<table>
<thead>
<tr>
<th>No.</th>
<th>Project Name</th>
<th>Project Description</th>
<th>Category</th>
<th>Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>SW Ford Lane Improvements</td>
<td>Upgrade SW Ford Lane between Culver Highway 361 and US 97 to minor collector road standards, potentially in conjunction with US 97/SW Ford Lane intersection improvements (project 29).</td>
<td>Operation</td>
<td>$2,100,000</td>
</tr>
<tr>
<td>51</td>
<td>NW Hickory Lane Paving</td>
<td>Pave NW Hickory Lane from NW Danube Drive to NW Boise Drive.</td>
<td>Pavement, Operation</td>
<td>$1,500,000</td>
</tr>
<tr>
<td>52</td>
<td>SE Laurel Lane/SE Springer Road/SE Haystack Reservoir Road Paving</td>
<td>Upgrade and pave SE Laurel Lane, SE Springer Road and SE Haystack Reservoir Road from US 26 to SW Southside Road to improve the connection from US 97 to US 26.</td>
<td>Pavement, Operation, Connectivity</td>
<td>$10,260,000</td>
</tr>
<tr>
<td>53</td>
<td>Camp Sherman Road Improvements</td>
<td>Upgrade Camp Sherman Road to minor collector road standards.</td>
<td>Operation</td>
<td>$9,240,000</td>
</tr>
<tr>
<td>54</td>
<td>NW Columbia Drive Improvements</td>
<td>Upgrade NW Columbia Drive from NW Fir Lane to NW Dogwood Lane and north of US 26 to Juniper Lane, potentially in conjunction with US 26/NW Columbia Drive intersection improvements (project 10).</td>
<td>Operation</td>
<td>$4,100,000</td>
</tr>
<tr>
<td>55</td>
<td>NE Clark Drive/NE Buckley Lane Paving</td>
<td>Upgrade NE Clark Drive and NE Buckley Lane from US 97 to the Town of Gateway.</td>
<td>Pavement, Connectivity</td>
<td>$2,950,000</td>
</tr>
<tr>
<td>56</td>
<td>SW Park Lane Improvements</td>
<td>Upgrade SW Park between US 97 and Old Culver Highway potentially in conjunction with access closures at SW Norris Lane and SW Opal Lane (projects 31 and 32).</td>
<td>Operation</td>
<td>$2,000,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Long-Term (10-20 years)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>57</td>
<td>North Adams Drive Improvements</td>
<td>Upgrade N Adams Drive from NE Juniper Lane to NE Cherry Lane to minor collector road standards.</td>
<td>Operation</td>
<td>$14,350,000</td>
</tr>
<tr>
<td>58</td>
<td>NW Fir Lane Improvements</td>
<td>Upgrade NW Fir Lane from NW Columbia Drive to N Adams Drive, potentially in conjunction with US 26/NW Fir Lane intersection improvements (project 34).</td>
<td>Operation</td>
<td>$4,100,000</td>
</tr>
<tr>
<td>59</td>
<td>NW Dogwood Lane Improvements</td>
<td>Upgrade NW Dogwood Lane from NW Columbia Drive to NE Clark Drive to minor collector road standards, potentially in conjunction with US 26/NW Dogwood Lane intersection improvements (project 36).</td>
<td>Operation</td>
<td>$8,250,000</td>
</tr>
<tr>
<td>60</td>
<td>SW Deschutes Drive Improvements (north of SW Ford Lane)</td>
<td>Upgrade SW Deschutes Drive to minor collector road standards between SW Highland Drive and Culver Highway 361, potentially in conjunction with Highway 361/SW Deschutes Drive intersection improvements (project 38).</td>
<td>Operation</td>
<td>$2,100,000</td>
</tr>
</tbody>
</table>
### 4.3 PROJECTS TO ACCOMMODATE FUTURE URBAN GROWTH

Table 4-3 lists potential transportation projects that are in close proximity to the City of Madras. These projects are designed to facilitate traffic movement from future urban development; increase connectivity of future development to existing neighborhoods, commercial areas and highways; and provide guidelines for roadway alignments as future development occurs. These projects are unlikely to be constructed until the land is brought into the urban growth boundary or is annexed. However, identification of the projects is necessary in order to prevent conflicting uses from impeding future construction of the planned facilities. The projects were prioritized into short-, mid- and long-term based on a general assumption of the timeframe when various areas near the city will be urbanized.

The projects in Table 4-3 are all conceptual in nature and do not identify specific right-of-way locations. They include logical extensions and intersections of the existing road system to meet projected future needs. As indicated in Section 7.2, further refinement planning will need to take place prior to development of any of the projects. Such planning will likely be done by the city as the land is annexed.

