			3.0						3.0	
Lane Grp Cap (vph)		266			246						1332	
v/s Ratio Prot		c0.12			c0.11							
v/s Ratio Perm											0.52	
v/c Ratio		0.78			0.72						0.93	
Uniform Delay, d1		40.5			40.3						20.5	
Progression Factor		1.00			1.22						1.00	
Incremental Delay, d2		13.5			9.8						13.1	
Delay (s)		54.0			59.0						33.6	
Level of Service		D			E						C	
Approach Delay (s)		54.0			59.0			0.0			33.6	
Approach LOS		D			E			A			C	

Intersection Summary			
HCM 2000 Control Delay	39.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	124	0	144	822	0	0
Future Volume (vph)	124	0	144	822	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5			4.5		
Lane Util. Factor	1.00			0.95		
Frt	1.00			1.00		
Flt Protected	0.95			0.99		
Satd. Flow (prot)	1770			3513		
Flt Permitted	0.95			0.99		
Satd. Flow (perm)	1770			3513		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	135	0	157	893	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	135	0	0	1050	0	0
Turn Type	Prot		Perm	NA		
Protected Phases	7			2		
Permitted Phases			2			
Actuated Green, G (s)	9.6			56.4		
Effective Green, g (s)	9.6			56.4		
Actuated g/C Ratio	0.13			0.75		
Clearance Time (s)	4.5			4.5		
Vehicle Extension (s)	3.0			3.0		
Lane Grp Cap (vph)	226			2641		
v/s Ratio Prot	c0.08					
v/s Ratio Perm				0.30		
v/c Ratio	0.60			0.40		
Uniform Delay, d1	30.9			3.3		
Progression Factor	1.28			1.00		
Incremental Delay, d2	2.7			0.4		
Delay (s)	42.2			3.7		
Level of Service	D			A		
Approach Delay (s)	42.2			3.7	0.0	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	41.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	155	0	148	691	0	0
Future Volume (vph)	155	0	148	691	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5			4.5		
Lane Util. Factor	1.00			0.95		
Frt	1.00			1.00		
Flt Protected	0.95			0.99		
Satd. Flow (prot)	1770			3508		
Flt Permitted	0.95			0.99		
Satd. Flow (perm)	1770			3508		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	168	0	161	751	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	168	0	0	912	0	0
Turn Type	Prot		Perm	NA		
Protected Phases	4			2		
Permitted Phases			2			
Actuated Green, G (s)	14.8			76.2		
Effective Green, g (s)	14.8			76.2		
Actuated g/C Ratio	0.15			0.76		
Clearance Time (s)	4.5			4.5		
Vehicle Extension (s)	3.0			3.0		
Lane Grp Cap (vph)	261			2673		
v/s Ratio Prot	c0.09					
v/s Ratio Perm				0.26		
v/c Ratio	0.64			0.34		
Uniform Delay, d1	40.1			3.8		
Progression Factor	0.78			1.00		
Incremental Delay, d2	3.2			0.3		
Delay (s)	34.5			4.2		
Level of Service	C			A		
Approach Delay (s)	34.5			4.2	0.0	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	39.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	0	155	40	0	31	109	575	35	61	767	130
Future Volume (vph)	93	0	155	40	0	31	109	575	35	61	767	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.92			0.94		1.00	0.99		1.00	0.98	
Flt Protected		0.98			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1252			1377		1367	1297		1203	1288	
Flt Permitted		0.85			0.63		0.17	1.00		0.34	1.00	
Satd. Flow (perm)		1090			893		249	1297		425	1288	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	104	0	174	45	0	35	122	646	39	69	862	146
RTOR Reduction (vph)	0	60	0	0	28	0	0	2	0	0	6	0
Lane Group Flow (vph)	0	218	0	0	52	0	122	683	0	69	1002	0
Heavy Vehicles (%)	37%	0%	36%	0%	0%	60%	32%	48%	0%	50%	44%	46%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		18.7			18.7		73.1	73.1		73.1	73.1	
Effective Green, g (s)		18.7			18.7		73.1	73.1		73.1	73.1	
Actuated g/C Ratio		0.19			0.19		0.73	0.73		0.73	0.73	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		202			165		180	940		308	934	
v/s Ratio Prot								0.53			c0.78	
v/s Ratio Perm		c0.20			0.06		0.49			0.16		
v/c Ratio		1.08			0.32		0.68	0.73		0.22	1.07	
Uniform Delay, d1		41.0			35.5		7.5	8.0		4.5	13.9	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		85.6			1.1		9.7	2.8		0.4	51.0	
Delay (s)		126.6			36.6		17.2	10.9		4.9	64.8	
Level of Service		F			D		B	B		A	E	
Approach Delay (s)		126.6			36.6			11.8			61.0	
Approach LOS		F			D			B			E	

Intersection Summary			
HCM 2000 Control Delay	50.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	100.8	Sum of lost time (s)	9.0
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	0	155	53	0	62	109	483	39	61	767	130
Future Volume (vph)	93	0	155	53	0	62	109	483	39	61	767	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.92			0.93		1.00	0.99		1.00	0.98	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1674			1298		1770	1288		1399	1261	
Flt Permitted		0.70			0.98		0.08	1.00		0.34	1.00	
Satd. Flow (perm)		1188			1298		154	1288		497	1261	
Peak-hour factor, PHF	0.92	0.92	0.92	0.89	0.92	0.89	0.92	0.89	0.89	0.89	0.89	0.92
Adj. Flow (vph)	101	0	168	60	0	70	118	543	44	69	862	141
RTOR Reduction (vph)	0	49	0	0	49	0	0	2	0	0	5	0
Lane Group Flow (vph)	0	220	0	0	81	0	118	585	0	69	998	0
Heavy Vehicles (%)	2%	2%	2%	44%	2%	23%	2%	45%	57%	29%	55%	2%
Turn Type	Perm	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases		4		8	8			2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		18.5			11.9		70.1	70.1		70.1	70.1	
Effective Green, g (s)		18.5			11.9		70.1	70.1		70.1	70.1	
Actuated g/C Ratio		0.16			0.10		0.61	0.61		0.61	0.61	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		192			135		94	792		305	775	
v/s Ratio Prot					c0.06			0.45			c0.79	
v/s Ratio Perm		c0.18					0.76			0.14		
v/c Ratio		1.14			0.60		1.26	0.74		0.23	1.29	
Uniform Delay, d1		47.8			48.8		22.0	15.5		9.8	22.0	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		108.9			7.0		176.3	3.6		0.4	139.4	
Delay (s)		156.7			55.7		198.2	19.1		10.2	161.3	
Level of Service		F			E		F	B		B	F	
Approach Delay (s)		156.7			55.7			49.1			151.6	
Approach LOS		F			E			D			F	

Intersection Summary			
HCM 2000 Control Delay	113.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	114.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	83.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	186	155	0	149	31	0	1024	35	0	1197	130
Future Volume (vph)	0	186	155	0	149	31	0	1024	35	0	1197	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5			4.5			4.5	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frt		0.94			0.98			1.00			0.99	
Flt Protected		1.00			1.00			1.00			1.00	
Satd. Flow (prot)		1533			1681			2453			2467	
Flt Permitted		1.00			1.00			1.00			1.00	
Satd. Flow (perm)		1533			1681			2453			2467	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	0	209	174	0	167	35	0	1151	39	0	1345	146
RTOR Reduction (vph)	0	24	0	0	6	0	0	3	0	0	9	0
Lane Group Flow (vph)	0	359	0	0	196	0	0	1187	0	0	1482	0
Heavy Vehicles (%)	37%	0%	36%	0%	0%	60%	32%	48%	0%	50%	44%	46%
Turn Type		NA			NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases												
Actuated Green, G (s)		23.1			23.1			65.8			65.8	
Effective Green, g (s)		23.1			23.1			65.8			65.8	
Actuated g/C Ratio		0.24			0.24			0.67			0.67	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		361			396			1648			1658	
v/s Ratio Prot		c0.23			0.12			0.48			c0.60	
v/s Ratio Perm												
v/c Ratio		1.00			0.49			0.72			0.89	
Uniform Delay, d1		37.3			32.4			10.2			13.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		45.8			1.0			1.6			6.6	
Delay (s)		83.2			33.3			11.8			19.8	
Level of Service		F			C			B			B	
Approach Delay (s)		83.2			33.3			11.8			19.8	
Approach LOS		F			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	97.9	Sum of lost time (s)	9.0
Intersection Capacity Utilization	64.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	148	155	0	162	62	0	893	39	0	1041	130
Future Volume (vph)	0	148	155	0	162	62	0	893	39	0	1041	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5			4.5			4.5	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frt		0.93			0.96			0.99			0.98	
Flt Protected		1.00			1.00			1.00			1.00	
Satd. Flow (prot)		1734			1692			2465			2379	
Flt Permitted		1.00			1.00			1.00			1.00	
Satd. Flow (perm)		1734			1692			2465			2379	
Peak-hour factor, PHF	0.92	0.92	0.92	0.89	0.92	0.89	0.92	0.89	0.89	0.89	0.89	0.92
Adj. Flow (vph)	0	161	168	0	176	70	0	1003	44	0	1170	141
RTOR Reduction (vph)	0	28	0	0	11	0	0	4	0	0	13	0
Lane Group Flow (vph)	0	301	0	0	236	0	0	1043	0	0	1298	0
Heavy Vehicles (%)	2%	2%	2%	44%	2%	23%	2%	45%	57%	29%	55%	2%
Turn Type		NA			NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases												
Actuated Green, G (s)		19.1			19.1			48.3			48.3	
Effective Green, g (s)		19.1			19.1			48.3			48.3	
Actuated g/C Ratio		0.25			0.25			0.63			0.63	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		433			423			1558			1504	
v/s Ratio Prot		c0.17			0.14			0.42			c0.55	
v/s Ratio Perm												
v/c Ratio		0.70			0.56			0.67			0.86	
Uniform Delay, d1		26.0			25.0			9.0			11.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		4.8			1.6			1.1			5.4	
Delay (s)		30.8			26.6			10.1			16.8	
Level of Service		C			C			B			B	
Approach Delay (s)		30.8			26.6			10.1			16.8	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	76.4	Sum of lost time (s)	9.0
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Appendix 7: Alternatives Memorandum

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MEMORANDUM

Date: March 1, 2017 Project #: 18351

To: Madras TSP Advisory Committee

From: Matt Kittelson, PE and Yi-Min Ha

Project: Madras Transportation System Plan Update

Subject: Alternatives Analysis

This memorandum provides an assessment of roadway, intersection, pedestrian, bicycle, and transit alternatives for consideration in the Madras Transportation System Plan (TSP) Update. These preliminary recommendations will be reviewed with the Technical Advisory Committee (TAC), Project Advisory Committee (PAC) and Project Management Team (PMT). Following a review by these committees a community open house will be held to further refine the alternatives.

BACKGROUND

The Madras TSP Update will serve as the basis of future transportation improvements within the Madras urban growth boundary. This update is focusing on the broad transportation system (all modes of travel) with a specific emphasis on roadway connections and improvements along the US 97 and US 26 alignments through the community. A specific update to the bicycle and pedestrian plans was completed in 2012.

PLAN ELEMENTS

This alternatives assessment is broken down into the following potential project elements, which will be prioritized in the final Plan:

- Projects – capital investments made to improve the existing transportation system. Examples include new or improvement roadway connections, intersection enhancements, shared-use paths, bicycle lanes, sidewalks, crosswalks, and transit amenities.
- Future Studies – areas of the transportation system that will require additional analysis and refinement to identify the appropriate project for implementation. This could include areas such as the south US 97 alignment through Madras where additional technical and environmental studies will be necessary to establish a preferred alternative.

- Policies – statements adopted in the Madras TSP that are intended to influence and guide decisions and actions related to the development and planning of the transportation system.

ALTERNATIVES EVALUATION

Projects have been developed to address the gaps and deficiencies identified in the Existing and Future System Assessment and through PMT, advisory committee, and public input. Project alternatives are based on feedback from the advisory committee and the general public, the 2012 Madras Transportation System Plan, and the project team's experience with developing transportation plans and projects.

The following subsections identify the key categories of alternatives included in this evaluation. These include:

- Roadway Improvement Alternatives
- Intersection Improvement Alternatives
- Concept Area Plans
- South US 97 Highway Alternatives
- Roadway Cross-section Standards
- Pedestrian, Bicycle, and Multi-use Path Plans
- Transit Improvement Alternatives

The alternatives proposed for each modal plan are presented in the follow subsections.

Each alternative is evaluated against the Goals & Objectives of this TSP Update. The following criterion is used:

● - Meets goal and objective

○ - Partially meets goal and objective

Roadway Improvement Alternatives

This section identifies roadway improvement alternatives for consideration within the Madras TSP Update. The projects

Table 1 shows the alternatives by ID number. Figure 1 shows the location of these projects within Madras.

More specific improvement options for the South 97 area are discussed in a later section.

Intersection Improvement Alternatives

This section identifies intersection improvement alternatives for consideration within the Madras TSP Update. These projects are intended to improve connectivity within Madras and address existing safety

Table 2 shows the alternatives by ID number. Figure 1 shows the location of these projects within Madras.

More specific intersection improvement options for the US 97/Fairgrounds Road and US 97/Hall Road intersections are discussed in the South Madras Highway Alternatives section.

Concept Areas

There are three concept areas within the City of Madras that were identified by the project management team with input from the TSP advisory committees. These concept areas have the potential to attract development and grow at a faster rate compared to the rest of Madras. The three concept areas are shown in Figure 1

The focus of these Concept Areas is to identify transportation system improvements that will guide or assist development within the respective areas. The improvements planned within each area are shown on Figure 1 and described in more detail in the following subsections.

North Industrial Concept Area

The North Industrial Concept area is a partial developed area along US 26 north and west of the downtown Madras core. This area has seen increased industrial development and is currently the subject of the Madras Industrial Readiness Plan. Preliminary roadway improvement projects developed through that planning effort have been incorporated into the alternatives presented in this memorandum. The final outcomes of that plan should also be considered.

A key consideration of this concept area is improved existing or future access points to US 26. The area is currently served mostly via the exiting US 26/Cherry Lane intersection. Improvements to this and other intersections proposed for consideration in this TSP update include:

- US 26/Cherry Lane – Realign eastern leg to eliminate existing intersection offset. This improvement may require modifications or exceptions to the Madras urban growth boundary.
- Future connection to US 26 at proposed Wright Street extension
- US 26/Earl Street – Improved intersection that would provide access to existing and planned roadway network west and east of US 26.

Future roadway connections planned west of US 26 and within the existing industrial area are intended to expand the developable area and aid in future job creation for the community. Lands east of US 26 are undeveloped today. Future development plans may suggest modified roadway alignment options that would provide local access between Cherry Lane and the proposed Earl Street extension.

Central Madras Concept Area

The Central Madras Concept Area includes lands generally north of the North Y intersection and south of Jefferson Street. The improvements planned in this area are intended to improve circulation between US 26 and US 97, provide efficient access to/from the highway for transportation system users, and address existing safety concerns.

Key improvements under consideration include:

- Provide speed transition warnings for vehicles traveling southbound on US 97 towards Jefferson Street.
- Realign eastern leg of the US 97/Jefferson Street intersection to eliminate existing intersection offset.
- Widen US 97 from Cedar Street to Plum Street to complete 3-lane section
- Extend Cedar Street east of US 97 to improve local circulation and access to US 97 for businesses.
- Realign Jefferson Street at US 26 to connect with Lee Street.
- Improve and expand the local street system west of US 26 and east of US 97 to reduce reliance on the state highway system for local trips.

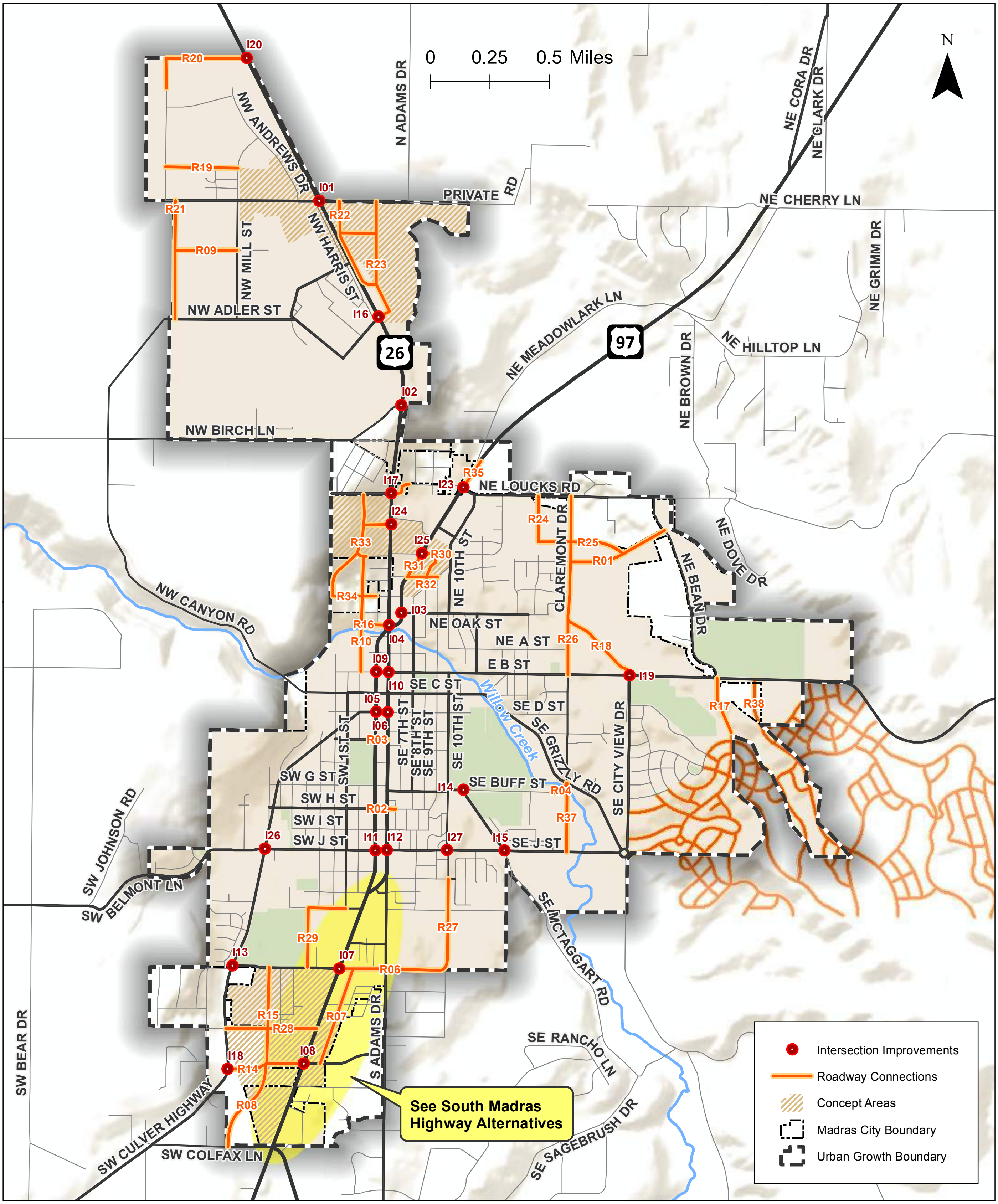
South Madras Concept Area

The South Madras Concept Area is generally the lands south of J Street and between Culver Highway and US 97. This area is a key future development area for the City of Madras. US 97 in this area consists of a 3-lane cross section with no existing capacity enhancements at intersections (i.e., traffic signals, roundabouts, etc.).

As this area develops in the future, the need for access to lands east and west of the highway will increasingly conflict with the high travel demand along the highway itself.

This TSP update has identified several alternatives to address the transportation needs in this area. These alternatives have been divided into two groups:

- **South Madras Highway Alternatives:** 5 alternatives have been developed that present different options to improve access to/from the highway in the area. These alternatives are presented in the next section.
    - NOTE: Identifying a final alternative for this section of highway will require a future refinement planning process conducted in close coordination with many agencies partners, including ODOT, Jefferson County, and other local, state, and federal entities. This TSP should refine the list of alternatives under consideration by that future process and near term
- **Local System Alternatives:** These improvements are intended to reduce the reliance on the highway for local trips. Specific improvements include:
    - Improved local street connections between Fairgrounds Road north to the downtown area.
    - Parallel road improvements east of US 97and improved access east to 10th Street.
    - The identification on an internal roadway network within the area between Culver Highway, US 97, Fairgrounds Road, and Colfax Road.



Roadway Projects
Madras, Oregon

Figure

1

H:\projfile\18351 - Madras TSP Update PDX\gis\Alternatives Analysis\XX_Roadway Connection - Copy.mxd - jsommerville - 1:10 PM 1/10/2017

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Oregon Department of Transportation

Table 1 – Roadway Connection Improvement Alternatives

ID*	Location	Project Description	Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment	Notes
R01	Marigold Street Extension	Extend Marigold Street from Claremont Drive to Bean Drive.	●	●	○	●	○	• Would improve east/west connectivity.
R02	H Street Extension	Connect H Street between 4th and Commerce Streets.	○	○	○	●	○	• The location of this proposed realignment is not known. The specific project will depend on land availability and constraints.
R03	E Street Connection	Realign E Street in the vicinity of 4th Street and 5th Street to provide a continuous east/west connection	○	○	○	●	○	• The location of this proposed realignment is not known. The specific project will depend on land availability and constraints.
R04	Buff Street Extension	Extend Buff Street to Grizzly Road	●	●	○	●	○	• Would improve connectivity in east Madras
R05	Plum Street Extension	Extend Plum Street to Henry Street & 9th Street	●	○	●	●	○	• Would improve connections east of US 97
R06	Fairgrounds Road Eastern Extension	Extend Fairgrounds Road to 10th Street extension.	●	●	●	●	●	• Would provide increased connectivity and route choice between US 97, Adams Drive, and 10th Street.
R07	Hall Road to Fairgrounds Road Eastern N/S Connection	Construct new roadway between proposed Fairgrounds Road Extension (R06) and Hall Road.	●	●	○	●	○	• Would provide increased n/s connection and alternative access options for businesses along US 97.
R08	Hall Road to Colfax Lane Connection	Construct new roadway between proposed Hall Road extension to Colfax Lane	●	●	○	●	●	• Would provide increased n/s connection and alternative access options for future development west of US 97.
R09	Paul Jasa Way Extension	Extend Paul Jasa Way to connect to Demers Drive	○	●	○	○	○	• Would be driven largely by future development.
R10	3rd Street Extension	Extend 3rd St to Cedar Street	●	○	○	●	○	• Prove n/s connectivity alternative to US 97 and US 26. Would allow alternative route around North Y intersection.
R14	Hall Road Extension	Extend Hall Rd to Culver Highway	●	●	●	●	●	• Would provide e/w connectivity through south concept area
R15	Hall Street-Fairgrounds Road Connection	Construct new roadway to connect Hall Rd Extension (R14) to Fairgrounds Rd	●	●	○	●	●	• Would provide n/s connectivity through south concept area
R16	Maple Street Extension	Extend Maple Street west to 3rd Street extension (R10)	●	○	○	●	○	• Would provide improved connectivity around North Y intersection

ID*	Location	Project Description	Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment	Notes
R17	Southern Bean Drive Extension	Extend Bean Drive from B Street to Yarrow Avenue Extension (R11) and J Street Extension (R12)	●	○	○	●	○	• Final alignment of this project will need to accommodate topographical constraints and final development activity in the area.
R18	Claremont Drive Improvement	Improve Claremont Drive between B Street and future Claremont Drive/Oak Street intersection	●	●	○	●	○	• Would improve connectivity in east Madras
R19	Jersey Street Extension	Extend Jersey Street from Mill Street to the Wright Street Extension. Construct US 26 frontage roadway between Jersey St/Mill St intersection	○	●	○	○	○	• Would be driven largely by future development.
R20	Wright Street Extension	Extend Wright Street to UGB and then east to US 26.	○	●	○	○	○	• Would be driven largely by future development.
R21	Demers Drive Extension	Extend/improve Demers Drive between Adler St and Cherry Lane.	○	●	○	○	○	• Would be driven largely by future development.
R22	Easterly US 26 Frontage Road	Construct US 26 frontage roadway between Cherry Lane and the proposed Easterly Early Street Extension.	○	●	○	○	○	• Would be driven largely by future development.
R23	Easterly Earl Street Extension	Construct new roadway between Cherry Lane and Earl Street/US 26 intersection.	○	●	○	○	○	• Would be driven largely by future development.
R24	16th Street Extension	Extend 16th Street from Loucks Rd to Cedar Street Extension	○	●	○	●	○	• Would be driven largely by future development.
R25	Cedar Street Eastern Extension	Extend Cedar Street from 16th Street extension to Marigold Street extension.	○	●	●	●	○	• Would be driven largely by future development.
R26	Kinkade Road/Claremont Drive Extension	Extend Kinkade Road/Claremont Drive from B Street to Loucks Drive	●	●	○	●	○	• Would improve n/s connectivity between Loucks Drive and J Street.
R27	10th Street Extension	Extend 10th Street to Fairground Road extension (R06)	●	●	●	●	●	• Would improve connectivity.
R28	E/W connection between Fairgrounds Road and Hall Road	Create new e/w connection between Fairgrounds Road and Hall Road within the South Concept Area	●	●	○	●	○	• Exact location of this roadway will depend on future development plans. Access to US 97 and Culver Highway should be evaluated.
R29	Fairgrounds Road to 2nd Street Connection	Construct a roadway connecting Fairgrounds Road and 2nd Street	●	○	○	●	●	• Would provide local street connection from South Concept Area to downtown Madras.

ID*	Location	Project Description	Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment	Notes
R30	Cedar Street Western Extension	Connect Cedar Street from US 97 on the west to 10th Street on the east with a new major collector	○	●	●	●	○	• Should be coupled with improvements to the US 97/Cedar Street intersection (I25)
R31	U 97 Widening	Widen US 97 to 3-lane section south of Cedar Street to Plum Street	●	○	●	○	●	• Would provide a center turn lane.
R32	8th Street Extension	Extend 8th Street to Cedar Street	○	●	●	●	○	• Would improve connectivity in central concept area
R33	Central Concept Area Connecting Roads	Construct roadways connecting Lee Street, US 26 and Poplar Street in the Central Concept Area	●	●	●	●	○	• Would improve connectivity and provide highway alternatives west of US 26 alignment.
R34	Poplar Street Extension	Extend Poplar Street from 4th Street to the Central Concept Area Connecting Roads (R33)	●	●	●	●	○	• Would improve connectivity and provide highway alternatives west of US 26 alignment.
R35	US 97 Traffic Calming	Implement speed treatments and advance warning signs on US 97 approaching Loucks Road	○	○	●	○	○	• Would address existing speed transition concern as vehicles enter Madras from north of US 97.
R36	Jefferson Street Realignment	Realign Jefferson Street to connect with Lee Street	●	○	●	○	○	• Will help with circulation between US 97 and US 26 north of the North Y.
R37	Kinkade Road Extension	Extend Kinkade Road from Grizzly Road to J Street	●	●	○	●	○	• Will improve connectivity and route options on the east side of Madras. • Will require crossing of Willow Creek
R38	Yarrow Community Network Improvements	Construct a roadway network consistent with the topographical constraints and development activity in the Yarrow Community.	○	○	○	○	○	• The Yarrow Community Master Plan identifies an expanded roadway network in the vicinity

Table 2 – Intersection Improvement Alternatives

ID*	Location	Project Description	Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment	Notes
I01	US 26/Cherry Lane	Realign Cherry Lane to the east to eliminate intersection skew. Capacity enhancements may be required in the future due to increased development east or west of the highway.	○	●	○	○	○	• Realignment of Cherry Lane east of US 26 may require modification to the UGB.
I02	US 26/Depot Road	Upgrade intersection to address capacity needs.	○	●	○	○	○	• Evaluate need for capacity enhancement as development increases in the area. Future road may extend east from this intersection.
I03	US 97/Oak Street	Upgrade intersection to address capacity and safety needs	○	○	●	○	○	• Consider capacity improvement. The need for such an improvement will depend on intersection volume growth in the future.
I04	North Y Intersection Improvements	Upgrade intersection to address capacity and safety needs for concept area.	●	●	●	○	○	• Key considerations include redesign to add another turn lane from US 97 southbound to 4th Street. Consider feasibility of roundabout.
I05	D Street/4th Street	Upgrade intersection to address capacity and safety needs.	○	○	●	●	○	• Consider adding curb extensions and pedestrian countdown timers.
I06	D Street/5th Street	Upgrade intersection to address capacity and safety needs.	○	○	●	●	○	• Monitor crash patterns for improvement options
I07	US 97/Fairgrounds	Construct intersection improvement to address capacity and safety needs for concept area.	●	●	●	●	○	• See South 97 Highway Alternatives for more detail
I08	US 97/Hall Road	Construct intersection improvement to address capacity and geometric design needs for concept area.	●	●	●	●	○	• See South 97 Highway Alternatives for more detail
I09	B Street/4th Street	Upgrade intersection to address safety needs	○	○	●	●	○	• Monitor to identify potential safety improvement options
I10	B Street/5th Street	Upgrade intersection to address safety needs	○	○	●	●	○	• Monitor to identify potential safety improvement options
I11	J Street/4th Street	Construct traffic signal. Relocate pole or redesign intersection to mitigate sight distance obstruction at this intersection.	●	●	●	●	○	• Part of US 97: J Street Intersection (Madras South Y) Project.
I12	J Street/5th Street	Construct traffic signal. Relocate pole or redesign intersection to mitigate sight distance obstruction at this intersection.	●	●	●	●	○	• Part of US 97: J Street Intersection (Madras South Y) Project.

ID*	Location	Project Description	Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment	Notes
I13	Culver Highway/ Fairgrounds Road	Eliminate intersection skew angle	○	○	○	○	○	• Would likely require additional right-of-way
I14	SE 10th Street, Buff Street/McTaggart Road	Construct intersection improvement that connects SE 10th Street, Buff Street and McTaggart Road.	●	○	○	●	○	• Consider the feasibility of a roundabout.
I15	J Street/McTaggart Road	Construct intersection improvement at J Street and McTaggart Road.	●	○	○	●	○	• Consider the feasibility of a roundabout.
I16	US 26/Earl Street Concept Area Intersection Enhancements	Upgrade intersection to address capacity needs for concept area. Construct two parallel frontage roads between the railroad tracks and Earl Street. Current eastbound left-turn and northbound left-turn movements would be removed. A non-traversable median will be constructed on US 26 to prevent left-turns between US 26 and Earl Street.	●	●	○	○	○	• The Need for an improvement will be largely due to increased development in the area.
I17	US 26/Lee Street Concept Area Intersection Enhancements	Upgrade intersection to address capacity needs for concept area	○	●	○	○	○	• Should be coupled with Jefferson Street Realignment (R36)
I18	Culver Highway/Hall Road Extension Concept Area Intersection Enhancements	Upgrade intersection to address capacity needs for concept area	○	●	○	○	○	• Need for improvement would be driven by development intensity in the area
I19	City View Drive/ B Street	Construct intersection improvement at City View Drive and B Street.	●	○	○	●	○	• Consider the feasibility of a roundabout.
I23	US 97/Loucks Road Realignment	Reconfigure intersection to eliminate the existing alignment issue for vehicles westbound on Loucks Road.	●	○	○	●	○	• Existing alignment may confuse drivers
I24	US 26/Mazatlan Intersection	Add west leg to intersection and construct southbound right-turn lane.	○	○	○	○	○	• This intersection improvement was identified in a development master plan. Access would be right-in, right-out.

ID*	Location	Project Description	Mobility and Connectivity	Economic Development	Safety	Multimodal Users	Environment	Notes
I25	US 97/Cedar Street	Construct intersection for connection between US 97 and Cedar Street Eastern Extension	●	●	○	●	○	• Should be coupled with project R30
I26	J Street/Culver Highway	Consider long-term capacity enhancements.	○	●	○	○	○	• J Street and Culver Highway will likely see continued increased demand. This intersection may require capacity improvements to accommodate this demand. The need for such an improvement should be periodically monitored.

South Madras Highway Alternatives

This section presents highway configuration alternatives for US 97 in south Madras, OR. The purpose of these alternatives are to evaluate options that would allow for through trips on US 97 and US 26 within Madras while providing options for access locations to the Madras local system.

The general boundaries of the study are the US 97/US 26 alignment from J Street in the north to the southern Madras city limits (just north of US 97/US 26/Colfax Lane).

The alternatives currently under evaluation include:

- **No-Build:** Would maintain existing roadway configuration.
- **5-lane section:** Would expand the existing 3-lane section to 5-lanes.
- **Extended one-way couplet:** Would extend the existing one-way couplet south through the study area. This alternative would utilize the existing US 97/US 26 alignment as the southbound couplet and use a part of the existing Adams Drive corridor as the northbound alignment.
- **Truck/vehicle bypass:** Would construct an improvement consistent with the currently planned truck bypass that would traverse around the Madras core via a west side alignment. This bypass is currently part of the Madras Transportation System Plan.
- **Jug-handle intersection improvements:** Would retain the existing 3-lane section and identify locations where jug-handle intersection improvement could be made.

The assumed configurations of these alternatives are shown in Figure 2.

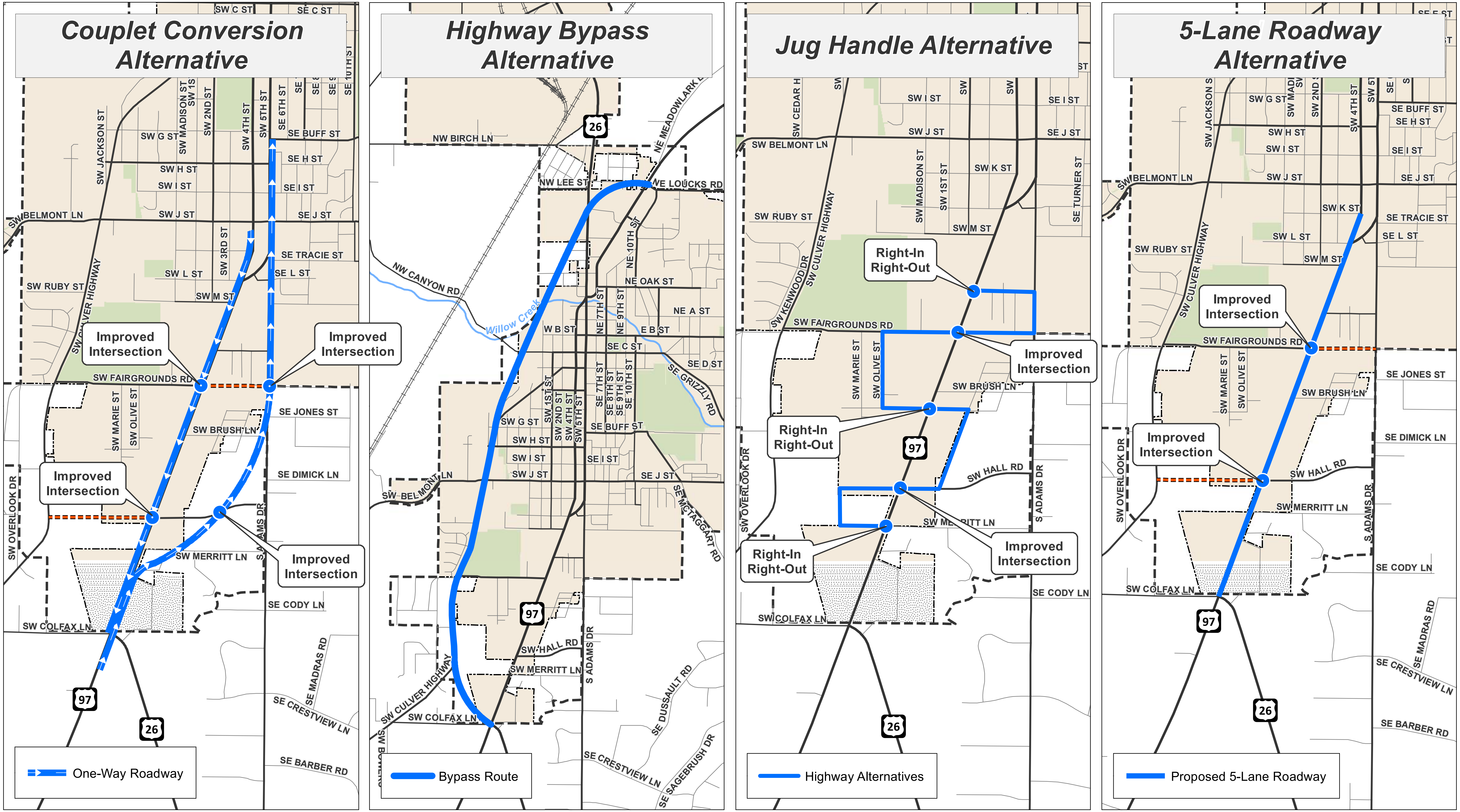
These alternatives would serve the south Madras concept area, an area of the city that has significant development potential in the future. The area was recently zoned for mixed use development.

Local System Improvements

With any alternative, the Madras TSP will include local street system improvement projects that aim to:

- Reduce local trip reliance on the highway
- Improve connectivity from the southern area of Madras to the downtown core for all travel modes
- Develop a complete, redundant local street grid

These improvements are discussed further in the South Madras Concept Area section and the roadway improvement alternatives section of this memorandum.



THE CITY OF MADRAS

DRAFT

South Madras Highway Alternatives
Madras TSP Update

Figure
2

Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: City of Madras

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No-Build

Key alternative assumptions:

- Maintain existing highway configuration
- Construct intersection improvement at Fairground Road and Hall Road intersections
- Fairground Road extended east to Adams Drive
- Hall Road extended west to Culver Highway

Table3. Summary of No Build Alternative

Criteria	Notes
Meets Mobility Targets?	No, the US 97 intersections with Fairgrounds Road and Halls Road would experience high delay as either a traffic signal or roundabout for both the highway mainline and side-street movements.
Ability to Phase?	Yes, the improvements needed to construct this alternative are relatively minor and could be completed in phases.
Allow Interim Development?	Yes, though the ability serve development in the long-term may be challenged the poor operations expected at the highway access intersections.
Cost of Infrastructure Improvements?	Low
Other/Comments	The No Build option is straight forward and low cost. However, this alternative has a low resiliency to serve side-street demand while also serving highway volumes.

Figure 3 – Existing 3-lane section in south Madras

5-Lane Section

Key alternative assumptions:

- Highway section would be expanded to 5-lanes (two through lanes and a center turn lane)
- Construct intersection improvement at Fairground Road and Hall Road intersections
- Fairground Road extended east to Adams Drive
- Hall Road extended west to Culver Highway

Table 4. Summary of 5 Lane Section Alternative

Criteria	Notes
Meets Mobility Targets?	Yes, the US 97 intersections with Fairgrounds Road and Halls Road are both expected to operate with a v/c of less than 1.0 with as many as 1,000 additional side-street trips added when configured as a traffic signal. A multi-lane roundabout configuration would experience higher delays, but is expected to operate with a v/c near 1.0. Both a roundabout and signalized intersection configuration would operate below v/c of 1.0 with 500 additional side-street trips.
Ability to Phase?	Yes, the widened highway section and intersection improvements could be completed in phases.
Allow interim Development?	Yes, though the cost to do so may be high given the high cost to widen the highway to a 5-lane section. Alternative mobility targets may be necessary till the full improvement is constructed.
Cost of Infrastructure Improvements?	Potentially high given right-of-way constraints to the north.
Other/Comments	The 5-lane section alternative adds a significant amount of capacity to the highway, but faces right-of-way constraints to the north. In addition, this improvement could significantly alter the environment for non-auto modes. Need to assess this alternative against long-term community values and goals for this area.

Figure 4 – Existing 5-lane section in Redmond

Extend One-Way Couplet

Key alternative assumptions:

- Existing highway section would become 2-lane southbound portion of the couplet
- A section of the existing Adams Road alignment would become the new 2-lane northbound portion of the couplet
- Intersection improvements would be constructed at Fairgrounds Road and Hall Road intersections with the northbound and southbound couplets.
- Fairground Road extended east to Adams Drive (northbound couplet)
- Hall Road extended west to Culver Highway

Table 5. Summary of One Way Couplet Alternative

Criteria	Notes
Meets Mobility Targets?	Yes, all couplet intersections are expected to operate below a v/c of 1.0 with the construction of signalized intersections and near 1.0 with the construction of roundabouts.
Ability to Phase?	Potentially, the ability to phase this improvement would depend on available right-of-way to complete the couplet. The interim condition would continue to rely on a 3-lane highway section.
Allow interim Development?	Challenging. Given the significant modification to the highway proposed by this improvement, a single development would be unlikely to much more than pay towards the overall improvement cost. Alternative mobility targets would likely be necessary.
Cost of Infrastructure Improvements?	High, construction of the couplet would require significant modification to the existing highway section, significant improvements to Adams Drive, and large right-of-way acquisitions. It would also require four intersection improvements.
Other/Comments	While challenging to implement, the couplet alternative could bring unique economic opportunities to Madras by effectively extending the downtown core south. It could also improve the highway environment for non-auto modes.

Figure 5 – Existing couplet section in Madras

Truck/Vehicle Bypass

Key alternative assumptions:

- Bypass route would be constructed west of the current highway alignment.
- The bypass would extend to north of the North Y intersection.
- The existence of the bypass was assumed to reduce demand on the highway by roughly 30 percent.
- Intersection improvements would be constructed at the Fairgrounds Road and Hall Road intersections with the current highway alignment.
- Fairground Road extended east to Adams Drive
- Hall Road extended west to Culver Highway

Table 6. Summary of Bypass Alternative

Criteria	Notes
Meets Mobility Targets?	Potentially, the reduction in volume on the current highway alignment helps operations, but demand would still be high and potentially require additional north/south capacity at improved intersections.
Ability to Phase?	Low, improvements could be made to the existing highway alignment prior to the bypass construction. However, the bypass would require significant time and resources to complete.
Allow interim Development?	Challenging. Alternative mobility targets would likely be necessary until the bypass is completed.
Cost of Infrastructure Improvements?	Very high.
Other/Comments	The bypass option would be very challenging to implement and could have a negative economic effect on the Madras community. Limiting the bypass to “trucks only” would also be difficult.

Jug Handle Intersection Improvements

Key alternative assumptions:

- Two-phase signals would be constructed at the Fairgrounds Road and Hall Road intersections.
- Right-in, right-out intersections would be constructed north and south of these intersections to allow movements on and off the highway. The location of these improvements would be a key aspect of this alternative.
- Fairground Road extended east to Adams Drive
- Hall Road extended west to Culver Highway

Table 7. Summary of Jug Handle Alternative

Criteria	Notes
Meets Mobility Targets?	Potentially, though north/south capacity enhancements may still be necessary at the Fairgrounds Road and Hall Road intersections, potentially in the form of auxiliary through lanes.
Ability to Phase?	High, improvements could be made in the short term to the Fairgrounds Road and Hall Road intersections. Local roadway improvements could be made to build towards right-in, right-out connections.
Allow interim Development?	Yes, local development could partner with ODOT and Madras to build tangible phases of this alternative.
Cost of Infrastructure Improvements?	Unknown, would depend of local improvement needs and the potential need to build auxiliary lanes on the highway alignment.
Other/Comments	This alternative could also build towards an eventual overcrossing of the highway at either Fairgrounds Road or Hall Road. The largest challenge of this alternative would be to provide adequate wayfinding for travelers coming to/from the highway if right-in, right-out intersections cannot be sited close to the existing intersections.

The jug handle alternative would experience significant queues in the northbound and southbound direction with the current 2 through lane configuration. Table 6 and Table 7 illustrates the anticipated 95th percentile queue for a 2-lane and 4-lane jug handle configuration. As shown, an additional through lane for each direction would significantly decrease the northbound and southbound queue. It is expected to also decrease the queue for the minor street approach.

Table 8. Jug Handle 95th Percentile Queue with 2-Lane and 4-Lane Configurations for 1,000 additional trips at US 97/Fairgrounds Road

95th Percentile Queue (ft)				
Condition	**EB**	**WB**	**NB**	**SB**
Jug Handle (2 Lane)	450	350	1,200	1,600
Jug Handle (4 Lane)	350	250	200	300

Table 9. Jug Handle 95th Percentile Queue with 2-Lane and 4-Lane Configurations for 1,000 additional trips at US 97/Hall Road

95th Percentile Queue (ft)				
Condition	**EB**	**WB**	**NB**	**SB**
Jug Handle (2 Lane)	250	200	750	1,300
Jug Handle (4 Lane)	150	100	150	250

Figure 6 – Example of a Jughandle intersection

Roadway Cross-section Guidelines

The current design guidelines for roadway within Madras are shown in Table 10. The information is intended to provide general guidelines for roadway requirements. Specific standards are maintained in the City's Public Improvement Design and Construction Standards.