Several of the projects in Table 4-3 have been identified in the city TSP, as indicated in the Source column. The other projects were identified as a result of discussions between the City and the County during the preparation of the County TSP. The County will coordinate with the City on these projects, but will not take the lead in constructing the projects. In most cases, development and construction of the projects will be up to private developers or the City.

Figure 4-3 shows the general location of the projects.

#### TABLE 4-3 PROJECTS TO ACCOMMODATE FUTURE URBAN GROWTH

<table>
<thead>
<tr>
<th>No.</th>
<th>Project Name</th>
<th>Project Description</th>
<th>Category</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Short Term (0-5 years)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>61</td>
<td>SE E Street Extension</td>
<td>Extend SE E Street east as a minor collector.</td>
<td>Connectivity</td>
<td>Madras TSP</td>
</tr>
<tr>
<td>62</td>
<td>SE J Street Extension</td>
<td>Extend SE J Street east as a major collector.</td>
<td>Connectivity</td>
<td>Madras TSP</td>
</tr>
<tr>
<td>63</td>
<td>NE Bean Drive Extension (South)</td>
<td>Extend NE Bean Drive south of E Ashwood Road (will become SE Bean Drive) as a major collector to intersect the SE E Street and SE J Street extensions (projects 61 and 62).</td>
<td>Connectivity</td>
<td>Madras TSP</td>
</tr>
<tr>
<td></td>
<td><strong>Mid-Term (5-10 years)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>64</td>
<td>NE Kinkade Road Extension</td>
<td>Extend NE Kinkade Road north from the UGB as a major collector, to connect with the NE Bean Drive extension (project 67) and NE Boxwood Lane.</td>
<td>Connectivity</td>
<td>Madras TSP</td>
</tr>
<tr>
<td>65</td>
<td>NE Kinkade Road/NE Loucks Road Roundabout</td>
<td>Construct a roundabout at the future NE Kinkade Road/NE Loucks Road intersection to accommodate future traffic volume.</td>
<td>Operation</td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Project Name</td>
<td>Project Description</td>
<td>Category</td>
<td>Source</td>
</tr>
<tr>
<td>-----</td>
<td>--------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>--------------</td>
<td>--------</td>
</tr>
<tr>
<td>66</td>
<td>NE Bean Drive Realignment, Improvements (See Figure 4-10)</td>
<td>Realign NE Bean Drive on the south side of Loucks Road to remove curve by cemetery, improve as a major collector.</td>
<td>Operation</td>
<td></td>
</tr>
<tr>
<td>67</td>
<td>NE Bean Drive Extension (North) (See Figure 4-10)</td>
<td>Extend NE Bean Drive north of Loucks Road as a major collector, to connect with US 97 at a new intersection (project 19).</td>
<td>Connectivity</td>
<td></td>
</tr>
<tr>
<td>68</td>
<td>NE Loucks Road/NE Bean Drive Roundabout (See Figure 4-10)</td>
<td>Construct a roundabout at the future NE Loucks Road/NE Bean Drive intersection to accommodate future traffic volume.</td>
<td>Operation</td>
<td></td>
</tr>
<tr>
<td>69</td>
<td>NE Kinkade Road/NE Bean Drive Roundabout (See Figure 4-10)</td>
<td>Construct a roundabout at the future NE Kinkade Road/NE Bean Drive intersection to accommodate future traffic volume.</td>
<td>Operation</td>
<td></td>
</tr>
<tr>
<td>70</td>
<td>NE Hilltop Lane/NE Brown Drive/NE Meadowlark Lane Roundabout (See Figure 4-10)</td>
<td>Construct a roundabout at the NE Hilltop Lane/NE Meadowlark Lane/NE Brown Drive intersection to accommodate future traffic volume.</td>
<td>Operation</td>
<td></td>
</tr>
<tr>
<td>71</td>
<td>NE Meadowlark Lane/US 97 Connection (See Figure 4-10)</td>
<td>Construct a new road on the west side of US 97 to NE Meadowlark Lane, connecting with the proposed new intersection of US 97 with NE Bean Drive (project 67).</td>
<td>Connectivity, Operation</td>
<td></td>
</tr>
<tr>
<td>72</td>
<td>NE Clark Drive Extension to NE Loucks Road</td>
<td>Extend NE Clark Drive from US 97 to E Ashwood Road as a major collector.</td>
<td>Connectivity</td>
<td></td>
</tr>
<tr>
<td>73</td>
<td>NE Clark Drive/E Ashwood Road Roundabout</td>
<td>Construct a roundabout at the intersection of NE Clark Drive/E Ashwood Road to accommodate future traffic volume.</td>
<td>Operation</td>
<td></td>
</tr>
<tr>
<td>74</td>
<td>SE Fairgrounds Road Extension (East)</td>
<td>Extend SE Fairgrounds Road east, from the UGB to SE Grizzly Road, as a major collector.</td>
<td>Connectivity</td>
<td></td>
</tr>
<tr>
<td>75</td>
<td>SE Fairgrounds Road Roundabouts</td>
<td>Construct roundabouts at the future SE Fairgrounds Road/SE McTaggart Road and SE Fairgrounds Road/SE Grizzly Road intersections.</td>
<td>Operation</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Long-Term (10-20 years)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>76</td>
<td>SE Crestview Lane Extension</td>
<td>Extend SE Crestview Lane from S Adams Drive to US 26 as a minor collector.</td>
<td>Connectivity</td>
<td></td>
</tr>
</tbody>
</table>
Figure 4-5

Project 4

Culver Highway 361/US 97/Old Culver Highway Intersection Improvements
Figure 4-6
Project 8
NW Gumwood Lane Closure
Figure 4-7
Projects 9 and 10

NW Gumwood Lane Closure; US 26/NW Columbia Drive Intersection Improvements
Figure 4-8
Project 12
Culver Highway 361/SW Gem Lane Improvements
Figure 4-9
Project 13
US 97 Truck Bypass Alternatives
**TABLE 4-4 US 97 TRUCK BY-PASS ALTERNATIVES (project #13)**

<table>
<thead>
<tr>
<th>ALTERNATIVE</th>
<th>DESCRIPTION</th>
<th>ADVANTAGES</th>
<th>DISADVANTAGES</th>
</tr>
</thead>
</table>
| 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 right-of-way |
| 1A          | Move the original alignment to the east to avoid 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 right-of-way |
| 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 relative to Alt. 1 and 1A  
● Requires acquiring significant right-of-way  
● Impacts properties north of the existing Culver Highway 361/G Street intersection |
| 1C          | Extend US 97 as the fourth leg of the US 26/US 97 intersection. Use 1st Street and the Existing Culver Highway 361. | ● Utilizes the existing right-of-way | ● Major impact on the properties adjacent to 1st Street and Culver Highway 361  
● Requires closing existing driveways  
● Noise and vibration impact on adjacent residential properties  
● Requires acquiring significant right-of-way |
| 2           | Follow the existing Culver Highway 361 alignment and connect to the existing US 26/US 97 south intersection | ● Utilizes existing right-of-way except on the south section | ● Impacts existing properties on Culver Highway 361  
● Requires closing existing driveways  
● South section is outside UGB  
● Noise and vibration impact on adjacent residential properties |
| 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 361  
● 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  
● Right-of-way impact on properties south of Fairgrounds  
● South section is outside UGB  
● Requires realignment of US 26 east of US 97 |
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Benefits</th>
<th>Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>2B</td>
<td>Realignment of Alternative 2A providing a different connect to US 97</td>
<td>● Less new construction required than Alternative 2A</td>
<td>● Impacts the ballpark located north of Fairgrounds Road</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Realignment of US 26 east of US 97 can be optional</td>
<td>● Right-of-way impact on properties south of Fairgrounds</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>● Without optional realignment of US 26, no route continuity</td>
</tr>
<tr>
<td>2C</td>
<td>Uses the Marie Street alignment</td>
<td>● No impact outside UGB</td>
<td>● Impact to properties on Marie Street</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● No impact on the ballpark</td>
<td>● Impact on properties north of Fairgrounds Road opposite Marie Street</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Realignment of US 26 east of US 97 can be optional</td>
<td>● New right-of-way is required from the properties south of fairgrounds</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>● Without optional realignment of US 26, no route continuity</td>
</tr>
<tr>
<td>2D</td>
<td>Connection to Marie Street</td>
<td>● Does not impact the developed sections of Marie Street</td>
<td>● Impacts the ballpark located north of Fairgrounds Road</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>● New right-of-way is required from the properties south of fairgrounds</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>● Without optional realignment of US 26, no route continuity</td>
</tr>
</tbody>
</table>
New NE Bean Dr./US 97 Intersection; US 97/NE Meadowlark Lane Closure; US 97/NE Brown Dr. Closure; NE Kinkade Rd. Extension; NE Bean Dr. Realignment and Extension; Roundabouts at NE Bean Dr./NE Loucks Rd., NE Kinkade Rd./NE Loucks Rd., NE Kinkade Rd./NE Bean Dr., and NE Hilltop Lane/NE Brown Dr./NE Meadowlark Lane.
Figure 4-11

Projects 22 and 23

US 97/NE Cora Drive Closure; US 97/NE Clark Drive Intersection Improvements
Figure 4-12

Projects 26, 27, 47 and 48

SW Eureka Lane Closure; US 97/SW Bear Drive Intersection Improvements; SW Eureka Lane Extension; SW Bear Drive Improvements
Figure 4-13
Project 30
Culver Highway 361/SW Iris Lane/SW Elbe Drive Intersection Improvements
Figure 4-14

Project 35

US 26/NW Boise Drive Intersection Improvements
Figure 4-15
Project 37
US 26/S Adams Drive Intersection Improvements
Figure 4-16
Projects 39 and 40
US 97/NE Quaale Road and US 97/Old US 97 Intersection Improvements
Section 5

Other Transportation Systems
Other Transportation Systems

This section discusses transportation systems other than state highways and the County road system, including:

- Bicycle System;
- Pedestrian System;
- Public Transportation;
- Rail Service;
- Air Service; and
- Pipeline and Transmission System.