Change or additions to the street design guidelines are shown in **bold**.

Table 10– Street Design Guidelines

Classification	Cross Section	Minimum ROW	Turn Lanes[1]	Travel Lanes	Bike Lane	Sidewalk	On-Street Parking	Landscape Strip
Expressway	4 Lanes	98 feet	Yes	12 feet	No[2]	No[2]	No	Optional[3]
Urban Other	4 Lanes	98 feet	Yes	12 feet	Yes	Yes	No	Optional[3]
UBA	2 Lanes	56 feet	Optional[3]	12 feet	Yes	Yes	No	Optional[3]
STA	2 Lanes	70 feet	Optional[3]	12 feet	Yes	Yes	Yes	Optional[3]
City Expressway	2 Lanes	98 feet	Yes	12 feet	No[2]	No[2]	No	Yes
Arterial	2 Lanes	80 feet	Optional[3]	12 feet	Yes	Yes	No	Optional[3]
Major Collector	2 Lanes	70 feet	Optional[3]	12 feet	Yes	Yes	No	Optional[3]
Minor Collector	2 Lanes	60 feet	Optional[3]	12 feet	No	**Yes**	Optional[3]	Optional[3]
Local Street	2 Lanes	**55 feet**	No	32' paved width	No	**Yes**	**Yes**	Optional[3]
Industrial Roadway	**2 Lanes**	**60 feet**	**Optional[3]**	**12 feet**	**No**	**Optional[3]**	**Optional[3]**	**Optional[3]**
Public/Private Alley	**n/a**	**20 feet**	**No**	**15' paved width**	**No**	**No**	**No**	**No**
Multiuse Path	**n/a**	**30 feet**	**n/a**	**10' paved width**	**n/a**	**n/a**	**n/a**	**n/a**

ROW = Right-of-way
n/a = Not applicable
[1]Minimum width = 14 feet
[2]Bicycle and pedestrian traffic are to be accommodated by a 12-foot multi-use path
[3]Refer to City's Public Improvement Design and Construction Standards to determine when required.

Pedestrian, Bicycle, and Multi-Use Path Plans

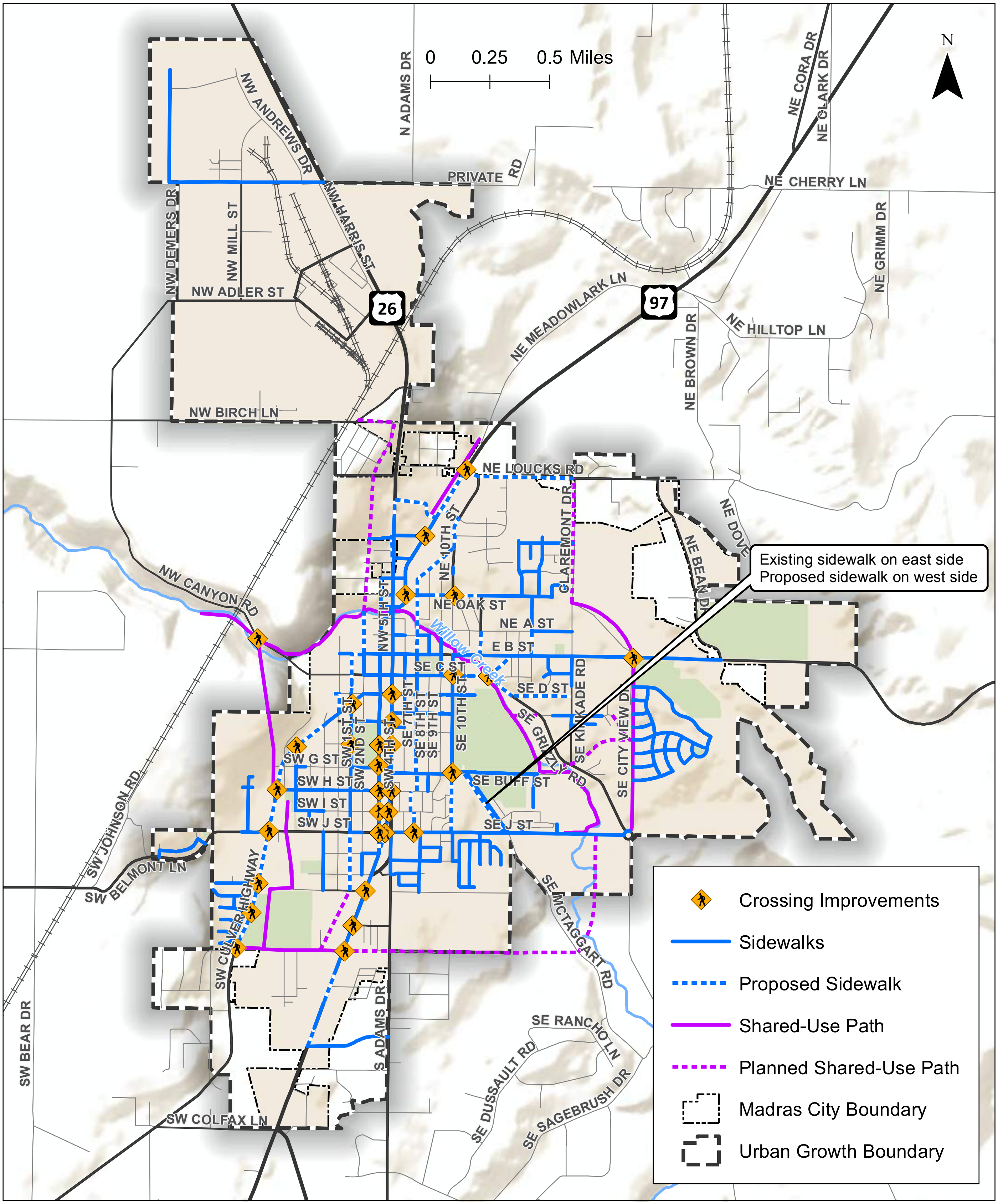
A focused effort was completed in 2012 to create detailed pedestrian, bicycle, and multi-use plans for the Madras TSP. This TSP update will incorporate the key findings and outcomes of that process. Minor updates to the respective pedestrian, bicycle, and multi-use plans are proposed based on input from city staff, partner agencies, the advisory committee, and the general public. These updates are listed below and reflected in Figures 7 and Figure 8. The maps have also been updated to reflect projects that have been completed.

- Add clarification to Kids Club crossing
- Add need for crossing at J Street and Turner Street
- Need for sidewalks on both sides of McTaggart Road between J Street and Buff Street
- Identified existing facility along City View Drive as a multi-use path.

Transit

Public Transportation in Madras consists of a “dial-a-ride” demand response service. This service is funded through Cascades East Transit (CET) This service will pick up and carry citizens to any destination within Madras. Community Connector Service, also provided by CET, is available to Warm Springs, Culver, Metolius, and Redmond and is also available Monday through Friday. Service to additional areas (Bend, Sisters, Prineville, Mt. Bachelor, and La Pine) is available through Community Connector connections in Redmond.

Transit enhancements that may improve overall mobility for users within Madras include increased frequency of the Community Connector Service, including increased frequency, additional time of day service, additional route stops within the community, or the addition of a deviated fixed route service. These improvements should be considered and prioritized in coordination with CET.



Pedestrian Facilities
Madras, Oregon

Figure
7

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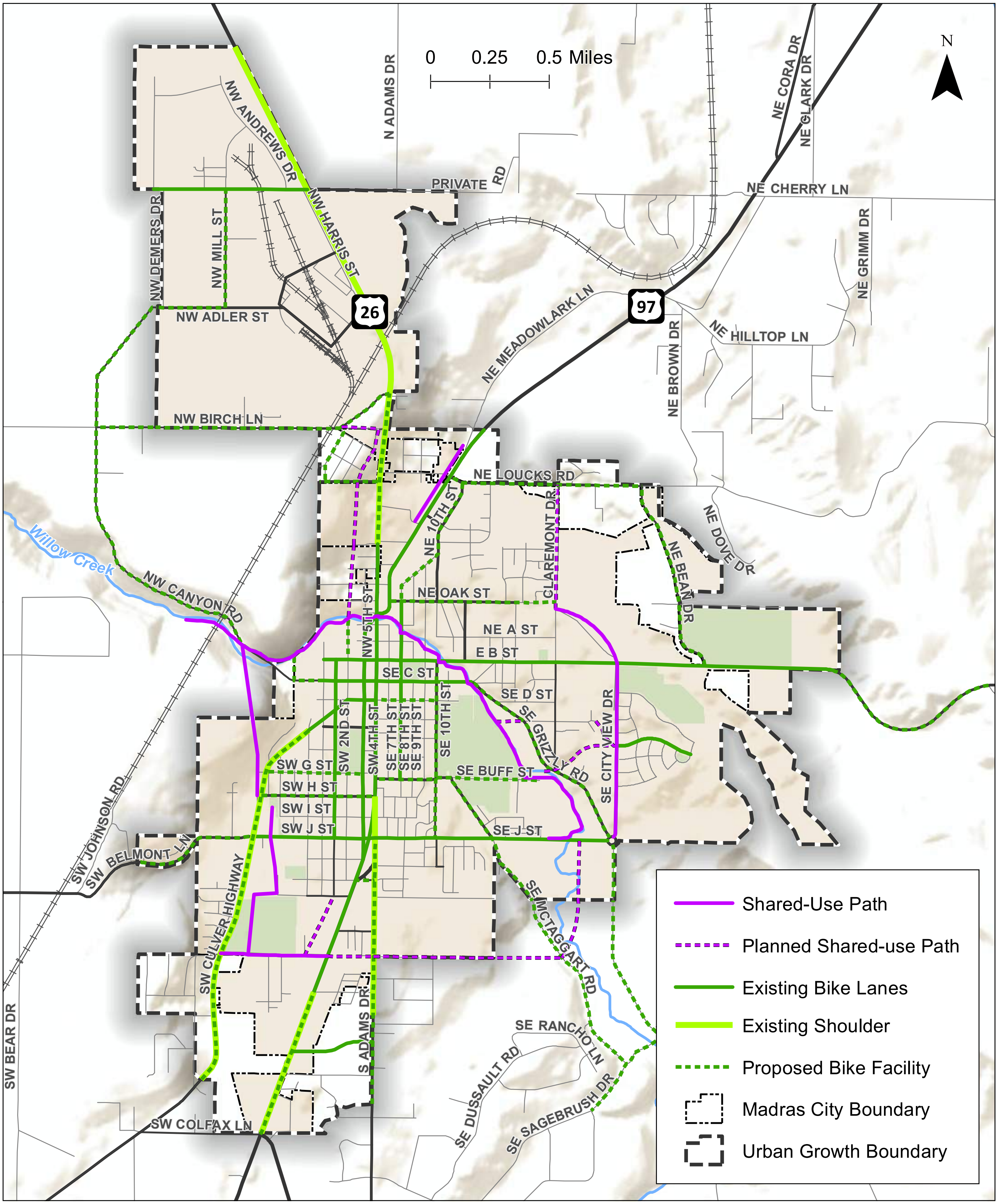
Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: The City of Madras



Bike Facilities
Madras, Oregon

Figure
8

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Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: The City of Madras

Appendix 8: Open House Comment Reports

Comment Report

Madras Transportation System Plan Update

Public Open House Events:

Community Transportation Needs and Concept Areas

July 11, 2016

Prepared by
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Public Involvement, Facilitation + Mediation Professional
Bend, Oregon

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EVALUATION: Open House Events Feedback 11

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Introduction

The City of Madras is updating its Transportation System Plan. A Transportation System Plan (TSP) is the document that guides the future development of the transportation system within Madras. It provides a vision for where roadway improvements are needed today and in the future; identifies safety improvements that will help all users travel around and through Madras more safely; and develop specific plans for pedestrian, bicycle, and transit systems.

Project goals and objectives include the following key themes:

- **Mobility and Connectivity**: Promote a transportation system that provides efficient connections.
- **Economic Development**: Support existing industry and encourage economic development in the City.
- **Safety**: Improve safety and accessibility throughout the City and especially within the downtown core.
- **Multimodal Users**: Safe and efficient transport of people and goods through active modes.
- **Environment**: Balance transportation services with the need to protect the environment.
- **Planning and Funding**: Maintain the safety, physical integrity, and function of the transportation network.

Community Generated Solutions

A Public Advisory Committee (PAC), appointed by the Madras City Council, is tasked with developing a recommendation for a preferred transportation plan for Madras. The PAC is supported by a Technical Advisory Committee (TAC) of local technical experts, as well as a project team of City staff and consultants. The project relies heavily on community input and public engagement efforts will continue to focus both on educating the community about the project and soliciting meaningful feedback as the PAC continues its work.

The PAC is currently focused on transportation improvement needs for Madras. To solicit input, the community was invited to two in-person Open Houses to provide feedback on possible transportation improvements the PAC is considering and identify any additional community needs or concerns. The Open Houses were held from 1:00 to 3:00 p.m. and 5:00 to 8:00 p.m. on Monday, July 11, 2016, at the Community Room of Central Oregon Community College in Madras. Paper comment forms were also made available for public input through July 22, 2016 at Madras City Hall.

The first Open House event highlighted three project concept areas, or areas identified for accelerated growth in Madras, with participants asked to also comment on transportation needs throughout the city. Property owners from the identified concept areas were asked to attend the first Open House to ensure input on these areas. The second Open House event focused both on the identified concept areas as well as the transportation needs of the entire city. The events were family friendly and participants were encouraged to bring their children to participate in the kids' transportation art table and enjoy light refreshments. Meeting materials were made available in English and Spanish and Spanish language translation was provided at the event.

Next Steps

The PAC will review community feedback from this process and work to develop draft Transportation System Plan alternatives. The PAC will continue to seek community input as the project continues and an additional community open house or other event will be held to seek community input on draft plans the PAC will work to develop and support. Ultimately, the PAC will present a Transportation System Update Plan to the Madras City Council for their consideration in 2017.

Community Outreach

With a commitment to broad outreach in the community, the project team utilized a number of tools to promote the Open House events. Outreach efforts included the use of the project website, social media, press releases, mailings, community fliers, and a utility bill announcement. Outreach materials were provided in both English and Spanish.

The project received media coverage during the survey period, including an article in the *Madras Pioneer* newspaper. To ensure that the City reached traditionally underrepresented communities, the project team partnered with an invaluable community partner. The Let's Talk Diversity Coalition assisted in community outreach, as well as translation of materials and meeting interpretation in Spanish.

Open House Content

Participants were asked to review and comment on possible transportation improvements the PAC has under consideration and identify any additional community needs or concerns. In addition to paper comment cards provided at the event, participants were asked to draw or write directly on maps at multiple displays at the events. All of the displays were provided in both English and Spanish. [Please see copies of Open House display boards and maps and the Comment Card form in the *Attachments* section of this document.]

Participants were welcomed at the entrance and displays explaining the project and the purpose of the Open House were positioned near the entrance.

Participation

The Open House events were attended by over 28 people. In addition to the comments captured on the event displays, six comment cards and one letter were received at the event, and one comment card was provided to the City following the event.

Report Form and Style

The comments summarized in this report are from a self-selected group of participants who elected to provide written comments at the Open Houses. The collected comments serve to offer the PAC and others feedback from these community members. Please note that the terms "participant" and "participants" in this report are interchangeable. In other words, comments summarized in the report were provided either by a participant or a few participants, unless it is specifically noted that there was significant or overwhelming support for of an idea or recommendation.

Open House Community Input

The notion of safety for all users was common throughout participant comments. Connectivity and transportation access were also important to participants, with many suggestions collected for improving the transportation system in the downtown core and across Madras. In addition, some participants noted concerns about the impacts of freight trucks on safety and livability in Madras. The Open House events offered participants an opportunity to share specific recommendations and identify potential transportation needs. Community comments are provided throughout the document.

Open House displays and the Comment Card form directed participants to the following themes:

A. **Pedestrian Needs**
B. **Bicycle Transportation Needs**
C. **Roadway Connection Needs**
D. **Freight Transportation Needs**
E. **Public Transportation Needs**
F. **Downtown Needs**
G. **North Industrial Concept Area**
H. **Central Madras Concept Area**
I. **South Madras Concept Area**

A. Pedestrian Needs

Safety was at the forefront of participant comments regarding pedestrian needs in Madras. Participants shared a desire for both improved sidewalk connectivity, as well as new sidewalks in a number of areas. In addition, participants said there was a need for new pedestrian crossings in a number of areas in the city, particularly for pedestrians accessing and moving around the downtown area.

General Comments on Pedestrian Needs

We need to add sidewalks to all of the areas that have a safety risk, not only for the pedestrians, but for the drivers.

I walk all over town with my kids. My kids walk to school.

We have sidewalks and paths where people walk for pleasure, but not when people walk for necessity.

Our sidewalks seem to serve the community well.

I frequently use sidewalks because I walk almost every day.

At the stop that is on the corner of the Fire Department there tends to be confusion for people that don't travel the area frequently, a stop light would be most effective. *(list continues on next page…)*

We need to have the sidewalk system completely connected, from one end of town to the other.
Have sidewalks in areas that have heavy traffic.

Identified Pedestrian Needs

Sidewalks

Community support for already identified priority need

Infill sidewalks (build sidewalks) on Oak Street.
Sidewalks along B Street, between multi-use trail and 14th Street.
Sidewalk on H Street, west of downtown.
Sidewalk on 7th Street, between D and Buff Streets.
Sidewalk on 10th Street, between Buff and J Streets.
Sidewalks on 97 south of Fairgrounds Road between Fairgrounds Road and Brush Lane.
Sidewalk on 6th Street, between A and B Streets.
Sidewalk on B Street, between 6th Street and Kincade Road.
Sidewalk on Culver Hwy.

Newly identified pedestrian needs from community

Sidewalks on G Street, west of downtown.
Sidewalk on 10th Street, between Oak Street and Henry Street.
Sidewalk needed on Canyon Road, between 3rd Street to multiuse path.
Sidewalk needed on Madison, between J Street and Culver Hwy.
Sidewalk needed on Belmont Lane, adjacent to Sunnyside Drive.
Complete sidewalks on J Street, between Hwy 97 and City View Drive.
Would like sidewalks on Oak Street, between Highway and 16th Street.

Improved and Safer Crossings

Community support for already identified priority need

Crossing at US 97 and M Street.
Crossing at US 97 and Bard Lane.
Crossing at US 97 and Fairgrounds Road.
Crossing at 10th Street at Oak Street.
J Street signals for pedestrians.

Newly identified needs from community

Improve crossings on B Street between multi-use trail at Willow Creek and 14th Street.
Crossing at Buff Street.
Crossing at J Street and Strawberry Lane, at the trail.
Crossing at J Street and McTaggart Road.
Better crosswalk area around Plumb and Poplar Streets, across Highways 97 and 26.
Create bridge or tunnel across Willow Creek on multiuse trail near Grizzly Road and Kincade Road from existing trail.

B. Bicycle Facilities Needs

Participants supported safer and additional bicycle facilities, including bicycle lanes. Some participants noted a desire for the continued construction of multi-use paths in the city that connect to community buildings such as the Aquatics Center, Central Oregon Community College, Jefferson County Library, and the Madras Post Office.

General Comments on Bicycle Facilities Needs

My daughter is 7 years old rides a bike, but I don't feel safe if there are no sidewalks for me to walk next to her.

I repeat, having sidewalks for walking. Signs for bikes and maintaining bike lanes painted as well as crosswalks painted.

Have events inviting people to the city, especially cyclists for information on how ride bikes safely?

I bike all over town. My son likes to ride his bike too. Generally, I feel pretty safe on my bike around town.

My husband bikes around town.

Bicycle Facilities Identified Needs

Community support for already identified priority need

Bike lane priority on 10th Street between Buff and J Streets.

Multi-use path between 2nd street and Fairgrounds Road.

Newly identified needs from community

Multi-use path from Yarrow Ave and City View Drive to Kemper Way Drive to connect through neighborhood to Aquatics Center.

Keep building more multi-use trails especially ones that connect key areas (e.g. library, post, COCC, etc.).

New bike route needed at 10th Street between Oak St and Willow Creek. The multi-use path would provide passage over the creek.

Better markings needed.

C. Roadway Connection Needs

The City and PAC identified multiple areas for improved connectivity to share with the community. A display map highlighted the following: A Possible Capacity Needs Area, an Industrial Readiness Plan area, and three Improved Connectivity Areas on the *Roadway Connection Needs* map. Participants were also welcome to comment on roadway connection needs throughout the city on the map. [Please see Figure 1 on the following page.]

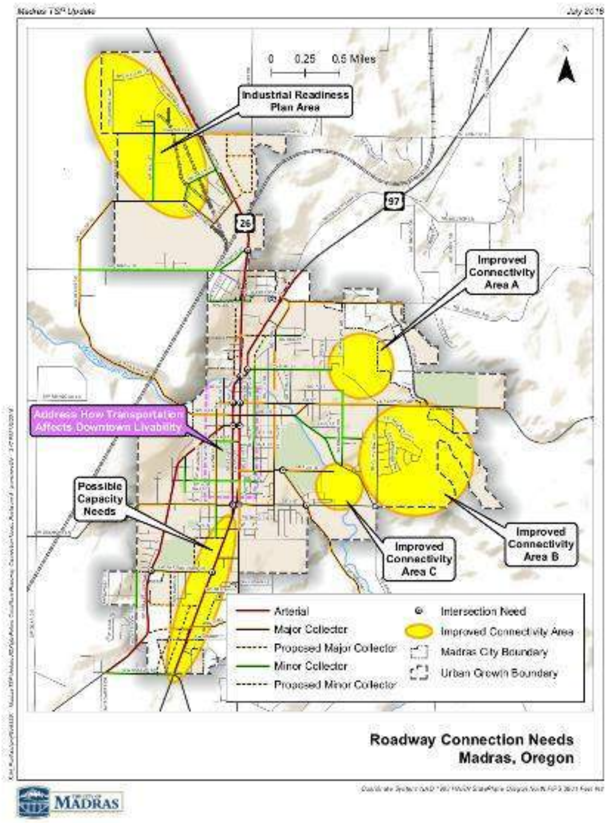


Figure 1.

Participants expressed interest and support for improved roadway connectivity in the city. In addition, participants said some already existing roads would provide connectivity if they were simply paved. A participant suggested the City wait to improve connectivity in the "Improved Connectivity Area B" on the display map until more people moved to the area.

General Comments on Connectivity

I would like to see more streets connecting.

Wait until more people move here to that area to the improved Connectivity Area B.

Connectivity Identified Needs

Connect Fairgrounds Road east to A Street.

Pave 1st and Madison Streets between J and M Streets.

Consider four lanes along Hwy 97 below and above downtown.

Repave J Street from Madison to the city limits.

Connect City View Drive and Jefferson Street in Improved Connectivity Area A.

Provide truck access at Cherry Lane, as well as good acceleration and deceleration lanes there.

Align Cherry Lane at Hwy 26.

Create a road from the north at the Y intersection of Hwys 97 and Hwy 26 west to 1st Street then south to Culver Hwy.

(list continues on next page…)

Extend City View Street from “B” Street (Ashwood Road) north to connect with Loucks Road and Highway 97. Completes an eastside route around the city center.

Cherry Lane does not connect after it becomes a private road somewhat east of Hwy 26.

D. Freight Transportation Needs

Many participants indicated they would support ways to reduce truck speeds or impacts in the city. Some participants shared concerns about trucks parked in the city center, indicating they felt they blocked site lines for smaller turning vehicles. Participants suggested designated rest areas or parking locations outside of the city center for large trucks. Support for a possible truck bypass identified on the Freight Transportation Needs display map was mixed with one participant in favor of a bypass and another not supportive.

General Comments on Freight Transportation Needs

Highway Bypass: Complete the once proposed west side highway bypass (north junction of highways 97 and 26 to south junction of 97 and 26) to take some of the highway through traffic off the downtown city streets. Make it a “truck route,” with traffic signals at the south junction of 97 and 26.

They drive too fast through town. Stop lights would slow them down. I'm not in favor of the bypass.

Trucks need to have designated rest areas because they do not allow other drivers to view the street. Change the designated rest areas to spaces that are less traveled on.

Construct a truck stop on the south side of the city.

They park on 4th and 5th Streets blocking vision for cars crossing.

Improve truck wayfinding. Trucks using A Street via Hwy 26 sometimes get lost and have difficulty finding their way to Hwy 97 and drive through the neighborhood.

Too many trucks from here to Biggs Junction. Trucks are the biggest users. Four lanes from Biggs to Weed, California.

E. Transit Needs

Participants were asked how they would improve transit service in Madras. Participants said more frequent bus service and additional routes were needed. Specifically, participants noted support for additional connections to Redmond, added stops in Redmond, and reasonably-priced service from Madras to Portland. Participants focus was again on safety with support indicated for the construction of bus shelters and more stops with pedestrian crossings. Some participants wrote that they felt support and funding for an improved transit system in Madras would require more paying users to support it.

General Comments on Transit Needs

Create one more bus route to Redmond to connect without going to Bend. Fund route or two in Madras. But it will take more people riding the bus and paying. More people riding the bus generates revenue for the bus system.

Practical inter-city transit would be great. I hate driving on Hwy 97.

I take Cascade East Transit to Redmond for work. We need more stops in Redmond in places besides the library.

We need more routes.

We need more frequency of buses.

More frequent bus transit to Redmond.

(list continues on next page…)

Bus service to Redmond COCC campus/Airport.
Cheaper bus service to PDX.
We need service to Portland.
Create bus shelters.
More bus pick-up areas with crossings.

F. Downtown Needs

Participants were asked to share their thoughts on transportation needs in the downtown area. Most comments focused on improving safety for all users downtown. Specific suggestions included adding and connecting sidewalks, decreasing vehicle speeds, and roadway and parking improvements.

Participants suggested a number of sidewalk improvements in the downtown area, noted below. A number of road improvements were also suggested and noted below, including recommendations to pave 1st, 2nd, and 10th Streets, narrow the highway between E and J Streets, improve the left hand turn flows at 4th and D Streets and 5th and D Streets, and install a stoplight and crossing at the J Street signal.

Downtown connectivity was also identified as important to participants, as well as improving the line of site for smaller vehicles downtown. Participants said they felt large truck parking downtown, angled parking, and an identified pole at J Street and Hwy 97 all block or impede the line of site for vehicles turning or parking downtown. High rates of vehicle speeds in the downtown area was also noted as a concern, as well as a lack of parking by participants.

Downtown Transportation Improvement Needs

Sidewalks
Sidewalks on 4th Street, south of J Street.*
Sidewalks on Madison at J Street.
Sidewalks gaps exist on 5th Street between G and E Streets: Fill these in.
Sidewalks on C Street between 1st and 3rd Streets. C Street connects to Canyon Road.
Road Improvements
Stoplight or Hwy crossing at J Street Signal*
Left turns at 4th and D and 5th and D conflict with each other.* Improve 3rd Street from D Street to B Street to provide secondary access to the Hwy.
Pavement improvements on 1st and 2nd Streets between F Street and K Street.
Pave 10th Street between and J and Buff Streets.
Narrow the highway between E Street and J Street.
I like the pop-outs to be more friendly and slow down traffic through town.
At 4th Street and H Street and 4th Street and C Street prohibit cargo trucks from parking. Designate specific parking area for cargo trucks.
There is a site distance problem at 5th and J Street as there is power pole blocking driver's site view.
Connectivity
Connect H Street between 4th and Commerce Streets.
Connect G Street with Buff Street between 4th and 5th Streets.

(list continues on next page…)

Improve connection from 7th and Buff Streets south to J and Hull Streets. (7th Street ends at I Street and then to continue there is an awkward jog to connect to Hull Street to get to J Street.)

Connect 4th and E Streets with 5th and E Streets. Provide direct connection from corner of 4th and E to corner of and 5th and E Streets. (E Street is discontinuous.)

Improve access at E Street and 4th Street intersection.

Traffic light at D Street and 4th Street. (Traffic gets backed up for vehicles turning right onto 4th Street and left onto 4th Street.)

Add traffic light at 4th and C Streets.

Add traffic light at 4th and J Streets.

Traffic signal lights at 4th and 5th and J Streets. They are very dangerous sigh problems for traffic heading east (and west) on "J" at 5th Street.

Open up Buff Street to meet Grissly Road (there is a lot of congestion during soccer season and when events are held at PAC) and Buff Street eastern connection loop to J Street (along west side of Willow Creek) create bus/traffic circulation vs one way in and out.

Cover all areas that are missed by adding sidewalks or signs for cyclists.

Improve Line of Site Suggestions

Pole which is in site line at Hwy 97 and J Street needs to be relocated.

Truck parking on 4th Street between D and E Streets blocks view.

Concern with angled parking on 7th Street fronting the park - the angled parking - big trucks park there and block site lines and makes road to narrow.

Speed

Concern about speed along 5th Street along downtown (vehicle speeds downtown on 4th and 5th Streets).

Enforce 25mph speed limit on J Street and Madison Street.

Parking

Lack of available parking downtown.

Parking south of Madras Paint & Glass is now limited because of my business. Too few spaces to accommodate pizza and nail business.

Increase parking, make some streets between the one-way Hwy roads pedestrian only (maybe F Street?).

Other

Stripe the parking lot between 6th and 7th Street and north of C Street.

I like the importance that is given to safety for drivers as well as pedestrians.

** (Already identified as a priority by City and PAC.)*

Concept Areas Community Input

The City has identified three geographical areas for accelerated growth in Madras, called "Concept Areas." The PAC and City sought community input on roadway design improvements to accommodate growth in these areas. In addition to soliciting broad community feedback on these areas, the City sent a mailer to individuals who owned property in the identified Concept Areas to encourage them to attend the Open House events and provide input.

North Industrial Concept Area **Central Concept Area** **South Concept Area**

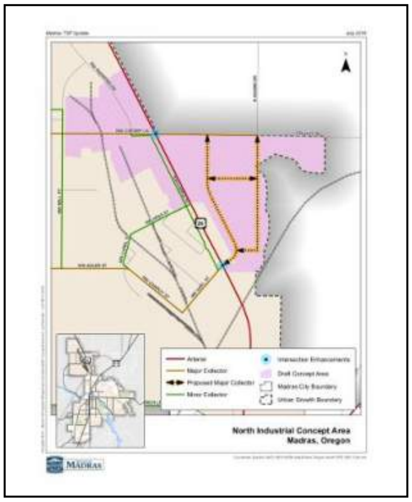


Figure 2.

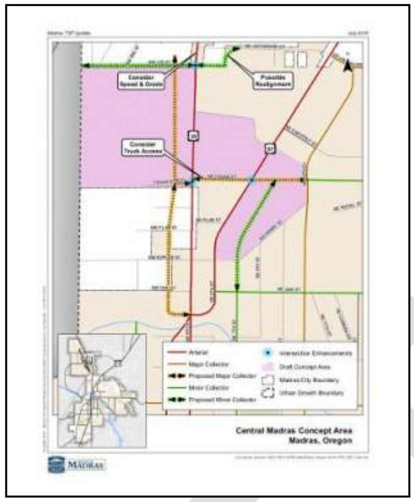


Figure 3.

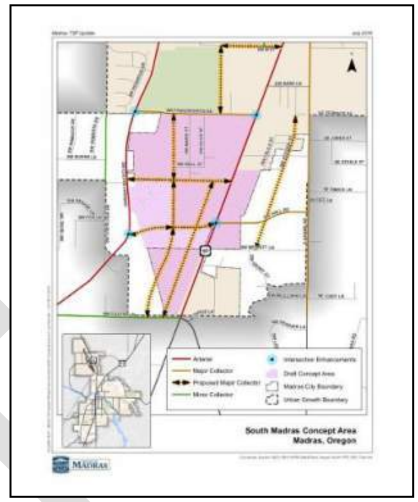


Figure 4.

G. North Industrial Concept Area [See Figure 2 above for reference.]

In the North Industrial Concept Area participants identified two needs, both focused on intersection improvements.

Participant Input:

Intersection improvement at Hess St and Hwy 26.

Intersection alignment of Cherry Lane with Hwy 26.

H. Central Madras Concept Area [See Figure 3 above for reference.]

Participants noted a variety of potential needs in this area including new business access and intersection and roadway improvements.

Participant Input:

Business access needed at Plum Street and Poplar Street with Business 97.

Intersection improvement at Oak Street and Business 97, which is also 6th Street.

Extend Plum Street to Henry Street through the North Concept Area.

Create a middle turn lane at Cedar Street and Business 97 (6th Street).

I. South Madras Concept Area [See Figure 4 above for reference.]

Participants provided suggestions for roadway and connectivity improvements in this area.

Participant Input:

Extend Fairgrounds Road to Adams Street and/or extend Fairgrounds Road farther than Adams Road to McTaggart Road.

Extend Fairgrounds Road to the east of the main highway to connect to South Adams Drive. Place traffic signal lights with turn signals at the intersection of Fairgrounds Road and the highway. This will allow vehicles from the east side of town (Ranchos, etc.) and to and from the fairgrounds to get onto and off the highway, and will break up the traffic flow on the main highway. *(list continues on next page…)*

New access road east of BiMart. Make a new road from Hall Street north to connect with the (new) Fairgrounds Road extension, east of (behind) BiMart. Access to the shopping center from this new road would take additional traffic off the main highway.

Create a road between the proposed extension of Hall Road and existing Colfax Lane. This connection would be between Culver Road and Hwy 97.

Concerned that an intersection improvement identified as a priority now at Hwy 97 and Hall Road would restrict business access just north of that intersection. Commenter said there an opportunity existed for a better public-private grid of streets in this section of the Concept Area.

Pullouts for businesses for on-street parking (cutouts for on-street parking) are needed at businesses south of Fairgrounds Road on Hwy 97.

Additional Community Input

Participants were asked if they had any additional ideas or comments they would like the PAC and project team to consider during the development of the Madras Transportation System Plan Update. Participants provided a number of suggestions, many of which were incorporated into the sections earlier in this document. In addition, participants provided these additional comments below.

Participant Input:

Trucks and cars regularly run red lights.

Safety improvements on Highway 26: Widen the highway from Madras to Warm Springs Grade – passing lanes, turn lanes, etc.

Four Lane Highway between Madras and Redmond.

When will drivers realize that speed limits and caution signs are in place for a reason? A greater effort needs to be made to educate drivers and *enforce* existing traffic laws, including distracted driving and driving while "buzzed" with alcohol or some (now legal) drugs.

EVALUATION: Open House Events Feedback

Participants who **completed Comment Cards** were asked to provide feedback on the events. Results are provided below.

		Strongly agree	Somewhat agree	Neutral	Somewhat disagree	Strongly disagree
Open house was useful to me.		3	2			
Open house made good use of my time.		3	2			
I understand how my input will be used.		1	2	2		

Open House Usefulness: Participants were asked what was the **most useful part of the Open House** they attended. Participants said the staff were friendly people and able to answer questions. Another participant said he or she appreciated the input from the engineers and other professionals at the event. A participant commented that he or she appreciated that the PAC and project team had taken the opinion of the community into consideration on the project. One participant wrote, "Thanks for giving us the chance to give our ideas."

Areas to Improve: Participants were also asked what they would **change to make future open houses better.** A participant suggested organizers indicate in future advertising how much time a participant would need to attend the Open House.

Outreach: Finally, participants were asked how they had **heard about the Open House events**? Responses included:

- Flyer mailed to residence (2 responses)
- Newspaper (2 responses)
- A friend from the Latino Communication Association

Attachment A: Madras TSP Update Project Committees

Madras TSP Update Public Advisory Committee Membership List

PAC Member	Affiliation
Tom Brown	*Madras City Council*
Bill Montgomery	*Madras City Council*
Dallas Stovall	*Brightwood*
Joel Hessel	*Madras Planning Commission*
Joe Krenowicz	*Madras Planning Commission, Madras Chamber of Commerce*
Rick Molitor	*Jefferson County School District*
Elaine Henderson	*Cascades East Transit Regional Public Transit Advisory Committee*
Stan Nowakowski	*Bicycle and Pedestrian Advocate*
Carolyn Harvey	*Let's Talk Diversity Coalition*
Lonny Macy	*Confederated Tribes of Warm Springs*
Bob Powers	*Madras Resident*

Madras TSP Update Technical Advisory Committee Membership List

TAC Member	Affiliation
Joel McCarroll	*ODOT Region 4*
Bill Hilton	ODOT Region 4
Jeff Rasmussen	*Jefferson County Administrator*
Scott Edelman	*Department of Land Conservation and Development*
Karen Friend	*Cascades East Transit*
Janet Brown	*Economic Development of Central Oregon*
Jeff Hurd,	*City of Madras* Public Works
Gus Burril	City of Madras City Manager
Chief Tanner Stanfill	*Madras Police Chief*
Lonny Macy	
Bob Powers	

Madras TSP Update Project Team

Name	Affiliation
City of Madras	
Nick Snead	*Community Development Director*
Jeff Hurd	*Public Works Director*
Oregon Department of Transportation	
Michael Duncan	*Region 4 Planner*
Consultant Team	
Matt Kittelson	*Kittelson & Associates, Inc.*
Joe Bessman	*Kittelson & Associates, Inc.*
Yi-Min Ha	*Kittelson & Associates, Inc.*
Anne E. George	*Anne E. George | Facilitation, Mediation, + Public Involvement*
DJ Heffernan	*Daniel Heffernan Company*

Attachment B: Open House Displays

Madras Transportation System Plan Update

Welcome!

Bienvenido!

THE CITY OF MADRAS

EST. 1910

www.madrastsp.com

What is a Transportation System Plan?

A Transportation System Plan (TSP) is the document that guides the City on what improvements to make to the roads, sidewalks, bicycle routes, freight, and public transportation system. It provides a vision for:

- Where future roadway improvements are needed to serve vehicles, bicycles, and pedestrians now and in the future. (We call this travel demand.)
- Safety improvements that will help all users (drivers, bicyclists, pedestrians, public transportation users) travel around and through Madras more safely.
- Specific plans for the development of the pedestrian, bicycle, and public transportation systems.
- Goals and policies that will help guide the development of the transportation system to try and meet all of these needs.

THE CITY OF MADRAS

¿Qué es el Plan de Sistema de Carreteras?

Un Plan de Sistema de Carreteras (TSP) es un documento que guía a la cuidad en cuanto que mejoras se le debe hacer a las carreteras, banquetas, rutas para bicicletas, camiones de mercancía, y el Sistema de transportación pública. Provee una visión para:

- Donde se pueden mejorar las carreteras para proveer el mejor servicio a los vehículos, bicicletas y peatones ahora y en el futuros (A esto le llamamos la demanda para viajes.)
- Mejoras a la seguridad que ayudaran a todas las personas que usan las carreteras (personas que manejan, ciclistas, peatones, personas que viajan por camión) y viajan alrededor o por Madrás.
- Planes específicos para el desarrollo de los sistemas para peatones, ciclistas y tránsito.
- Metas y pólizas que ayudaran a guiar el desarrollo del Sistema de carreteras para tratar de satisfacer todas las necesidades.

THE CITY OF MADRAS

How Can You Help?

Your Job Today:

The City of Madras is updating its Transportation System Plan. We want to hear from you. Specifically, we want to know what is needed to make driving, biking, walking and generally moving in or around Madras better!

- ***Step One:*** Walk around and take a look at the various maps. Feel free to write directly on the maps.

- ***Step Two:*** Fill out a Comment Card

Next Steps:

- The information you provide us today will help us create a list of ways we could improve the system.
- Stay informed by joining our email list, checking out the website, or attending a meeting!

THE CITY OF MADRAS

Cómo puedes ayudar

Su trabajo hoy:

La ciudad de Madrás esta actualizando el plan de sistema de carreteras. Queremos escuchar de usted. ¡Específicamente queremos saber que se ocupa para mejorar como maneja, anda en bicicleta, camina y viaja en o alrededor de Madrás!

- ***Primer Paso:*** Camine alrededor y vea los diferentes mapas. Siéntase libre a escribir directamente en los mapas.
- ***Segundo Paso:*** Llene la forma de comentarios.

Siguientes pasos:

- La información que usted comparta con nosotros hoy nos ayudara a crear una lista de maneras en las que podemos mejorar el sistema.
- ¡Manténgase informado por medio de unirse a nuestra lista de correo electrónico, revise nuestro sitio de web o asista a las juntas!

THE CITY OF MADRAS

Transit

Madras currently has direct transit service to:

- Redmond
- Metolius
- Culver
- Warm Springs

Connection service is available to:

- Sisters
- Prineville
- Bend
- La Pine

How would you improve the transit service in Madras?

- Added Route?
- More frequency?
- Other improvements?

THE CITY OF MADRAS

Tránsito

Madras actualmente con el servicio de transporte: directo

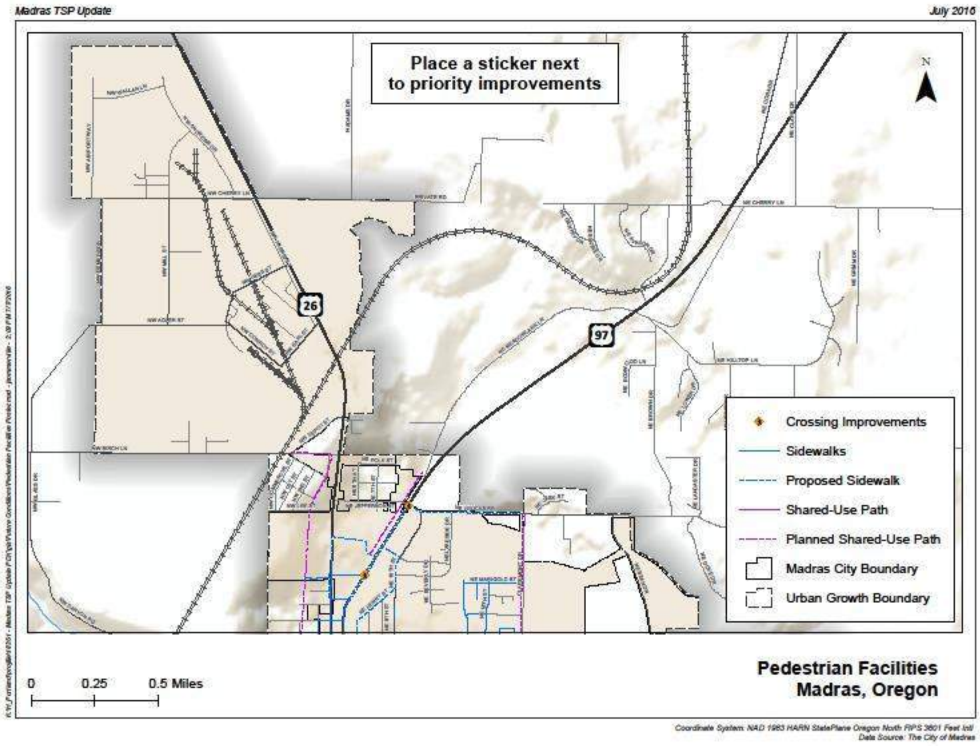
- Redmond
- Metolius
- Culver
- Warm Springs

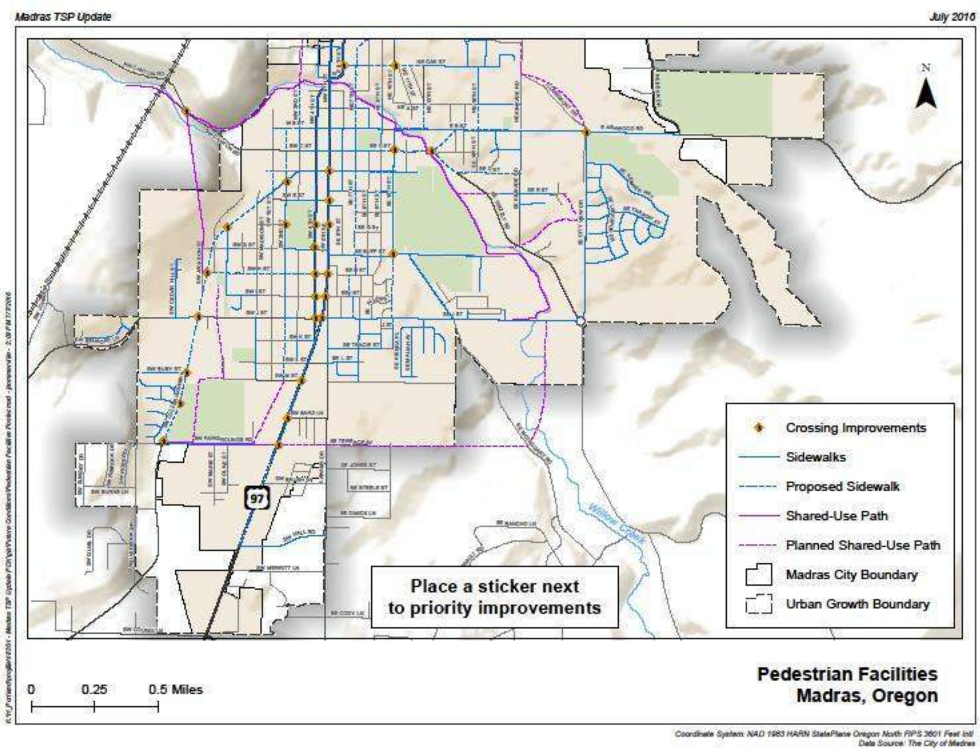
Servicio de conexión está disponible para:

- Sisters
- Prineville
- Bend
- La Pine

¿Cómo mejoraría el servicio de tránsito en Madras?