All of the TSP elements presented in this section are based on the requirements of the Oregon Transportation Planning Rule (TPR). The modal plans have been developed based on the existing and future conditions analysis, taking into consideration the interests of citizens, business owners, and governmental agencies as expressed by the Technical Advisory Committee and citizen input.

5.1 BICYCLE SYSTEM

Bicycles are legally classified as vehicles and can use all public roads in the County. However, the high speed and volume of traffic on major highways can be unsafe for non-auto users. As a result, roads with a low volume of traffic are preferred routes for bicycle use. For instance, the old alignment of US 97, where available and properly maintained, is often used by bicyclists for recreational purposes.

Bicycle travel can be a viable commuting option if bicycle lanes or paved shoulders are provided. However, in unincorporated areas of the county bicycling currently is primarily a form of recreation or exercise, rather than a viable mode of transportation, due to a lack of dedicated bicycle lanes or shoulder bikeways.

The Oregon Bicycle and Pedestrian Plan identifies the following categories of bicycle systems:

- **Shared Roadways**, where bicycles and motor vehicles share the same travel lanes. Generally safest in urban areas on roads with low speeds and low traffic volumes (less than 3000 ADT).
- **Shoulder Bikeways**, which are paved shoulders on roads, adjacent to vehicle travel lanes.
- **Bike Lanes**, where a portion of the road is specifically designated for use by bicyclists through the use of striping and signage. Bike lanes are most appropriate on urban arterials and on major collectors;
- **Multi-Use Paths**, which are separated from a road by an open space or barrier. Multi-use paths are often part of a community trail system used by walkers and joggers in addition to bicyclists, and may be in a different location than the road right-of-way since they serve a different purpose than the road system.
Generally, most roads in the rural parts of the county carry fewer than 3,000 ADT, which is consistent with ODOT guidelines for shared roadway bicycle use. However, most of the roads have minimal shoulder width, may have poor sight distance, are not signed to warn motorists of the potential for encountering bicyclists on the road, and tend to have high speed traffic, making them unsafe for bicyclists. In order to increase safety for bicyclists, county and public roads being constructed or upgraded should provide shoulder bikeways, while state highways and other arterials should include bike lanes. Currently, the only County roads that have adequate shoulder width for bikeways are Ashwood Road from the Madras city limits to the Deer Ridge correctional facility, and Chinook Drive from the Deschutes County line to Mustang Road in Crooked River Ranch. Willow Creek Trail in Madras is the main designated multi-use path in the county. There also is a multi-use path in Camp Sherman.

ORS 366.514 requires that bicycle trails be provided when a highway, road or street is being constructed, reconstructed or relocated, except when the cost would be disproportionate to the need or when sparse population in the area indicates an absence of need. Road standards contained in the Jefferson County Code require that 3 – 8 foot wide paved shoulders be provided when county and local access roads are being constructed or improved. This will gradually begin to create a safer bicycle system.

Based on public comments and future needs, five mid-, and long-term bicycle and pedestrian projects have been identified. No short-term projects were identified due to lack of funding to complete the project. The projects were selected because they will utilize the existing right-of-way to establish a network of bicycle lanes and routes providing a safe, interconnected bicycle system for recreational use as well as encourage commuter use between Madras, Metolius and Culver. The projects were prioritized based on the desire to facilitate bicycle commuting between cities and provide recreational routes that would serve the greatest population. The County may also designate and sign bicycle routes in locations where a continuous road system does not exist, to provide route guidance to bicyclists. Table 5-1 shows the bicycle facility project list. Figure 5-1 shows the location of the projects.