- ¿Más rutas?
- ¿Más frecuencia?
- ¿Otras mejoras?


Madras TSP Update
July 2016
Place a sticker next to priority improvements
26
97
Crossing Improvements
Sidewalks
Proposed Sidewalk
Shared-Use Path
Planned Shared-Use Path
Madras City Boundary
Urban Growth Boundary
0
0.25
0.5 Miles
Pedestrian Facilities
Madras, Oregon
Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: The City of Madras


Madras TSP Update
July 2016
97
Willow Creek
Crossing Improvements
Sidewalks
Proposed Sidewalk
Shared-Use Path
Planned Shared-Use Path
Madras City Boundary
Urban Growth Boundary
Place a sticker next to priority improvements
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Pedestrian Facilities
Madras, Oregon
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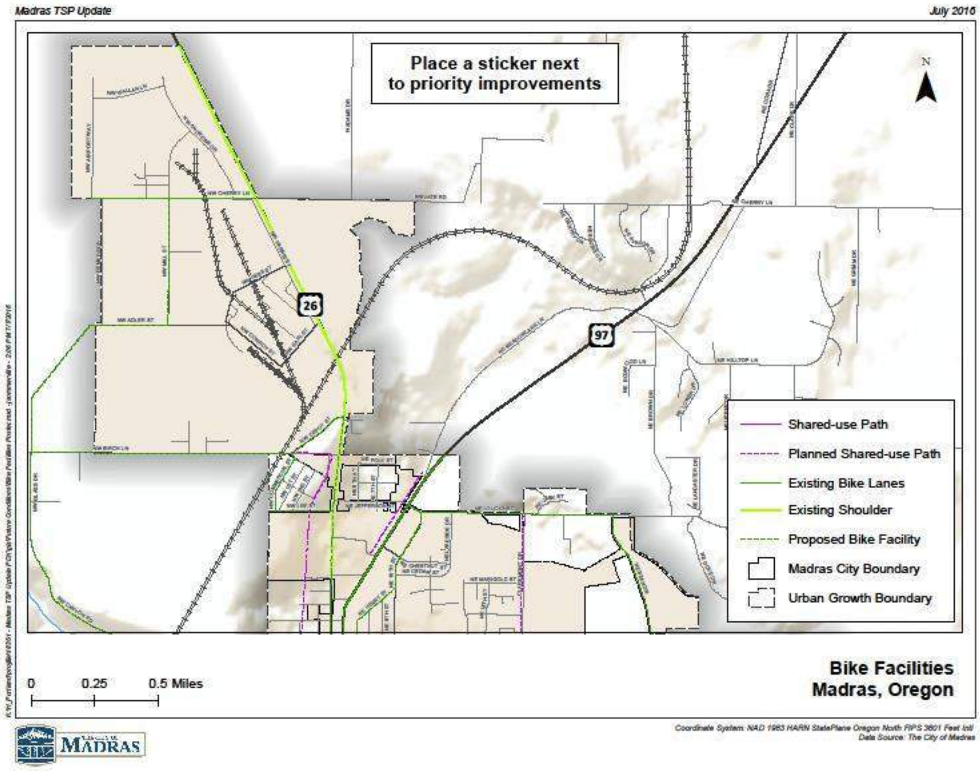
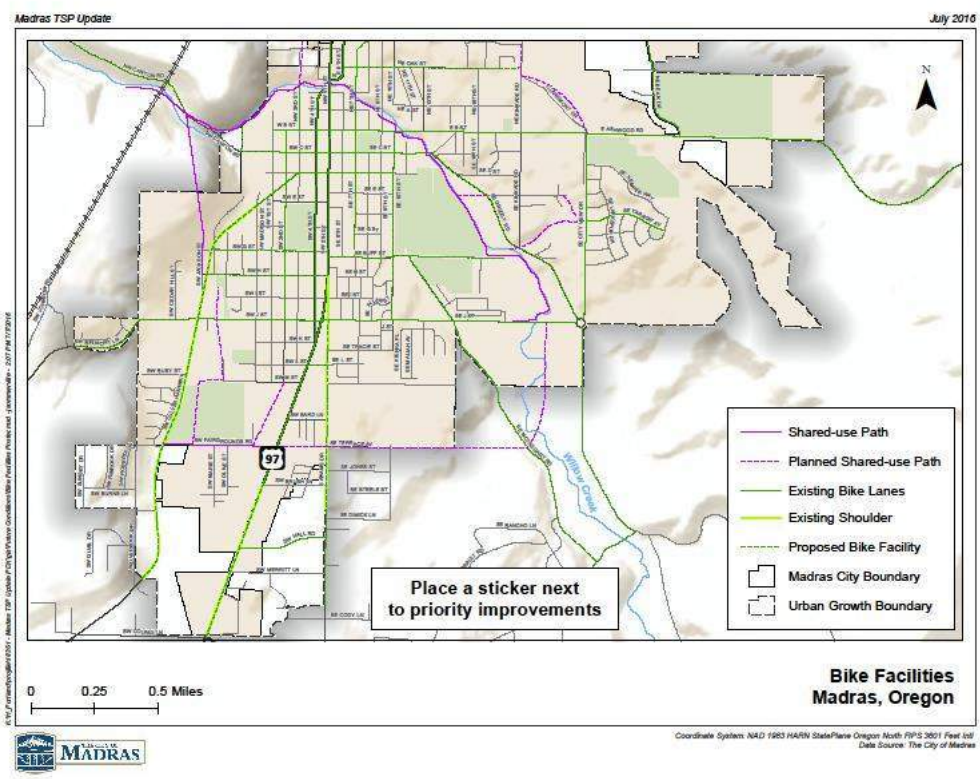

Madras TSP Update
July 2016
Place a sticker next to priority improvements
Shared-use Path
Planned Shared-use Path
Existing Bike Lanes
Existing Shoulder
Proposed Bike Facility
Madras City Boundary
Urban Growth Boundary
0 0.25 0.5 Miles
Bike Facilities
Madras, Oregon
MADRAS


Madras TSP Update
July 2016
Shared-use Path
Planned Shared-use Path
Existing Bike Lanes
Existing Shoulder
Proposed Bike Facility
Madras City Boundary
Urban Growth Boundary
Place a sticker next to priority improvements
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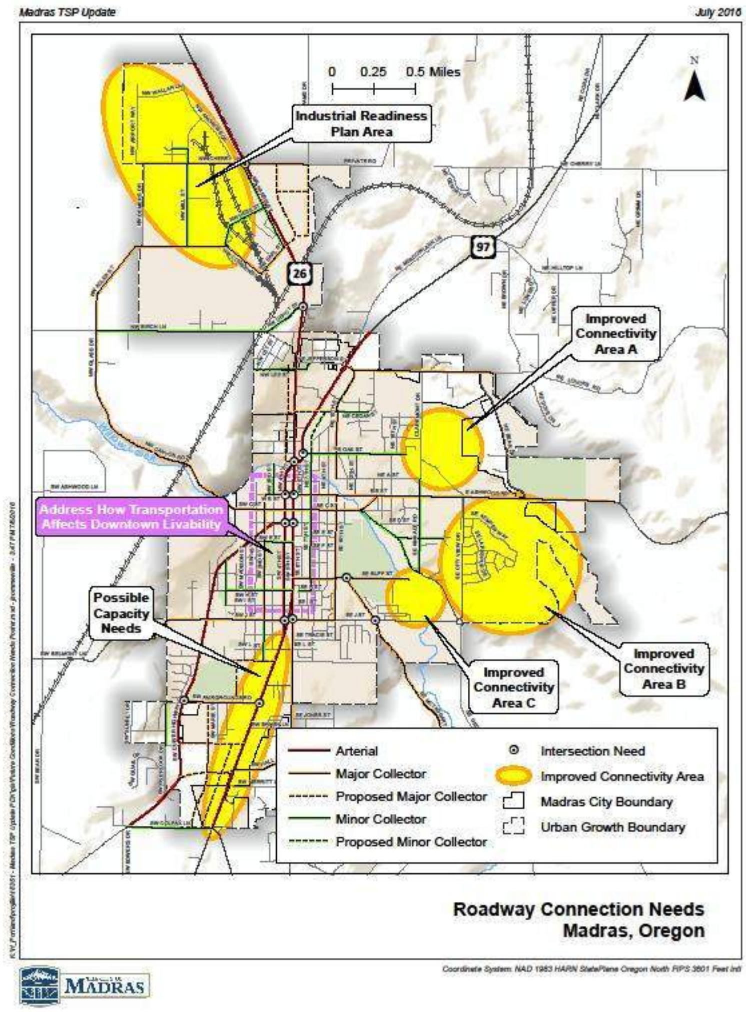
Bike Facilities
Madras, Oregon
MADRAS


Madras TSP Update
July 2016
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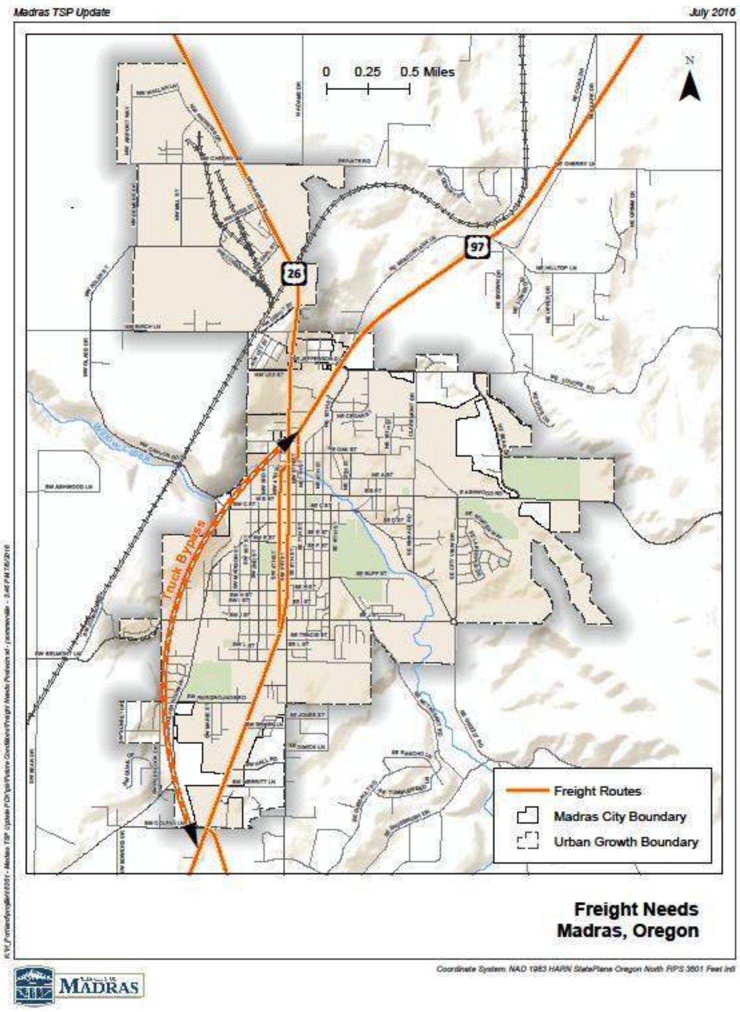
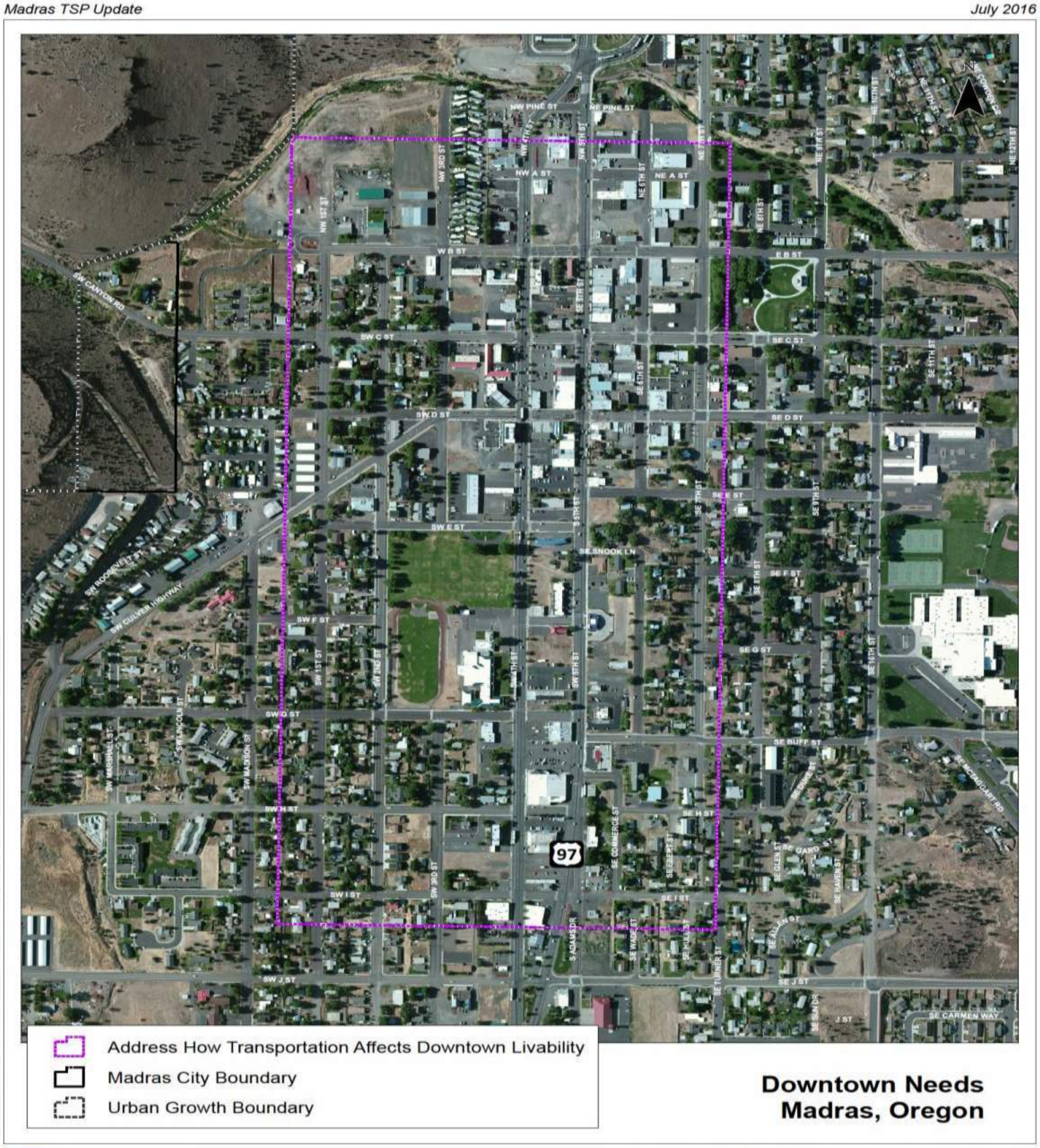
N
Industrial Readiness Plan Area
26
97
Improved Connectivity Area A
Address How Transportation Affects Downtown Livability
Possible Capacity Needs
Improved Connectivity Area C
Improved Connectivity Area B
Arterial
Major Collector
Proposed Major Collector
Minor Collector
Proposed Minor Collector
Intersection Need
Improved Connectivity Area
Madras City Boundary
Urban Growth Boundary
Roadway Connection Needs
Madras, Oregon
MADRAS


Madras TSP Update
July 2016
0 0.25 0.5 Miles
N
26
97
Truck Bypass
Freight Routes
Madras City Boundary
Urban Growth Boundary
Freight Needs
Madras, Oregon
Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
MADRAS

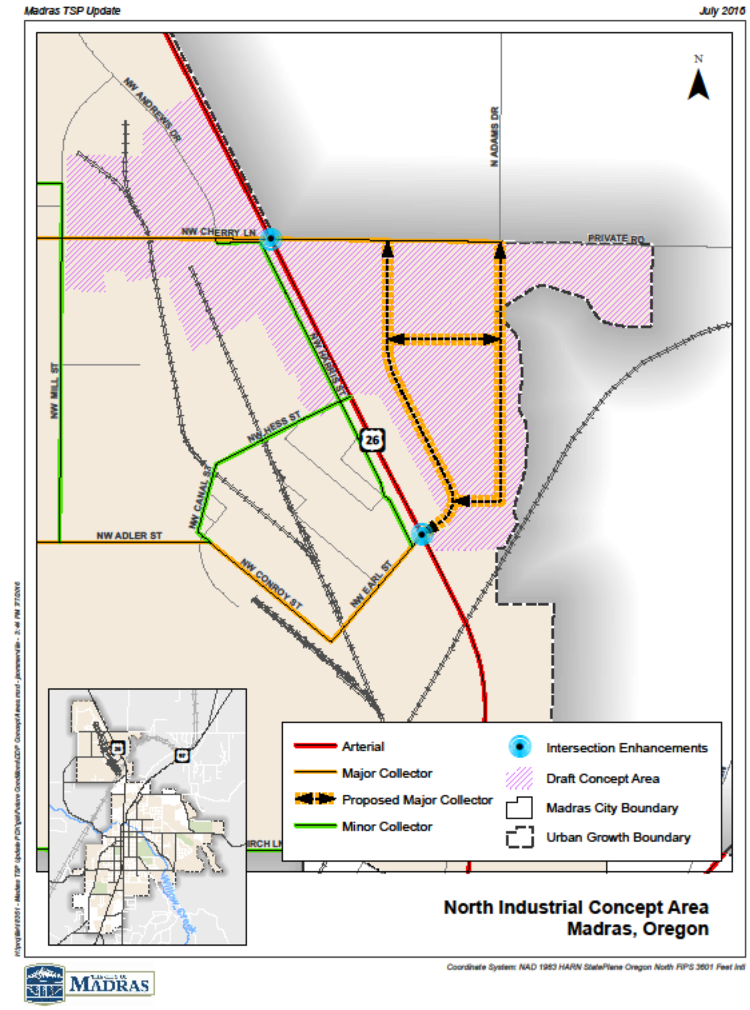
Madras TSP Update

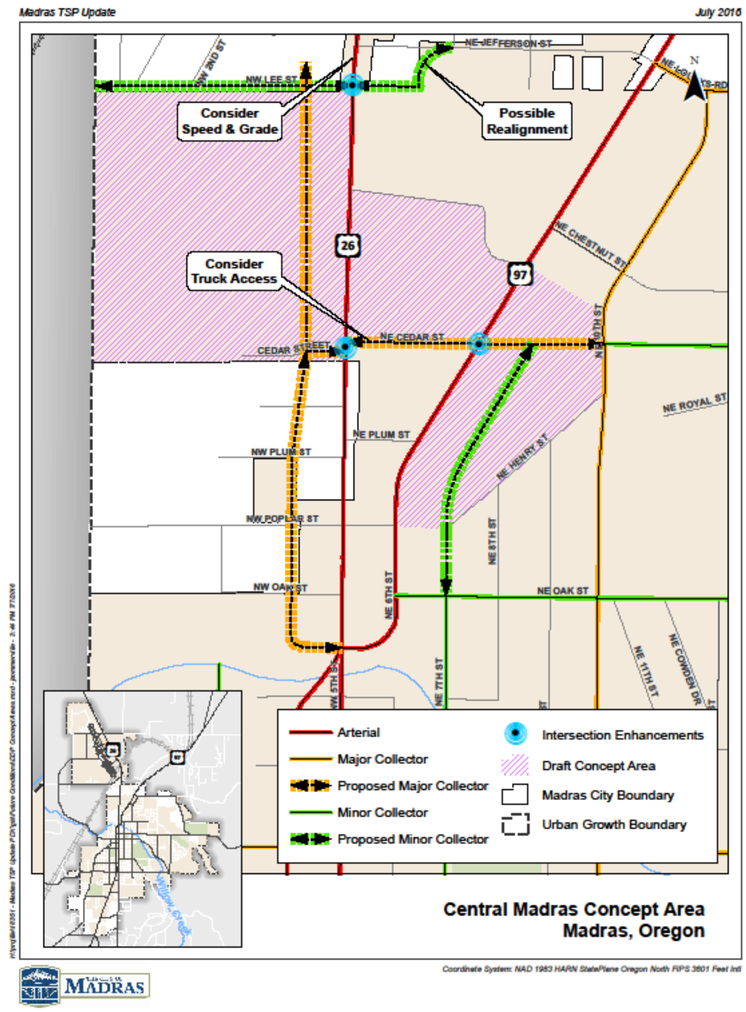
July 2016

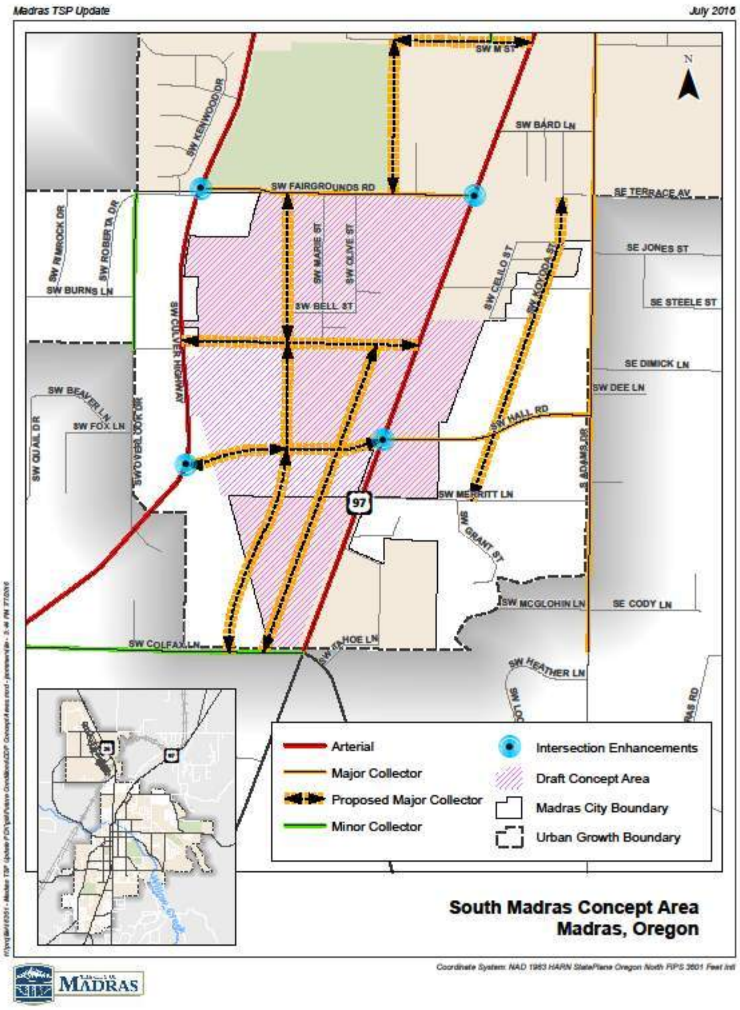


Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl

THE CITY OF MADRAS


Madras TSP Update
July 2016
NW ANDREWS DR
N ADAMS DR
NW CHERRY LN
PRIVATE RD
NW MILL ST
NW HESS ST
NW CANAL ST
NW ADLER ST
NW CONROY ST
NW EARL ST
26
Arterial
Major Collector
Proposed Major Collector
Minor Collector
Intersection Enhancements
Draft Concept Area
Madras City Boundary
Urban Growth Boundary
North Industrial Concept Area
Madras, Oregon
Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
MADRAS


Madras TSP Update
July 2016
Consider Speed & Grade
Possible Realignment
Consider Truck Access
NW LEE ST
NE JEFFERSON ST
NE CHESTNUT ST
CEDAR STREET
NE CEDAR ST
NE PLUM ST
NW PLUM ST
NW POPLAR ST
NE HENRY ST
NE ROYAL ST
NW OAK ST
NE OAK ST
NE 5TH ST
NE 7TH ST
NE 8TH ST
NE 11TH ST
NE COWDEN DR
26
97
Arterial
Major Collector
Proposed Major Collector
Minor Collector
Proposed Minor Collector
Intersection Enhancements
Draft Concept Area
Madras City Boundary
Urban Growth Boundary
Central Madras Concept Area
Madras, Oregon
Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
MADRAS


Madras TSP Update
July 2016
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SW BARD LN
SW M ST
SE TERRACE AV
SE JONES ST
SE STEELE ST
SE DIMICK LN
SW DEE LN
SW HALL RD
SW MERRITT LN
SW BELL ST
SW CULVER HIGHWAY
SW BURNS LN
SW COLFAX LN
SE CODY LN
SW MCGLOHIN LN
97
Arterial
Major Collector
Proposed Major Collector
Minor Collector
Intersection Enhancements
Draft Concept Area
Madras City Boundary
Urban Growth Boundary
South Madras Concept Area
Madras, Oregon
MADRAS

Attachment C: Comment Card Form

Madras Transportation System Plan July 2016

Thank you for attending! Please take a few minutes to provide us with comments. Your comments will be reviewed by the project team and will inform refinement of the identified transportation needs. If you don't complete the form tonight, please mail it to Madras City Hall, 125 SW "E" Street, Madras OR 97741 or email it to nsnead@ci.madras.or.us before July 22, 2016.

WHAT IS A TRANSPORTATION SYSTEM PLAN?

A Transportation System Plan (TSP) is the document that guides the future development of the transportation system within Madras. It provides a vision for:

- Where future roadway improvements are needed to serve vehicles, bicycles, and pedestrians now and in the future. (We call this travel demand.)
- Safety improvements that will help all users (drivers, bicyclists, pedestrians, public transportation users) travel around and through Madras more safely.
- Specific plans for the development of the pedestrian, bicycle, and transit systems.
- Goals and policies that will help guide the development of the transportation system to try and meet all of these needs.

HOW WILL YOUR INPUT BE USED

The feedback you provide during this open house will be used to identify what transportation needs in Madras should be addressed by this Transportation System Plan Update.

TELL US WHAT YOU THINK ABOUT THE TRANSPORTATION NEEDS

Pedestrian System – sidewalks, roadway crossings, trails

How do you use the sidewalks, trails, and roadway crossings or crosswalks when you walk in Madras today?	What improvements would you like to see made?
Other comments?	

Bicycle System – bicycle lanes, trails

How do you use the bicycle transportation system (bicycle lanes and trails) in or around Madras today?	What improvements would you like to see made?
Other comments?	

Transit System – route options, stop locations

How do you use the public transportation system in or around Madras today?	What improvements would you like to see made?
Other comments?	

Vehicle System – connectivity, capacity, intersection improvements

How do you use the transportation system today in a vehicle in or around Madras?	What improvements would you like to see made?
Other comments?	

Freight System – truck routes, interactions with freight

What is your experience with trucks carrying freight in or around Madras?	What improvements would you like to see made?
Other comments?	

Downtown Madras

• What do you like about the transportation system within or around downtown Madras? • How could we make downtown better for vehicles, bicyclists, pedestrians, and public transportation users in Madras?

OTHER COMMENTS

Please share any other ideas or comments that you would like the project team to consider during the development of the Madras Transportation System Plan. Thank you!

OPEN HOUSE EVALUATION – TELL US HOW WE DID

	Strongly agree	Somewhat agree	Neutral	Somewhat disagree	Strongly disagree
Open house was useful to me.	☐	☐	☐	☐	☐
Open house made good use of my time	☐	☐	☐	☐	☐
I understand how my input will be used.	☐	☐	☐	☐	☐

What was the most useful part of the open house?

What could we change to make future open houses better?

How did you hear about the open house?

Plan de Sistema de Carreteras de Madras Julio 2016

¡Gracias por asistir! Por favor tome algunos minutos para dejarnos sus comentarios. Sus comentarios serán analizados por el equipo del proyecto y nosotros les informaremos cuando se identifiquen las necesidades de las carreteras. Si no termina de llenar la forma hoy, por favor envíela a Madrás City Hall, 125 SW "E" Street, Madrás OR 97741 o por correo electrónico a nsnead@ci.madras.or.us antes del 22 de Julio, 2016.

QUE ES EL PLAN DE SISTEMA DE CARRETERAS?

Un Plan de Sistema de Carreteras (TSP) es el documento que guía el desarrollo futuro del Sistema de carreteras de Madrás. Provee una visión para:

- Donde se pueden mejorar las carreteras para proveer el mejor servicio a los vehículos, bicicletas y peatones ahora y en el futuros (A esto le llamamos la demanda para viajes.)
- Mejoras a la seguridad que ayudaran a todas las personas que usan las carreteras (personas que manejan, ciclistas, peatones, personas que viajan por camión) y viajan alrededor o por Madrás.
- Planes específicos para el desarrollo de los sistemas para peatones, ciclistas y tránsito.
- Metas y pólizas que ayudaran a guiar el desarrollo del Sistema de carreteras para tratar de satisfacer todas las necesidades.

COMO SE USARA SU OPINION

La información que usted provea durante este evento se usara para identificar las necesidades para las carreteras en Madrás y se usara en la actualización del plan de Sistema de carreteras.

EXPLIQUE QUE PIENSA USTED DE LAS NECESIDADES PARA LAS CARRETERAS

Sistema para Peatones- banquetas, pasos peatonales, caminos

Como usa usted las banquetas, caminos, y pasos peatonales cuando camina en Madrás hoy en día?	¿Qué mejoras le gustaría ver?
¿Otros comentarios?	

Sistema para bicicletas – carriles para bicicletas, caminos

¿Cómo usa usted el sistema de carreteras para bicicletas (carriles para bicicletas y caminos) alrededor o en Madrás hoy en día?	¿Qué mejoras le gustaría ver?
¿Otros comentarios?	

Sistema de Transito – opciones para rutas, lugares para parar

¿Cómo usa el sistema de carreteras públicas en o alrededor de Madrás hoy en día?	¿Qué mejoras le gustaría ver?
¿Otros comentarios?	

Sistema para vehículos – conexiones, capacidad, mejoras en intersecciones

¿Cómo usa usted el sistema de carreteras hoy en su vehículo en o alrededor de Madrás?	¿Qué mejoras le gustaría ver?
¿Otros comentarios?	

Sistema de transporte de mercancías – rutas para troques, interacciones con mercancía

¿Qué es su experiencia con los troques que cargan mercancía en o alrededor de Madrás?	¿Qué mejoras le gustaría ver?
¿Otros comentarios?	

El Centro de Madrás

- ¿Qué le gusta del sistema de carreteras dentro o alrededor del centro de la cuidad de Madrás?
- ¿Cómo podemos arreglar el centro de la cuidad para las personas que usan vehículos, ciclistas, transportación publica y peatones?

OTROS COMENTARIOS

Por favor comparta otras ideas o comentarios que usted crea que se deban de considerar por el equipo de proyecto durante el desarrollo del plan de sistema de carreteras de Madrás. ¡Gracias!

EVALUACION DEL EVENTO – DIGANOS COMO ESTUVO EL EVENTO

	Muy de Acuerdo	De Acuerdo	Neutral	Desacuerdo	Total desacuerdo
El evento fue útil para mi	☐	☐	☐	☐	☐
El evento fue un buen uso de mi tiempo	☐	☐	☐	☐	☐
Entiendo cómo se utilizara mi opinión	☐	☐	☐	☐	☐

¿Qué fue lo más útil del evento?

¿Qué cambios podemos hacer para mejorar los eventos en el futuro?

¿Cómo escucho de este evento?

Comment Report

Madras Transportation System Plan Update

Public Open House Events:

Alternatives Analysis

March 7, 2017

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- Community Generated Solutions 1
- Next Steps 2
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Open House Content 2
- Participation 2
- Report Form and Style 2
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- D. Vehicle System 4
  - General Comments on Vehicle System 4
- E. South Madras Highway Improvements 4
  - General Comments South Madras Highway Improvements 4

Attachment A: Madras TSP Update Project Committees i

Madras TSP Update Public Advisory Committee Membership List i

Madras TSP Update Technical Advisory Committee Membership List i

Madras TSP Update Project Team i

Attachment B: Open House Displays & Comments Forms ii

Introduction

The City of Madras is updating its Transportation System Plan. A Transportation System Plan (TSP) is the document that guides the future development of the transportation system within Madras. It provides a vision for where roadway improvements are needed today and in the future; identifies safety improvements that will help all users travel around and through Madras more safely; and develop specific plans for pedestrian, bicycle, and transit systems.

Project goals and objectives include the following key themes:

- **Mobility and Connectivity**: Promote a transportation system that provides efficient connections.
- **Economic Development**: Support existing industry and encourage economic development in the City.
- **Safety**: Improve safety and accessibility throughout the City and especially within the downtown core.
- **Multimodal Users**: Safe and efficient transport of people and goods through active modes.
- **Environment**: Balance transportation services with the need to protect the environment.
- **Planning and Funding**: Maintain the safety, physical integrity, and function of the transportation network.

Community Generated Solutions

A Public Advisory Committee (PAC), appointed by the Madras City Council, is tasked with developing a recommendation for a preferred transportation plan for Madras. The PAC is supported by a Technical Advisory Committee (TAC) of local technical experts, as well as a project team of City staff and consultants. The project relies heavily on community input and public engagement efforts will continue to focus both on educating the community about the project and soliciting meaningful feedback as the PAC continues its work.

The PAC is currently working to establish a refined list of project alternatives. These alternatives have been developed to address the transportation needs previously identified by the TSP update.

To solicit input on these alternatives, the community was invited to an in-person Open House to provide feedback. The Open House was held from 4:00 to 7:00 p.m. on Tuesday, March 7, 2017, at the Community Room of Central Oregon Community College in Madras.

The events were family friendly and participants were encouraged to bring their children to participate in the kids' transportation art table and enjoy light refreshments. Meeting materials were made available in English and Spanish and Spanish language translation was provided at the event.

Next Steps
The PAC will review community feedback from this process and work to develop a preferred transportation plan. This document will be the core material within the draft Transportation System Plan expected to be adopted in Fall 2017. A third Public Open House will be held at that time.

Community Outreach
With a commitment to broad outreach in the community, the project team utilized a number of tools to promote the Open House events. Outreach efforts included the use of the project website, social media, press releases, mailings, community fliers, and a utility bill announcement. Outreach materials were provided in both English and Spanish when possible.

To ensure that the City reached traditionally underrepresented communities, the project team partnered with an invaluable community partner. The Let's Talk Diversity Coalition assisted in community outreach, as well as translation of materials and meeting interpretation in Spanish.

Open House Content
Participants were asked to review and comment on proposed transportation improvements (draft alternatives) the PAC has under consideration and identify proposed modifications or additions. Also, the community was invited to provide feedback on key criteria to evaluate improvements to the South 97 area of Madras. In addition to paper comment cards provided at the event, participants were asked to draw or write directly on maps at multiple displays at the events. All of the displays were provided in both English and Spanish. [Please see copies of Open House display boards and maps and the Comment Card form in the *Attachments* section of this document.]

Participants were welcomed at the entrance and displays explaining the project and the purpose of the Open House were positioned near the entrance.

Participation
The Open House events were attended by 20-30 people. In addition to the comments captured on the event displays, seven comment cards were received at the event

Report Form and Style
The comments summarized in this report are from a self-selected group of participants who elected to provide written comments at the Open House. The collected comments serve to offer the PAC and others feedback from these community members. Please note that the terms "participant" and "participants" in this report are interchangeable. In other words, comments summarized in the report were provided either by a participant or a few participants, unless it is specifically noted that there was significant or overwhelming support for of an idea or recommendation.

Open House Community Input

The comments received during the Open House generally support the draft projects presented. Suggests heard from attendees focused on improving multimodal connectivity for all users.

The Open House events offered participants an opportunity to share specific recommendations to improve the transportation projects recommended. A summary of those comments is included in the following sections.

Open House displays and the Comment Card form directed participants to the following themes:

A. **Pedestrian System**
B. **Bicycle System**
C. **Transit System**
D. **Vehicle System**
E. **South Madras Highway Evaluation Criteria**

A. Pedestrian System

Participants provided positive reviews of the proposed pedestrian improvement plan. Comments to improve the system were focus on local improvements where the commenter was familiar with the system.

General Comments on Pedestrian System

My daughter and I mainly travel around Madras on foot. We've found it difficult to maneuver.
Proposed improvements are excellent, especially crossing improvements! The highway through town makes these important.
Pedestrian and bike path to the butte on the south end of town would be helpful.
Flashing lights at H & 4th/5th Street for pedestrians
I am not an aggressive walker and have at times had to speed up to avoid vehicles.
We should have driver education to increase the level of respect for pedestrians
Increasing accessibility options for folks is a good thing. Clear signs are important.
We would like sidewalks on Oak between Aspen Ct. and 10th
We walk regularly on Willow Creek trail
Development of the full plan would be great
An improved crossing of US 97 near the McDonalds and the end of the trail would be nice

B. Bicycle System

Many participants were not active riders, but were interested in riding more. Comments received focused on making the bike system more inviting to potential users.

General Comments on Bicycle System

I would like to use the bike system in the future
Pedestrian system constraints hold make access to bicycle system.
Would be nice to have access to business locations. These are much needed!

C. Transit System

Improvement plans for the transit system were generally supported by the participants. Suggestions for modifications generally focused on providing more information to users and finding ways to entice new riders.

General Comments on Transit System

More information on need for transfers should be provided to riders
The vison seems great
A trial user program may entice riders

D. Vehicle System

Participants were supportive of the proposed vehicle system improvements. One participant noted the need for traffic signals at US 97/J Street, which is already a planned project pending future funding.

General Comments on Vehicle System

The options presented are good
Proposed improvement are much needed!
Traffic signals are need at US 97/J Street

E. South Madras Highway Improvements

Participants were asked to review draft South Madras Highway Improvement options and provide feedback on criteria that will be important for the future evaluation of these.