<table>
<thead>
<tr>
<th>No.</th>
<th>Project Name</th>
<th>Project Description</th>
<th>Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>Mid-Term (5-10 years)</strong></td>
<td></td>
</tr>
<tr>
<td>B1</td>
<td>Madras/Metolius/Culver Bicycle Connection</td>
<td>Widen shoulders on Culver Highway 361 to provide bicycle connection between Madras, Culver and Metolius. Install bicycle route signs.</td>
<td>$3,800,000</td>
</tr>
<tr>
<td>B2</td>
<td>Westside Bicycle Loop</td>
<td>Construct bicycle lanes or wider shoulders on Gem Lane, Jordan Road, Mountain View Drive and Belmont Lane to provide a looped scenic bicycle route west of Madras. The project will also provide access to Lake Billy Chinook, although improvement of Jordan Road from the rim down to the lake to safely accommodate bicycle and pedestrian traffic may not be feasible.</td>
<td>$7,300,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Long-Term (10-20 years)</strong></td>
<td></td>
</tr>
<tr>
<td>B3</td>
<td>Madras to Town of Gateway Bicycle Route</td>
<td>Construct six foot shoulders on NE Clark Drive and the planned NE Clark Drive extension. Designate the road as a bicycle route from Madras to Gateway.</td>
<td>$9,580,000</td>
</tr>
<tr>
<td>B4</td>
<td>Cove Palisades to Peter Skene Ogden Bicycle Connection</td>
<td>Designate SW Gem Lane, SW Feather Drive, SW Green Drive, SW Monroe Lane and Old Culver Highway 361 as a bicycle connection from the Cove Palisades State Park to Peter Skene Ogden Scenic Wayside.</td>
<td>$4,500,000</td>
</tr>
<tr>
<td>B5</td>
<td>Culver Loop</td>
<td>Construct six foot shoulders on SW Iris Lane between Feather Drive and Highway 361 to provide a looped route around Culver in conjunction with projects B1 and B4.</td>
<td>$65,000</td>
</tr>
</tbody>
</table>
5.2 PEDESTRIAN SYSTEM

In unincorporated areas of the county walking is mainly a form of recreation or exercise, rather than a viable mode of transportation. The high speed and volume of traffic on highways and major county roads are unsafe for pedestrian. Low-volume roads with paved shoulders are preferred routes for pedestrian use. In most cases, bikeways and bike lanes can be used by pedestrians as well as bicyclists, although multi-use paths may provide greater safety from vehicles.

The only dedicated pedestrian paths in the unincorporated area of the County are the walking path in Juniper Hills Park and a portion of the Willow Creek trail.

Pedestrian facilities suitable for walking to work, school and shopping occur inside urban growth boundaries rather than in rural areas of the County. Section 402.8(F) of the 2007 Jefferson County Zoning Ordinance states that sidewalks may be required when proposed development is within an urban growth boundary, when property is within one-fourth mile of a school, shopping center or other use likely to create pedestrian traffic, or when the surrounding area is developed with sidewalks or is zoned for commercial, industrial or urban residential uses. Section 12.18 of the Jefferson County Code states that roads within one mile of an urban growth boundary may be required to be developed in accordance with city standards when it is likely that the road would eventually become connected to the city street system. This could include requirements for curbs and sidewalks.

This combination of paved roadway shoulders in rural areas and sidewalks in urban or urbanizable areas form the County’s pedestrian system plan.

5.3 PUBLIC TRANSPORTATION

Jefferson County does not provide public transportation services. There are few options in the County to meet the needs of people unable to drive vehicles. This includes some seniors, the developmentally or medically disabled, people who have lost driving privileges due to suspended or revoked licenses, and people who do not own vehicles for financial or other reasons.

Existing public transportation service includes a fixed-route bus service operated by CAC Transportation Inc., a private transportation group based in Bend, which provides twice daily service between Bend and the Portland airport, stopping in Madras. While this service is useful for those traveling to Portland, its schedule does not allow travel from Madras to Bend and return the same day.

The Central Oregon Council on Aging (COCOA), a charitable non-profit public benefit corporation, provides dial-a-ride service for senior citizens and persons with disabilities in Deschutes and Jefferson Counties. Service from Madras to Bend is provided once a week. People on the Oregon Health Plan can use a dial-a-ride service for medical appointments. The East Cascade Brokerage, based in Redmond, pools resources from the tri-county area to provide rides on request through a call-in service similar to dial-a-ride. However, their vans currently do not have the special equipment, such as wheelchair lifts, that are needed to serve some clients. Crooked River Ranch also operates a dial-a-ride van three days a week.

Public bus service and passenger rail service are not available in the county. Greyhound Bus service is available from Bend to Eugene, where connections can be made to cities along the I-5 corridor.
As the population of the County increases, the demand for public transportation within and between cities will become more important. A potential solution is a public dial-a-ride service that will provide the needed transit service to the section of the population that does not have access to a motor vehicle. Such service is likely to be needed and developed within cities before being provided in the unincorporated areas of the County where low density and widely scattered population make transit service impractical.

The County recently adopted a Coordinated Human Services Transportation Plan, prepared by the Central Oregon Intergovernmental Council. The intent of the Plan is 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. The Plan includes a review of the level of existing public transportation services; existing and potential funding sources; identification of special populations and where they need to travel but are unable to due to cost, lack of service or other reason; and a formulation of strategies to meet the transportation needs. The strategies were prioritized in order to identify those that could conceivably be accomplished within a year or two. The Coordinated Human Services Transportation Plan will serve as the County’s public transportation plan. The Plan is attached as Appendix II.

5.4 RAIL SERVICE

The Burlington Northern Santa Fe Railway (BNSF) and the Union Pacific Railroad serve the US 97 corridor through Oregon from the Washington State line to the California border through the Oregon Trunk Line. The Trunk Line consists of approximately 40 miles of track which is owned by BNSF. Union Pacific Railroad has trackage rights to use the Trunk Line. Currently, Union Pacific has one train operating daily in each direction, and BNSF operates 12 to 15 trains daily. The line passes through the cities of Madras, Metolius, and Culver, and provides vital transport for industrial and agricultural freight. It carries approximately 8 million gross tons of freight per year.

There are no short-line railroads in the county.

According to the 2001 Oregon Rail Plan, BNSF has identified future improvements needed to provide clearance sufficient for high-cube double-stack traffic for five tunnels located on an 88-mile stretch in Wasco and Jefferson Counties. A preliminary estimate of improvements totals $6.3 million. In addition, BNSF may work to minimize the number of rail crossings within the County to improve safety.

5.5 AIR SERVICE

There are six air transportation facilities in the county (one heliport and five airports). Of those, only two of the airport facilities are open to the public: the Madras/City-County Airport and the Lake Billy Chinook Airport.

The Madras/City-County Airport is the main facility that provides air transportation service in Jefferson County. It is located at the northwest edge of the City of Madras. Access is provided via Cherry Lane, which connects to US 26. The airport is included in the statewide air transportation study, and serves mostly large local businesses, commercial and heavy industrial firms, and the United States Forest Service. It is anticipated that the airport will continue to provide this service for
the long-term. In 1994 the airport had 45 aircraft based at the airport, with approximately 9,300 aircraft operations. The airport operation was anticipated to grow to around 11,570 operations by 2014, with 56 based aircraft. The 1997 Airport Layout Plan Report, which was undertaken by the City of Madras and the State Department of Aviation, identifies the future needs of the facility. The report identifies the current, short-term and long-term facility needs and necessary improvements to maintain a safe, efficient, economical, and environmentally acceptable air transportation facility for the area. The Airport Layout Plan Report will serve as the transportation system plan for the Madras City-County Airport.

The second public airport in the County, Lake Billy Chinook Airport, is used by smaller operators and recreational pilots. The Airport is located approximately 6 miles west of the City of Culver. Access is provided from Jordan Lane past the south end of Lake Billy Chinook. Although open to the flying public, the airport is privately owned. It is primarily used by smaller operators and recreational pilots. There are approximately eight aircraft based at the airport, with 90-percent used for general aviation. No future access and road needs have been identified for this facility, therefore, no specific plan is being proposed at this time.

5.6 PIPELINE AND TRANSMISSION SYSTEM

Jefferson County is served by one major interstate transmission pipeline. The facility is a 36-inch diameter natural gas pipeline operated by Pacific Gas Transmission Company, whose local office is located in Redmond, OR. This line runs for approximately 30 miles through the county east of Highway 97 from the Cove Canyon area to the Lone Pine area enroute from Canada to California. The line transmits between 800 million and 1 billion cubic-feet of Canadian natural gas to California each day. No future needs were identified for this transmission pipeline. Therefore, no changes or alternatives have been developed for this mode of transportation.

Additional pipeline transportation in and through the county includes transport of water from the Deschutes Valley Water District facility at Opal Springs, and transmission lines for electricity and telephone service throughout the county.
Section 6
Transportation Financing
Transportation Financing

The Transportation Planning Rule (OAR 660-12-040) does not require that county TSPs include a financing plan. However, developing such a plan is prudent for determining which needs and projects cannot be funded at current revenue levels. The finance overview presented in this section is intended to provide historical context for road expenditures and revenues in the county and to identify primary sources for capital project funding. Analyses of past funding availability and projections were conducted to explore the potential for various funding mechanisms.

6.1 FUNDING FOR HIGHWAY PROJECTS

Funding for the highway projects listed in Table 4-1 would come from ODOT, although it is possible that private development projects that would generate significant amounts of traffic may need to construct some of the intersection improvements in order to mitigate the impact to the highway facility. The County currently has no funds available to contribute to road projects involving state highways.

The Statewide Transportation Improvement Program, known as the STIP, is Oregon's four year transportation capital improvement program. It is the document that identifies the funding for, and scheduling of, transportation projects and programs, including projects on the federal, state, city, and county transportation systems, multimodal projects (highway, passenger rail, freight, public transit, bicycle and pedestrian), and projects in the National Parks, National Forests, and Indian tribal lands. The STIP is used to identify major local, state and federal transportation system investments that rely in whole or in part on federal funding, or that are deemed to be of regional or statewide significance regardless of funding source. The STIP includes lists of projects that are approved to be carried out during a four-year time period.