General Comments South Madras Highway Improvements

I have a preference for the couplet option
Safety for bikes and pedestrians!
Widening to 5-lanes may provide the best long-term solution
Bypass sounds great, but may have challenges
The existing 3-lane section doesn't seem like a viable long-term option
Couplet seems okay, but may require out of direction travel for users

Attachment A: Madras TSP Update Project Committees

Madras TSP Update Public Advisory Committee Membership List

PAC Member	Affiliation
Tom Brown	*Madras Planning Commission*
Bill Montgomery	*Madras City Council*
Dallas Stovall	*Brightwood*
Joel Hessel	*Madras Planning Commission*
Joe Krenowicz	*Madras Planning Commission, Madras Chamber of Commerce*
Rick Molitor	*Jefferson County School District*
Elaine Henderson	*Cascades East Transit Regional Public Transit Advisory Committee*
Stan Nowakowski	*Bicycle and Pedestrian Advocate*
Carolyn Harvey	*Let's Talk Diversity Coalition*
Lonny Macy	*Confederated Tribes of Warm Springs*
Bob Powers	*Madras Resident*

Madras TSP Update Technical Advisory Committee Membership List

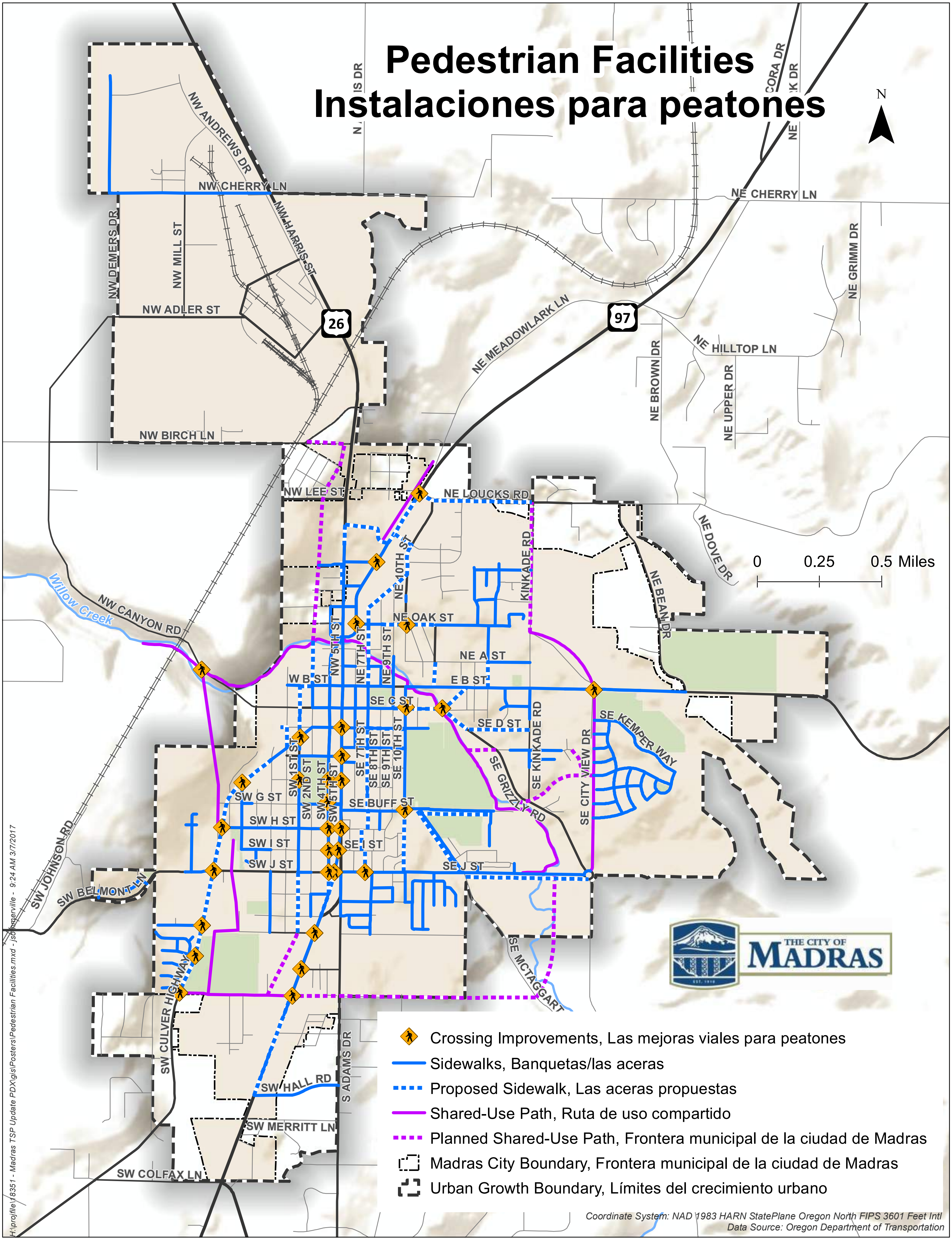
TAC Member	Affiliation
Joel McCarroll	*ODOT Region 4*
Bill Hilton	*ODOT* Region 4
Jeff Rasmussen	*Jefferson County* Administrator
Scott Edelman	*Department of Land Conservation and Development*
Jackson Lester	*Cascades East Transit*
Janet Brown	*Economic Development of Central Oregon*
Jeff Hurd,	*City of Madras* Public Works
Gus Burril	City of Madras City Manager
Chief Tanner Stanfill	*Madras Police Chief*
Lonny Macy	
Bob Powers	

Madras TSP Update Project Team

Name	Affiliation
City of Madras	
Nick Snead	*Community Development Director*
Jeff Hurd	*Public Works Director*
Oregon Department of Transportation	
Michael Duncan	*Region 4 Planner*
Consultant Team	
Matt Kittelson	*Kittelson & Associates, Inc.*
Julia Kuhn	*Kittelson & Associates, Inc.*
Yi-Min Ha	*Kittelson & Associates, Inc.*
Anne E. George	*Anne E. George | Facilitation, Mediation, + Public Involvement*
DJ Heffernan	*Daniel Heffernan Company*

Attachment B: Open House Displays & Comments Forms

Pedestrian Facilities
Instalaciones para peatones



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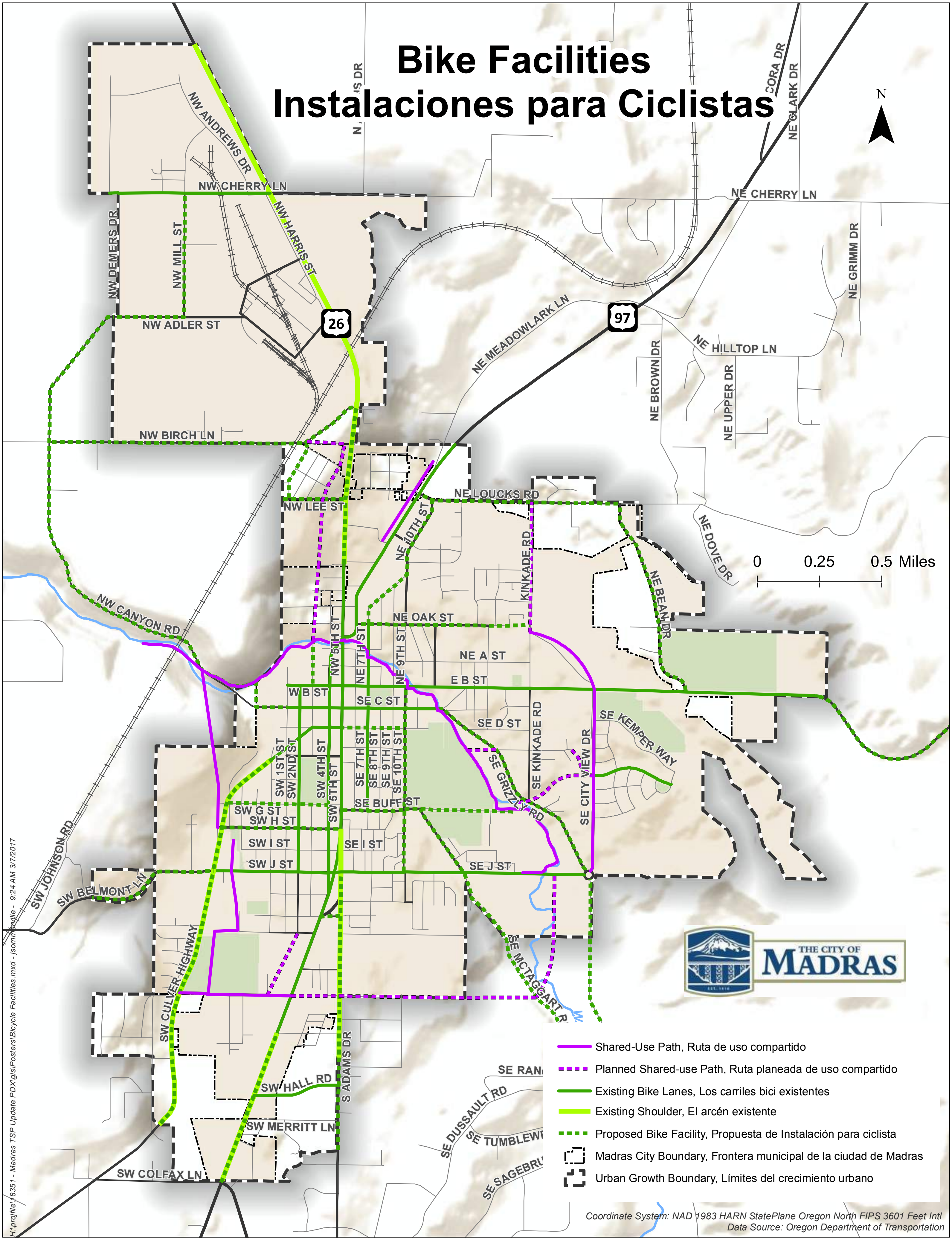
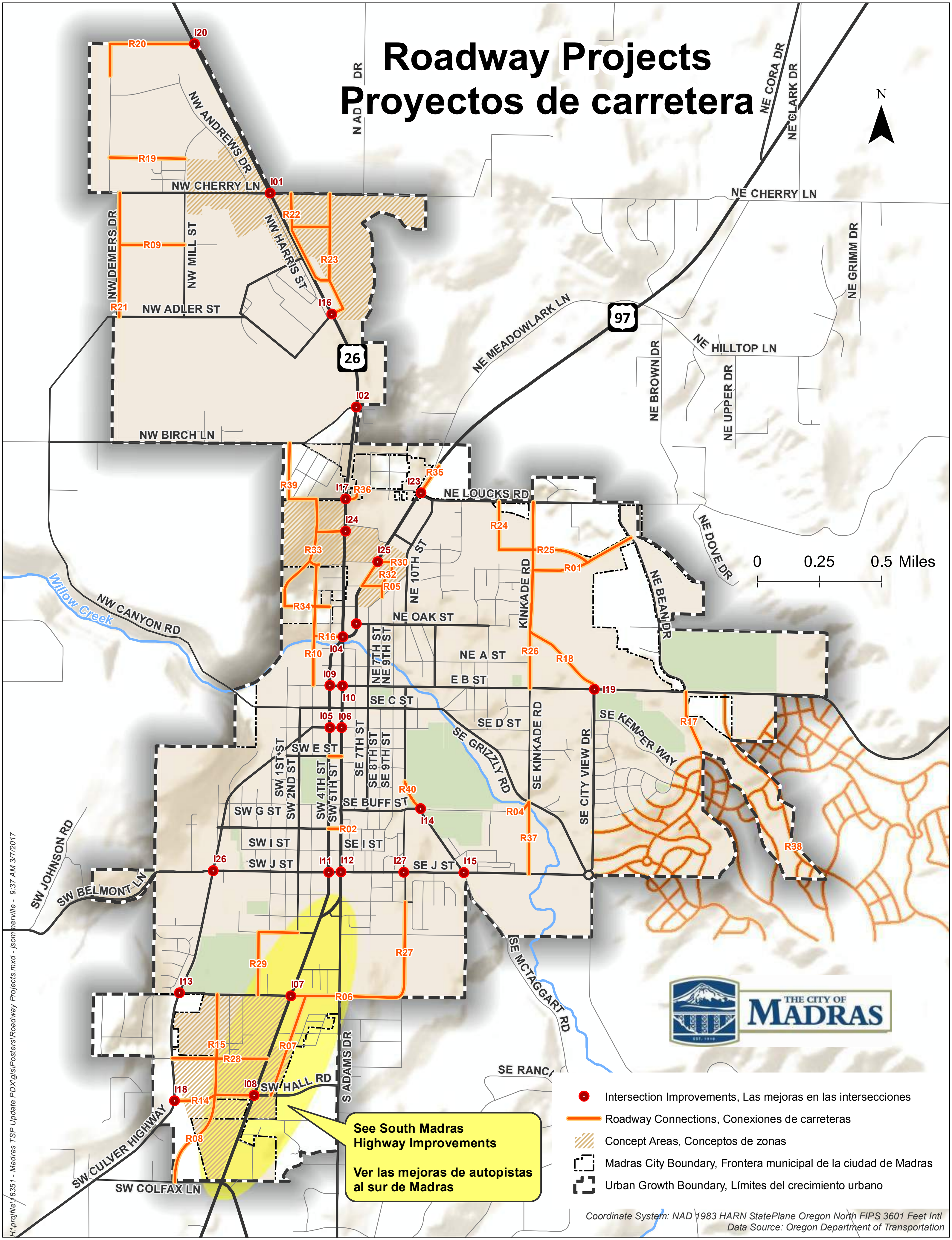
Bike Facilities
Instalaciones para Ciclistas





Roadway Projects
Proyectos de carretera
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Intersection Improvements, Las mejoras en las intersecciones
Roadway Connections, Conexiones de carreteras
Concept Areas, Conceptos de zonas
Madras City Boundary, Frontera municipal de la ciudad de Madras
Urban Growth Boundary, Límites del crecimiento urbano
See South Madras Highway Improvements
Ver las mejoras de autopistas al sur de Madras
THE CITY OF MADRAS
Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Oregon Department of Transportation
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NE CORA DR
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NE GRIMM DR
NE MEADOWLARK LN
NE HILLTOP LN
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SE GRIZZLY RD
SE KINKADE RD
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Madras Transportation System Plan Update

Welcome!
Bienvenido!

www.madrastsp.com

What is a Transportation System Plan?

A Transportation System Plan (TSP) is the document that guides the City on what improvements to make to the roads, sidewalks, bicycle routes, freight, and public transportation system. It provides a vision for:

- Where future roadway improvements are needed to serve vehicles, bicycles, and pedestrians now and in the future. (We call this travel demand.)
- Safety improvements that will help all users (drivers, bicyclists, pedestrians, public transportation users) travel around and through Madras more safely.
- Specific plans for the development of the pedestrian, bicycle, and public transportation systems.
- Goals and policies that will help guide the development of the transportation system to try and meet all of these needs.

THE CITY OF MADRAS

EST. 1910

How Can You Help?

Your Job Today:

The City of Madras is updating its Transportation System Plan. A Public Advisory Committee of local Madras residents has been working for over a year on ways to improve our plan. Now we want to hear from you again! Specifically, we want to know what you think of these draft plans to improve the transportation system in Madras. These include improvements to the:

- Roadway system
- Bicycle system
- Pedestrian system
- Transit (bus) system

- ***Step One:*** Walk around and take a look at the various maps. Feel free to write directly on the maps.

- ***Step Two:*** Fill out a Comment Card.

Next Steps:

- We'll use the feedback we hear from you to refine these project lists and move towards a Draft Transportation System Plan. Once we refine the final draft plan we will ask you, the public, again to let us know what you think.

THE CITY OF MADRAS

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Transit

Madras currently has direct transit bus service to:

- Redmond
- Metolius
- Culver
- Warm Springs

Connection service is available to:

- Sisters
- Prineville
- Bend
- La Pine

Madras intends to work with Cascades East Transit to expand the community bus connector service through:

- Increased frequency
- Additional time of day service
- Additional route stops in the community

THE CITY OF MADRAS

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South Madras Highway Improvements

- **Purpose:** Improvements to the highway area in south Madras are intended to allow for people traveling through Madras on US 97 and US 26, while providing options for local access to Madras streets and shops.
- **Outcome:** The Transportation System Plan Update will identify criteria important to the community that should be used to develop and evaluate improvement alternatives for this section of highway. In the future, the City and ODOT will use these criteria again to develop and evaluate improvement alternatives.

THE CITY OF MADRAS

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South Madras Highway Improvements

Criteria: Roadways are more than just places for vehicles to drive. They serve many functions that impact the look, feel, and function of a community. Different roadway configurations have different effects.

The project team thinks the following are key criteria that should be considered when evaluating these highway alternatives:

- Safety for all users
- Positive Economic impacts/outcomes
- Cost of infrastructure
- Mobility for traffic on US 97/US 26, including freight
- Mobility/access for local traffic
- Mobility for non-auto users

Are any of the above important to you? Why?

What other criteria do you think should be considered? Why? (Write below)

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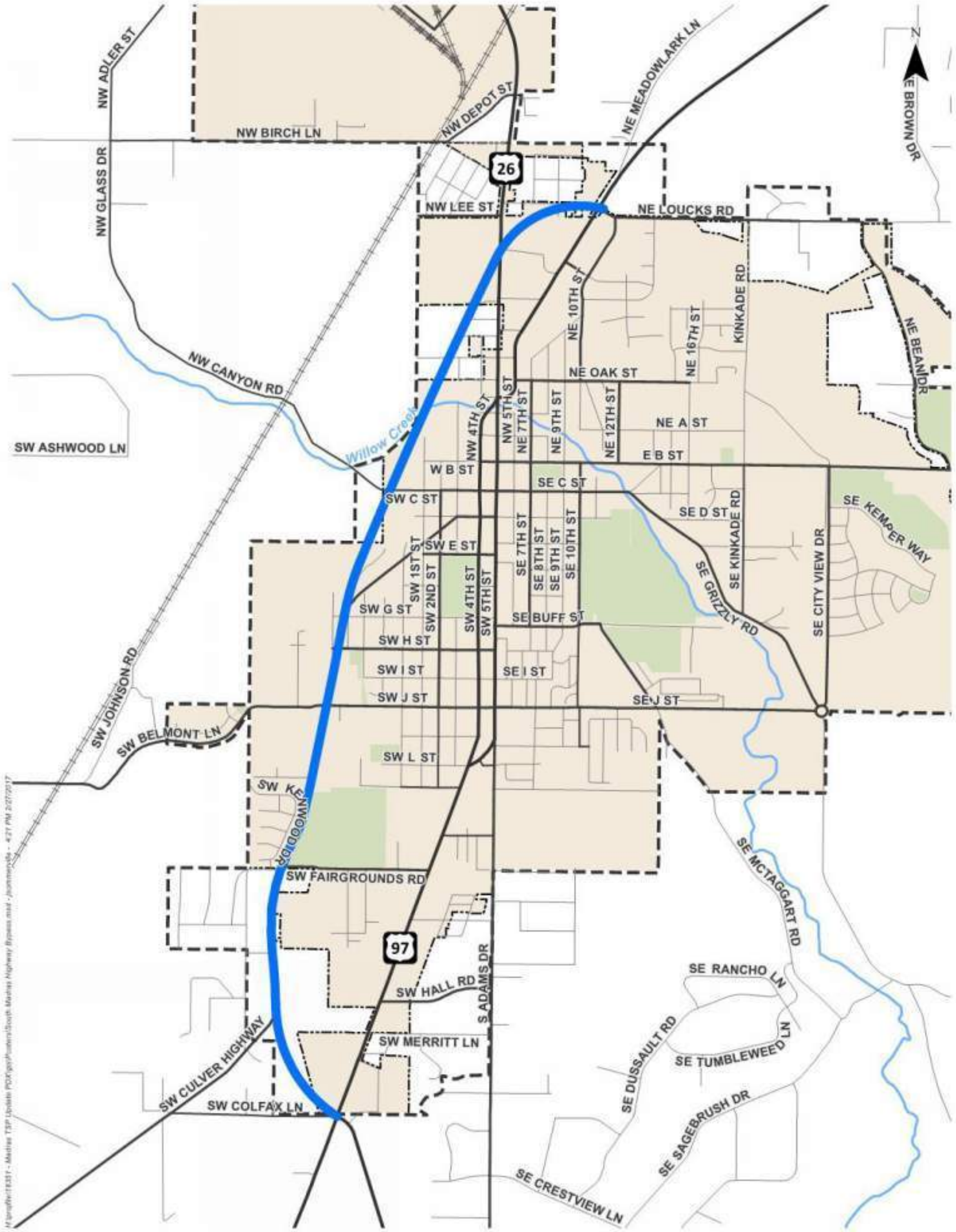
Draft Improvement Options: Bypass



Pros:

- Would remove congestion and trucks from the downtown Madras core
- Would provide the opportunity to make downtown Madras more visitor friendly
- Could make it easier or quicker for vehicles traveling through Madras

Cons:

- Would be very expensive and likely take a while to plan, fund, and construct
- The economic impacts to Madras would need to be considered

THE CITY OF MADRAS
EST. 1910

Draft Improvement Options: Couplet Extension

Pros:

- Would extend downtown Madras to the south
- Would improve traffic flow/reduce congestion to US 97 without creating a very wide road
- Could create an environment more friendly to pedestrian and bicycle users

Cons:

- Where the couplet extension would go needs to be evaluated
- The cost of this improvement needs to be better understood

THE CITY OF MADRAS
EST. 1910

Draft Improvement Options: Maintain 3-Lane Section

Pros:

- Would limit local impacts
- Would be least expensive option
- Could be improved to enhance pedestrian and bicycle environment

Cons:

- Limited ability to serve increasing highway traffic
- Limited ability to serve increasing local traffic

THE CITY OF MADRAS
EST. 1910

Draft Improvement Options: Widen to 5-Lane Section

Pros:

- Would improve traffic flow and reduce congestion along the highway
- Would allow for traffic improvement options at intersections

Cons:

- Could make turning onto and off of the highway difficult
- Similar roadways in Oregon have had poor safety records
- Pedestrian and bicycle users may not feel comfortable

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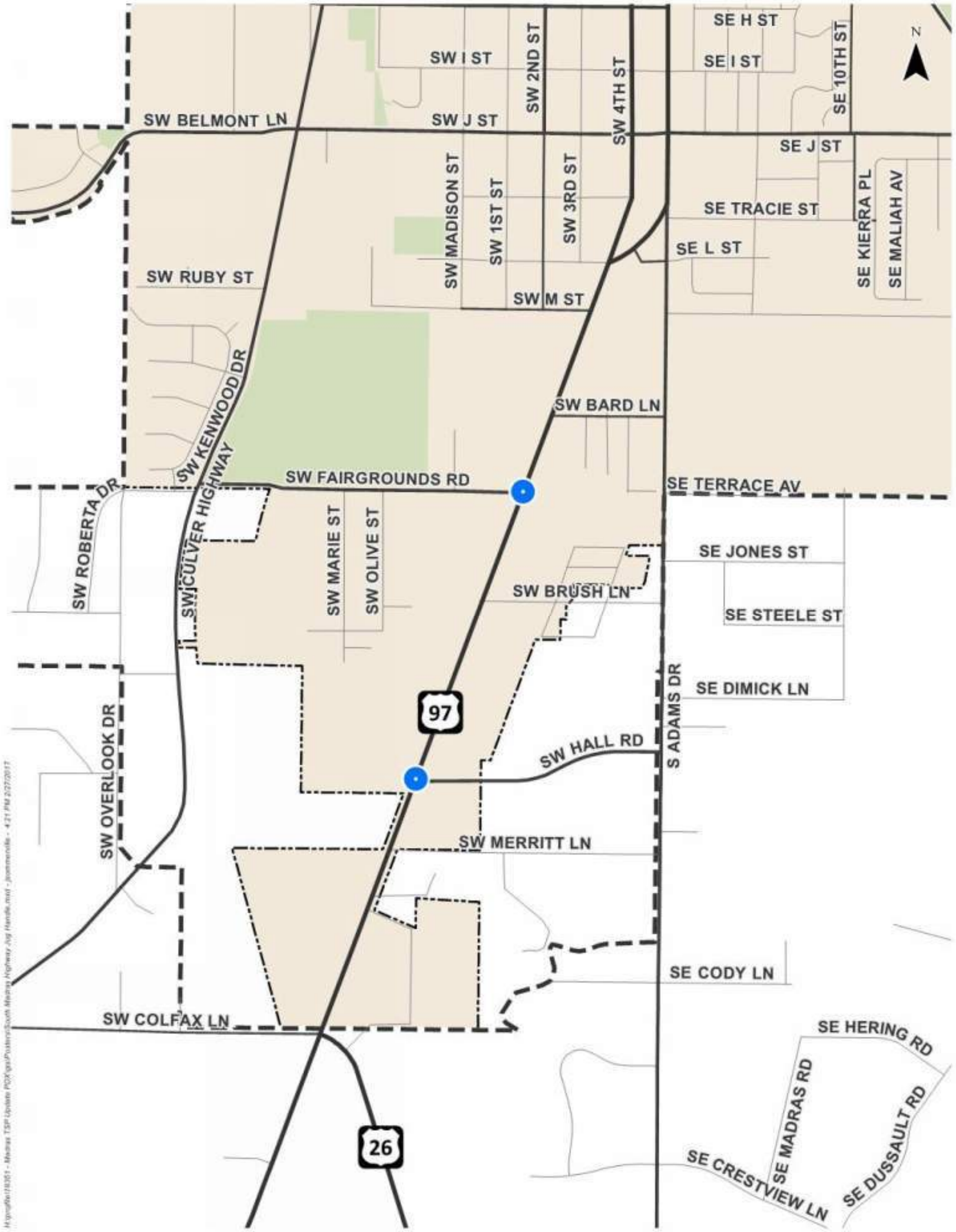
Draft Improvement Options: Interim Intersection Improvements



Concept:

- Could be done near-term and for less money
- Would build towards ultimate solution
- Possible idea:
  - –Jug-handle intersections

Example of a Jughandle intersection

THE CITY OF MADRAS
EST. 1910

Madras Transportation System Plan Update

Welcome!

Bienvenido!

Que es el Plan de Sistemas de Transportación?

Un Plan de Sistemas de Transportación (TSP) es el documento que guía a la cuidad sobre que reparaciones se ocupa hacer a las carreteras, banquetas, rutas de bicicleta, vehículos de carga, y el Sistema de transportación publica. Provee la visión para:

- Donde se ocupa hacer reparos para poder mejorar las carreteras para los vehículos, bicicletas, y peatones, ahora y en el futuro. (A esto le llamamos las solicitudes de viajar.)

- Mejoras a la seguridad que ayudara a todos los que (los que manejan, andan en bicicleta, peatones y los que usan la transportación publica) viajan alrededor y a través de Madrás mas seguramente.

- Planes específicos para el desarrollo de los sistemas de transportación de peatones, bicicleta y transportación publica.

- Metas y pólizas que ayudan a guiar y desarrollar el Sistema de transportación para tratar de satisfacer todas las necesidades.

THE CITY OF MADRAS
EST. 1910

Como puede ayudar usted?

Su trabajo aquí hoy:

La cuidad de Madrás esta actualizando su Plan de Sistemas de Transportación. Un comité publico de residentes de Madrás, ha estado trabajando por mas de un año para mejorar el plan. Ahora queremos escuchar su opinión nuevamente! Específicamente, queremos saber su opinión sobre los planes para mejorar el Sistema de transportación en Madrás. Estas mejoras incluyen:

- Sistema de Carreteras
- Sistema de Bicicleta
- Sistema para Peatones
- Sistema de Transito (Autobús)

- ***Primer Paso:*** Camine alrededor y vea los mapas. Siéntase libre a escribir directamente en los mapas.

- ***Segundo Paso:*** Anote sus comentarios en la tarjeta de comentarios.

Siguientes Pasos:

- Usaremos sus comentarios para delinear las listas de proyectos y seguir trabajando en el bosquejo del Plan de Sistemas de Transportación. Una ves que tengamos el bosquejo, le preguntaremos al publicó, nuevamente, que nos de su opinión.

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Transito

Madrás actualmente tiene un servicio de autobús de transito a:

- Redmond
- Metolius
- Culver
- Warm Springs

Hay servicio de conexión en:

- Sisters
- Prineville
- Bend
- La Pine

Madrás se a propuesto a trabajar con Cascades East Transit para aumentar el servicio de conexión por medio de:

- Aumentar la frecuencia
- Agregar mas tiempo durante el día
- Agregar paradas adicionales en la ruta en la comunidad

Mejoras al carretera del sur de Madrás

- **Propósito:** Mejoras al área de la carretera del sur de Madrás se harán para permitir que las personas puedan viajar a través de Madrás en US 97 y US 26, y a la misma ves permitir opciones de acceso a las carreteras y negocios de Madrás.
- **Resultado:** El Plan de Sistemas de Transportación identificara el criterio importante para la comunidad que se debería de usar para desarrollar y evaluar en las alternativas de mejoras para esta sección de carretera. Y en el futuro la cuidad y ODOT usaran este criterio para desarrollar y evaluar las alternativas de mejoras.

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Mejoras a la carretera del Sur de Madrás

Criterio: Las carreteras son mas que simples lugares para que los vehículos anden. Tienen mas funciones e impactan como se ve, se siente, y la función de la comunidad. La variedad de configuraciones de carreteras tienen diferentes efectos.

Nosotros creemos que el siguiente criterio es clave y que debería de ser considerado cuando evaluemos estas alternativas de la carretera:

- Seguridad para todos los que usan las carreteras
- Impactos/resultados positivos económicos
- Costo de infraestructura
- Movilidad del trafico en US 97/US 26, incluyendo vehículos de carga
- Movilidad/acceso para el trafico local
- Movilidad para las personas que no usan autos

Son importantes para usted los comentarios anteriores? Porque?

Que otro criterio se debería considerar? Porque? (Anote abajo)

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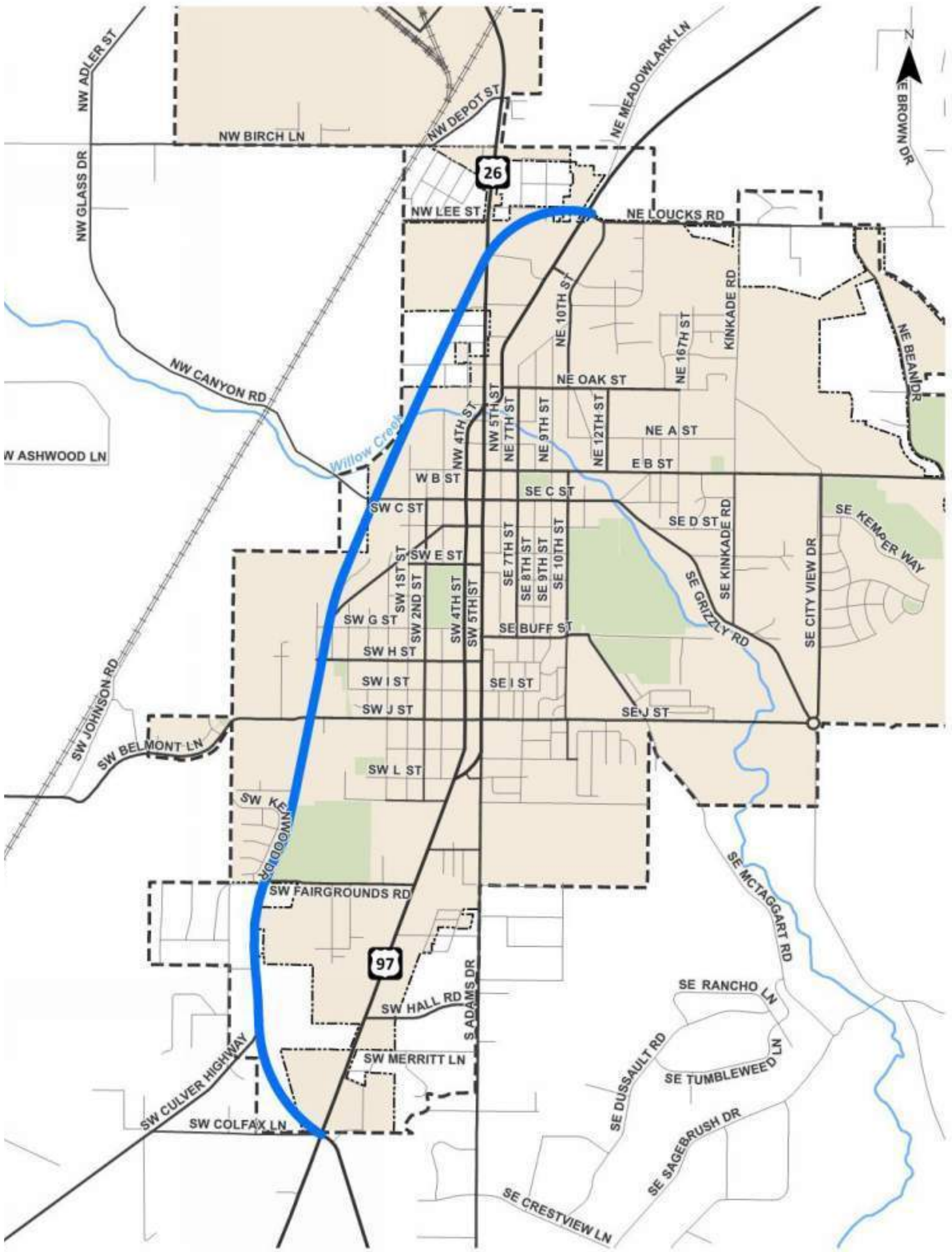
Proyecto de opciones de Mejora: Carretera de circunvalación



Pros:

- Quitara la congestión y trocas de el centro de Madrás
- Proveerá la oportunidad para hacer el centro de Madrás mas amistoso para la personas que visitan
- Pudiera ser mas fácil o rápido para los vehículos que están viajando por Madrás

Contras:

- Seria muy caro y tomaría tiempo planearlo y construirlo
- Los impactos a Madrás tendrían que ser considerados

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Proyecto de opciones de Mejora : Extensión de Copla

Pros:

- Extendería el centro de Madrás hacia el sur
- Mejoraría el flujo de trafico. Reduciría la congestión hacia US 97 sin crear una carretera ancha
- Puede crear un medio ambienta mas amistoso para los peatones y personas que usan bicicletas

Contras:

- El área donde se haría la extensión de copla tendría que ser evaluada
- El costo de esta mejora se necesita entender mejor

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Proyecto de opciones de Mejora: Arreglar la sección de 3 carriles


Sección de 3 carriles en Madrás

Pros:

- Limitaría los impactos locales
- Seria la opción menos costosa
- Pudiera ser mejorada para aumentar el medio ambiente para los peatones y bicicletas

Contras:

- Limita la habilidad de server el aumento en trafico de la carretera
- Limita la habilidad de server el aumento de trafico local

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Proyecto de opciones de Mejora : Aumentar la sección de 5 carriles

Pros:

- Mejoraría el flujo de trafico y reduciría la congestión en la carretera
- Permitiría mas opciones para mejoras en las intersecciones

Contras:

- Pudiera causar dificultades para entrar y salir de la carretera
- Carreteras similares en Oregón han tenido registros de seguridad muy malos
- Los peatones y personas que usan bicicletas pudieran sentirse incomodos

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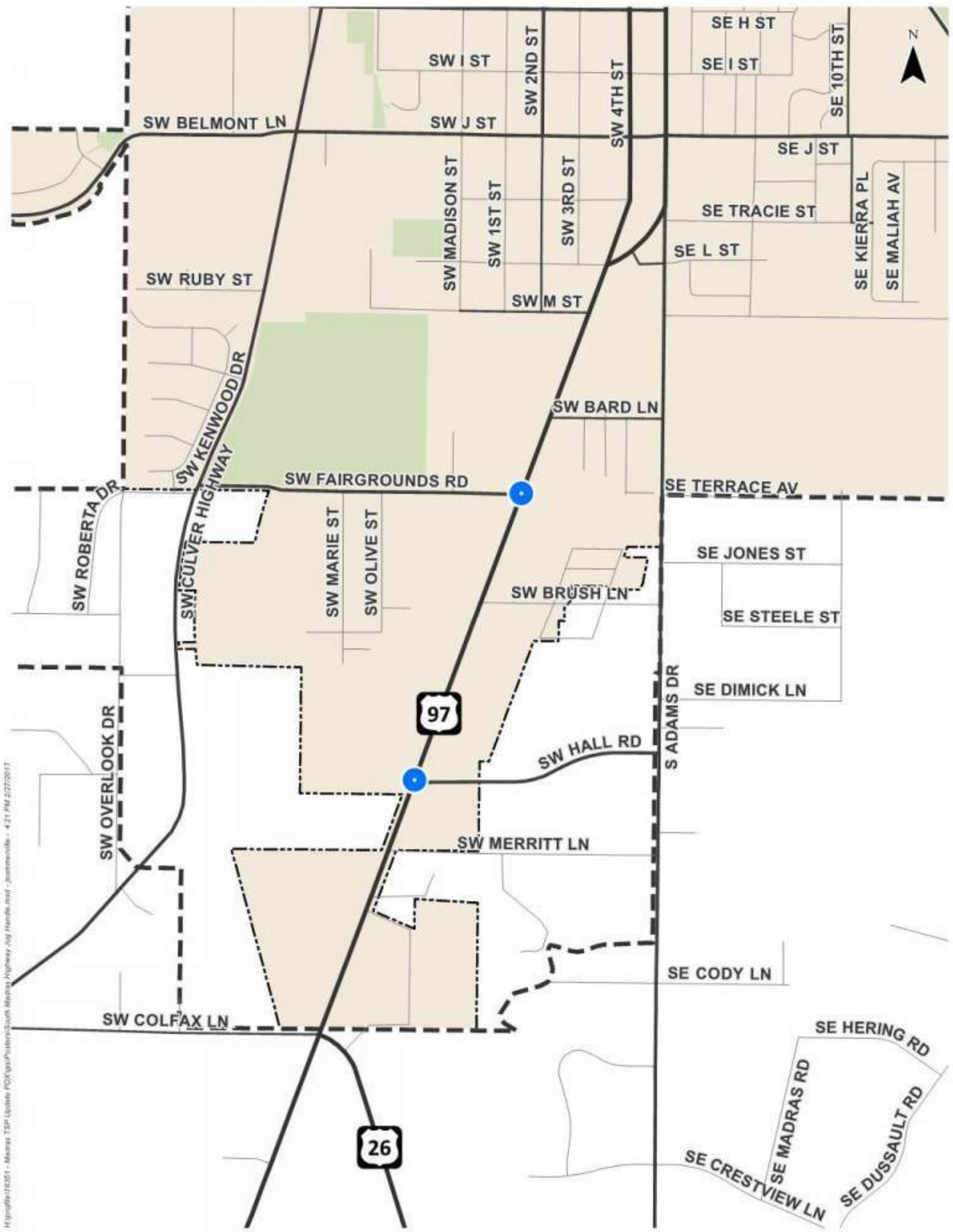
Proyecto de opciones de Mejora : Mejoras intermediaras para la intersección



Concepto:

- Se pudiera hacer en mas poco tiempo y por costo mas bajo
- Pudiera construir hacia una solución completa
- Idea posible:
  - –Cruce de intersecciones

Example of a Jughandle intersection

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Madras Transportation System Plan March 2017

Thank you for attending! Please take a few minutes to provide us with comments. Your comments will be reviewed by the project team and will inform refinement of the identified transportation alternatives. If you don't complete the form tonight, please mail it to Madras City Hall, 125 SW "E" Street, Madras OR 97741 or email it to nsnead@ci.madras.or.us before March 24, 2017.

WHAT IS A TRANSPORTATION SYSTEM PLAN?

A **Transportation System Plan (TSP)** is the document that guides the future development of the transportation system within Madras. It provides a vision for:

- Where future roadway improvements are needed to serve vehicles, bicycles, and pedestrians now and in the future. (We call this travel demand.)
- Safety improvements that will help all users (drivers, bicyclists, pedestrians, public transportation users) travel around and through Madras more safely.
- Specific plans for the development of the pedestrian, bicycle, and transit systems.
- Goals and policies that will help guide the development of the transportation system to try and meet all of these needs.

HOW WILL YOUR INPUT BE USED

The feedback you provide during this open house will be used to refine the planned transportation projects in Madras that will be included in this Transportation System Plan Update.

TELL US WHAT YOU THINK ABOUT THE PROPOSED TRANSPORTATION PROJECTS

Pedestrian System – sidewalks, roadway crossings, trails

How do you use the sidewalks, trails, and roadway crossings or crosswalks when you walk in Madras today?	What do you think of the proposed pedestrian plan?
Other comments?	

Bicycle System – bicycle lanes, trails

How do you use the bicycle transportation system (bicycle lanes and trails) in or around Madras today?	What do you think of the proposed bicycle plan?
Other comments?	

Transit System – route options, stop locations

How do you use the public transportation system in or around Madras today?	What do you think of the long term vision for the transit system?
Other comments?	

Vehicle System – connectivity, capacity, intersection improvements

How do you use the transportation system today in a vehicle in or around Madras?	What do you think of the proposed roadway and intersection projects?
Other comments?	

South Madras Highway Improvements

What criteria do you think should be considered when evaluating highway improvement options?	What are the main issues that should be addressed in the south highway area?
Other comments?	

OTHER COMMENTS

Please share any other ideas or comments that you would like the project team to consider during the development of the Madras Transportation System Plan. Thank you!

OPEN HOUSE EVALUATION – TELL US HOW WE DID

	Strongly agree	Somewhat agree	Neutral	Somewhat disagree	Strongly disagree
Open house was useful to me.	☐	☐	☐	☐	☐
Open house made good use of my time	☐	☐	☐	☐	☐
I understand how my input will be used.	☐	☐	☐	☐	☐

What was the most useful part of the open house?

What could we change to make future open houses better?

How did you hear about the open house?

Plan de Sistema de Transportacion de Madras   Marzo 2017

¡Gracias por asistir! Por favor tome algunos minutos para proveernos con sus comentarios. Sus comentarios serán revisados por el equipo del proyecto e informarán las alternativas finalizadas. SI no completa la forma hoy, por favor envíela a Madrás City Hall, 125 SW "E" Street, Madrás OR 97741 o por email a nsnead@ci.madras.or.us antes del 24 de marzo, 2017.

¿QUE ES UN PLAN DE SISTEMA DE TRANSPORTACION?

Un **Plan de Sistema de Transportación (TSP)** es un documento que guía el desarrollo del futuro del Sistema de transportación para Madrás y provee la visión para:

- Donde se ocupa hacer reparos para poder mejorar las carreteras para los vehículos, bicicletas, y peatones, ahora y en el futuro. (A esto le llamamos las solicitudes de viajar.)
- Mejoras a la seguridad que ayudara a todos los que (los que manejan, andan en bicicleta, peatones y los que usan la transportación publica) viajan alrededor y a través de Madrás más seguramente.
- Planes específicos para el desarrollo de los sistemas de transportación de peatones, bicicleta y transportación pública.
- Metas y pólizas que ayudan a guiar y desarrollar el Sistema de transportación para tratar de satisfacer todas las necesidades.

COMO SE USARÁ SU OPINION

Su opinión durante esta junta se usará para refinar los proyectos de transportación en Madrás que incluirán el Plan de Sistema de Transportación actualizado.

DIGANOS QUE PIENSA SOBRE LOS PROYECTOS PROPUESTOS

Sistema para Peatones-banquetas, áreas de cruzar y caminos

¿Cómo le gusta usar las banquetas, caminos, áreas de cruzar cuando camina en Madrás hoy en día?	¿Qué le parece el plan para peatones propuesto?
¿Otros comentarios?	

Sistema de bicicletas– carriles de bicicletas y caminos

¿Cómo usa usted el Sistema de bicicletas hoy en día (carriles para bicicletas y caminos) en o alrededor de Madrás?	¿Qué piensa usted del sistema para bicicletas que se ha propuesto?
¿Otros comentarios?	

Sistema de Transito– opciones para rutas, áreas para parar

¿Cómo usa usted el sistema de transportación en o alrededor de Madrás hoy en día?	¿Qué piensa usted de nuestra visión a largo plazo del sistema de transito?
¿Otros comentarios?	

Sistema para Vehículos – conexiones, capacidad, arreglos a las intersecciones

¿Cómo usa usted el sistema de transportación en su vehículo hoy en día en y alrededor de Madrás?	¿Qué piensa usted de los proyectos para la carretera e intersecciones?
¿Otros comentarios?	

Mejoras a la carretera al Sur de Madrás

¿Qué criterio cree usted que debería de ser considerado cuando evalué las opciones para mejorar la carretera?	¿Qué son los problemas mayores que deberían de ser dirigidos en el área de la carretera del sur?
¿Otros comentarios?	

OTROS COMENTARIOS

Por favor comparta otras ideas o comentarios que a usted le gustaría que el equipo del Proyecto considere durante el desarrollo del Plan de Sistema de transportación. ¡Gracias!

EVALUACION DE LA JUNTA – DIGANOS COMO HICIMOS

	De Acuerdo	Un poco de acuerdo	Neutral	No estoy de acuerdo un poco	No estoy de acuerdo
Esta junta fue de valor para mi	☐	☐	☐	☐	☐
Esta junta fue buen uso de mi tiempo	☐	☐	☐	☐	☐
Entiendo cómo se usará mi opinión	☐	☐	☐	☐	☐

¿Que fue la parte más útil de esta junta?

¿Qué podemos hacer para mejorar estas juntas en el futuro?

¿Cómo se dio cuenta de esta junta?

Do you drive, bike, walk, or take transit in Madras?

The City wants to hear from you on March 7!

City of Madras Community Open Houses: Tuesday, March 7, 2017
Drop in: 4:00 to 7:00pm
Central Oregon Community College Madras Campus Community Meeting Room
1170 E. Ashwood Road, Madras, Oregon.

Based on community input, the City of Madras has developed draft projects to make driving, biking, walking, or taking transit in Madras better for everyone.
Come tell us what you think of these ideas!

- **Drop in** any time between 4:00 to 7:00pm (no formal presentation)
- Review and provide feedback on proposed projects to improve the:
    - **Roadway system**, including possible improvement options for US 97 in the south part of town
    - **Bicycle system**
    - **Pedestrian system**
    - **Transit system**
- **Talk directly with City staff** and share your experience of moving in or around Madras.
- **Bring the whole family** (snacks will be available and a kids table for map drawing).
- **English and Spanish** language interpretation and materials will be available.

These meetings and event location are accessible. Other accommodations are available upon advance request. Please contact the City of Madras no later than 72 hours in advance of the meeting at 541-475-2344.

¿Usted maneja, anda en bicicleta, camina o viaja por autobús en Madrás?

¡La cuidad quiere escuchar su opinión el 7 de marzo!

Junta de la comunidad para la Cuidad de Madrás: martes, 7 de Marzo, 2017

Participe entre: 4:00pm y 7:00pm

El edificio de COCC de Madrás Salón Comunitario
1170 E. Ashwood Road, Madras, Oregon.

Basado en las opiniones de la comunidad, la Cuidad de Madrás ha desarrollado proyectos de opciones para mejorar las áreas de tránsito para todos, si maneja, anda en bicicleta, camina o anda en autobús.

¡Venga y comparta sus ideas!

- **Participe entre** 4:00 to 7:00pm (no habrá una presentación formal)
- Revise y de su opinión sobre los proyectos propuestos para mejorar:
  - **El Sistema de Carreteras**, incluyendo las posibles opciones de mejoras al US 97 en la parte del sur de la cuidad
  - **Sistema para Bicicletas**
  - **Sistema para Peatones**
  - **Sistema de Transito (Autobús)**
- **Hable directamente con el personal de la Cuidad** y comparta su experiencia de andar en o alrededor de Madrás.
- **Traiga a toda su familia** (se proveerá una merienda y una mesa para que los niños dibujen).
- Habrá documentos e intérpretes en **Inglés y Español**

Estas juntas y eventos en el local son accesibles. Se pueden hacer otros arreglos si se piden de antemano. Por favor contacte a la Cuidad de Madrás antes de la junta por lo menos 72 horas antes del evento al 541-475-2344.

FOR IMMEDIATE RELEASE:
CONTACT:
Nick Snead
Community Development Director, City of Madras
541-325-0304
nsnead@ci.madras.or.us
http://www.madrastsp.com/

Do you drive, bicycle, walk, or take transit in Madras?
Then the City wants to hear from you on March 7th!

Madras, Oregon, February 20 - Join the City for an interactive and family-friendly Open House event on **Tuesday, March 7, from 4:00 to 7:00 p.m. at the Community Meeting Room at Central Oregon Community College, Madras**. If you live, work, go to school, travel in or through Madras, or own a business or property in the area, then the City wants to hear from you!

The City is updating its Transportation System Plan. As part of that process, the City formed a Public Advisory Committee (PAC) last year with the goal of developing community-supported recommendations to update the Transportation System Plan for Madras. Input from prior public engagement efforts and the PAC have helped to develop recommended projects that will help the City's transportation system grow over the next 20 years. The City and PAC are eager to hear from community members about these recommended projects.

Drop in anytime during the Open House Event on March 7
Location: Central Oregon Community College, Madras, Community Meeting Room
1170 E. Ashwood Road, Madras, Oregon

- Drop in any time between 4:00 and 7:00 p.m. (no formal presentation)
- Review and provide feedback on proposed projects to improve the:
  - **Roadway system**, including possible improvement options for US 97 in the south part of town
  - **Bicycle system**
  - **Pedestrian system**
  - **Transit system**
- Talk directly with City staff and share your experience of getting around and through Madras.
- Bring the whole family (snacks will be available and a kids table for map drawing).
- English and Spanish language interpretation and materials will be available.

These meetings and event location are accessible. Other accommodations are available upon advance request. Please contact the City of Madras no later than 72 hours in advance of the meeting at 541-475-2344.

END

Comment Report

Madras Transportation System Plan Update

Public Open House #3

Community Transportation Projects and Concept Areas

January 18, 2018

Prepared by
Anne E. George Facilitation, Mediation + Public Involvement
Bend, Oregon

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Introduction

Over the past two years, in cooperation with a Public Advisory Committee, Technical Advisory Committee, the community-at-large, and local and state agencies, the City of Madras has collaborated on an update to its Transportation System Plan. A Transportation System Plan (TSP) is the document that guides the future development of the transportation system within Madras. It provides a vision for where roadway improvements are needed today and in the future; identifies safety improvements that will help all users travel around and through Madras more safely; and develop specific plans for vehicle, pedestrian, bicycle, and transit systems.

The goal of the third and final Open House was to share with the community a final Draft Transportation System Plan Update and seek community input. The project team will use this input to refine the document before it is presented to the Madras and Jefferson County Planning Commissions and ultimately the Madras City Council. This TSP Update effort also included the development of three Concept Area Plans: The North Industrial, East Madras, and South Madras Concept Area Plans were identified as areas for improvements to prepare for and address potential rapid growth in Madras.

Madras TSP Update Project Goals and Objectives:

- **Mobility and Connectivity**: Promote a transportation system that provides efficient connections.
- **Economic Development**: Support existing industry and encourage economic development in the City.
- **Safety**: Improve safety and accessibility throughout the City and especially within the downtown core.
- **Multimodal Users**: Safe and efficient transport of people and goods through active modes.
- **Environment**: Balance transportation services with the need to protect the environment.
- **Planning and Funding**: Maintain the safety, physical integrity, and function of the transportation network.

Community Generated Solutions

A Public Advisory Committee (PAC), appointed by the Madras City Council, was tasked with developing a recommendation for a preferred Transportation System Plan Update for Madras. The PAC was supported by a Technical Advisory Committee (TAC) of local technical experts, as well as a project team of City staff and consultants. The project relied heavily on community input and this event was the third in a series of community open houses held over a two-year period.

The Open House #3 was held from 4:00 to 7:00 p.m. on Thursday, January 18, 2018, at the Community Room of Central Oregon Community College in Madras. Comments were received at the event and paper comment forms were also made available for public input through February 1, 2018 at Madras City Hall.

The event was family-friendly and participants were encouraged to bring their children to participate in the kids' transportation art table and enjoy light refreshments. Meeting materials were made available in both English and Spanish, and Spanish language interpretation was provided at the event. The event was also ADA accessible and additional accommodations were available upon request.

Next Steps

The project team will review community feedback from this process and finalize the Draft Transportation System Plan Update for Madras City Council consideration in mid-2018.

Community Outreach

With a commitment to broad outreach in the community, the project team utilized a number of tools to promote the Open House event. Outreach efforts included the use of the project website, social media, press releases, and community fliers. Outreach materials were provided in both English and Spanish. The event received media coverage, including an article in the *Madras Pioneer* newspaper, a week prior to the event, informing the community of the Open House. To ensure that the City reached traditionally underrepresented communities, the project team also partnered with an invaluable community organization, the Let's Talk Diversity Coalition in Madras. The organization assisted in community outreach, as well as translation of materials and meeting interpretation.

Open House Content

Participants were asked to review and comment on possible transportation improvements, specifically project concepts on the City's vehicle, freight, pedestrian, bicycle and transit systems. These systems describe how drivers, bicyclists, and pedestrians move safely and efficiently in and through the City. Participants were also asked to weigh in on possible South Madras highway improvements, an area identified for near- and long-term improvements. General comments about the Transportation System Plan in Madras were also solicited.

In addition to paper comment cards provided at the event, participants were asked to draw or write directly on maps at multiple displays at the events. *[Please see copies of the Open House display boards and maps in the Attachments section of this document.]*

Participants were welcomed at the entrance and displays explaining the project and the purpose of the Open House were positioned near the entrance.

Participation

The Open House was attended by over 13 community members. In addition to the comments captured on the event displays, three comment cards were received.

Open House Community Input

Participants generally appreciated the improvements proposed in the Draft Transportation System Plan Update. Safety and mobility were key strengths of the plan for participants, as were improvements to address capacity. The Open House events offered participants an opportunity to share specific recommendations and feedback. Community comments are included below.

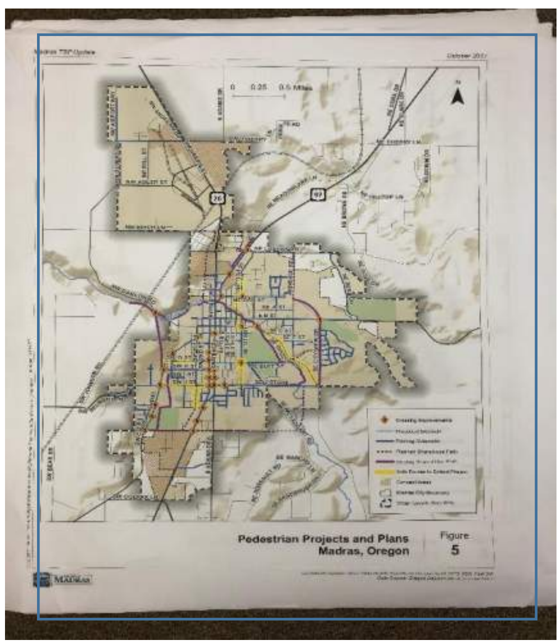
<u>Community Comments</u>

Open House Themes:

A. Pedestrian System – sidewalks, roadway crossings, trails
B. Bicycle System – bicycle lanes, trails
C. Transit System
D. Vehicle and Freight System – connectivity, capacity, intersection improvements
E. South Madras Highway Improvements
F. Other Comments

<u>A. Pedestrian System</u>

The plan calls for pedestrian crossing improvements throughout downtown, adjacent neighborhoods, and a number of intersections in the eastern and western parts of the city. Safety and connectivity were important to participants. The proposed improved pedestrian crossings were well received.



Please see Appendix for a larger version of this image.

Comments on Pedestrian System Updates

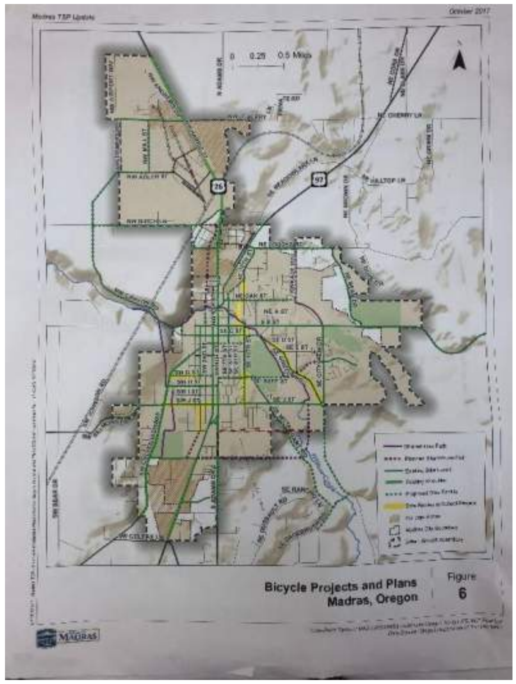
I think these are excellent. The more connections for peds and bikes the easier it is to travel and get to town. It improves public health. I really like adding more of the flashing crossings as they seem to work well.

Obviously, making sure all systems are accessible to all, including those with functional and access needs.

This is needed because we want to avoid deaths.

B. Bicycle System

Participants supported proposed changes to the bicycle system of Madras, including a proposed bike facility to create connected and safe routes for bicyclists in a number of North-South and East-West corridors.



Please see Appendix for a larger version of this image.

General Comments on Bicycle System Updates

This system allows riding bikes without worry of traffic from vehicles.
I think these are excellent. The more connections for peds and bikes the easier it is to travel and get to town. It improves public health. I really like adding more of the flashing crossings as they seem to work well.
Map notation: A participant suggested a shared-use path be made at Adams at SE M Street and connecting to a proposed Bike Facility path below SE Cityview Drive.

C. Transit System

The City and PAC identified multiple areas for improved connectivity. Participants were asked for their feedback on the vision for the transit system in Madras, and they were generally supportive. Comments included:

General Comments on Transit System

I would like to see weekend community connector services. There are needs for better in-town services that connect people to hubs or services, e.g. public health/Best Care that don't require calling ahead 24 hours before.
I'm from Culver, and the CET goes from Culver, then Madras, then Redmond. This isn't necessarily "in Madras" but it would be nice if there was a CET route directly from Culver to Redmond.
What are the numbers to prove that the transit system is used? Is there special transportation for handicapped?

D. Vehicle and Freight System Updates

Currently most through and local traffic utilize 4th and 5th Streets to move north or south through the city. These corridors are also central downtown retail and business streets. The draft plan calls for a number of intersection improvements throughout the downtown corridor as well as in north and south sections of Highway 97 in the city. In addition, there are a number of proposed major and minor collector streets and an industrial roadway outlined in the plan. The collector roads would encourage traffic to utilize improved roads on the east side of the city, lessening vehicle traffic load on local downtown streets where schools, shops and restaurants exist. Lastly, the plan calls for a proposed truck bypass to be located along Culver Highway directly west of downtown to move large freight vehicles traveling north or south out of the downtown corridor. Please see the images from the Open House below and on the following page.

Figure 1 Figure 2

Figure 3

Figure 4

Please see Appendix for larger versions of these images.

Participants were generally supportive of the plan and their comments focused on a desire for safety, capacity and mobility.

General Comments on Vehicle System

Participant Input:

I think anything that bypasses 4th and 5th for through travelers is vital. On holiday weekends and during the summer, the backups at the south junction are pretty significant. You have to plan around the traffic increases as a local.

I have a concern about NE Bean becoming a major collector as a person that lives on this road. We already have issues with speed and more as people that use it to get to Loucks Road drive on it.

I think the intersection with the Highway and Colfax needs improvement. It gets a lot of traffic from the highway so crossing across or entering it from Colfax or Tahoe Lane is dangerous and requires a lot of wait time. Also the intersection with Dover Lane and the highway is super dangerous – many accidents.

All ideas are needed to make roadway safer for the public.

Map notation: Participants suggested additional intersection improvements at L and 5th Streets and L and Turner Streets.

Map notation: The north section of the plan is development driven.

Map notation: A participant circled SW 1st Street.

Map notation: A participant crossed out the notation "202" at H Street and 4th and 5th Streets.

E. South Madras Highway Improvements

The project team shared a number of proposed improvements to the Highway 97 area in South Madras. Participants were supportive, citing congestion and safety concerns in this area.

Comments on South Madras Highway Improvements

Participant Input on Near-Term Improvement Options:

I think roundabouts work well and like that option more than a jug handle. I do thing creating more local access routes here is great.

It is needed because the traffic on Highway 97 is never ending.

Participant Input on Long-Term Improvement Options:

We need to be ready for the future.

I approve of restricting left-hand turns onto the highway and I'd like that extended up to Dollar Tree.

Participant Other Comment:

As someone that takes a lot of back streets and connectors, more of these!

F. Additional Community Input

Participants were asked to share any additional comments for the project team to consider during the refinement of the Draft Madras Transportation System Plan. Participant comments appear below:

Additional Participant Input

I wish we could have parking areas for CMV (commercial motor vehicles). They often park on side streets and off the highway and it blocks/obstructs safely viewing street when exiting driveways. Sometimes they will block driveways.

I think it is silly that there are two roundabouts in East Madras, where there is barely any traffic, and none closer to the city, where the traffic flow is heavier.

What have you done to prevent flooding? The main street for snow removal and school transport is "B" Street. 2015 and 2016 the street flooded; how do the new street improvements remedy the water back up. The Highway 97 and Highway 26 seem to limit the flow of water to relieve "B" Street flooding or downtown flooding.

EVALUATION: Open House Events Feedback

Participants who **completed Comment Cards** were asked to provide feedback on the events. Results are provided below.

		Strongly agree	Somewhat agree	Neutral	Somewhat disagree	Strongly disagree
Open house was useful to me.		2	1			
Open house made good use of my time.		2	1			
I understand how my input will be used.		1	1			

Participants were also asked what was the **most useful part of the Open House** they attended. Participants said it was useful to see proposed changes for the transportation system. Participants also commented they thought it was helpful to have staff on site to explain the plans, talk with community members, and listen to feedback.

Areas to Improve: Participants were also asked what they would **change to make future open houses better.** Two participants said there was nothing to improve and one did not comment.

Outreach: Participants were asked how they had **heard about the Open House events**? Responses included:

- Newspaper
- City Facebook event
- An interpreter from the event

Attachment A: Madras TSP Update Project Committees

Madras TSP Update Public Advisory Committee Membership List

PAC Member	Affiliation
Tom Brown	*Madras City Council*
Bill Montgomery	*Madras City Council*
Dallas Stovall	*Brightwood*
Joel Hessel	*Madras Planning Commission*
Joe Krenowicz	*Madras Planning Commission, Madras Chamber of Commerce*
Rick Molitor	*Jefferson County School District*
Elaine Henderson	*Cascades East Transit Regional Public Transit Advisory Committee*
Stan Nowakowski	*Bicycle and Pedestrian Advocate*
Carolyn Harvey	*Let's Talk Diversity Coalition*
Lonny Macy	*Confederated Tribes of Warm Springs*
Bob Powers	*Madras Resident*

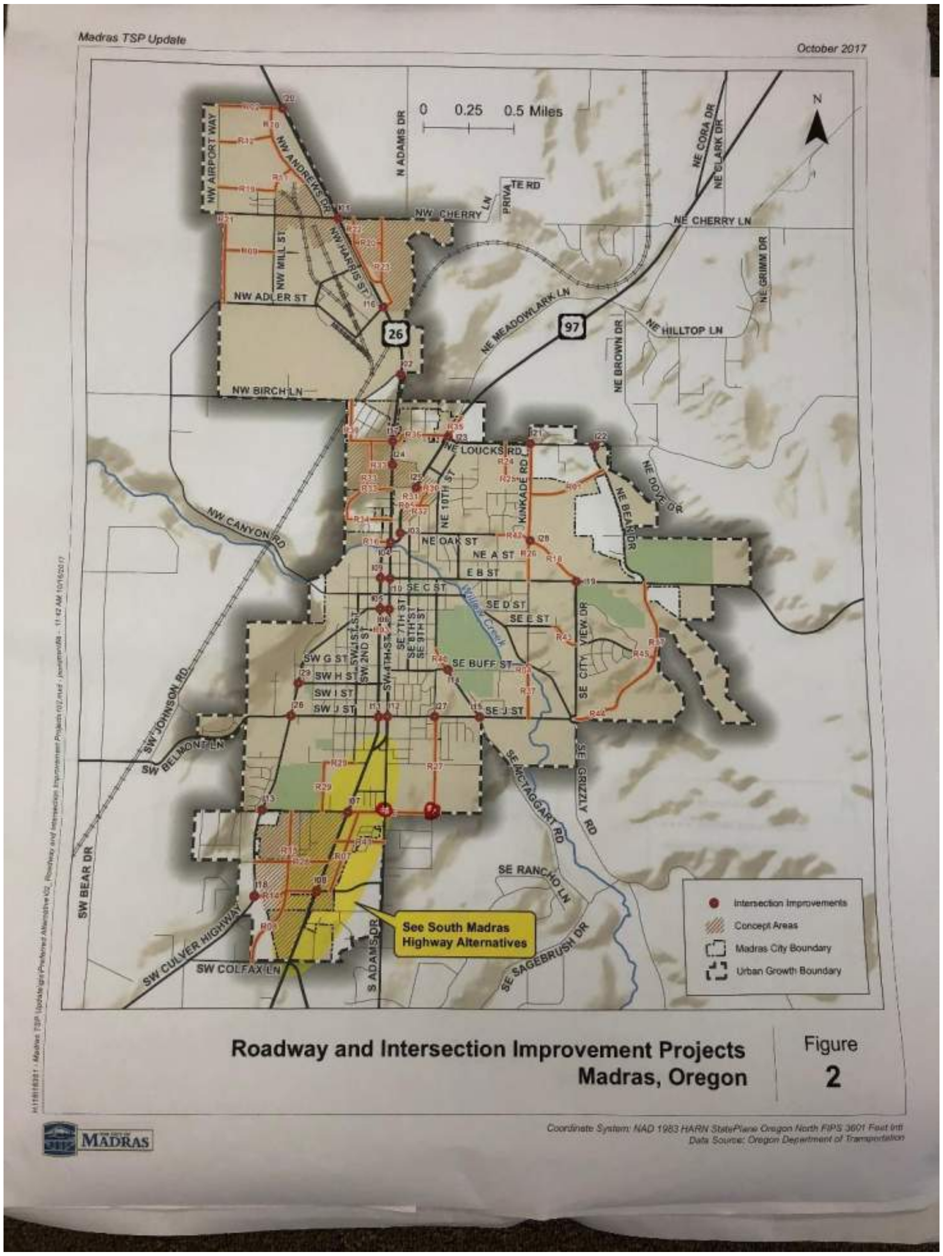
Madras TSP Update Technical Advisory Committee Membership List

TAC Member	Affiliation
Joel McCarroll	*ODOT Region 4*
Bill Hilton	ODOT Region 4
Jeff Rasmussen	*Jefferson County Administrator*
Scott Edelman	*Department of Land Conservation and Development*
Karen Friend	*Cascades East Transit*
Janet Brown	*Economic Development of Central Oregon*
Jeff Hurd,	*City of Madras* Public Works
Gus Burril	City of Madras City Manager
Chief Tanner Stanfill	*Madras Police Chief*
Lonny Macy	
Bob Powers	

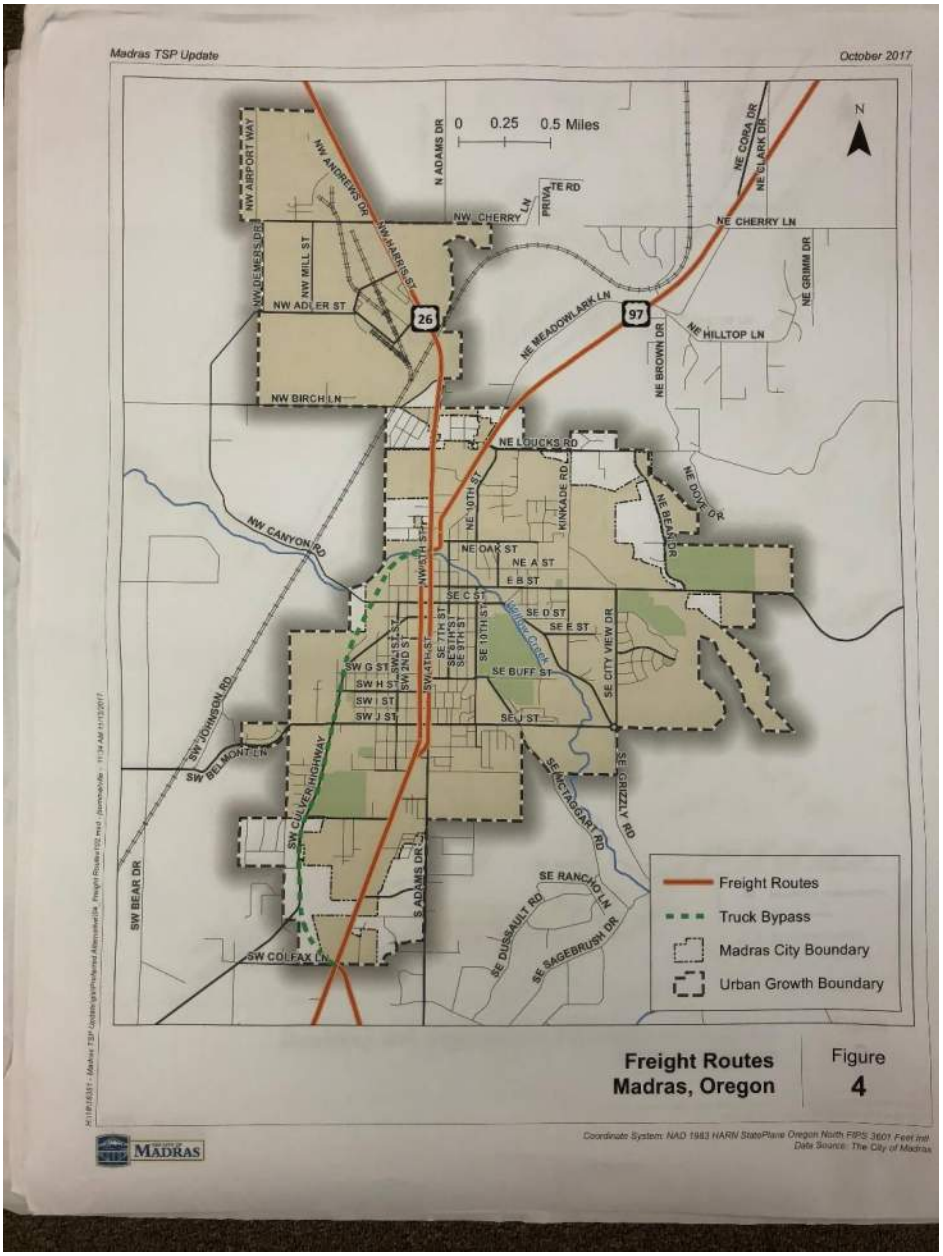
Madras TSP Update Project Team

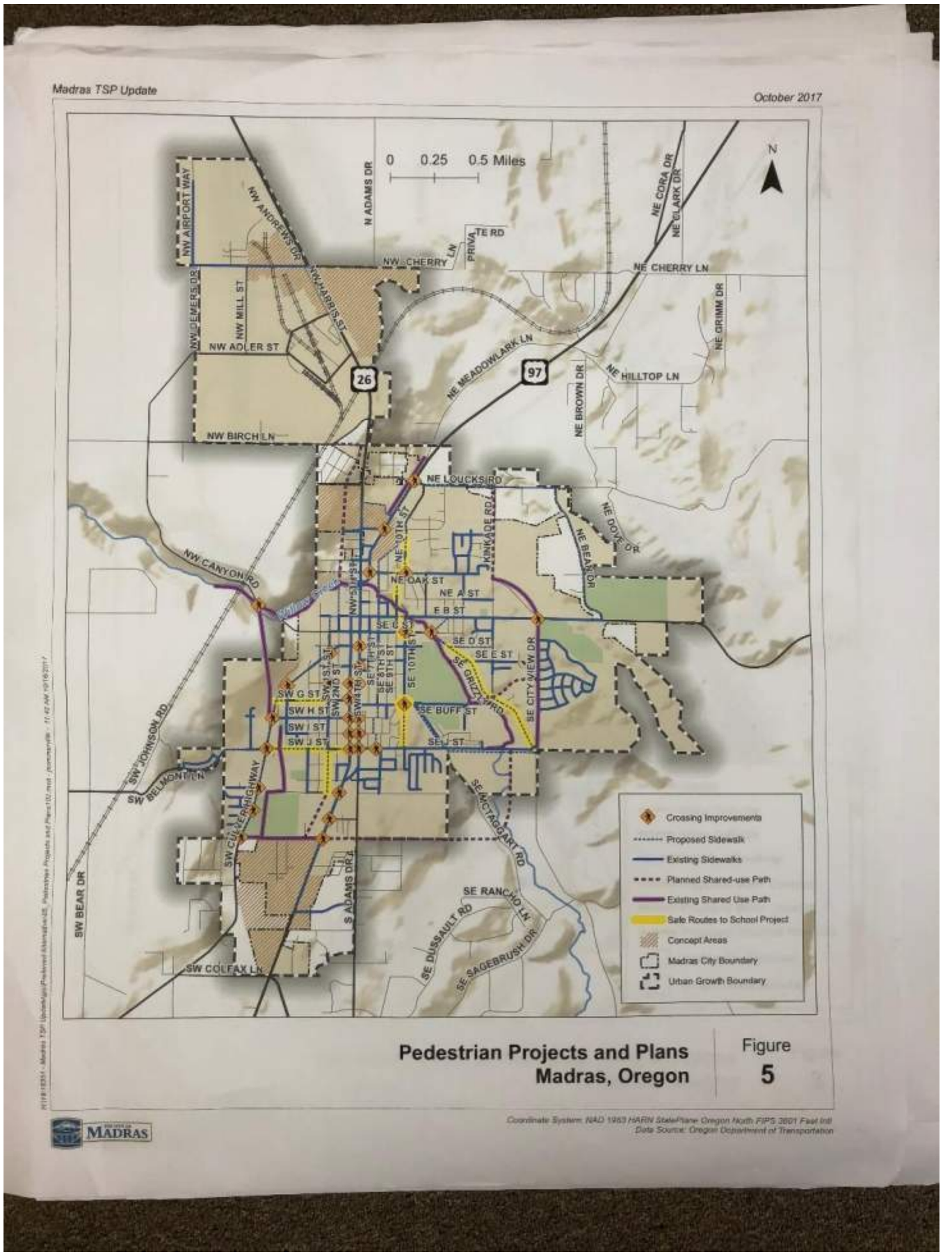
Name	Affiliation
City of Madras	
Nick Snead	*Community Development Director*
Jeff Hurd	*Public Works Director*
Oregon Department of Transportation	
Michael Duncan	*Region 4 Planner*
Consultant Team	
Matt Kittelson	*Kittelson & Associates, Inc.*
Julia Kuhn	*Kittelson & Associates, Inc.*
Yi-Min Ha	*Kittelson & Associates, Inc.*
Anne E. George	*Anne E. George | Facilitation, Mediation, + Public Involvement*
DJ Heffernan	*Daniel Heffernan Company*

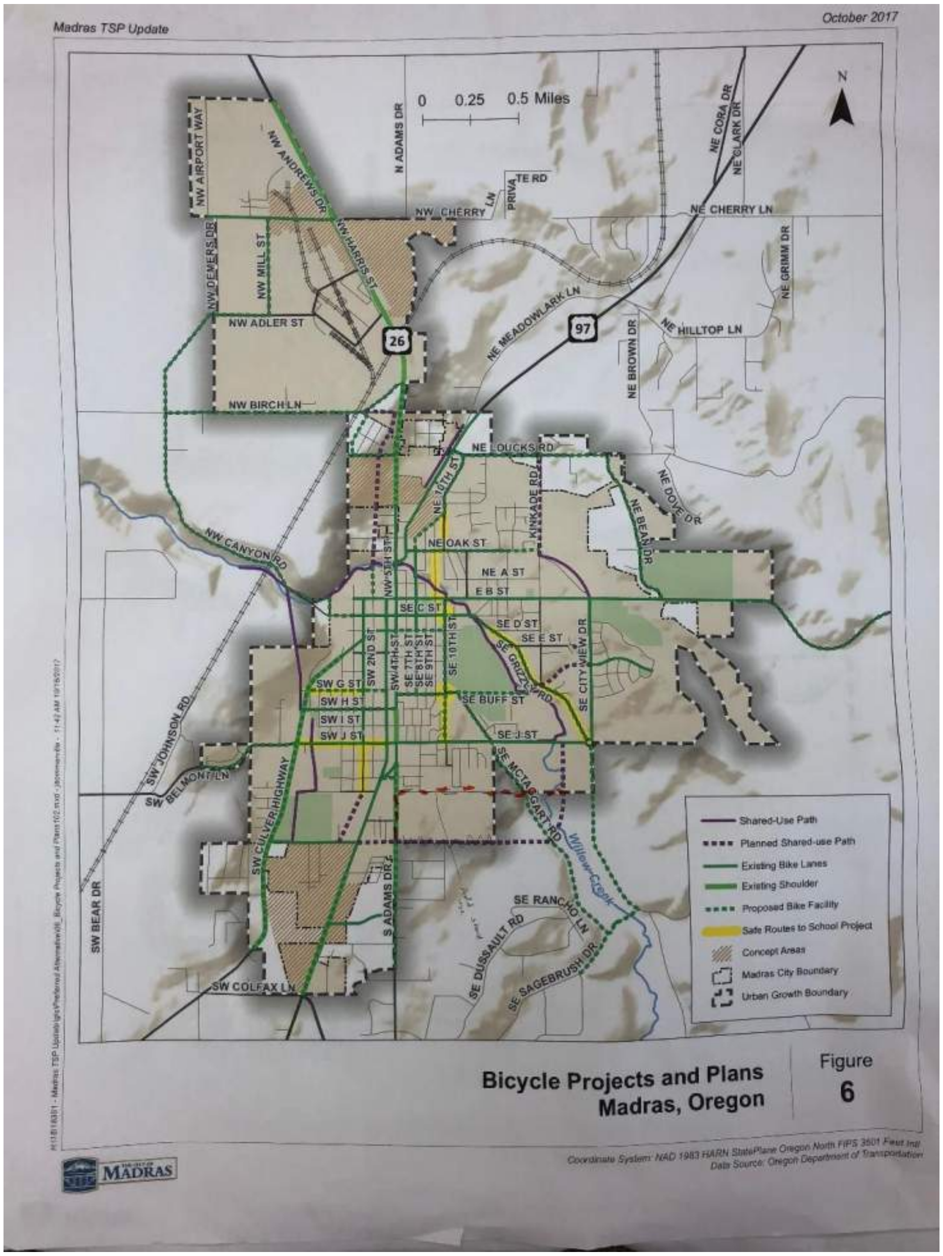
Attachment B: Open House Displays


Madras TSP Update
October 2017
0 0.25 0.5 Miles
N
Intersection Improvements
Concept Areas
Madras City Boundary
Urban Growth Boundary
See South Madras Highway Alternatives
Roadway and Intersection Improvement Projects
Madras, Oregon
Figure 2
MADRAS


Madras TSP Update
October 2017
0 0.25 0.5 Miles
N
Arterial
Major Collector
Minor Collector
Industrial Roadway
Proposed Major Collector
Proposed Minor Collector
Proposed Industrial Roadway
Madras City Boundary
Urban Growth Boundary
Madras Functional Roadway Classifications
Madras, Oregon
Figure
3


Madras TSP Update
October 2017
0 0.25 0.5 Miles
N
Freight Routes
Truck Bypass
Madras City Boundary
Urban Growth Boundary
NW AIRPORT WAY
NW ANDREWS DR
N ADAMS DR
NW CHERRY LN
NE CHERRY LN
NE CORA DR
NE CLARK DR
NE GRIMM DR
NW DEMERS DR
NW MILL ST
NW HARRIS ST
NW ADLER ST
26
97
NE MEADOWLARK LN
NE HILLTOP LN
NE BROWN DR
NW BIRCH LN
NE LOUCKS RD
NE 10TH ST
KINKADE RD
NE DOVE DR
NE BEAR DR
NW CANYON RD
NE OAK ST
NE A ST
E B ST
SE C ST
SE D ST
SE E ST
SE CITY VIEW DR
SE BUFF ST
SE 10TH ST
SW 4TH ST
SW G ST
SW H ST
SW I ST
SW J ST
SE J ST
SW JOHNSON RD
SW BELMONT LN
SW CULVER HIGHWAY
SE MCTAGGART RD
SE GRIZZLY RD
SW BEAR DR
S ADAMS DR
SE RANCHO LN
SE DUSSAULT RD
SE SAGEBRUSH DR
SW COLFAX LN
Freight Routes
Madras, Oregon
Figure
4
MADRAS


Madras TSP Update
October 2017
0 0.25 0.5 Miles
N
NW AIRPORT WAY
NW ANDREWS DR
N ADAMS DR
NW CHERRY LN
NE CHERRY LN
NE CORA DR
NE CLARK DR
NE GRIMM DR
NW DEMERS DR
NW MILL ST
NW ADLER ST
NW BIRCH LN
NE MEADOWLARK LN
NE HILLTOP LN
NE BROWN DR
26
97
NE LOUCKS RD
NE 10TH ST
KINKADE RD
NE OAK ST
NE A ST
E B ST
NE DOVE DR
NE BEAR DR
NW CANYON RD
SE D ST
SE E ST
SE CITY VIEW DR
SW G ST
SW H ST
SW I ST
SW J ST
SE BUFF ST
SE 10TH ST
SW JOHNSON RD
SW BELMONT LN
SW CULVER HIGHWAY
S ADAMS DR
SE MCTAGGART RD
SE RANCHO LN
SE DUSSAULT RD
SE SAGEBRUSH DR
SW BEAR DR
SW COLFAX LN
Crossing Improvements
Proposed Sidewalk
Existing Sidewalks
Planned Shared-use Path
Existing Shared Use Path
Safe Routes to School Project
Concept Areas
Madras City Boundary
Urban Growth Boundary
Pedestrian Projects and Plans
Madras, Oregon
Figure
5
MADRAS


Madras TSP Update
October 2017
0 0.25 0.5 Miles
N
NW AIRPORT WAY
NW ANDREWS DR
N ADAMS DR
NW CHERRY LN
NE CHERRY LN
NW DEMERS DR
NW MILL ST
NW HARRIS ST
NW ADLER ST
NW BIRCH LN
NE MEADOWLARK LN
NE HILLTOP LN
NE BROWN DR
NE GRIMM DR
NE CORA DR
NE CLARK DR
26
97
NE LOUCKS RD
NE 10TH ST
KINKADE RD
NE DOVE DR
NE BEAN DR
NW CANYON RD
NE OAK ST
NE A ST
E B ST
SE C ST
SE D ST
SE E ST
SE CITY VIEW DR
SW 2ND ST
SW 4TH ST
SE 7TH ST
SE 8TH ST
SE 9TH ST
SE 10TH ST
SW G ST
SW H ST
SW I ST
SW J ST
SE BUFF ST
SE J ST
SW JOHNSON RD
SW BELMONT LN
SW CULVER HIGHWAY
S ADAMS DR
SE MCTAGGART RD
SE RANCHO LN
SE DUSSAULT RD
SE SAGEBRUSH DR
Willow Creek
SW BEAR DR
SW COLFAX LN
Shared-Use Path
Planned Shared-use Path
Existing Bike Lanes
Existing Shoulder
Proposed Bike Facility
Safe Routes to School Project
Concept Areas
Madras City Boundary
Urban Growth Boundary
Bicycle Projects and Plans
Madras, Oregon
Figure
6
Coordinate System: NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Oregon Department of Transportation
MADRAS

Madras Transportation System Plan Update

Welcome!
Bienvenido

What is a Transportation System Plan?

A Transportation System Plan (TSP) is the document that guides the City on what improvements to make to the roads, sidewalks, bicycle routes, freight, and public transportation system. It provides a vision for:

- Where future roadway improvements are needed to serve vehicles, bicycles, and pedestrians now and in the future. (We call this travel demand.)
- Safety improvements that will help all users (drivers, bicyclists, pedestrians, public transportation users) travel around and through Madras more safely.
- Specific plans for the development of the pedestrian, bicycle, and public transportation systems.
- Goals and policies that will help guide the development of the transportation system to try and meet all of these needs.

THE CITY OF MADRAS

EST. 1910

How Can You Help?

Your Job Today:

The City of Madras is updating its Transportation System Plan. A Public Advisory Committee of local Madras residents has been working for over a year on ways to improve our plan. Now we want to hear from you again! Specifically, we want to know what you think of the draft Transportation System Plan, that includes improvements for:

- Roadway system
- Bicycle system
- Pedestrian system
- Transit (bus) system

- ***Step One:*** Walk around and take a look at the various maps. Feel free to write directly on the maps.

- ***Step Two:*** Fill out a Comment Card.

Next Steps:

- We'll use the feedback we hear from you to refine this Draft Transportation System Plan. The next steps is for the City of Madras to consider the document for adoptions.

THE CITY OF MADRAS
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Transit

Madras currently has direct transit bus service to:

- Redmond
- Metolius
- Culver
- Warm Springs

Connection service is available to:

- Sisters
- Prineville
- Bend
- La Pine

Madras intends to work with Cascades East Transit to expand the community bus connector service through:

- Increased frequency
- Additional time of day service
- Additional route stops in the community

THE CITY OF MADRAS
EST. 1910

South Madras Highway Improvements

- **Purpose:** Improvements to the highway area in south Madras are intended to allow for people traveling through Madras on US 97 and US 26, while providing options for local access to Madras streets and shops.
- **Outcome:** The Transportation System Plan Update will identify near-term improvement options for the local street system and highway connections in the area. The City and ODOT will continue to explore long-term improvement options

THE CITY OF MADRAS

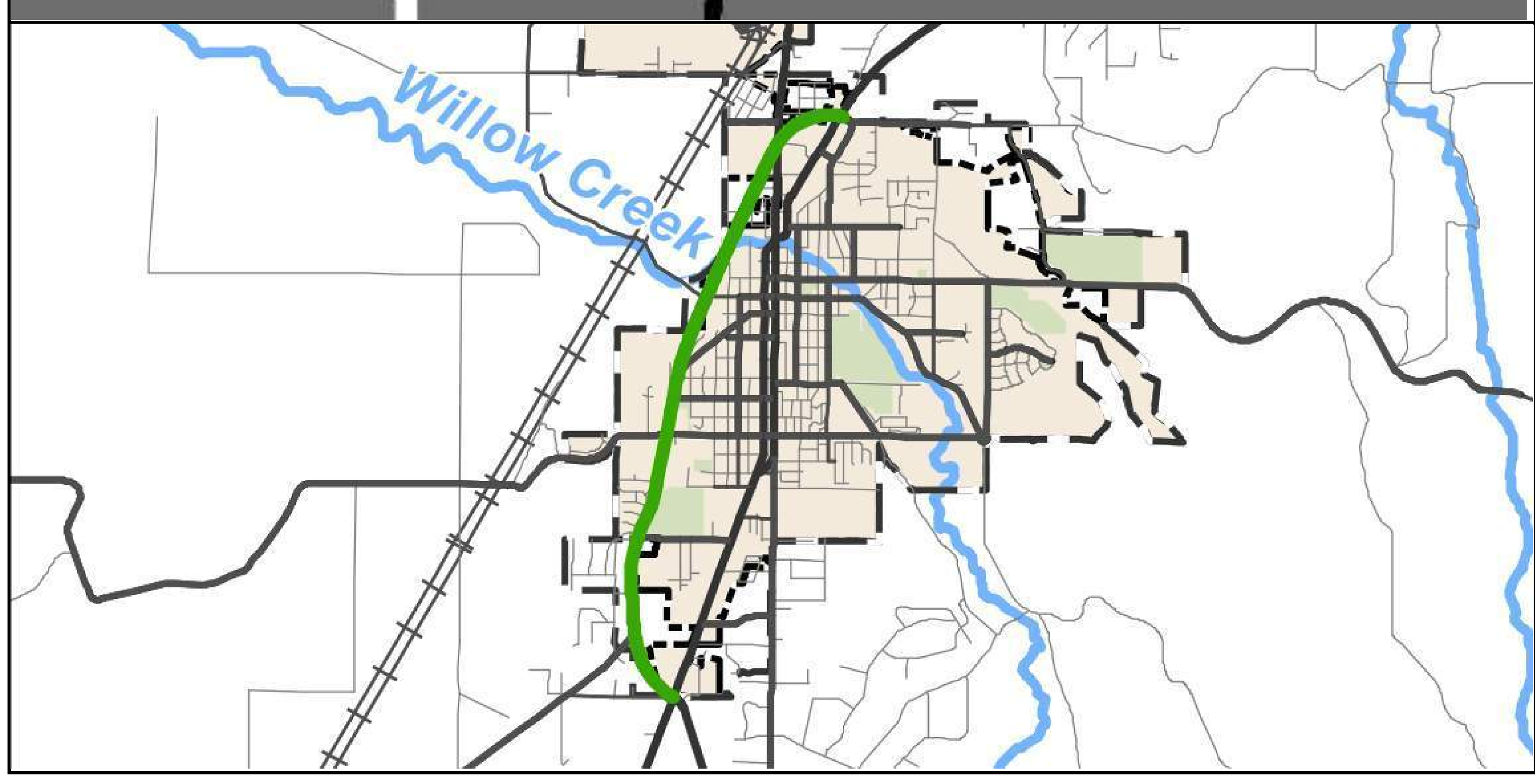
South Madras Highway Improvements – Long-term Improvement Options

The City of Madras and ODOT plan to continue to explore the improvement options for US 97 through south Madras. Some options under consideration include:

Existing Section
Maintain existing 3-lane roadway configuration.

5-Lane Section
Expand the existing 3-lane section to a 5-lane section.

One-Way Couplet Extension
Extend the existing one-way couplet south through the study area. This alternative would utilize the existing US 97/US 26 alignment as the southbound couplet and use a part of the existing Adams Drive corridor as the northbound alignment.



Truck/Vehicle Bypass
Construct an improvement consistent with the currently planned truck bypass that would traverse around the Madras core via a west side alignment. This bypass is currently planned as part of the Madras Transportation System Plan.

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South Madras Highway Improvements – Local System Improvement Options

The following are planned improvements intended to enhance connections to and from the south Madras area:

- Improved local street connections between Fairgrounds Road north to the downtown area.
- Parallel road improvements east of US 97 and improved access east to 10th Street.
- Development of a local and collector street network within the area between Culver Highway, US 97, Fairgrounds Road, and Colfax Road.
- Improved access to Culver Highway.

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EST. 1910

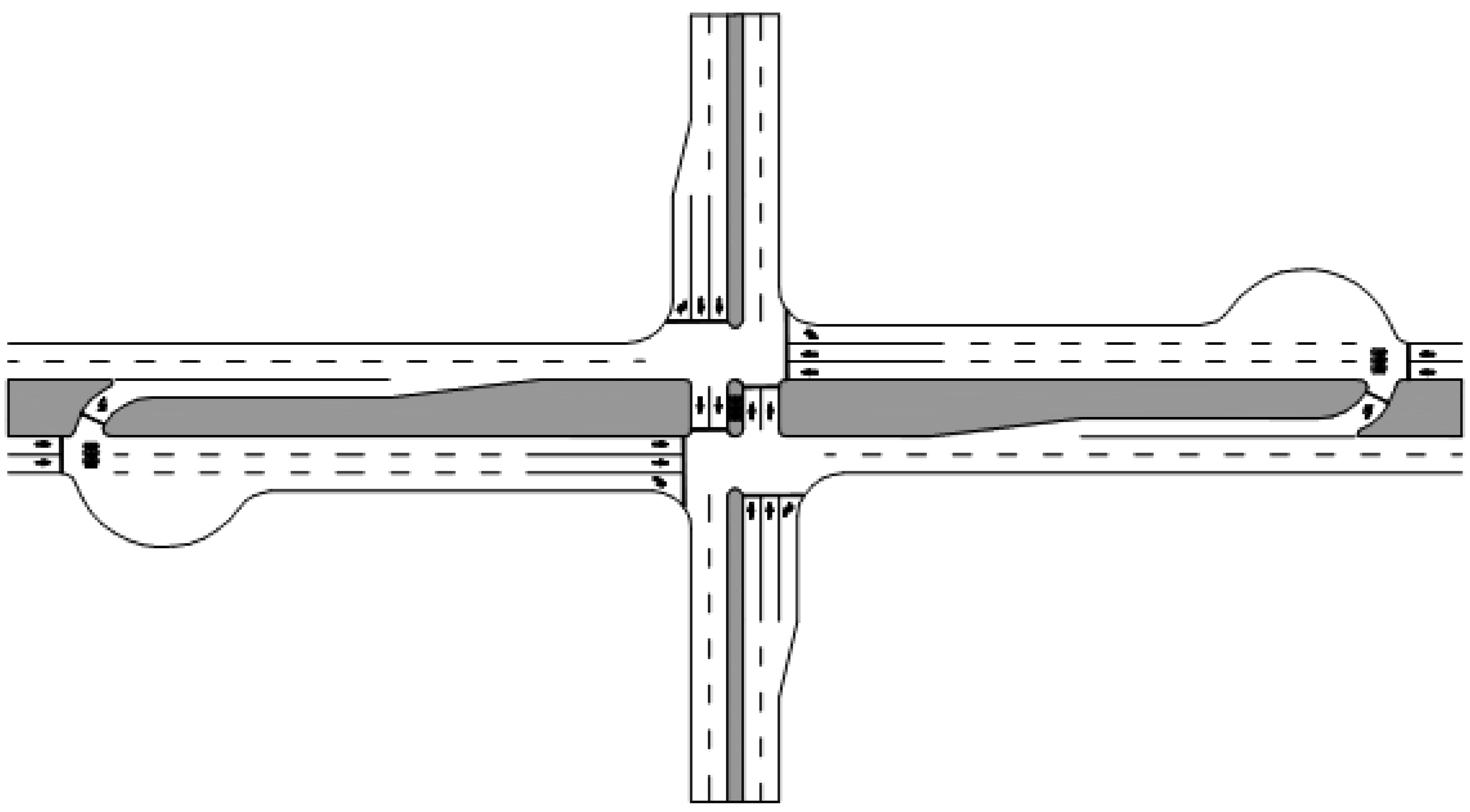
South Madras Highway Improvements –
Near-Term Highway Improvement Options

- Possible near-term intersection improvement options at the US 97 intersections with Fairgrounds Road and at Hall Road include:

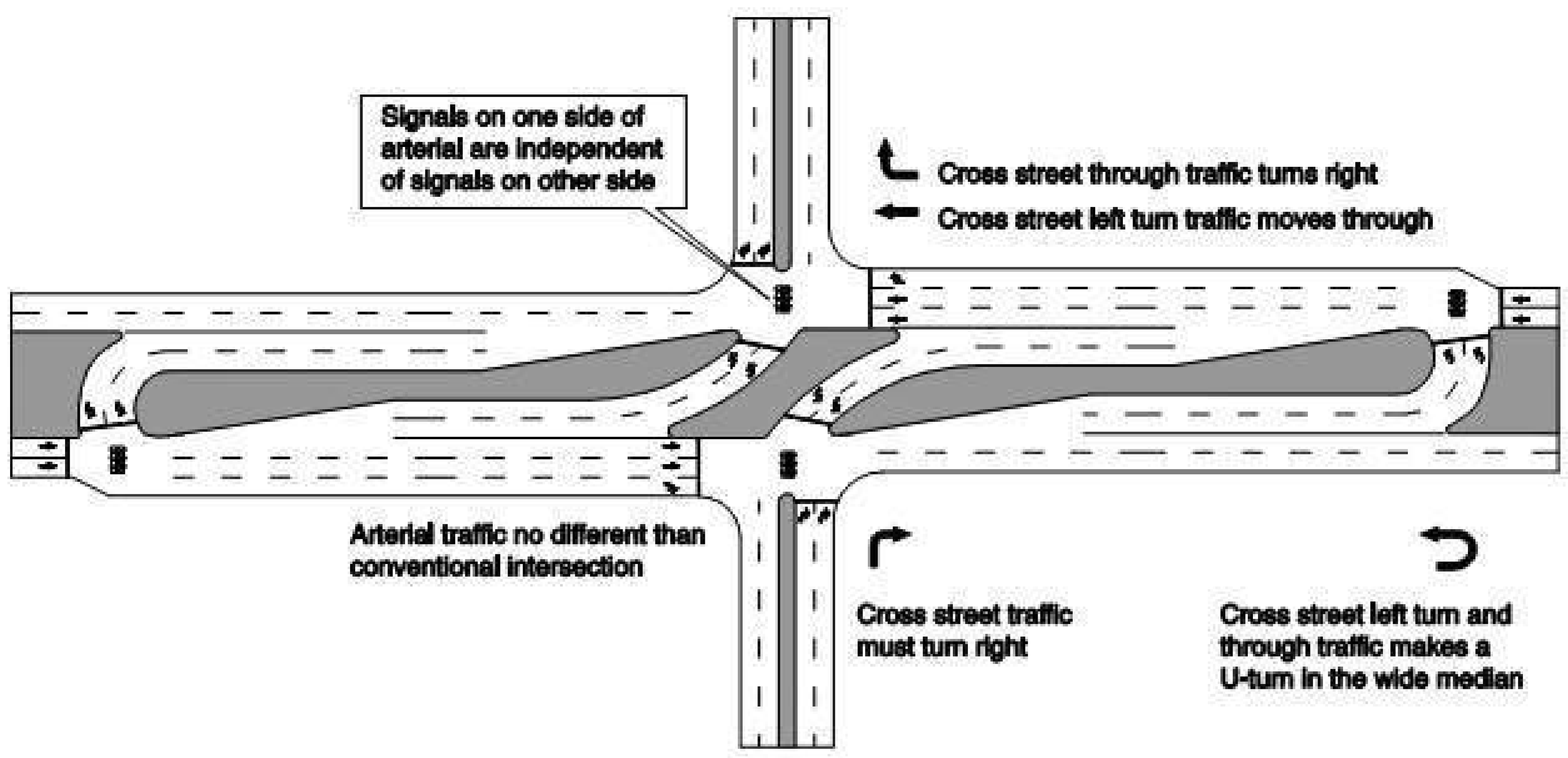
Roundabout Example

Jug-Handle Example

Median U-Turn Example



Restricted Crossing U-Turn Example



THE CITY OF MADRAS
EST. 1910

Appendix 9: Madras Freight Route Alternatives Analysis

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION PLANNING/TRAFFIC ENGINEERING
610 SW ALDER, SUITE 700 • PORTLAND, OR 97205 • (503) 228-5230 • FAX (503) 273-8169

October 10, 2006 Project #: 7976

Chuck McGraw
City of Madras
Community Development Department
71 SE "D" Street
Madras, Oregon 97741

RE: City of Madras TSP Refinement Plans and Amendments

Dear Chuck:

This report provides additional information to update the City of Madras's Transportation System Plan (TSP). The information provided in this report has been divided into three areas: Refinement Plans, Updated Project List, and Additional Amendments. The following sections provide the background and details of these areas.