The 2006 – 2009 STIP includes funding for the US 97/SW Iris Lane intersection improvements (project 1 on the highway projects list in Table 4-1). The draft 2008 -2011 STIP includes two additional projects. The first involves closure of the NW Gumwood Lane intersections, along with the improvements at the Columbia Drive intersection (projects 8, 9 and 10 in Table 4-1). The second is the US 97/NE Cherry Lane intersection improvements (project 11 in Table 4-1).

6.2 FUNDING FOR COUNTY ROAD AND BICYCLE PROJECTS

Existing Revenue Sources

Financial data from the Public Works Department’s audited budget for the 2000-2001 to 2004-2005 fiscal years were reviewed to determine the County’s ability to fund various transportation projects. Since 2001, the average revenue of the County’s Public Works Department has been approximately $1.87 million dollars. This revenue has remained relatively constant during the review period.

State revenue is the largest funding source for the Public Works Department. This funding includes motor-vehicle revenue, land sales revenue, weed contracts, and ODOT project funds. The vast majority of state revenue is from the “gas tax.” Approximately $1,150,000 is anticipated to be
received from this source in the 2007/2008 fiscal year. All of the proposed road and bicycle projects are “gas tax eligible.”

In the past, federal grants also served as a primary funding source. The majority of federal grants came from forest timber dollars, which contributed approximately $500,000 annually to the Public Works Department budget. That source of funds is no longer assured. Other sources of federal grants include federal mineral leases and FEMA reimbursement.

The Public Works Department also collects miscellaneous fees that provide some additional funding. These fees usually consist of service charges for various Public Works services. Sales of various materials, equipment, and supplies provide some revenue to the Department. This includes taxes from property foreclosures and office rentals. Funding from reimbursed items provides additional revenue. This includes transfers from other funds, reimbursement from miscellaneous funds, and fuel service reimbursement.

Table 6-1 shows the amount of funding received from each revenue source during the last five years.

**TABLE 6-1  PUBLIC WORKS DEPARTMENT HISTORICAL REVENUE SOURCES**

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal Grants</td>
<td>$382,348</td>
<td>$521,331</td>
<td>$746,613</td>
<td>$546,597</td>
<td>$539,101</td>
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<td>Federal Revenue</td>
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<td>$16,087</td>
<td>$16,549</td>
<td>$18,864</td>
<td>$16,078</td>
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<tr>
<td>State Revenue</td>
<td>$898,203</td>
<td>$906,889</td>
<td>$953,793</td>
<td>$1,408,370</td>
<td>$1,245,698</td>
</tr>
<tr>
<td>Misc. Fees</td>
<td>$8,187</td>
<td>$8,016</td>
<td>$7,830</td>
<td>$7,704</td>
<td>$7,631</td>
</tr>
<tr>
<td>Sales &amp; Misc. Revenue</td>
<td>$4,558</td>
<td>$3,379</td>
<td>$4,562</td>
<td>$24,953</td>
<td>$3,164</td>
</tr>
<tr>
<td>Reimbursed Items</td>
<td>$182,124</td>
<td>$374,736</td>
<td>$140,065</td>
<td>$134,085</td>
<td>$247,403</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$1,475,420</strong></td>
<td><strong>$1,830,438</strong></td>
<td><strong>$1,869,412</strong></td>
<td><strong>$2,140,573</strong></td>
<td><strong>$2,059,075</strong></td>
</tr>
</tbody>
</table>

**Current Transportation System Development Charges (SDCs)**

Many jurisdictions require new development to mitigate its impact on the public road system by contributing to capital improvement funds. SDCs constitute a mandatory collection method to assure the construction of improvements to facilities as contemplated in the transportation capital improvements plan.

According to ORS 223.297, an SDC is defined as a reimbursement fee, an improvement fee, or a combination thereof, assessed or collected at the time of increased usage of a capital improvement or issuance of a development permit, building permit, or connection to the capital improvement. SDCs do not include any fees assessed or collected as part of a local improvement district, a charge in lieu of a local improvement district assessment, or the cost of complying with requirements or conditions imposed upon a land use decision, expedited land division, or limited land use decision. The SDCs may only be spent on capital improvements associated with the systems for which the fees are assessed, including expenditures relating to payment of debts.
The County currently applies transportation and park system development charges to new developments in the County. The SDC ordinance was adopted in 1996. The transportation SDC has been set up at $86.92/daily trip generated by new development in Crooked River Ranch and $90.56/daily trip generated by new development in other unincorporated areas of the County. On an average, the County collects approximately $89,000 in transportation SDCs annually. Current SDC dollars have been allocated to financing the construction of “J” Street, in collaboration with the City of Madras. SDCs will only be available for other transportation improvement projects after the financing of “J” Street is complete. With the current rate of SDC collection, the SDC fund is not anticipated to be available for other improvements until 2015.