Background

Per Oregon Administrative Rule (OAR) Division 12, "Transportation Planning" 660-012-000, the City of Madras initiated the process to prepare its long-range transportation plan in 1994 with the help of a grant from the Oregon Department of Transportation (ODOT). A consultant team prepared the Transportation System Plan (TSP), which was published in 1995. After the City and ODOT staff's extensive review, the document was modified and republished in 1998. The City adopted the modified TSP in August 1998.

The impact of the, then newly proposed, Department of Correction's facility located to the east of the City was not included in the original TSP. In order to incorporate the impact of the proposed facility, the City decided to update its Comprehensive Plan and TSP through the Transportation Growth Management (TGM) grant from ODOT and Department of Land Conservation and Development (DLCD) in 2000. The plan was completed and adopted by the City in 2001.

In 2005, Jefferson County began preparing their TSP with the help of a grant from ODOT. The county TSP project included the preparation of refinement plans for the Madras Truck Route and J Street improvements. This report summarizes the results of those refinement plans. In addition, this report updates the list of City projects to reflect the impact of the County TSP project list in an effort to coordinate the City's TSP project list with the new County's TSP project list. Furthermore, during the County TSP process, City staff recognized the need to include additional amendments to address the growing development trends in the City. These amendments are also included in this report.

Madras Truck Route Refinement Plan

Determination of Need

Technical Memoranda "A" and "B" of the Jefferson County TSP project provide detailed information needed to determine the needs of the proposed Madras Truck Route. The information provided in this section is a summary of the memoranda.

US 97 and US 26, in Central Oregon, are critical elements of Oregon's Statewide Highway Freight System. The *1999 Oregon Highway Plan* classifies these roadways as Statewide Highways and designated Freight Routes. According to the 2004 Automatic Traffic Recorder (ATR) data obtained from ODOT, US 97 carries around 6,300 average daily traffic (ADT) and US 26 carries around 11,900 ADT, just north of City of Madras downtown. Through downtown Madras US 97/US 26 carries around 19,700 ADT, while south of downtown Madras, US 97/US 26 carries around 13,100 ADT. The ATR data also show that 14%–18% of the traffic on the highway is truck traffic. These high traffic volumes and truck percentages indicate the importance of the truck mobility through downtown Madras.

Technical Memoranda "A" provided the near-term operational and safety analysis of US 97/US 26 through downtown Madras. The US97/US26 North intersection was recently realigned and upgraded as part of ODOT's 2004–2007 Statewide Transportation Improvement Program (STIP) project. With the upgrade, the intersection is anticipated to operate at level-of-service (LOS) "C" and at a volume-to-capacity (v/c) ratio of 0.73 during the 30th highest hour. This level of operation meets the ODOT mobility standard of 0.75 for the intersection.

While the operation of the US 97/US 26 North intersection will meet the operational standards in the near term, the proposed intersection modification will not eliminate operational concerns related to truck traffic traveling through downtown Madras. Downtown Madras will continue to have numerous traffic signals and low travel speeds that do not facilitate the mobility of freight traffic on US 97/US 26. As such, in spite of the recent upgrade to the US 97/US 26 North intersection, a truck route bypassing downtown Madras is anticipated to reduce the volume of downtown truck traffic, improve the operation of the intersections in downtown, and facilitate truck mobility around Madras.

A safety analysis was also conducted on US 97/US 26 around Madras as part of the needs analysis. The crash data (for a three year period) obtained from the ODOT Crash Unit revealed that US 97/US 26 through the Madras City Limit experienced annual crash rates of 1.34, 1.86, and 1.46 crashes per million vehicle miles traveled, respectively. These crash rates are higher than the statewide average for similar facilities, which were reported at 1.16, 1.28 and 0.99 for the same three year period, respectively.

Long-Term Transportation Need

Technical Memorandum "B" analyzed various traffic volume forecast scenarios to determine the most realistic estimate of future traffic volume in the area. The analysis reviewed three traffic volume forecasting methodologies, namely, historic traffic growth, ODOT future volume forecast and updated population forecast. Based on extensive discussions with City, ODOT and County staff, the updated population forecast methodology that included the impact of the Department of Correction facilities that is currently under construction on the east side of the city, was determined to most closely approximate the future traffic volume forecast in and around the city. As such, the traffic volume on US 97/US 26 through downtown Madras and south of downtown were forecasted to grow annually at 3.37% and 2.37%, respectively.

Based on the forecasted traffic volume, US 97/US 26 North and South intersection are anticipated to operate at LOS "F" in year 2025 if no improvements are made to the facilities through downtown Madras.

The existing and future operational and safety analysis indicates that, at the current pace of traffic growth, US 97/US 26 is anticipated to carry a high volume of traffic through downtown Madras by 2025. The increase in traffic volume in downtown Madras will deteriorate the operation and safety of the roadway. As US 97 and US 26 are classified as highways of statewide significance, the mobility of vehicles on the highway is important to the economic viability of the state.

Alternative Analysis

Concerns with Approved Alternative

Figure 1 shows the approved alignment of the Madras Truck Route as recommended in the 2001 City of Madras TSP Update. Several new developments have occurred in Madras since the adoption of the TSP. Some of the new commercial developments that were approved have impacted the feasibility of the approved truck route alignment. One of the major developments is a new hotel and mixed-use retail development planned and approved for construction to the west of the existing US 97/US 26 North intersection in downtown. The location of this development eliminates the ability to create the northern connection of the truck route as previously planned in the TSP update.

A second concern relates to access management along Culver Highway 361. The route is anticipated to have a high volume of truck traffic and relatively high travel speed. Access from adjacent properties will likely be limited to facilitate the mobility of truck traffic and enhance safety. However, the section of existing Culver Highway 361 that the planned truck route is to follow is lined with single- and multi-family homes that have direct access to the highway. Access management to facilitate the truck route along this section of highway would be challenging.

Given these concerns and the high cost of the planned alignment, this refinement plan evaluates the feasibility of an alternative alignment taking right-of-way impact, in-process developments, and current and future transportation operation and safety concerns into account.

Refinement Plan Alternatives

The Madras Truck Route will provide alternate access for regional traffic passing through Madras, thus reducing traffic volume and the percentage of truck traffic traveling through downtown Madras. The alternate access can be provided on existing roadways or on a new roadway that bypasses the downtown area. After considering the existing roadway network, impact on existing businesses, and physical constraints, past studies recommended that a feasible alternative is to provide a truck bypass that generally follows the existing Culver Highway 361 alignment. Taking those recommendations into account, this refinement plan developed additional alternative based on the information received from two sources: 1) comments received from the public and input from

County, ODOT, and City staff; and 2) the technical analysis of traffic operations and safety on the roadway. Three new alignment options were proposed for the northern connection of the bypass and four new alignment options were proposed for the southern connection. Figure 2 shows the alternative alignments and provides the advantages and disadvantages of each.

The Madras Truck Route is anticipated to be a limited-access expressway with a median barrier to improve the mobility of vehicles. It is planned to have four 12-foot travel lanes and a 12-foot raised median, with four-foot shy distance, two eight-foot bike lanes, an eight-foot planer strip and a six-foot sidewalk on both sides for a total of 114-foot right-of-way (See Figure 2 for detail cross-section). Access to the expressway will be provided via right-in/right-out driveways and full-access traffic signals at the intersections with Fairground Road, Belmont Street, and C Street.

The Madras Truck Route has various advantages and disadvantages, highlighted below.

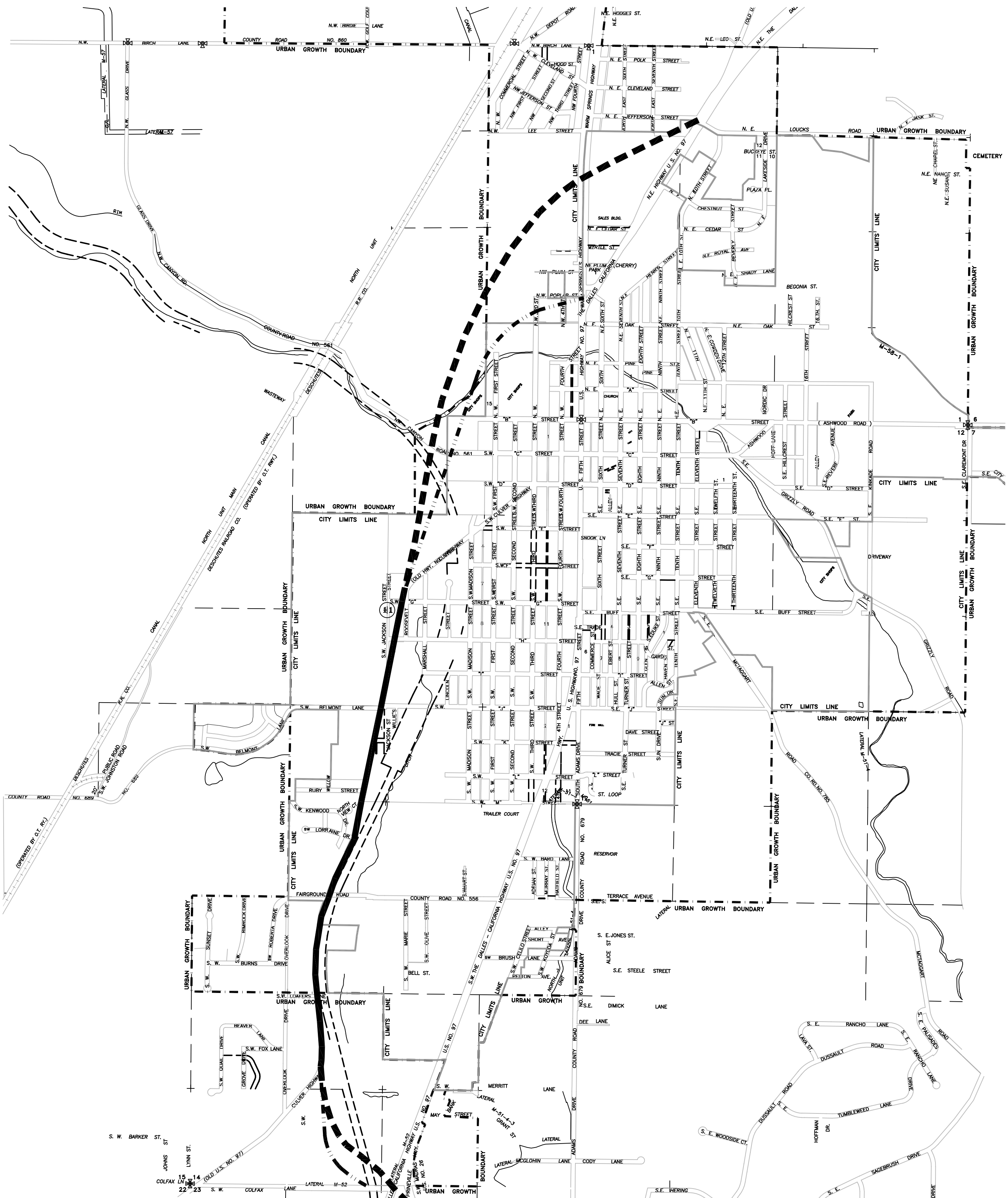
Advantages

- Reduces regular and truck traffic through downtown Madras, thus improving safety and mobility for local traffic and pedestrians in downtown Madras.
- Increases the mobility of regional truck traffic by providing an access-controlled facility.
- Utilizes existing right-of-way of Culver Highway 361 for majority of the alignment.
- Minimal impact on land outside the urban growth boundary, which will require a goal exception from Department of Land Conservation and Development (DLCD).

Disadvantage

- Impacts access to and from existing properties along Culver Highway. Alternate access, such as a frontage road, should be provided to the affected properties.
- Changes the characteristic of portions of Culver Highway from a rural/semi-urban highway to a higher speed, limited-access expressway.
- Requires acquisition of significant right-of-way along Culver Highway.

According to the City staff, the Alternative 1C and Alternative 2 concepts appear to have the most advantages. Alternative 1C begin at the US 97/US 26 North intersection as a west approach of the intersection. It then follows 1st Street and the existing Culver Highway alignment. The alignment does not impact the proposed hotel development and preserves the area for further development. In addition, the alignment stays to the east of the railroad track and the bluff on the west side of the city, which will reduce the cost of the project considerably. However, the alignment will have a right-of-way and access impact on the properties on 1st Street and portions of the Culver Highway alignment.



LEGEND

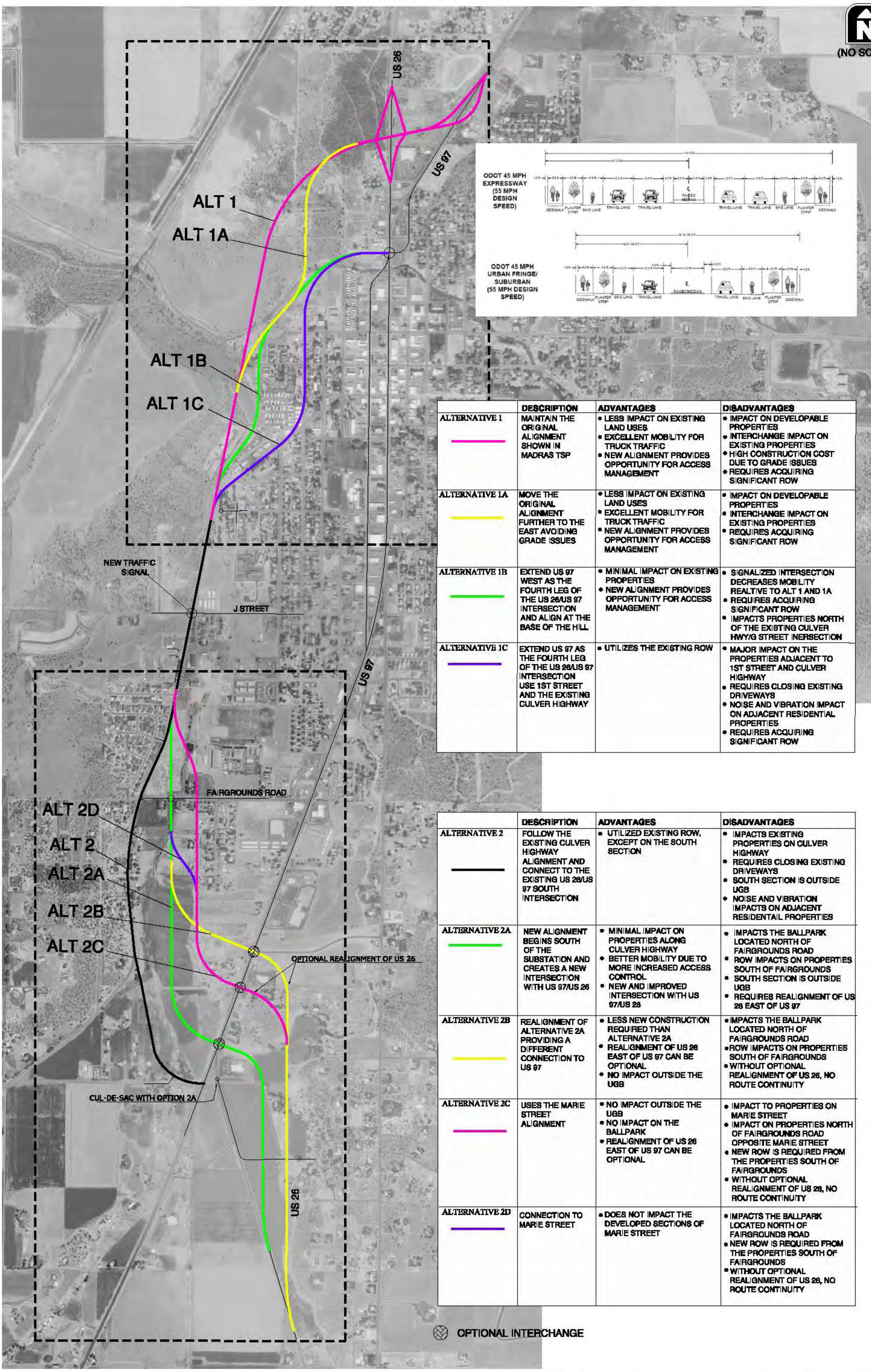
- Existing Infrastructure
- 2001 Madras TSP Udpate Alignment
- 1998 Madras TSP Alignment
- Madras UGB

APPROVED MADRAS TRUCK ROUTE
2001 CITY OF MADRAS TSP UPDATE
MADRAS, OREGON

FIGURE 1

K:\H_Portland\projfile\7976 - Madras TSP Amendment\dwgs\figs\FIGS.dwg Oct 10, 2006 - 11:49am - sonta Layout Tab: FIG 01

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION PLANNING / TRAFFIC ENGINEERING



	DESCRIPTION	ADVANTAGES	DISADVANTAGES
ALTERNATIVE 1	MAINTAIN THE ORIGINAL ALIGNMENT SHOWN IN MADRAS TSP	• LESS IMPACT ON EXISTING LAND USES • EXCELLENT MOBILITY FOR TRUCK TRAFFIC • NEW ALIGNMENT PROVIDES OPPORTUNITY FOR ACCESS MANAGEMENT	• IMPACT ON DEVELOPABLE PROPERTIES • INTERCHANGE IMPACT ON EXISTING PROPERTIES • HIGH CONSTRUCTION COST DUE TO GRADE ISSUES • REQUIRES ACQUIRING SIGNIFICANT ROW
ALTERNATIVE 1A	MOVE THE ORIGINAL ALIGNMENT FURTHER TO THE EAST AVOIDING GRADE ISSUES	• LESS IMPACT ON EXISTING LAND USES • EXCELLENT MOBILITY FOR TRUCK TRAFFIC • NEW ALIGNMENT PROVIDES OPPORTUNITY FOR ACCESS MANAGEMENT	• IMPACT ON DEVELOPABLE PROPERTIES • INTERCHANGE IMPACT ON EXISTING PROPERTIES • REQUIRES ACQUIRING SIGNIFICANT ROW
ALTERNATIVE 1B	EXTEND US 97 WEST AS THE FOURTH LEG OF THE US 26/US 97 INTERSECTION AND ALIGN AT THE BASE OF THE HILL	• MINIMAL IMPACT ON EXISTING PROPERTIES • NEW ALIGNMENT PROVIDES OPPORTUNITY FOR ACCESS MANAGEMENT	• SIGNALIZED INTERSECTION DECREASES MOBILITY REALTIVE TO ALT 1 AND 1A • REQUIRES ACQUIRING SIGNIFICANT ROW • IMPACTS PROPERTIES NORTH OF THE EXISTING CULVER HWY/G STREET INERSECTION
ALTERNATIVE 1C	EXTEND US 97 AS THE FOURTH LEG OF THE US 26/US 97 INTERSECTION USE 1ST STREET AND THE EXISTING CULVER HIGHWAY	• UTILIZES THE EXISTING ROW	• MAJOR IMPACT ON THE PROPERTIES ADJACENT TO 1ST STREET AND CULVER HIGHWAY • REQUIRES CLOSING EXISTING DRIVEWAYS • NOISE AND VIBRATION IMPACT ON ADJACENT RESIDENTIAL PROPERTIES • REQUIRES ACQUIRING SIGNIFICANT ROW

	DESCRIPTION	ADVANTAGES	DISADVANTAGES
ALTERNATIVE 2	FOLLOW THE EXISTING CULVER HIGHWAY ALIGNMENT AND CONNECT TO THE EXISTING US 26/US 97 SOUTH INTERSECTION	• UTILIZED EXISTING ROW, EXCEPT ON THE SOUTH SECTION	• IMPACTS EXISTING PROPERTIES ON CULVER HIGHWAY • REQUIRES CLOSING EXISTING DRIVEWAYS • SOUTH SECTION IS OUTSIDE UGB • NOISE AND VIBRATION IMPACTS ON ADJACENT RESIDENTAIL PROPERTIES
ALTERNATIVE 2A	NEW ALIGNMENT BEGINS SOUTH OF THE SUBSTATION AND CREATES A NEW INTERSECTION WITH US 97/US 26	• MINIMAL IMPACT ON PROPERTIES ALONG CULVER HIGHWAY • BETTER MOBILITY DUE TO MORE INCREASED ACCESS CONTROL • NEW AND IMPROVED INTERSECTION WITH US 97/US 26	• IMPACTS THE BALLPARK LOCATED NORTH OF FAIRGROUNDS ROAD • ROW IMPACTS ON PROPERTIES SOUTH OF FAIRGROUNDS • SOUTH SECTION IS OUTSIDE UGB • REQUIRES REALIGNMENT OF US 26 EAST OF US 97
ALTERNATIVE 2B	REALIGNMENT OF ALTERNATIVE 2A PROVIDING A DIFFERENT CONNECTION TO US 97	• LESS NEW CONSTRUCTION REQUIRED THAN ALTERNATIVE 2A • REALIGNMENT OF US 26 EAST OF US 97 CAN BE OPTIONAL • NO IMPACT OUTSIDE THE UGB	• IMPACTS THE BALLPARK LOCATED NORTH OF FAIRGROUNDS ROAD • ROW IMPACTS ON PROPERTIES SOUTH OF FAIRGROUNDS • WITHOUT OPTIONAL REALIGNMENT OF US 26, NO ROUTE CONTINUITY
ALTERNATIVE 2C	USES THE MARIE STREET ALIGNMENT	• NO IMPACT OUTSIDE THE UGB • NO IMPACT ON THE BALLPARK • REALIGNMENT OF US 26 EAST OF US 97 CAN BE OPTIONAL	• IMPACT TO PROPERTIES ON MARIE STREET • IMPACT ON PROPERTIES NORTH OF FAIRGROUNDS ROAD OPPOSITE MARIE STREET • NEW ROW IS REQUIRED FROM THE PROPERTIES SOUTH OF FAIRGROUNDS • WITHOUT OPTIONAL REALIGNMENT OF US 26, NO ROUTE CONTINUITY
ALTERNATIVE 2D	CONNECTION TO MARIE STREET	• DOES NOT IMPACT THE DEVELOPED SECTIONS OF MARIE STREET	• IMPACTS THE BALLPARK LOCATED NORTH OF FAIRGROUNDS ROAD • NEW ROW IS REQUIRED FROM THE PROPERTIES SOUTH OF FAIRGROUNDS • WITHOUT OPTIONAL REALIGNMENT OF US 26, NO ROUTE CONTINUITY

OPTIONAL INTERCHANGE

MADRAS TRUCK ROUTE REFINEMENT PLAN ALTERNATIVES
PROJECT 18
MADRAS, OREGON

FIGURE 2

Alternative 2 follows the existing alignment of Culver Highway to SW Loafers Lane, where it diverts to intersect with US 97 near the existing US 97/US 26 South intersection. This new intersection with US 97 will most likely be a grade-separated interchange in the long run. As shown in Figure 2, various other alignments were analyzed for advantages and disadvantages. However, based on discussion with City staff, it was determined that Alternative 2, which follows the approved alignment of the Madras Truck Route, is the most feasible.

The planning-level cost estimate for Alternative 1C, improvement to the existing alignment of Culver Highway 361, and Alternative 2, is approximately $7.5 million, $8.75 million, and $3 million, respectively. The total estimated cost is $19.25 million, without consideration for right of way acquisition, impacts to adjacent properties, or the cost of interchanges.

Evaluation of the Madras Truck Route/US 97/US 26 North Intersection

Alternative 1C connects to the existing US 97/US 26 North intersection as the fourth leg of the intersection, which currently serves a small retail development. The impact of the truck route on the turning movements at the intersection was determined after reviewing the existing turning movement patterns. In order to estimate traffic volume on the Madras Truck Route, approximately 55 percent of the existing westbound left-turning traffic and 30 percent of the southbound through traffic was assigned to the new truck route. Similarly, 55 percent of the northbound right-turning traffic and 30 percent of the northbound through traffic is estimated to use the new truck route. With these turning movement estimates, the intersection is anticipated to operate at volume to capacity ratio of 0.70 in 2025 traffic condition with the lane configuration listed below.

- Northbound: left-turn, through, and through-right lanes
- Southbound: left-turn, dual through, and right-turn lanes
- Eastbound: dual left-turn, through, and through right-turn lanes
- Westbound: dual left-turn, through, and through right-turn lanes

Even with the lanes recommended above, the total delay incurred at a traffic signal will increase as traffic volume increases. Therefore, it is recommended to preserve the option to provide an interchange at the Madras Truck Route/US 97/US 26 North intersection in the future. An interchange will provide the highest degree of mobility and route continuity for US 97 and US 26. By reducing delay in transporting goods and services, the interchange is anticipated to enhance the economic benefit to the region

Evaluation of the Madras Truck Route/US 97/US 26 South Intersection

The growth in traffic on US 97 and US 26 south of Madras is anticipated to deteriorate the operation of the existing US 97/US 26 South intersection. Without the Madras Truck Route, the intersection will require a traffic signal to meet the ODOT mobility standard in 2025. The intersection is anticipated to operate at a volume-to-capacity ratio of 0.67 under 2025 traffic conditions with a traffic signal installed. With the Madras Truck Route, which is anticipated to connect to US 97 in the vicinity of the intersection, the intersection area would need to be redesigned to an interchange to provide adequate mobility for truck traffic.

Recommendation

The next steps required to formalize the Madras Truck Route include conducting a further detail analysis and a feasibility study to determine the full impact of the proposed truck by-pass on adjacent properties and finalizing the preferred alternative. The analysis should consider other potential solutions to mitigate the operation and safety of US 97/US 26 through downtown. Options include optimizing the operation of US 97/US 26 through downtown Madras and/or adding capacity to the existing roadway. The study would likely need to include a National Environmental Policy Act (NEPA) analysis and appropriate environmental assessments of the alternative alignments of the future US 97 Truck Bypass before a final preferred alternative alignment is chosen.

J Street Improvement Refinement Plan

Background and Determination of Need

J Street is the main east-west connection in the south end of downtown Madras and provides access to the Palisades State Park to the west and new residential developments to the east. On the westside of Madras, J Street is known as Belmont Street and is mostly a two-lane rural roadway with minimal shoulder widths and shallow drainage ditches on both sides of the roadway. To the east of US 97, J Street is a two-lane roadway with urban features, (e.g. bike lanes and sidewalks), and provides access to new residential developments on the east end of the roadway, near McTaggart Road.

Past studies have identified the need to improve the operation of the intersections of J Street and US 97/US 26 Northbound and Southbound. In order to determine that the J Street improvements are still needed, analyses were conducted at three study intersections, namely J Street/US 97/US 26 Northbound, J Street/US 97/ US 26 Southbound, J Street/Adams Drive, to evaluate the existing operation of the intersections. The following section is a summary to technical analysis provided in Technical Memoranda "A", "B" and "C" of the Jefferson County TSP.

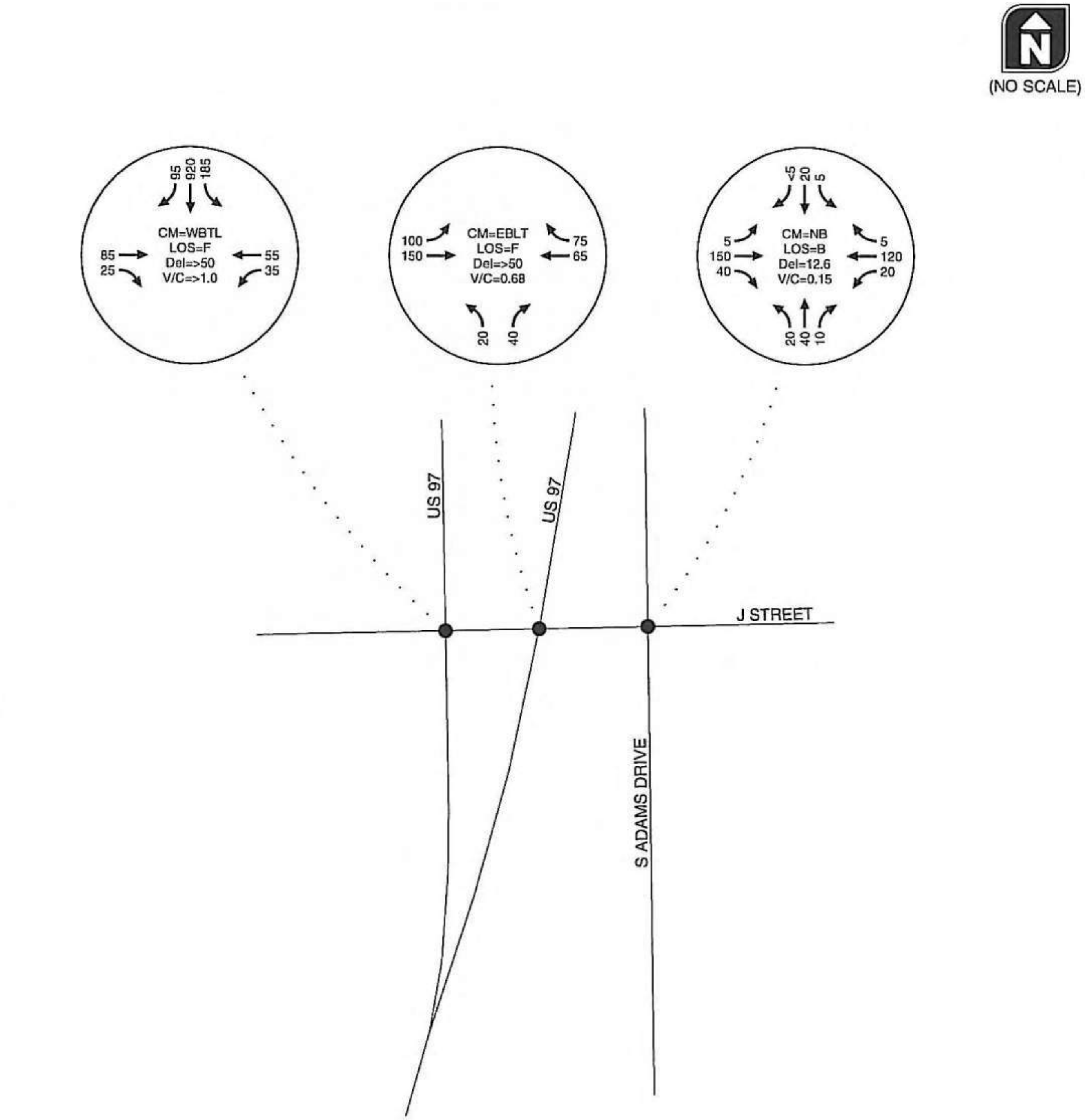
The operation analysis was based on the 30th highest traffic volume and latest analysis guidelines provided by ODOT. Figure 3 shows the results of the operational analysis at the intersections. As shown in the figure, all the intersections meet the OHP standard, except the J Street/US 97/US 26 Southbound intersection. The westbound left-turn movement at the J Street/US 97/US 26 Southbound intersection operates at volume-to-capacity ratio greater than 1.0 during the 30th highest hour.

As mentioned in the Madras Truck Route Refinement Plan section, the traffic volume in downtown Madras is anticipated to grow at the rate of 3.37% annually. Using this growth rate, a 20-year analysis was conducted to the study intersection. Based on the analysis, the J Street/US 97/US 26 Northbound and Southbound intersections are anticipated to operation over capacity in year 2025 if no improvements are made at the intersections.

Similarly, a review of the five year crash history (from 2000–2004) revealed that there were six and seven crashes reported at the J Street/US 97/US 26 Southbound and J Street/US 97/US 26 Northbound intersections, respectively. The majority of the crashes were angle-type collisions. One of the potential causes of the high number of crashes is the close proximity of the two intersections which makes it an unsafe environment for motorists in the area. With the anticipated 70-percent increase in traffic volume over the next 20 years, the number and severity of crashes at the intersections are likely to increase in the future if no improvements are made at the intersection.

In addition, field observation revealed several other factors impacting the capacity and safety of the intersection:

- When looking north, the sight distance for the westbound movement at the J Street/US 97/US 26 Southbound intersection is not adequate for safe turning movements. The existing on-street parking on US 97/US 26 southbound blocks the view of oncoming southbound traffic.



2005 EXISTING TRAFFIC CONDITIONS
30th HIGHEST HOUR
MADRAS, OREGON

FIGURE 3

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- The westbound through movement at the J Street/US 97/US 26 Southbound intersection is not aligned with the corresponding receiving lane.
- US 97/US 26 Southbound traffic merges from two lanes to one lane through the J Street intersection.
- US 97/ US 26 Northbound traffic diverges from one lane to two lanes through the J Street intersection.

In summary, J Street forms two closely spaced (60 feet apart) intersections with the US 97/US 26 couplet. The close proximity of these intersections presents traffic operation problems on J Street including high vehicle delay for east-west traffic, queuing problems, and safety concerns. In addition, the US 97/US 26 couplet is two lanes in each direction to the north of J Street and one lane in each direction to the south. The lane transition occurs through J Street exacerbating the operation and safety concerns at the intersection. As a result, it was determined that the intersections of J Street and US 97/US 26 Northbound and Southbound continue to need improvements to provide a safe operational environment in both the short and long term.

Alternative Analysis

The 1998 City of Madras TSP proposed two design alternatives at the J Street/US 97/US 26 intersections. The design alternatives provided more distance between the US 97/US 26 southbound and northbound intersections with J Street. The first alternative realigned US 97/US 26 northbound (or 5th Street) to 7th Street, while the second alternative realigned it to 10th Street. The TSP recommends realigning US 97/US 26 northbound to 10th Street as 7th Street is found to have "inadequate geometry to function as a good north-south route."

Subsequently, the 2001 City of Madras TSP Update reviewed the alternatives presented in the 1998 TSP and recommended two additional design alternatives. These alternatives are show in Figure 4 and discussed below.

Design Option 1

Design Option 1 shortens the existing one-way couplet by shifting the couplet transition north of J Street and signalizing the J Street/US 97/US 26 intersection. With this option, there will be only one intersection between J Street and US 97/US 26, which eliminates the operational hazards of having two closely spaced intersections. However, this design option will impact existing businesses located between the US 97/US 26 couplet, north of J Street.

Design Option 2

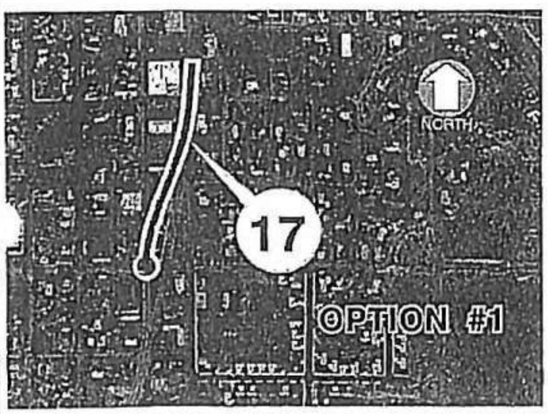
Design Option 2 extends the existing one-way US 97/US 26 couplet through downtown by shifting the couplet transition south of J Street and signalizing both the southbound and northbound J Street intersections. With this option, the current alignment of Adams Drive will be used for the realigned section of US 97/26. While this option will increase the distance between the existing closely spaced intersections, the new signalized intersections will still be within 200 feet of one another and will require signal coordination to reduce queues.

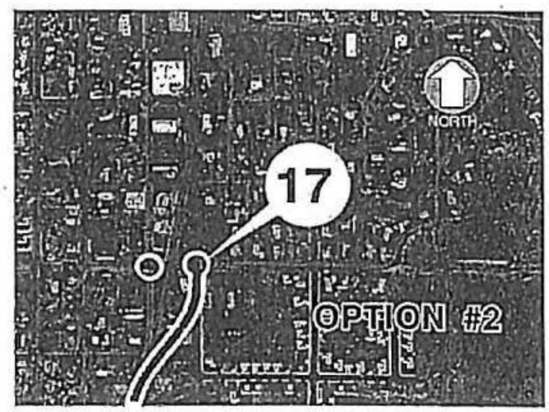
#17 "J" Street/US 97 Intersection Realignment

PURPOSE:
Provides a safe "J" Street crossing of the US 26/US 97 couplet and improves the east-west connectivity within Madras.

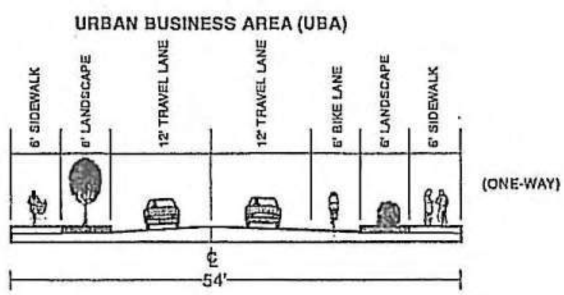
PROJECT DESCRIPTION:
This project has two design options that both require significant right-of-way and will likely impact existing businesses. Design Option #1 shortens the existing one-way couplet by shifting the couplet transition north of "J" Street and signalizing the "J" Street/US 26/US 97 intersection. Design Option #2 lengthens the existing one-way couplet by shifting the couplet transition south of "J" street and signalizing both the 4th Street and 5th Street intersections. Both of these design options will require Adams Drive to be reconfigured.

TIME FRAME: 10-20 years





TYPICAL CROSS-SECTION:



Based on qualitative review of the design options, the 2001 TSP update recommended Design Option 2 as a preferred alternative. The main advantage of Design Option 2 over Design Option 1 is that it "allows for future 5-lane section" of the highway.

Refinement Plan Alternatives

Alternative Solution A: Install Traffic Signal at the Current Intersection Location

One of the options to improve the operation of the J Street/US 97/US 26 intersections is to install traffic signals at the current location of the northbound and southbound intersections. Due to the proximity of these intersections (there is approximately 60 feet of storage between the intersections), a Synchro analysis was conducted at the intersections to take the progression of traffic between the intersections into consideration. The northbound and southbound intersections are anticipated to operate at volume to capacity ratio of 0.48 and 0.41, respectively, during the weekday p.m. peak hour periods with the traffic signals in place under 2005 traffic conditions.

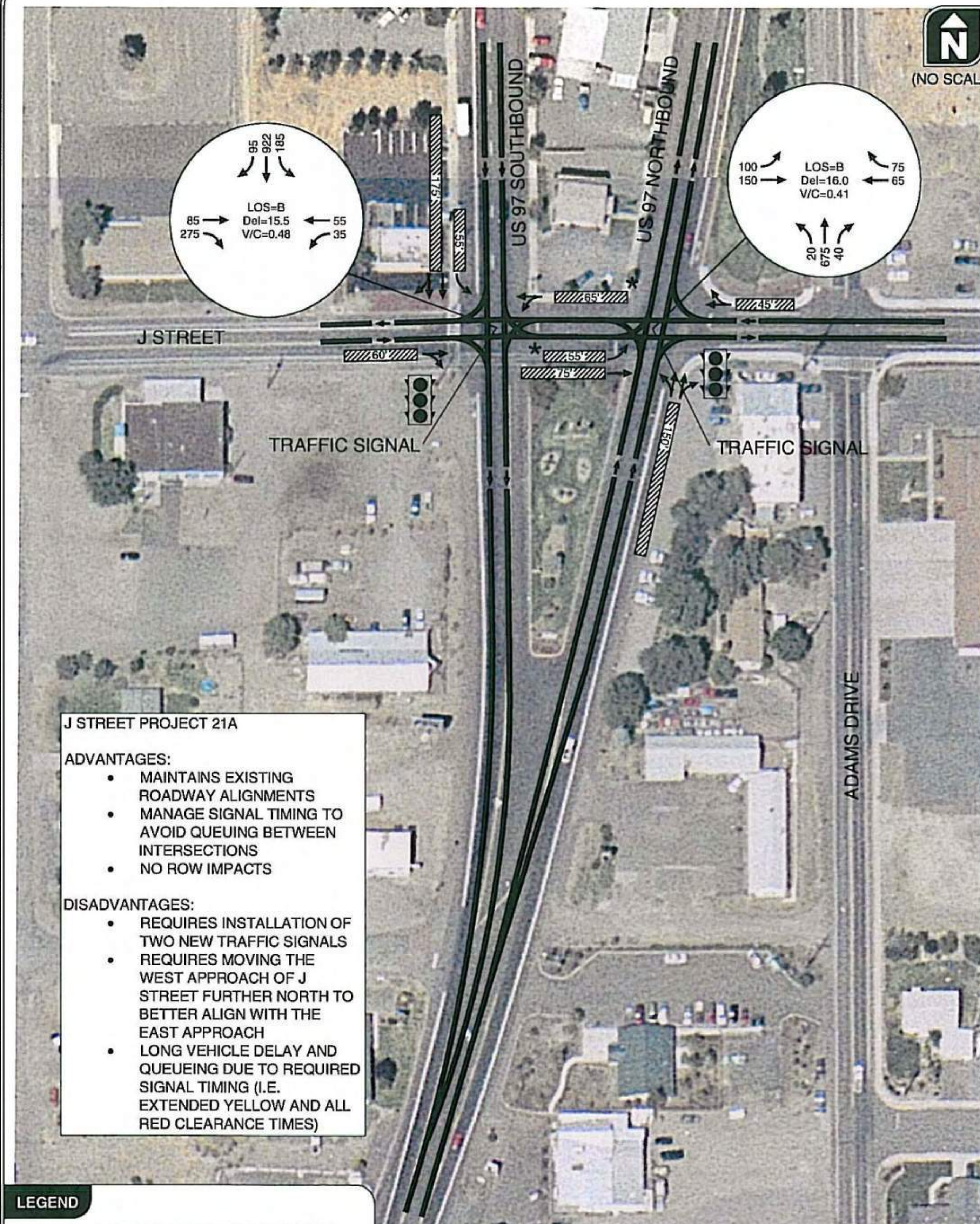
A review of the 95th percentile queues between the intersections showed that the eastbound and westbound queues at the intersections will exceed the 60 feet of available storage between the intersections. Subsequently, the queues are anticipated to spill back through the upstream signals. Even with east-west coordination between the intersections, the queues between the intersections are anticipated to exceed available storage. Furthermore, with anticipated growth in traffic on US 97/26, the coordination of the signals in the east-west direction will adversely impact the operation and queue for the north-south traffic at both the intersections. Consequently, it was determined that installing traffic signals at the current intersection location is not a viable solution. Figure 5 shows the general layout of this solution.

Alternative Solution B: Single Point Urban Intersection

One option to eliminate the issue of queues between the intersections is to redesign the two intersections into a one signal-point urban intersection. The intersection is anticipated to operate at a volume-to-capacity ratio of 0.59 as a single intersection under 2005 traffic condition. The intersection needs to be improved to the lane configuration listed below to meet the ODOT mobility standard of volume to capacity ratio 0.70 under 2025 traffic condition.

- Northbound: left-turn, dual through, and right-turn lanes
- Southbound: dual left-turn, dual through, and right-turn lanes
- Eastbound and Westbound: dual left-turn, through, and through-right turn lanes

This lane configuration will widen the intersection considerably and have adverse impact on the properties adjacent to the intersection. In addition, pedestrian and bicycle mobility through the intersection will be challenging, especially for children and the elderly. Hence, this solution was not determined to address all the operational and safety needs of the area. Figure 6 shows the single-line drawing of alternative solution B.



J STREET PROJECT 21A

ADVANTAGES:

- MAINTAINS EXISTING ROADWAY ALIGNMENTS
- MANAGE SIGNAL TIMING TO AVOID QUEUING BETWEEN INTERSECTIONS
- NO ROW IMPACTS

DISADVANTAGES:

- REQUIRES INSTALLATION OF TWO NEW TRAFFIC SIGNALS
- REQUIRES MOVING THE WEST APPROACH OF J STREET FURTHER NORTH TO BETTER ALIGN WITH THE EAST APPROACH
- LONG VEHICLE DELAY AND QUEUEING DUE TO REQUIRED SIGNAL TIMING (I.E. EXTENDED YELLOW AND ALL RED CLEARANCE TIMES)

LEGEND

- 95TH PERCENTILE QUEUE

* - QUEUE LONGER THAN 60' OF AVAILABLE STORAGE

POTENTIAL J STREET ALTERNATIVE SOLUTION A
INSTALL TRAFFIC SIGNAL AT CURRENT LOCATION
2005 30TH HIGHEST HOUR TRAFFIC CONDITIONS

FIGURE 5

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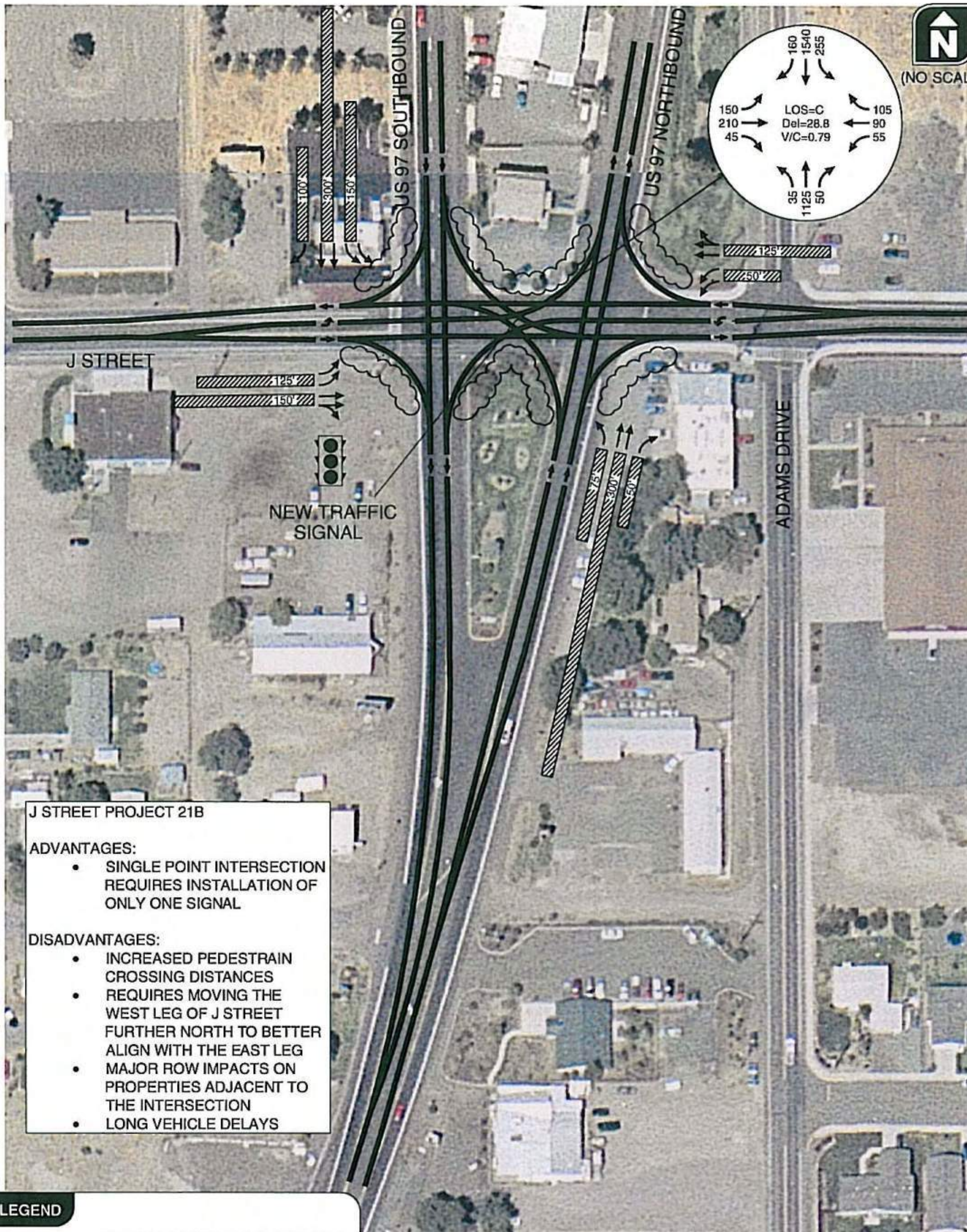

LEGEND

- 95TH PERCENTILE QUEUE
- RIGHT-OF-WAY IMPACT

POTENTIAL J STREET ALTERNATIVE SOLUTION B
SINGLE POINT URBAN INTERSECTION
2025 30TH HIGHEST HOUR TRAFFIC CONDITIONS

FIGURE 6

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Kittelson & Associates, Inc.
Transportation Engineering / Planning

Alternative Solution C: US 97/US 26 Realignment

As discussed previously, the 2001 Madras TSP Update evaluated realigning the highway north and south of J Street. The report recommended realigning the highway to the south of J Street based on the impact to current businesses and other concerns.

The current refinement plan evaluated two options for realigning the US 97/US 26 northbound approach south of J Street. The southern of the two alignments was determined to have lesser impact of the properties, based on discussions with City and County staff. A Synchro analysis was conducted to ensure that the traffic signal at the new realigned intersection would operate acceptably. The analysis showed that the J Street/US 97/US 26 Southbound intersection would operate at a volume-to-capacity ratio of 0.73 and the J Street/US 97/US 26 Northbound intersection would operate at a volume-to-capacity ratio of 0.67 during the 2025 30th highest hour conditions. Figure 7 shows the single-line drawing of alternative alignment C. Figure 8 shows the double-line drawing of the southern alignment option.

The US 97/US 26 realignment project has several advantages and disadvantages, which are highlighted below.

Advantages

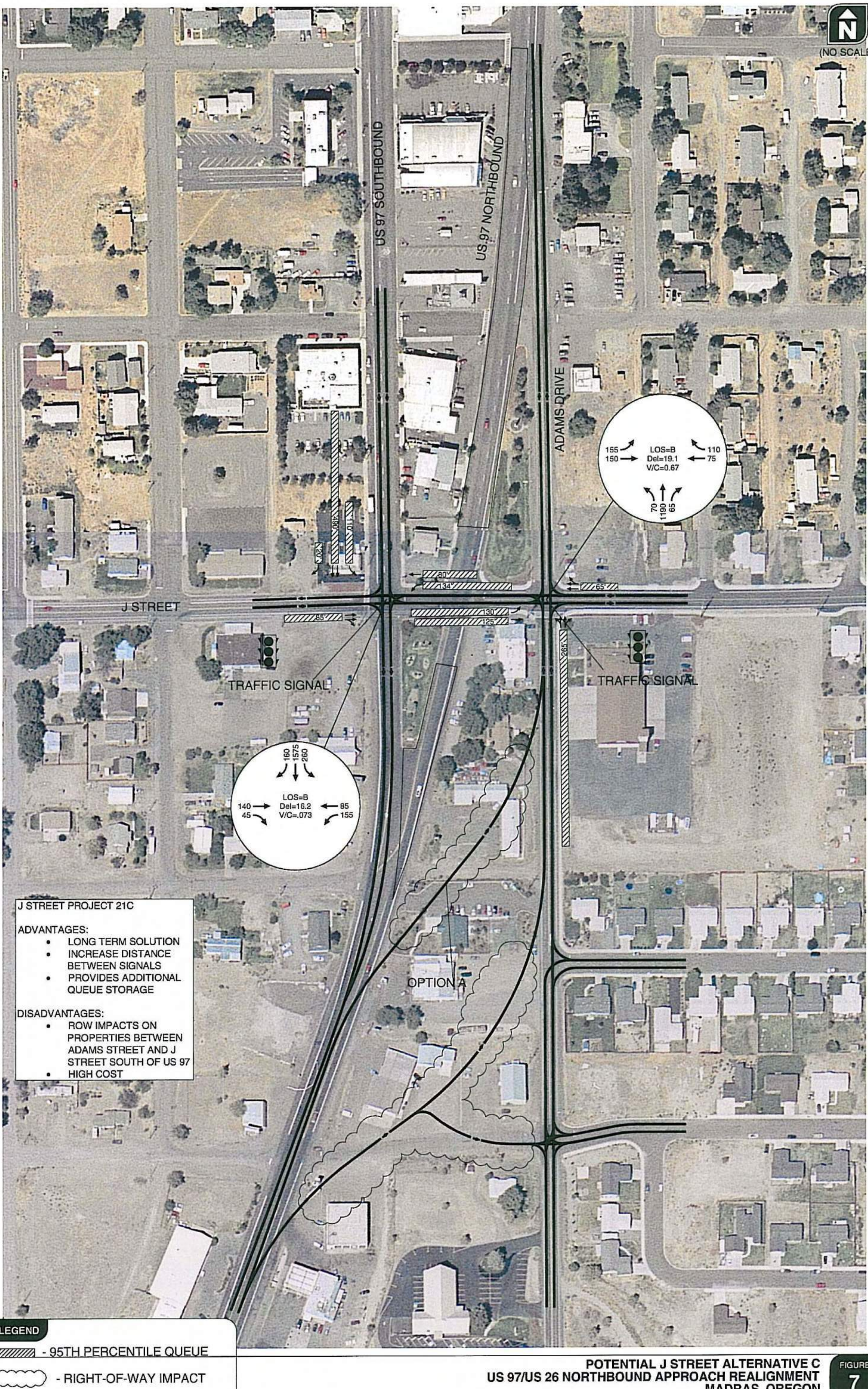
- Provides enough queuing distance between the northbound and southbound approaches of the highway, to store the vehicles on J Street.
- Reduces the speed for the northbound approach by using a low-speed design for the realignment.
- Extends the couplet south and provides access to additional properties for development.

Disadvantages

- Adversely impacts properties south of J Street between Adams Street and US 97/US 26.
- Substantial construction and right-of-way cost. ODOT cost estimate for the project is approximately $9 million.

Recommendation

The transportation alternatives presented above were discussed in detail in the technical advisory committee meetings and presented to the public in an open house. Based on the discussion and review comments received, Alternative C, the realignment of the US 97/US 26 northbound approach to Adams Street, was found to be most feasible and provides a long-term solution.



LEGEND
- 95TH PERCENTILE QUEUE
- RIGHT-OF-WAY IMPACT

POTENTIAL J STREET ALTERNATIVE C
US 97/US 26 NORTHBOUND APPROACH REALIGNMENT
MADRAS, OREGON

FIGURE 7

Kittelson & Associates, Inc.
Transportation Engineering / Planning

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J STREET ALTERNATIVE SOLUTION C - DOUBLE-LINE DRAWING OF US 97/US 26 NORTHBOUND APPROACH REALIGNMENT MADRAS, OREGON

FIGURE 8

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City of Madras TSP Project List Update

Several projects were identified in and around the City of Madras city limits during the course of preparing Jefferson County TSP. These projects addressed the long-term transportation needs of the County and City. The projects were reviewed by the technical advisory committee for the Jefferson County TSP, which included staff from City of Madras planning division, engineering division, school district as well as the police department. Some of these projects impacted the list of projects approved in the 2001 City of Madras TSP Update. In addition, the updated project list takes into consideration the recent residential developments in the east side of town.

In an effort to coordinate the two project lists (County and City), this section updates the City of Madras TSP project list to match the ones recommended in the County TSP. The following section identifies the projects that are impacted. The project number listed below refers to the City's TSP project list. Figure 9 provides the updated Figure B6 of the 2001 City of Madras TSP Update.

#6 Fairgrounds Road Extension (US 26/US 97 to ~~Adams Drive~~ Grizzly Road)

Extend Fairground Road future east to Grizzly Road. This extension represents anticipated future growth in the area.

#7 ~~Oak Street~~ Maple Street Extension (~~3rd~~-1st Street to US 26/US 97)

In order to coordinate with the newly constructed US 26/US 97 North intersection, and preserving the option of extending the fourth leg of the intersection as the Madras Truck Route, change Oak Street extension to Maple Street extension.

#8 ~~3rd~~ 1st Street Extension (~~Oak Street~~ Maple Street to B Street)

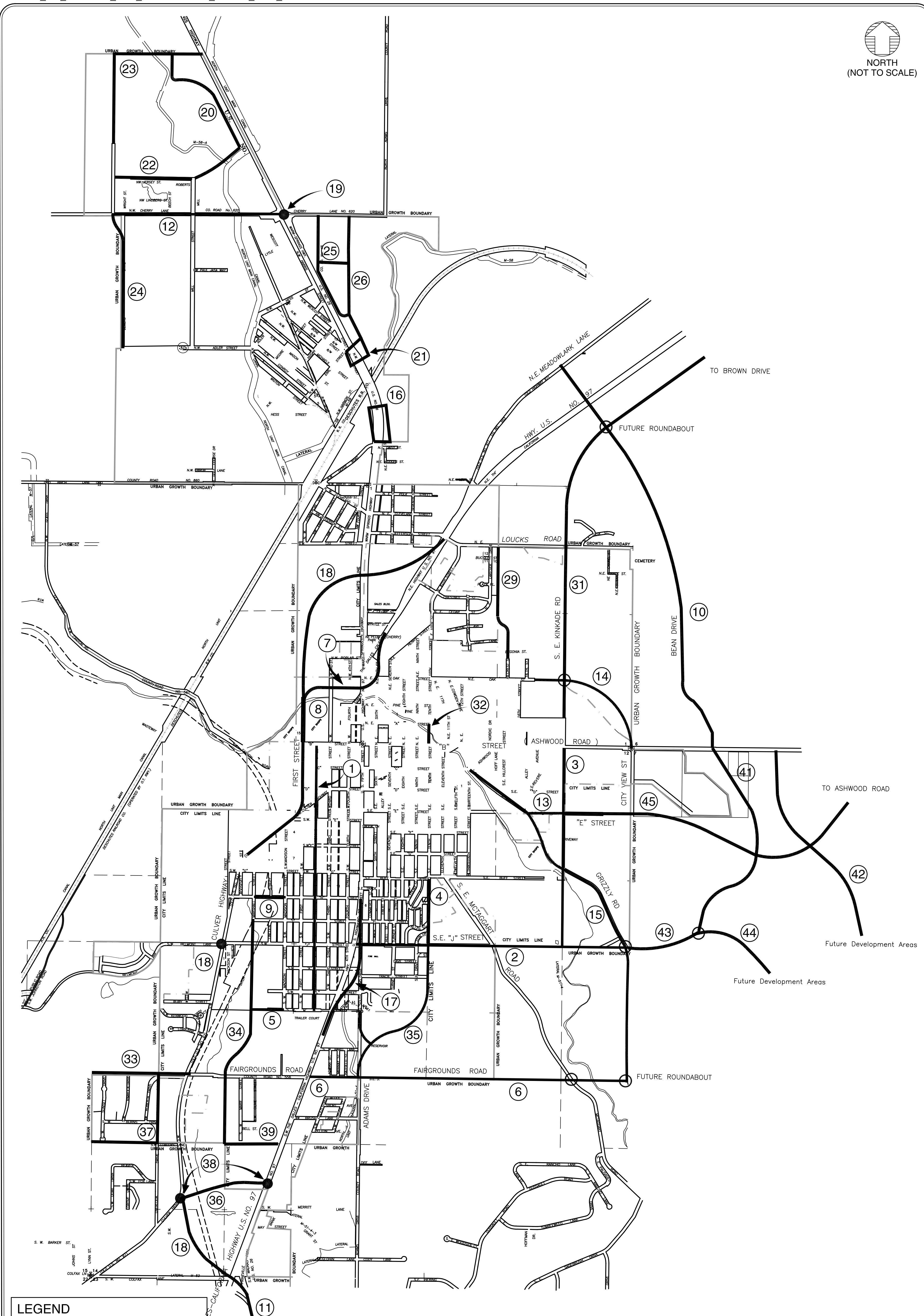
In order to coordinate with the Madras Truck Route option, change the project to 1st Street extension from Maple Street to B Street.

#10 ~~Claremont Street~~ Bean Drive Extension (~~US 97~~ Meadow Lark to ~~Grizzly Road~~ B Street)

Change project #10 Claremont Street extension from US 97 to Grizzly Road to Bean Drive extension from Meadow Lark to B Street to coordinate with Jefferson County TSP. The future intersection of Bean Drive/Kinkade Road is planned to be a modern roundabout.

#14 Oak Street Extension (16th Street to ~~Claremont~~ City View Street)

The alignment of the Oak Street extension is altered to form a curvilinear roadway and intersection opposite the City View Street/B Street intersection. A modern roundabout is planned at the intersection of Kinkade Avenue and Oak Street.



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UPDATED SUMMARY OF PROPOSED TRANSPORTATION SYSTEM IMPROVEMENTS

CITY OF MADRAS COMPREHENSIVE PLAN AND TRANSPORTATION SYSTEM PLAN UPDATE

OCTOBER 2006

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FIGURE B6

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FIGURE 9

#17 J Street/US 97 Intersection Realignment

Based on the refinement plan presented in previous section of this report, update the J Street/US 97 intersection realignment design to the double-line design shown in Figure 8. The project is estimated to cost approximately $9 million dollars including right-of-way acquisition, engineering and construction cost, according to the ODOT cost estimate.

#18A – D Madras Truck By-Pass Alignments

The Madras Truck Route refinement plan analyzed various alternative alignments, as described in the previous section. Based on the discussion on those alignments, the alignment that extends the truck route as the fourth leg of the US 97/US 26 North intersection and follows 1st Street to the current alignment of Culver Highway was identified as the most feasible alignment. The alignment is named as Alternative 1C and Alternative 2 in Figure 2. Even though the alignment addresses some of the concerns, such as the impact on the hotel development and cost of construction, it is anticipated to continue to have major right-of-way and access impacts on the properties adjacent to Culver Highway. As such, it is recommended that a detailed quantitative impact analysis be conducted in accordance with NEPA process before a final preferred alternative is selected.

#27 ~~Alder Street Improvements (Glass Drive to Mill Street)~~

This project is recommended to be removed from the list as it has already been built and is not identified in Jefferson County TSP.

#28 ~~Lakeside Drive Extension (Loucks Road to Kinkade Avenue)~~

This project is replaced by the Kinkade Avenue extension and is not included in the Jefferson County TSP.

#30 ~~Cedar Street Extension (Lakeside Drive to Claremont Extension)~~

This project is recommended to be removed from the list as Marigold Street, which runs parallel to Cedar Street, is proposed to extended to Bean Drive.

#31 Kinkade Avenue Extension (~~US 97~~ Brown Drive to ~~"A"~~ B Street)

The alignment of this project is modified to be extended north from B Street to the future extension of Bean Drive and continue to the northeast to Brown Drive. This project is anticipated to provide residential developments around Brown Drive with alternative access to downtown Madras without relying on US 97. The intersections of Kinkade Avenue/Bean Drive and Kinkade Avenue/Oak Street are planned to be modern roundabouts.

#35 Adams Drive/10th Street Connection

The alignment of this project is modified to illustrate a road connection on 10th Street from J Street to Fairgrounds Road and on Fairgrounds Road from 10th Street to Adams Drive (rearrange alignment to an "L" shape).

#41 Bean Drive Extension (Ashwood Road to J Street Extension)

The alignment of Bean Drive extension has been modified to accommodate current development pattern in the area. The final alignment of this project will need to accommodate topographical constraints and final developmental activity in the area.

#42 North-South UGB Road #1 (~~"E"~~ B Street to J Street)

The final alignment of this project will need to accommodate topographical constraints and development activity in the area.

#43 J Street Extenstion (Grizzly Road to Bean Drive Extension)

The alignment of the extension has been modified to accommodate current development pattern in the area. The final alignment of this project will need to accommodate topographical constraints and developmental activity in the area.

#44 East-West UGB Road #1 (~~Kinkade Avenue to Claremont~~ City View Street to Future Growth Area)

The final alignment of this project will need to accommodate topographical constraints and development activity in the area.

#45 ~~East-West UGB Road #1~~ E Street Extension (Kinkade Avenue to ~~"J" Street Extension~~ Ashwood Road)

Extend E Street east to Ashwood Road to accommodate future development in the area. The final alignment of this project will need to accommodate topographical constraints and development plan.

Additional Amendments

In recent years, City of Madras has witnessed a high pace of growth. The rate of growth is primarily attributed to the construction of the Department of Correction facility on the east side of the city and to the general population growth in Central Oregon, especially around the cities of Bend and Redmond. As such, large areas that were previously uninhabited are now being developed into residential sub-divisions, especially on the east side of the city. The updated list of projects provided in the previous section addressed some of the long-term transportation needs of these areas to accommodate the growth.

Furthermore, City of Madras is recommending to amend the City's TSP to include additional engineering standards and guidelines. These standards and guidelines will assist city officials in requiring new construction to follow standard engineering practices. It will also ensure that basic operational and safety features are provided in the design of the transportation system in and around the city.

Modern Roundabout Design and Operation Consideration

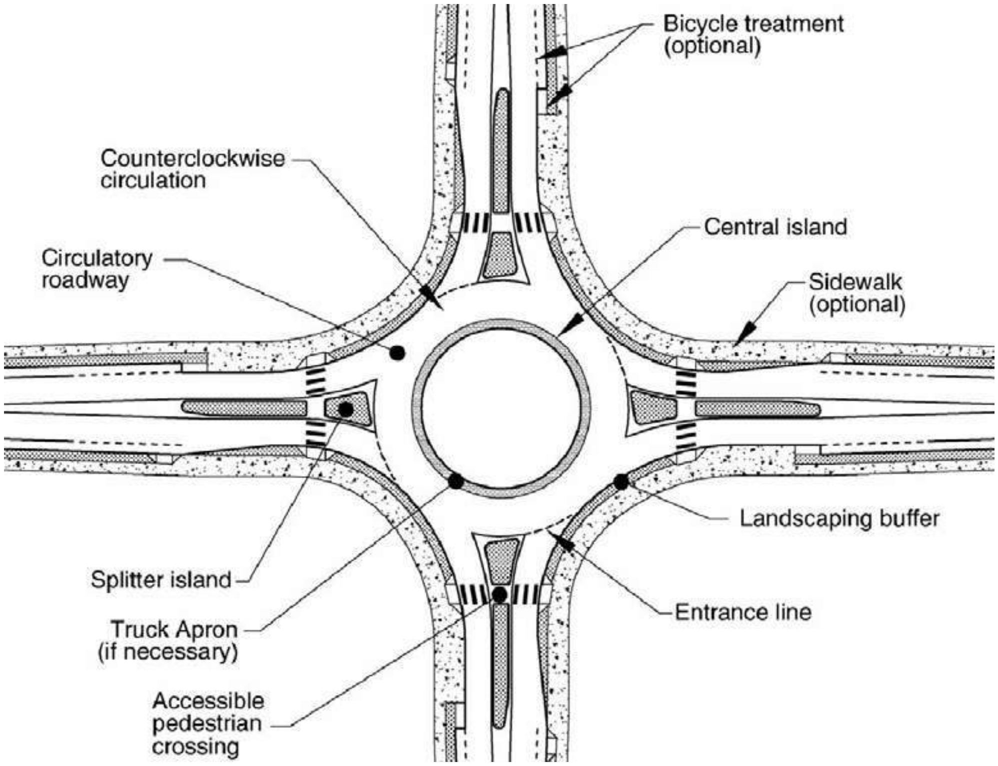
Modern roundabouts are a form of intersection design that provide safe and efficient flow of traffic within a certain range of traffic volume. Numerous research studies in the U.S. and abroad have shown that the operation of roundabouts is highly dependent on its geometric design and the characteristic of the traffic volume it serves. The detailed information on the safety, operations, and design of roundabout is provided in *Roundabouts: An Informational Guide*, published by the Federal Highway Administration (FHWA). The document stipulates that before the details of the geometry are defined, three fundamental elements must be determined in the preliminary design stage:

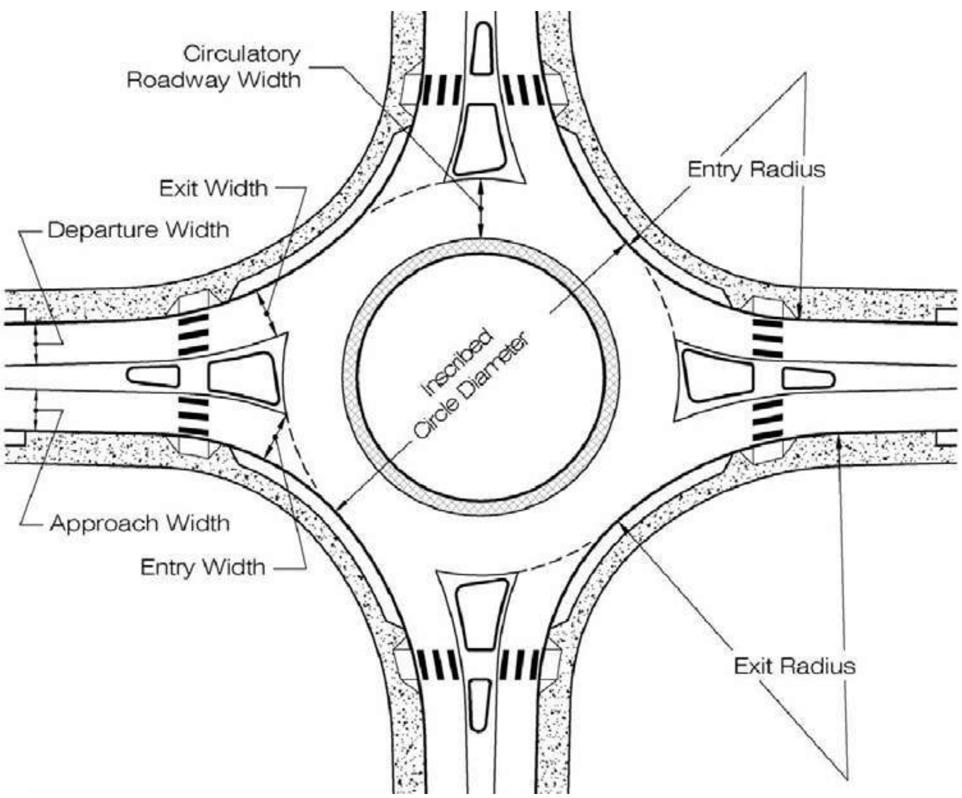
1. The optimal roundabout size;
2. The optimal position; and
3. The optimal alignment and arrangement of approach legs.

The document also highlights following critical design principals for roundabouts:

- Speed Profiles
- Design Speed
- Vehicle Paths
- Speed-Curve Relationship
- Speed Consistency

Other design considerations like design vehicle and non-motorized design users, among others, are also discussed in detail in the document. A volume-to-capacity (v/c) ratio of 0.85 is recommended as the operational standard of a roundabout. Exception to the v/c ratio standard is recommended when long-term analysis is conducted. Figure 10 shows key features and dimensions of modern roundabout.





KEY ROUNDABOUT FEATURES AND DIMENSIONS
MADRAS, OREGON

FIGURE 10

City of Madras Roundabout Standard

City of Madras and Jefferson County are planning to build several modern roundabouts around the city. In an effort to ensure that proper engineering standards are used when constructing roundabouts in and around the city, following design guidelines are recommended to be followed:

1. *Roundabouts: An Informational Guide* published by FHWA
2. *A Policy on Geometric Design of Highways and Streets* (Green Book), published by AASHTO
3. *Manual of Uniform Traffic Control Devices*, published by FHWA

Table 1 shows the recommended inscribed circle diameter ranges that is provided in Exhibit 6-19 of the roundabout guide.

Table 1 Recommended Inscribed Circle Diameter Ranges from Exhibit 6-19 of the *Roundabouts: An Informational Guide*

Site Category	Typical Design Vehicle	Inscribed Circle Diameter Range *
Mini-Roundabout	Single-Unit Truck	45 – 80 feet
Urban Compact	Single-Unit Truck/Bus	80 – 100 feet
Urban Single Lane	WB-50	100 – 130 feet
Urban Double Lane	WB-50	150 – 180 feet
Rural Single Lane	WB-67	115 – 130 feet
Rural Double Lane	WB-67	180 – 200 feet

* Assumes 90 degree angles between entries and no more then four legs.

Intersections of roadway facility types should consider all forms on intersection to ensure safe operating environment. Subject to a discretionary analysis by the Public Works Department, a modern roundabout is the initially preferred form of intersection between two major collectors or higher facilities. Based on City of Madras staff review of roundabouts in the region, a modern roundabout with an inscribed circle diameter of 190 feet and right-of-way of 252 feet diameter shall be dedicated as default, if no safety and operational analysis is presented to justify a smaller inscribed circle diameter. A roundabout with smaller inscribed diameter might be approved at certain location if a 20-year traffic safety and operation analysis determines that a smaller roundabout will operate adequately in the long-term. It is recommended that such a safety and operational analysis be conducted at all proposed/planned roundabouts before a final design is approved.

Planned Roundabouts

City of Madras and Jefferson County are planning to construct modern roundabouts at the following intersections:

- Kinkade Avenue/Oak Street/City View Street

- Kinkade Avenue extension/Bean Drive extension
- J Street extension/Bean Drive extension
- J Street extension/Grizzly Road
- Fairground Road extension/Grizzly Road
- Fairground Road extension/McTaggart Road

US 97/US 26 Highway Upgrade: K Street to Colfax Road

City of Madras and ODOT are planning to upgrade US 97/US 26 south of downtown Madras, from K Street to Colfax Road. The highway upgrade is anticipated to improve the operation and safety of motorist on the highway by reducing speed and adding urban features on the highway. Within a 100-foot right-of-way, the cross-section of the highway will include:

- Two 12-foot travel lanes
- One 16-foot center two-way left-turn lane
- Two 8-foot bike lanes
- 15-foot planter strip/drainage ditch on each side
- 6-foot sidewalk on each side

Figure 11 shows the cross-section of the US 97/US 26 highway upgrade. It should be noted that the above cross-section was included at the request of City staff. No specific reviews of the cross-section were conducted as part of the TSP amendment process.

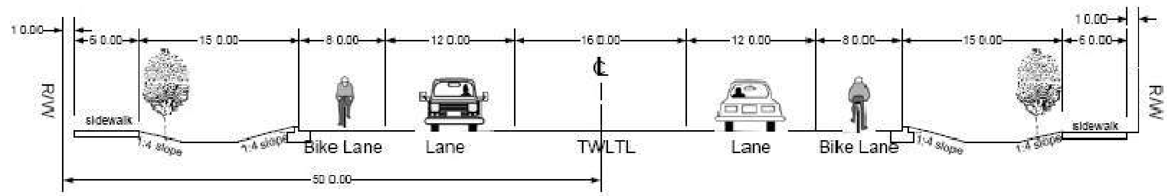
Culver Highway Upgrade: 1st Street to Colfax Road

Culver Highway is planned to be upgraded from 1st Street to Colfax Road as part of the Madras Truck Route. The design will include urban features and a posted speed of 45 mph.

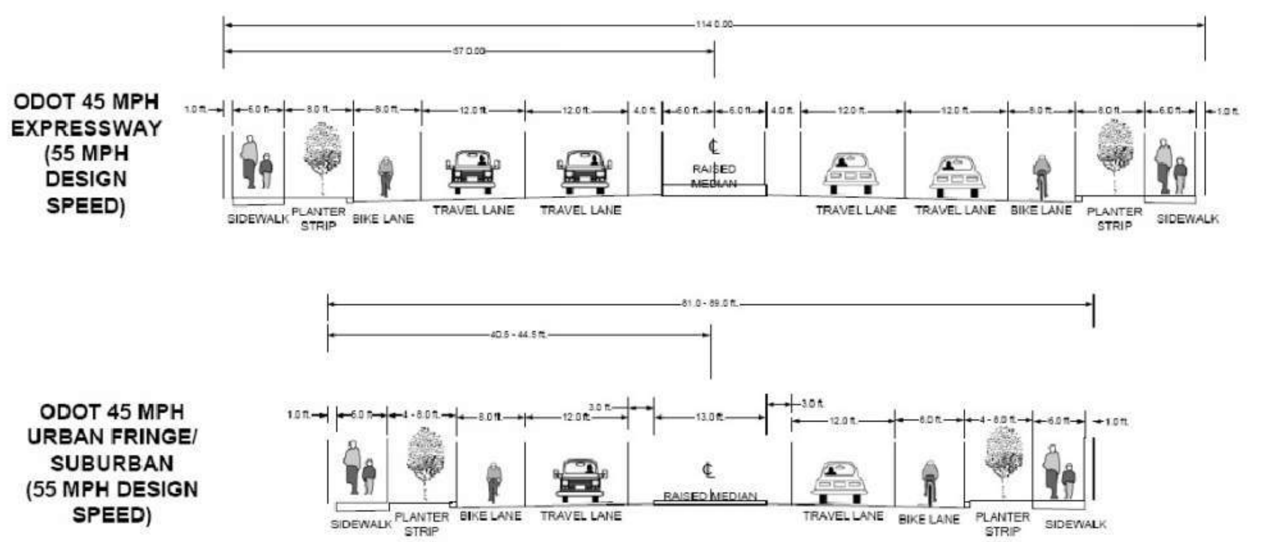
- Two 12-foot travel lanes
- One 13-foot raised median with 3-foot shy distance on each side
- Two 8-foot bike lanes
- 4-8-foot planter strip on each side
- 6-foot sidewalk on each side

Figure 11 also shows the planned cross-section of Culver Highway/Madras Truck Route upgrade. Similar to US 97/US 26 cross-section, it should be noted that the cross-section for Culver Highway was included at the request of City staff. No specific reviews or impact analysis of the cross-section were conducted as part of the TSP amendment process.

TYPICAL SECTION US 97 – "K" STREET TO COLFAX RD.



TYPICAL SECTION CULVER HIGHWAY - 1ST STREET TO COLFAX RD.



US 97/US 26 AND CULVER HIGHWAY PLANNED CROSS-SECTION
MADRAS, OREGON

FIGURE **11**

Appendix 10: Access Management Strategy for US 97 & J Street

US 97 "J" Street Realignment (Madras South Y)
Master Plan
Access Management Strategy

Context & Background:

The US 97 "J" Street Realignment (Madras South Y) is a modernization and safety improvement project near the southern end of the US 97 couplet through Madras. This portion of US 97 is designated as a Statewide Highway in the Oregon highway Plan and listed as a Freight Route. This project will make a significant investment in this section of highway, and every attempt should be made to maximize the benefits and protect this investment for the long term. Access management is an important tool to help achieve these expectations, and represents a core function for increasing and maintaining operational effectiveness and safety benefits of the highway and adjacent city streets. In its simplest form, access management involves balancing access (i.e., roadways to driveways) to developed lands while also ensuring the safe and efficient movement of all modes traffic on the highways or streets. Therefore it is important that access management decisions be based on a very deliberate consideration of relevant and accurate information, appropriate technical and professional judgment, and the needs of the affected property owners, travelers and the community.

Currently at the *South Y*, the section of J Street located between 4th and 5th Streets (northbound and southbound US 97) is approximately 50 feet in length, which creates an unsafe condition because it does not provide adequate room for vehicles waiting to cross the intersection or turn onto US 97. In 2001 the City constructed an extension of J Street to the east of these intersections with US 97 and J Street now functions as a major east-west route across Madras. Based on vehicle crash data, this location was ranked as a *Top 10% SPIS* (Safety Priority Index System) site in 2007, indicating it to be within the top 10% of the worst crash sites in Oregon based on crash frequency and severity. This project, after thorough evaluation of several alternatives and input from the community, will realign the northbound lanes of US 97 resulting in further separation between the US 97 northbound and southbound intersections with J Street and facilitating the signalization of those intersections.

This project is the master plan for this portion of the US 97/US 26 couplet corridor and portions of this project may be constructed in one or more phases to address immediate intersection improvements at US 97 and "J" Street.

Recent changes to the Highway permitting process (SB 264) did not make any significant changes to the current Division 51 rules for project delivery but Project Development relies on the access permitting standards when they consider how to correct access issues that arise on projects. The current access management rule changes are being considered in the context of this project. SB 264 describes a different way of evaluating highway accesses and there is an expectation that property owners will experience changes in how ODOT addresses their access concerns.

Access Management Sub-Team

The Access Management Sub-Team includes ODOT Region staff Mike Darling - Project Leader, Wade Coatney – Roadway Designer, Mary Whitaker - Senior Right of Way Agent, Dan Serpico – Senior Traffic Analyst, Bill Hilton – District 10 Operations Coordinator; and City of Madras Staff Gus Burril - City Administrator, Jeff Hurd - Public Works Director, and Nick Snead, Community Development Director. This sub-team has multiple assignments which include:

- Develop this Access Management Strategy, as the project is developed and refined, documenting the summary of proposed access closures, relocations, modifications, combined, unchanged, or re-installed accesses; and mapping of proposed access locations, and treatments such as medians, channelization, parking modifications, pedestrian safety features, etc.
- Complete all related and necessary analysis and documentation work products for access management (e.g., a detailed and comprehensive analysis of all accesses within the project limits for use in completing the final Official Project Access List for required approvals).
- Review of each existing access within the traffic influence area of the project limits on the state highway and city streets, public and private, and review of documents to ensure the legal status of each access, in accordance with ODOT and City of Madras policies.
- Communicate and collaborate with property and business owners, City Officials, other stakeholders such as emergency service providers, and the general public on the planned scope of the project and the anticipated effects of access management within the project area.
- Make recommendations on whether or not ODOT should acquire access rights within the project limits. At a minimum, the Access Management Subteam recommends purchasing access control along the realigned portion of northbound US 97 from L Street to H Street.

Access Management Purpose & Goals

The purpose of this project is to realign the northbound lanes of US 97 at the *South Y* to provide greater separation between the US 97 / J Street intersections and enable the installation of traffic signals. This will enhance the safe and efficient operation of the highway as well as J Street, which now functions as a major east-west route through Madras. Consistent with the purpose of this project, access management is an important tool for promoting safe and efficient travel for both local and long distance users of the roadway. Too many access points along busy roads lead to an increased number of conflict points between vehicles entering and exiting driveways and through vehicles on the road. This leads to increased vehicle delay, decreased *level of service*, and deterioration of safety for all modes of travel. The goals of access management decision-making on this project include minimizing such effects, balanced with ensuring safe and effective access to adjacent properties and businesses. For this project, access management should support all modes of travel, and help the project in attracting tourism, community patronage, and economic development.

The access management goals for the project are:

- To employ access management strategies consistent with the statewide function of US 97 that will enhance safety and efficiency along the highway.
- To support the overall statewide goal of promoting a safe and efficient transportation system while enhancing the livability of Madras and planned development patterns.
- To Permit all private, approved and constructed approaches in the project limits on state highways.
- To implement Access Management measures that improve operation, safety, facilitate project goals, and protect the functional classification of the highway to the greatest extent possible.
- To consider Emergency Services needs in the project design.
- Consider the economic consequences of changes in access when modifying or closing an approach to an existing business.

Therefore, the goals for access management on this project are basically the same as the purpose of the project. Also included are these general expectations for all ODOT Region 4 modernization projects located in or near communities:

- Contribute to the livability and economic vitality of all citizens associated with the transportation facility, including consideration of aesthetic values that are important to the community.
- Provide a balanced roadway grid system and provide adequate access to properties for its authorized and planned uses, using the adjacent street system where possible, and where achievable, driveway consolidation where feasible, and additional driveway closures and restrictions as opportunities arise over time.

General Strategies to Achieve the Access Management Goals

The following techniques describe how the number of access points to a roadway can be restricted or reduced, and could be applicable to and considered for use in addressing the conditions within the project area:

- Move in the direction of spacing standards between access points (driveways) and public/private roads based on the type of development and the speed along the road.
- Review current site circulation for adequate access based on the current approved use considering economic development needs of property.
- Sharing/consolidating access points between adjacent properties.
- Purchase of access control.
- Providing driveway access via local roads where possible and/or practical.
- Improvements or additions to the local road system.
- Constructing frontage roads to separate local traffic from through-traffic.
- Providing service drives to prevent spill-over of vehicle queues on the adjoining roadways.
- Providing deceleration and right turn lanes, when warrants can be met.
- Offsetting driveways at proper distances to produce T-intersections that minimize the number of conflict points between traffic using the driveways and through traffic.
- Installing median barriers to control conflicts associated with left-turn movements (in or out of driveway or roadway), and restrict movements in general

In somc cases, access could be allowed to a property at less than the designated spacing standards, but only where access control does not exists, where the property cannot get effective access, and the designated spacing standard cannot be accomplished for other feasibility reasons. Other options, such as partial access (e.g., right-in-only, right-out only, right-in-right-out-only, etc.) or joint access may be considered before allowing acccsscs at less than dcsignated standards. Any decision-making for dcviations from the standards must be documented per OAR 734-051, and all access management decisions, as well as elements of this Access Management Strategy, will follow OAR 734-051 and the Oregon Highway Plan (OHP).

Specific Strategies to Achieve the Access Management Goals

The fundamental problem of the US 97 and "J" Street intersections is congestion and insufficient distance between the northbound and southbound intersections with J Street. The traffic at the existing intersections "backs up" on a regular basis. This problem is amplified by the number and spacing of surrounding driveways to the city streets and local businesses.

The solution to this problcm, as adoptcd by the City of Madras in their Transportation System Plan in August 1998 and updated in October 2006, is to further separate the northbound and southbound highway traffic by extending the couplet further south through the realignment of the northbound lanes and signalizing the two intersections. This separation and signalization, along with implementation of various access management techniques, will essentially resolve the problems noted above for the long term.

The more specific strategies to address these access management concerns include:

- Working toward access management spacing standards within the project limits (e.g., by optimizing spacing between driveways).
- Multiple highway accesses to same property will be evaluated to be reduced, combined or closed. Properties with access to the highway and that have adequate access to the property for its authorized and planned uses will be evaluated for closure.
- In combination with the first two strategies, construct city street improvements and modifications for the local grid system, to ensure continued effective access for existing businesses and private property.
- Construct curb, gutter, sidewalk, and bike lanc shouldcrs to ensure safe and convenient pedestrian and bicycle access.

In summary, all accesses, including those on the side streets within the intersection influence areas will be reviewed for compatibility with the final alignments and intersection layout. The function of the signals at the intersections will be of highest importance. To increase the safety and operations of the intersections, accesses may be moved, modified, restricted, or closed.

This strategy may be implemented in one or more phases or projects over time. This strategy is the master plan which provides the overall frame work for managing access in this important corridor.

Strategies for Each of the Highway Accesses within the Project Area

The following provides details of how the project addresses each access to the state highway or city streets within the project area, and is a result of public involvement and communication with individual property and business owners. For those permitted approaches on US 97 (4^{th} and 5^{th} Streets) and Un-Permitted accesses on city streets, the intended closure or modification will be per OAR 734-051 and SB 86. For those accesses which have not been permitted through ODOT, or do not meet 'grandfather' criteria, the intended closure or modification notice will be per ORS 374.

The numbered strategy statements reference access points on US 97 and city streets with corresponding numbers on the attached map. Each statement lists the current property owner, the tax lot number, the present occupant and a detailed strategy for each access point (labeled 1A, 1B, 1C...etc for each individual access to a property).

0) "G" Street: City Street Owned by City of Madras

0A - Un-Permitted public street access to southbound US 97 (4^{th} Street) on the west.
Proposed Action: District 10 to Inventory

0B - Un-Permitted public street access to southbound US 97 (4^{th} Street) on the east.
Proposed Action: District 10 to Inventory

0C - Un-Permitted public street access to northbound US 97 (5^{th} Street) on the west.
Proposed Action: District 10 to Inventory

1) Property Owned by: Kim Millard
Tax Lot #: 11-13-12BC; TL 3800 & 3900
Occupied by: Dairy Queen

1A – Permitted approach (#13787) to northbound US 97 (5^{th} Street). Approach to remain and a new dust pan approach will be constructed further to the north at 24' wide as part of the improvements that are being constructed along this property's frontage.
Proposed Action: District 10 to Cancel Permit and Re-issue a new Permit

1B – Permitted approach (#13788) to northbound US 97 (5^{th} Street). Approach to remain and a new dust pan approach will be constructed further to the north at 24' wide as part of the improvements that are being constructed along this property's frontage.
Proposed Action: District 10 to Cancel Permit and Re-issue a new Permit

2) Buff Street: City Street Owned by City of Madras
Un-Permitted public street access to northbound US 97 (5^{th} Street) on the east to remain.
Proposed Action: District 10 to Inventory

3) Property Owned by: Metol, Inc. & Carlemon, LLC
Tax Lot #: 11-13-11DA; TL 100
Occupied by: Sears & Erickson's Market

3A – Un-Permitted access to northbound US 97 (5^{th} Street). This access, as well as 3B & 3C serve the parking lot between Sears and Erickson's Market from 5^{th} Street. In addition there are 3 accesses (3E, 3F, & 3G) to the same parking lot from the 4^{th} Street side of the property. This access may be shifted and will bc constructed as a left-out only approach. Some parking lot reconfiguration for internal circulation may be required with the plan for two approaches off of 5^{th} Street and 4^{th} Street each.
Proposed Action: District 10 to Issue Permit

3B – Un-Permitted access to northbound US 97 (5^{th} Street). This access serves the parking lot between Sears and Erickson's Market. This access will be closed in accordance with the plan for two approaches off of 5^{th} Street and 4^{th} Street.
Proposed Action: District 10 to Issue Closure Letter

3C – Un-Permitted access to northbound US 97 (5^{th} Street). This access may be shifted and constructed as a left-in only approach.
Proposed Action: District 10 to Issue Permit

3D – Un-Permitted access to northbound US 97 (5^{th} Street). This access serves the Thriftway Store loading dock. Large delivery trucks stop on the highway to back into this access. This unsafe situation has been discussed with the Store Manager from Thriftway and they recognize that it is unsafe, even to the point of explaining that some delivery truck drivers are unwilling to use this access. The solution agreed upon by the City & property Owner, is the designation of a designated loading zone on 5^{th} St adjacent to Thriftway as a loading zone for trucks.
Proposed Action: District 10 to Issue Closure Letter

3E – Un-Permitted access to southbound US 97 (4^{th} Street). This access may be shifted and will be constructed as a left-in only approach.
Proposed Action: District 10 to Issue Permit

3F – Un-Permitted access to southbound US 97 (4^{th} Street). This access serves the parking lot between Sears and Erickson's Market. This access will be closed in accordance with the plan for two approaches off of 4^{th} Street and two off 5^{th} Street.
Proposed Action: District 10 to Issue Closure Letter

3G – Un-Permitted access to southbound US 97 (4^{th} Street). This access may be shifted and will be constructed as a left-out only approach.
Proposed Action: District 10 to Issue Permit

3H – Access to G Street serving Sears parking lot. This parking lot is separated from the larger parking lot that is accessed by 3E, 3F & 3G. Unknown permit status. Beyond project work limits.
Proposed Action: None

3I – Access to G Street serving Sears parking lot. This parking lot is separated from the larger parking lot that is accessed by 3E, 3F & 3G. Unknown permit status. Beyond project work limits.
Proposed Action: None

3J – Un-Permitted access to southbound US 97 (4th Street) serving Sears parking lot. This parking lot is separated from the larger parking lot that is accessed by 3E, 3F & 3G. Beyond project work limits.
Proposed Action: None

4) Property Owned by: Warrick & Hagedorn
Tax Lot #: 11-13-12CB; TL 1900
Occupied by: Ralph's Furniture

4A – Permitted approach (#52626) to northbound US 97 (5th Street). The property has alternate access through accesses 4B and 4C from Trade Street, but they are very close to the intersection of US 97 & Trade St. This permitted approach will remain, and a new dust pan approach will be constructed further to the south as part of the improvements that are being constructed along this property's frontage.
Proposed Action: District 10 to Cancel Permit and Re-Issue Permit

4B – Access to Trade Street (City Street). Unknown permit status.
Proposed Action: None

4C – Access to Trade Street (City Street) at back of building for deliveries. Unknown permit status.
Proposed Action: None

5) S.E. Trade Street: City Street Owned by City of Madras
Un-Permitted public street access to northbound US 97 (5th Street) on the east.
Proposed Action: District 10 to Inventory

6) Property Owned by: Kelley, Kelley & Randall
Tax Lot #: 11-13-12CB; TL 2000
Occupied by: Vacant

6A – Open frontagc to US 97 (5th Street) with approximately 9 parallel parking spaces which are partially, if not entirely within highway right of way. Construction of an access along building frontage is not feasible (or allowable) due to close proximity of the building to the right of way and due to reasonable alternate access. On street parking will be available after project (est. 4 – 5 spaces along property frontage). Property backs against S.E. Commerce Street and is accessible from S.E. Trade Street (6B).
Proposed Action: District 10 Issue Closure Letter

6B – Open frontage to Trade Street (City Street) along north side of building. Unknown permit status. A defined connection to Trade St. to be located at 50' minimum distance from US 97 right of way line.
Proposed Action: None

7) "old" South Adams Drive: City Street Owned by City of Madras
Un-permitted public street access to northbound US 97. South Adams Drive alignment will become new alignment for US 97 northbound.
Proposed Action: Transfer agreement betwecn City of Madras and ODOT

8) Reserved
9) Reserved

10) "H" Street: City Street Owned by City of Madras

10A – Un-Permitted public street access to southbound US 97 (4th Street) on the west.
Proposed Action: District 10 to Inventory

10B – Un-Permitted public street access to southbound US 97 (4th Street) on the east.
Proposed Action: District 10 to Inventory

10C – Un-Permitted public street access to northbound US 97 (5th Street) on the west.
Proposed Action: District 10 to Inventory

11) Property Owned by: Juniper Banking Co.
Tax Lot #: 11-13-11DA; TL 7600
Occupied by: Columbia Bank

11A – Un-Permitted access to southbound US 97 (4th Street). Access to property is provided by another access to US 97 (11B), as well as accesses to H (11C) and Third Strcets. This access conflicts with new curb extensions and ADA ramps at 4th & H Street intersections, as well as impacting the function of that intersection. This access will be closed with construction of the pedestrian bulb-out. Somc parking lot reconfiguration for internal circulation may be required.
Proposed Action: District 10 to Issue Closure Letter

11B – Un-Permitted access to southbound US 97 (4th Street). Acccss to property is providcd from H, Third and Fourth Streets after closure of 11A. Egress from existing drive-thru window is provided by this access. This access will remain open and function as a right out only for the drive-thru. Some parking lot reconfiguration for internal circulation may be required.
Proposed Action: District 10 to Issue Permit

11C – Access to "H" Street. Unknown permit status, but no plans to affect under project.
Proposed Action: None

12) Property Owned by: Tathwell
Tax Lot #: 11-13-11DA; TL 8500
Occupied by: Figaro's Pizza & Ace Hardware

12A – Un-Permitted access to southbound US 97 (4th Street). Access to property is provided from 5th Street (12C). According to the property and business owners, this access is required for ingress and egress of the large delivery trucks as well as patrons to the businesses.
Proposed Action: District 10 Issue Permit

12B – Permitted Approach (#13783) to northbound US 97 (5th Street). Access to property from east side will be provided by shared acess road (19) running adjacent to northbound realignment, near the current location of 12C. Provide approach to property from 4th Street (ref. 12A). Some parking lot reconfiguration for internal circulation may be required.
Proposed Action: District 10 Issue Modification Letter and Cancel Permit

12C – Permitted approach (#13783) to northbound US 97 (5th Street). Access to property will be provided from this approach near its current location, which will come off of the shared access road (19), and from the 4th Street approach.
Proposed Action: District 10 Issue Modification Letter and Cancel Permit

12D – New access to be constructed directly to northbound US 97 (5th Street). Access is needed to property for deliveries.
Proposed Action: District 10 to Issue Permit

13) Property Owned by: Shade Tree RE, Frank Bowen
Tax Lot #: 11-13-11DA; TL 8600 & 8700
Occupied by: Napa Auto Parts & Espresso Hometown Coffee.

13A – Un-Permitted access to southbound US 97 (4th Street). One of two existing accesses to southbound US 97. This access will be moved to the south between the two current accesses.
Proposed Action: District 10 to Issue Permit

13B – Un-Permitted access to southbound US 97 (4th Street). One of two existing accesses to southbound US 97. This property will be accessed from 4th Street from approach 13A.
Proposed Action: District 10 to Issue Closure Letter

13C – Permitted approach to northbound US 97 (5th Street). Approach (#13783 with 12B & 12C). Access to property from 5th Street will be provided from this approach near its current location, which will come off of the shared access road (#19).
Proposed Action: District 10 Issue Modification Letter and Cancel Permit

14) Property Owned by: Robert D. Powers, Sr. Trust
Tax Lot #: 11-13-11DA; TL 7900
Occupied by: Vacant (field)
Un-Permitted access to southbound US 97 (4th Street). No development on this site at this time. This access to be closed until property develops. Evaluate access when proposal for development occurs.
Proposed Action: District 10 to Issue Closure Letter.

15) Property Owned by: Chen, et. al.
Tax Lot #: 11-13-11DA; TL 8800
Occupied by: Ding Ho Restaurant

15A – Un-Permitted access to southbound US 97 (4th Street). Access to property from west will remain.
Proposed Action: District 10 to Issue Permit

15B – Un-Permitted access to southbound US 97 (4th Street). Access to this parking area is provided from access on I Street (#15D) which will remain. This access to be closed.
Proposed Action: District 10 Issue Closure Letter.

15C – Permitted approach (#13784) to northbound US 97 (5th Street). Access to property will be provided from this approach near its current location, which will come off of the shared access road (#19).
Proposed Action: District 10 to Issue Modification Letter and Cancel Permit

15D – Access to I Street. Unknown permit status. This access provides the only access to parking area after the closure of #15B. Access will remain and a new dust pan will be constructed as part of the improvements that are being constructed along this property's City Street frontage.
Proposed Action: None

16) Property Owned by: Wayne & Bev Shultz
Tax Lot #: 11-13-12CB; TL 2100, 2200 & 2300
Occupied by: Dentist Office complex

16A – Un-Permitted open frontage to US 97 northbound (5th Street) / S. Adams with approximately 19 existing "nose-in" parking spaces, many of which are partially or entirely within highway right of way. Construction of an access along building frontage is not feasible due to close proximity of the building to the highway right of way. On street parking will be available after the completion of the project (est. 11 – 12 spaces along property frontage, which is roughly 340 ft across the 3 tax lots). Property has access in the back from S.E. Commerce Street. Discussions with owner and City representatives have resulted in the plan to construct a right-in-only access (#16B) near the northern end of the property which will provide access to a parking area that the owner will construct. City also agreed to allow access to this parking lot from Commerce Street to be constructed by owner.
Proposed Action: Property Owner Notified under R/W Process

16B - Open frontage to US 97 (5th Street) / S. Adams with no approach permits. Construct a right-in-only approach near the northern end of the property which will provide access to a parking area to be constructed by the owner.
Proposed Action: District 10 to Issue Permit, R/W to grant an Access Reservation at new approach location

17) Property Owned by: Everett Fischer & Penny Marston
Tax Lot #: 11-13-12CB; TL 2400
Occupied by: Mark's Auto Repair

17A – Un-Permitted open frontage to S. Adams, which will become northbound US 97. Unknown City permit status. Access is also available from I Street (#17B) and may be available from S.E. Commerce Street across the back of the property as well. This frontage along northbound US 97 will be closed and on street parking (est. 4 – 5 spaces) will be provided.
Proposed Action: Property Owner Notified under R/W Process

17B – Access to I Street. Unknown permit status with City. Access to remain.
Proposed Action: None

18) Property Owned by: Powers Real Estate Trust
Tax Lot #: 11-13-11DA; TL 8000 & 8100
Occupied by: Sonny's Hair Salon

18A – One of three accesses to this property from I Street. As the property is currently developed this access gets mainly used. Unknown permit status. Currently no access to southbound US 97 (4th Street) and none planned. Field review shows that consolidation of the three existing accesses to this property may be feasible. As property redevelops, pursue consolidation of the three accesses to I Street at one location (near 18C) as far west along the property frontage as possible.
Proposed Action: None

18B – Curb cut access is evidently seldom used to I Street. Pursue consolidation into one access near 18C location as redevelopment allows.
Proposed Action: None

18C – Curb cut access is evidently seldom used to I Street. Pursue consolidation into one access near this location as redevelopment allows.
Proposed Action: None

19) Shared Access Road Access serving the east side of properties 12, 13 & 15 in this strategy
Proposed Action: District 10 to Inventory

20) "I" Street: City Street Owned by City of Madras

20A – Un-Permitted public street access to southbound US 97 (4th Street) on the west.
Proposed Action: District 10 to Inventory

20B – Un-Permitted public street access to southbound US 97 (4th Street) on the east.
Proposed Action: District 10 to Inventory

20C – Un-Permitted public street access to current northbound US 97 (5th Street) on the west. This intersection will move further east (to 20D/20E location) with realignment on northbound US 97.
Proposed Action: None

20D – Un-Permitted public street access to current northbound US 97 (5th Street) on the east. This intersection will move further east (to 20D/20E location) with realignment on northbound US 97.
Proposed Action: None

20E – Public street access to I Street from what is currently S. Adams on the west. Unknown permit status. S. Adams will become northbound US 97.
Proposed Action: District 10 to Inventory

20F – Public Street access to I Street from what is currently S. Adams on the east. Unknown permit status. S. Adams will become northbound US 97.
Proposed Action: District 10 to Inventory

21) Property Owned by: Jefferson County
Tax Lot #: 11-13-11DA; TL 9500, 9501 & 9700
Occupied by: Jefferson County Public Health

21A – Un-Permitted access to southbound US 97 (4th Street). One of two existing accesses to US 97. Property also has access from alley. Ingress to property will be provided from shared access further south near #21B location. This access to be closed. Some parking lot reconfiguration for internal circulation may be required with one, shared approach off of southbound US 97 (4th Street).
Proposed Action: District 10 to Issue Closure Letter

21B – Un-Permitted access to southbound US 97 (4th Street). One of two existing accesses to US 97. Ingress (right-in only) to this property as well as the next property to the south will be provided from a shared access near this location. Right-out access would be incompatible with right turn lane and signalized intersection at J Street. Determine location based on compatibility with right turn lane and property line between this property and TL 9701 to the south.
Proposed Action: District 10 to Issue Modification Letter and Issue Permit for shared approach with #23A (#21/23)

22) Property Owned by: James L. Brown
Tax Lot #: 11-13-11DA; TL 9100 & 9200
Occupied by: Madras Auto Body & Glass

22A – Un-Permitted access to southbound US 97 (4th Street). This access provides access to the back of building bay doors and storage area. Business also has access from current northbound 97 and will be provided access from future shared access road (see 22B & C). Closure of this access would result in significant modifications to the existing building beyond what is reasonable for the minimal volume and characteristics of the traffic that this access serves.
Proposed Action: District 10 issue Permit

22B – Permitted approach (#13791) to northbound US 97 (5th Street). Access will be provided from shared access road (#28).
Proposed Action: District 10 to Issue Modification Letter and Cancel Permit

22C – Un-Permitted access to northbound US 97 (5th Street). Access will be provided from shared access road (#28).
Proposed Action: District 10 to Issue Modification Letter

22D - Un-Permitted access to southbound US 97 (4th Street). Existing curb cut in sidewalk is blocked by a fence with no gate. Access will be provided from shared access road (#28).
Proposed Action: District 10 to Issue Closure Letter

23) Property Owned by: Brook's Acquisitions & JRB Foods
Tax Lot #: 11-13-11DA; TL 9701, 9800 & 9900
Occupied by: Pepe's and vacant field.

23A – Un-Permitted access to southbound US 97 (4th Street). One of two existing accesses to US 97; the other access (23B) is the exit from the drive through. This access provides access to Pepe's parking lot and drive through. Relocate this access due to incompatibility with signal function and planned right turn lane on southbound US 97. Access to be shared right in only. Access to property to be provided from shared access at #21B and the alley off of J Street. The alley will be improved to accommodate one-way traffic in northbound direction.
Proposed Action: District 10 to Issue Modification Letter and Issue Permit for shared approach #21B (#21/23)

23B – Un-Permitted access to southbound US 97 (4th Street). One of two existing accesses to US 97. This access provides exit from Pepe's drive through. Close this access due to incompatibility with signal function and planned right turn lane on southbound US 97. Access to property will be provided from alley off of J Street. The alley will be improved to accommodate one-way traffic in northbound direction.
Proposed Action: District 10 to Issue Closure Letter

23C – Access to J Street. Unknown Permit status. Close this access due to incompatibility with signal function. Access to property to be provided from #21/23 (shared right in access) and the alley off of J Street (#23D).
Proposed Action: City to Issue Closure Letter

23D – Access to City Alley. Unknown Permit status. One way access to the City Alley to remain.
Proposed Action: None

24) Property Owned by: Cosmic Owl, LLC
Tax Lot #: 11-13-11DA; TL 9000
Occupied by: AmeriTitle Co.

24A – Un-Permitted access to southbound US 97 (4th Street). Close this access due to incompatibility with signal function and planned left turn lane on southbound US 97. Access to property will be provided from shared access road (#28) on the east side.
Proposed Action: District 10 to Issue Closure Letter

24B – Permitted approach (#13785) to northbound US 97 (5^{th} Street). One of two existing approaches to northbound US 97. This approach will remain, but will connect to the new shared access road (#28) that will come off of US 97 to the north of this property. There will be no access provided to J Street.
Proposed Action: District 10 to Issue Modification Letter and Cancel Permit

24C – Permitted approach (#13785) to northbound US 97 (5^{th} Street). One of two existing approaches to northbound US 97. This approach will remain, but will connect to the new shared access road (#28) that will come off of US 97 to the north of this property. There will be no access provided to J Street.
Proposed Action: District 10 to Issue Modification Letter and Cancel Permit

25) Property Owned by: Quality Sounds
Tax Lot #: 11-13-11DA; TL 9400
Occupied by: Outpost Bargain Store

25A – Permitted approach (#13789) to northbound US 97 (5^{th} Street). One of two existing approaches to northbound US 97. This approach will remain, but will connect to the new shared access road (28) that will come off of northbound US 97.
Proposed Action: District 10 to Issue ~~Closure~~ Modification Letter and Cancel Permit

25B – Permitted approach (#13789) to northbound US 97 (5^{th} Street). One of two existing approaches to northbound US 97. This approach will remain, but will connect to the new shared access road (28) that will come off of northbound US 97.
Proposed Action: District 10 to Issue ~~Closure~~ Modification Letter and Cancel Permit

25C – Access to I Street. Unknown permit status. One of two accesses to I Street. Access will conflict with curb extension at I Street and 4^{th} Street intersection. Close this access.
Proposed Action: City to Issue Closure Letter

25D – Access to I Street. Unknown permit status. Move to mid-block to get accesses further away from US 97 / I Street intersections.
Proposed Action: None

26) Property Owned by: Donald & Helen Brackett and Victor & Nyla Delamarter
Tax Lot #: 11-13-12CB; TL 7400
Occupied by: Midland Real Estate

26A – Open frontage to S. Adams with parallel parking spaces which may be partially within city street right of way. Unknown permit status. S. Adams alignment will become northbound US 97 along this property. On street parking will be available after project (est. 2 – 3 spaces along property frontage). Property has access on the side from I Street (#26B).
Proposed Action: Property Owner Notified under R/W Process

26B – Access (open frontage) to I Street. Unknown permit status. Construct dust pan access to more clearly define access point.
Proposed Action: None

27) Property Owned by: Dennis Prince and Three Princes
Tax Lot #: 11-13-12CB; TL 7401
Occupied by: Vacant

27A – Open frontage to parking lot for auto shop from S. Adams. Unknown permit status. S. Adams alignment will become northbound US 97 along this property. On street parking will be available after project (est. 6 – 7 spaces). The current site is used by Prince's Auto Shop for parking of vehicles including large trucks and RV's. An approach from US 97 is needed since the alley access cannot accommodate large vehicles. The project will construct an access to US 97 (5th St). Evaluate access when proposal for development occurs.
Proposed Action: District 10 to Issue Permit, R/W to grant an Access Reservation at new approach location

27B – Access (open frontage) to parking lot from J Street. Unknown permit status. No development on this site at this time. Access along J Street frontage would conflict with future signal function. No access to be constructed at this time, evaluate access when proposal for development occurs. Lot can be accessed from alley (#J3).
Proposed Action: Property Owner Notified under R/W Process

28) Shared Access Road Access
Combined public shared road access to northbound US 97 (5th Street). Access will be left in – left out only.
Proposed Action: District 10 to Inventory

29) Reserved

30) "J" Street: City Street Owned by City of Madras

30A – Un-Permitted public street access to southbound US 97 (4th Street) on the west.
Proposed Action: District 10 to Inventory

30B – Un-Permitted public street access to southbound US 97 (4th Street) on the east.
Proposed Action: District 10 to Inventory

30C – Un-Permitted public street access to current northbound US 97 (5th Street) on the west. This intersection will move further east (to 30E location) with realignment on northbound US 97.
Proposed Action: None

30D – Un-Permitted public street access to current northbound US 97 (5th Street) on the east. This intersection will move further east (to 30F location) with realignment of northbound US 97

Proposed Action: None
30E – Public street access to J Street from what is currently S. Adams on the west. Unknown permit status but don't anticipate there being one (city street to city street). S. Adams will become northbound US 97.
Proposed Action: District 10 to Inventory

30F – Public street access to J Street from what is currently S. Adams on the east. Unknown permit status but don't anticipate there being one (city street to city street). S. Adams will become northbound US 97.
Proposed Action: District 10 to Inventory

31) Property Owned by: Zumwalt
Tax Lot #: 11-13-11DD; TL 700
Occupied by: High Desert Choppers

31A – Un-Permitted access to southbound US 97 (4th Street). Close this access due to incompatibility with signal function. Access to property will be provided from alley (#J2B).
Proposed Action: District 10 to Issue Closure Letter

31B – Access to J Street. Unknown permit status. Move access to this property to the alley due to incompatibility with signal function at current location.
Proposed Action: District 10 to Issue Closure Letter

32) Property Owned by: James & Dennis Prince
Tax Lot #: 11-13-11DD; TL 100 & 200
Occupied by: Prince's Automotive & Vacant Commercial Bldg.

32A – Permitted approach (#12012) to southbound US 97 (4th Street). This approach will remain, but will connect to the new shared access road (#37) that will come off of US 97 to the south of this location. There will be no access provided to J Street.
Proposed Action: District 10 to Issue Modification Letter and Cancel Permit

32B – Access to what is currently S. Adams. Unknown permit status. S. Adams alignment will become northbound US 97 along this property. Close this access due to incompatibility with signal function. This will require reconfiguration of building due to bay doors at this access. Access to property will be provided from shared access road (#37).
Proposed Action: Property Owner Notified under R/W Process

32C – Access to what is currently S. Adams. Unknown permit status. S. Adams will become northbound US 97 along this property. Close this access due to incompatibility with signal function. Access to property will be provided from shared access road (#37).
Proposed Action: Property Owner Notified under R/W Process

33) Property Owned by: Navan & Sajata Patel
Tax Lot #: 11-13-11DD; TL 400
Occupied by: Relax Inn

33A – Permitted approach (#5423) to southbound US 97 (4th Street). This approach will remain, but will connect to the new shared access road (#37) that will come off of US 97 to the north of this location.
Proposed Action: District 10 to Issue Modification Letter and Cancel Permit

33B – Un-Permitted access to southbound US 97 (4th Street). This access will remain, but will connect to the new shared access road (#37) that will come off of US 97 to the north of this location.
Proposed Action: District 10 to Issue Modification Letter

33C – Access to what is currently S. Adams. Unknown permit status. S. Adams will become northbound US 97 along this property. Construct combined public access, extension of K Street (#40B). Access to property will also be provided from shared access road (#37).
Proposed Action: Property Owner Notified under R/W Process

34) Property Owned by: H. Bart Jones
Tax Lot #: 11-13-11DD; TL 6600
Occupied by: National Grasslands Office

34A – Permitted approach (#10A35310) to southbound US 97 (4th Street). This approach will remain, but will connect to the new shared access road (#37) that will come off of US 97 to the north of this location.
Proposed Action: R/W Acquisition

34B – Access to what is currently S. Adams. Unknown permit status. S. Adams alignment will become northbound US 97 along this property. Construct combined public access, extension of K Street (#40B). Access to property will also be provided from shared access road (#37).
Proposed Action: R/W Acquisition

35) Property Owned by: Jefferson County Fire Dept.
Tax Lot #: 11-13-12CC; TL 300
Occupied by: Fire Hall

35A – Access to what is currently S. Adams. Unknown permit status. S. Adams alignment will become northbound US 97 along this property. This access lines up with the truck bay doors and serves as the primary emergency response access from the Fire Hall. Will become Right in – Right out Only, R/W to grant an Access Reservation at this approach location
Proposed Action: District 10 to Issue Permit

35B – Access to what is currently S. Adams. Unknown permit status. S. Adams will become northbound US 97 along this property. This access serves as a key access for volunteers responding to the station for emergency calls. Will become Right in – Right out Only. R/W to grant an Access Reservation at this approach location.
Proposed Action: District 10 to Issue Permit

35C – Access to J Street. Unknown permit status. This access serves the Fire Dept. as public access and for emergency responders. This access will remain, but will need to be modified and moved to east.
Proposed Action: None

35E – New access/fire lane to S. Adams for emergency vehicles will be constructed at this location.
Proposed Action: None

36) Property Owned by: Jefferson County Habitat for Humanity
Tax Lot #: 11-13-11DD; TL 800
Occupied by: Habitat Restore

Access to K Street. Unknown permit status. Single access serving this property. Access is very close to intersection. Relocate maximum feasible distance from US 97/K Street intersection.
Proposed Action: Follow up with owner on access location and modifications.
Proposed Action: None

37) Shared Access Road Access

Combined public shared road access to southbound US 97 (4th Street). Access will be left in – left out only.
Proposed Action: District 10 to Inventory

38) Property Owned by: Irene Prince
Tax Lot #: 11-13-11DD; TL 300 & 500
Occupied by: Residence & Storage Yard

38A – Access to what is currently S. Adams. Unknown permit status. S. Adams alignment will become northbound US 97 along this property. Close this access due to incompatibility with signal function. This will require reconfiguration of building due to bay doors at this access. Access to property will be provided from shared access road (#37).
Proposed Action: Property Owner Notified under R/W Process

38B – Access to what is currently S. Adams. Unknown permit status. S. Adams will become northbound US 97 along this property. Move this access to the shared access road on the west side of the property due to incompatibility with signal function. Access to property will be provided from shared access road (#37).
Proposed Action: Property Owner Notified under R/W Process

38C – Permitted approach (#6218) (gate in fence to residence) to northbound US 97 (5th Street). This access will remain, but will connect to the new shared access road (#37) that will come off of US 97 to the north of this location.
Proposed Action: District 10 to Issue Modification Letter and Cancel Permit

39) Reserved

40) "K" Street: City Street Owned by City of Madras

40A - Un-Permitted public street access to US 97 southbound (4th Street) on the west.
Proposed Action: District 10 to Inventory

40B - New public street access to US 97 northbound (5th Street) on the west.
Proposed Action: District 10 to Inventory

41) Property Owned by: Mt Jefferson Investments, LLC (Michael McGowan)
Tax Lot #: 11-13-11DD; TL 6200
Occupied by: South "Y" Complex

41A – Approach to US 97 (both north and southbound). Permitted Approach (#52487). This approach to remain, but will be restricted to right-in, right-out approach. District and City Staff to work with Property Owner on site circulation issues.
Proposed Action: District 10 to Contact Property Owner

41B – Access to K Street. Unknown permit status. No changes planned for this access.
Proposed Action: None

42) Property Owned by: Borthwick Corp.
Tax Lot #: 11-13-11DD; TL 6300
Occupied by: Cascade Exchange

42A – Un-Permitted open frontage to US 97 (both north and southbound) that is currently being used for parking on ODOT R/W. With the construction of future sidewalk there will be not be adequate space for parking in front of the building. Property also has frontage along L Street and 3rd Street. No US 97 access to be provided since the property has reasonable alternate access along L Street and 3rd Street. Provide access to L Street.
Proposed Action: District 10 to Issue Closure Letter

42B – Open frontage to L Street. Unknown permit status. Property also has frontage along 3rd Street. Construct dust pan access on L Street frontage at maximum feasible distance from US 97 intersection.
Proposed Action: None

43) Property Owned by: Andres Escalante et. al.
Tax Lot #: 11-13-11DD; TL 6700, 6790, 6800, 6801 & 7000
Occupied by: Mexican Restaurant

43A – Approach to US 97 (both north and southbound). Permitted Approaches (#11811). This approach will remain, but will connect to the new shared access road (#37) that will come off of southbound US 97 to the north of this location.
Proposed Action: District 10 to Issue Modification Letter, Cancel Permit

43B – Approach to US 97 (both north and southbound). Permitted Approaches (#11811). This approach will remain, but will connect to the new shared access road (#37) that will come off of southbound US 97 to the north of this location. Some modifications may be required in the vicinity of this approach to cul-de-sac or otherwise terminate the shared access road.
Proposed Action: District 10 to Issue Modification Letter, Cancel Permit

43C – Access to what is currently S. Adams. Unknown permit status. S. Adams will become northbound US 97 along and through partial acquisition of this property. This access serves as the primary access for bus service that stops at this location. Close this access due to incompatibility with signal function. All access for this property will be provided from shared access road (#37).
Proposed Action: Property Owner Notified under R/W Process

44) Property Owned by: Carlson Properties
Tax Lot #: 11-13-11DD; TL 6901
Occupied by: Miller Grocery and Central OR Heating & Cooling

44A – Permitted (#3059) approach to US 97. Majority of property being acquired for project. Potential for a portion of the remaining property to have access from shared access road (#37), however it is uncertain whether that owner will choose to retain that remaining portion.
Proposed Action: R/W Acquisition

44B – Access to L Street. Property being acquired for project. Unknown Permit Status. No access to remain.
Proposed Action: R/W Acquisition

45) Tracie Street @ S. Adams: City Streets Owned by City of Madras
Public street access to S. Adams on the east ("T" intersection). Modification will be made to accommodate a fire lane connecting to the Fire Station. "T" intersection will become 90° turn ("L" intersection).
Proposed Action: None

46) Property Owned by: Reynoso
Tax Lot #: 11-13-11DD; TL 6900
Occupied by: Best Tire Shop

46A – Access to S. Adams to remain.
Proposed Action: Right of Way Agent to Contact

46B – Access to L Street to remain. Construct dust pan approach.
Proposed Action: Right of Way Agent to Contact

47) Property Owned by: Dodson Family Trust
Tax Lot #: 11-13-11DD; TL 6100
Occupied by: Coldwell Banker
Access to K Street. Unknown permit status. No planned changes.
Proposed Action: None

48) Reserved
49) Reserved

50) "L" Street: City Street Owned by City of Madras

50A – Un-Permitted public street access to US 97 (both north and southbound) on the west. Will become right in – right out for southbound only.
Proposed Action: District 10 to Inventory

50B – Un-permitted public street access to US 97 (both north and southbound) on the east. Access to L Street to the east will be moved to new location further north off northbound realignment. Will become right in – right out for northbound only at new location (Refer to 50E).
Proposed Action: None

50C – Public street access to S. Adams on the west. Unknown permit status. City street to City Street access will remain.
Proposed Action: None

50D – Public street access to S. Adams on the east. Unknown permit status. City street to City Street access will remain.
Proposed Action: None

50E – New Public street connection of "L" Street to north bound US 97.
Proposed Action: District 10 Inventory

51) Property Owned by: Pekkola – Mombert Properties
Tax Lot #: 11-13-11DD; TL 7400
Occupied by: Cash & Release; Tire Shop

51A – Approach to US 97 (both north and southbound). Permitted Approaches (#10A35104). One of two existing approaches to US 97. This property also has access from L Street to the north, as well as potential access from 2nd Street to the west and M Street right of way to the south. This approach to be combined with 51B and shifted to the south. The connection will be located in the SB US 97 dedicated left turn refuge for to M St.
Proposed Action: Will be handled under the US 97 L St to Fairgrounds Project

51B – Approach to US 97 (both north and southbound). Permitted Approaches (#10A35104). One of two existing approaches to US 97. 51A to remain. This property also has access from L Street to the north, as well as potential access from 2nd Street to the west and M Street right of way to the south. This approach to be closed.
Proposed Action: Will be handled under the US 97 L St to Fairgrounds Project

51C – Access to L Street. This access to remain.
Proposed Action: None

52) Property Owned by: Lin & Huang
Tax Lot #: 11-13-11DD; TL 7300
Occupied by: Shell Station, Café

52A – Approach to US 97 (both north and southbound). Permitted Approach (#15374). One of three existing accesses to US 97. This property also has access to L Street (primary egress for trucks) on the north and unimproved M Street right of way on the south. This approach is to remain, but will be modified to a right in, right out only approach. The left turn will be restricted due to a few key issues: The access is located 100 feet into the couplet gore point and northbound lane addition. Sight distance will be greatly limited by vegetation and other street scape items. The southbound portion of the couplet transitions from two lanes into one lane just prior to the intersection. This is also a difficult turning movement for trucks to make, as it requires the entire roadway width to make this turn.
Proposed Action: Right of Way Agent to Contact, District 10 to Issue Modification Letter, Cancel Permit and Re-Issue Permit, R/W to grant an Access Reservation at this approach location

52B – Approach to US 97 (both north and southbound). Permitted Approaches (#15374). One of three existing accesses to US 97. This approach will be shifted to the south and modified to provide shared / public access that would serve this property as well as the property to the south of M Street (ref. #60B).
Proposed Action: Right of Way Agent to Contact, District 10 to Issue Closure Letter and Cancel Permit

52C – Open frontage along L Street. Unknown permit status. Primarily provides egress from truck shop and lesser access to service station. Access will be constructed to realigned L Street (refer to #52F).
Proposed Action: Property Owner Notified under R/W Process

52D – Open frontage along L Street. Unknown permit status. Primarily provides egress from truck shop and lesser access to service station. Access will be constructed to realigned L Street (refer to #52F).
Proposed Action: Property Owner Notified under R/W Process

52E – Permitted approach (#9404) to US 97 (both north and southbound). One of three existing approaches to US 97. This access will be shifted towards the south property line and will serve this property as well as the property to the south. This approach will be modified to a right in, right out only, due to the conflict in turning movements with the increased "M" Street traffic. The new alignment will close northbound left turns onto "L" Street and "K" Street, which is anticipated to significantly increase turning movements on "M" Street.
Proposed Action: District 10 to Issue Modification Letter, Issue new Permit, Cancel Existing Permit and R/W to grant an Access Reservation at this approach location

52F – New connection to new alignment of L Street. Connection to L St to be constructed to designate one approach at this location.
Proposed Action: None

53) Property Owned by: Free Methodist Church
Tax Lot #: 11-13-11DD; TL 7100
Occupied by: Free Methodist Church

53A – Access to L Street. Unknown permit status. This access cannot be connected back to L Street due to grades. Property has 3 other accesses to Adams Drive.
Proposed Action: Property Owner Notified under R/W Process

54 - 59) Reserved

60) "M" Street: City Street Owned by City of Madras

60A – Un-Permitted public street access to US 97 (both north and southbound) on the west.
Proposed Action: District 10 to Inventory

60B – Un-Permitted public street access to US 97 (both north and southbound) on the east.
Proposed Action: District 10 to Inventory

I1) Alley between 3rd and 4th Street: City Alley Owned by City of Madras
Public alley access to "I" Street on the south to remain. Unknown permit status.
Proposed Action: None

I2) Alley between 5th and Wade Street: City Alley Owned by City of Madras
Public alley access to "I" Street on the south to remain. Unknown permit status.
Proposed Action: None

J2A) Alley between 3rd and 4th Street: City Alley Owned by City of Madras
Public alley access to "J" Street on the north to remain, will become one-way northbound. Unknown permit status.
Proposed Action: None

J2B) Alley between 3rd and 4th Street: City Alley Owned by City of Madras
Public alley access to "J" Street on the south to remain, will be a right in – right out access to connect to property #31 then become one-way southbound. Unknown permit status.
Proposed Action: None

J3) Alley between 5th and Wade Street: City Alley Owned by City of Madras
Public alley access to "J" Street on the north to remain. Unknown permit status.
Proposed Action: None

J4) Property Owned by: McDaniel
Tax Lot #: 11-13-12CB; TL 7300
Occupied by: Residence

J4A - Private residence west of Wade Street from north side of "J" Street to remain. Unknown permit status. Property abuts alley behind but utility pole and guy wires make unusable. Driveway lines up with car port.
Proposed Action: None

J4B - Private residence on west side of Wade Street to remain. Unknown permit status.
Proposed Action: None

J5) Wade Street: City Street Owned by City of Madras
Public street access to J Street on the north to remain. Unknown permit status.
Proposed Action: None

Gus W. Burril 4/28/14

Gus Burril, City Administrator, City of Madras Recommendation: Date:

P Creedican 8/18/14

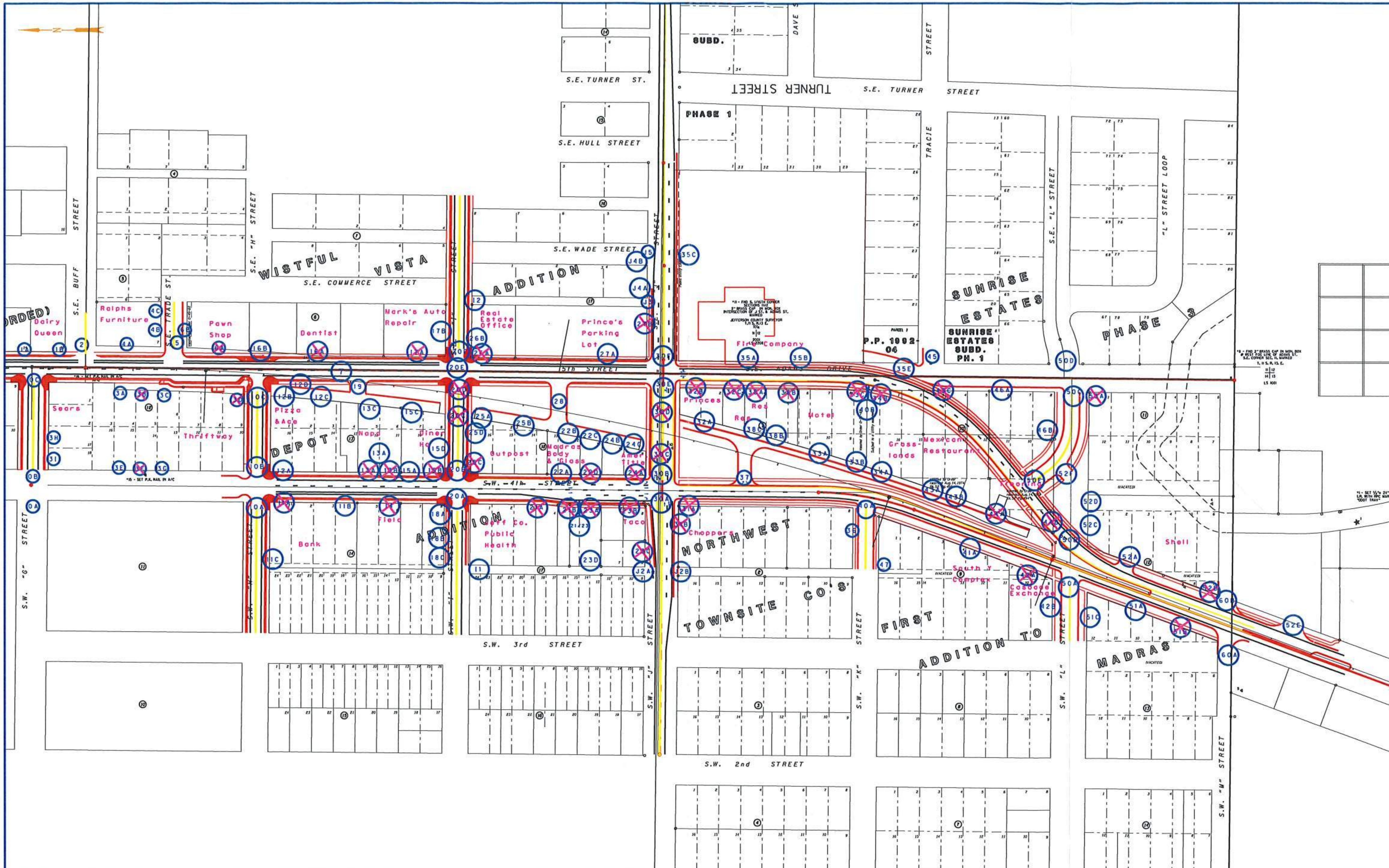
Pat Creedican, District 10 Manager Recommendation: Date:

8/18/14

Gary Farnsworth, Central Oregon Area Manager Recommendation: Date:

08.18.14

Bob Bryant, Region 4 Manager Approval: Date:


WISTFUL VISTA ADDITION
DEPOT ADDITION
NORTHWEST TOWNSITE CO'S FIRST ADDITION TO MADRAS
SUNRISE ESTATES PHASE 3
SUNRISE ESTATES SUBD. PH. 1
S.E. TURNER ST.
TURNER STREET
S.E. TURNER STREET
S.E. HULL STREET
S.E. WADE STREET
S.E. COMMERCE STREET
S.E. BUFF STREET
S.E. TRADE ST.
S.E. "H" STREET
S.E. "L" STREET
"L" STREET LOOP
TRACIE
DAVE
SUBD.
PHASE 1
P.P. 1992-04
S.W. 4th STREET
S.W. 3rd STREET
S.W. 2nd STREET
S.W. "G" STREET
S.W. "J" STREET
S.W. "K" STREET
S.W. "L" STREET
S.W. "M" STREET
Dairy Queen
Ralphs Furniture
Pawn Shop
Dentist
Mark's Auto Repair
Real Estate Office
Prince's Parking Lot
Fire Company
Sears
Thriftway
Pizza & Ace
Outpost
Madras Body & Glass
Princes
Motel
Gross-lands
Mexican Restaurant
Bank
Jeff Co. Public Health
Choppers
Taco
South Y Complex
Cascade Exchange
Shell