**Funding Needs**

Currently, all available County transportation system funding is spent on the maintenance of existing roads. Approximately $180,000 is currently budgeted annually for upgrades to increase the level of service and reduce maintenance on existing roads. Approximately $136,000 has been accumulated for bicycle and pedestrian projects. When these figures are compared to the cost estimates for the transportation projects listed in Tables 4-2 and 5-1, it becomes clear that additional funding sources will be needed in order to complete any of the projects.

As shown in Tables 4-2 and 5-1, a total of approximately $97 million would be needed for completion of the proposed county road and bicycle projects - short-term county road projects would cost approximately $4.3 million, approximately $49.3 million would be needed for the mid-term road and bicycle projects, and approximately $43 million would be needed for the long-term road and bicycle projects.

The County currently does not have funding to pay for any of the road improvement projects. A number of the proposed road projects involve county roads that should be improved to accommodate rerouted traffic when an existing county road access to a highway is closed or in conjunction with intersection improvements. Funding from ODOT may be possible for some of these projects. Funding for projects to accommodate future urban development will be up to private developers or the City.

Funding for bicycle projects adjacent to a state highway will come from ODOT. Funding for other bicycle and pedestrian projects may come from the County or private developers. ORS 366.514 requires that at least one percent of the total amount of the funds received in any fiscal year from the State Highway Fund be spent on bicycle or pedestrian projects. The one percent does not have to be used every year, but may be accumulated for up to ten years. As of 2007 the County had $136,000 in its bike/pedestrian project fund. In most cases, pedestrian facilities will take the form of widened roadway shoulders that will also serve as bicycle facilities. Funding constraints generally will not allow the County to develop separate pedestrian paths or provide sidewalks. However, developers will be encouraged to provide walking paths within new subdivisions.

Because of the lack of County funding, private developers will be required to contribute to road improvements when a new subdivision or other development will significantly increase traffic or otherwise adversely impact a road or intersection. Any requirement for privately-funded road improvements will be based on a direct nexus between the level of road impacts that will be caused by the development and the level of road improvements that are required.
Funding for Other Multi-Modal Projects

Funding for any rail improvements would be the responsibility of Burlington Northern Santa Fe Railroad. Any transmission line improvements will also be privately funded. The Madras City-County Airport Layout Plan Report contains discussions funding for projects at that facility. Any needed improvements at private airports will be the responsibility of the airport owners.

6.3 POTENTIAL FUNDING SOURCES

Annual revenue collected is spent on administrative tasks and the operation and maintenance of County facilities. The County does not have additional resources identified for capital improvement projects. Therefore, funding sources need to be explored to establish a capital funding program that addresses modernization, preservation, operations, and safety of the County’s transportation infrastructure.

The following programs are funding sources that could potentially be established or enhanced to fund transportation infrastructure projects in the County.

Statewide Transportation Improvement Program (STIP)

Every two years, ODOT allocates funding to improvement projects on state and local facilities through its four-year funding program, the Statewide Transportation Improvement Program (STIP). The STIP has provisions for funding local projects that are outside ODOT jurisdiction. Local jurisdictions must apply for this funding. Historically, Jefferson County has not consistently received STIP funding. With adoption of the TSP, the County will be in a stronger position to pursue funding for projects listed in the TSP because these projects will comply with the Transportation Planning Rule (TPR). However, it should be noted that simply being listed in the TSP does not guarantee STIP funding for any project.

Updated System Development Charges (SDC)

The current SDC program is based on an evaluation of transportation needs conducted in 1996. Since then, the transportation demand in the area has increased dramatically because of growth in Central Oregon. The SDC program charge should be based on the projected needs of the transportation system outside urban growth boundaries over a 20-year planning horizon. Once SDC eligible projects within the county have been identified and the total cost to implement the projects has been estimated, an SDC cost per trip assessment can be developed based on the trip generation potential of future development. As a result, the SDC program should be updated with the transportation project list presented in the TSP.

Local Improvement District (LID)

LIDs are created to finance road improvements through special assessment against benefited properties. A LID provides a mechanism to coordinate installation and funding of improvements between one or more property owners. LIDs may be formed when property owners petition the County for the purpose of constructing and funding public improvements in their neighborhood, or in some circumstances may be formed when the County determines that improvements are necessary.
Municipal Bonds

Municipal bonds are debt issued to fund public infrastructure projects. When an investor buys bonds, he or she is lending money to fund the public project with an agreement that the seller of the bond agrees to repay the principal amount of the loan at a specified time. The interest that investors receive is exempt from some income taxes. Jefferson County has the potential to issue municipal bonds to secure funding for various transportation projects.

Various Taxes

It is within county jurisdiction to levy taxes to fund public infrastructure projects that are needed to accommodate future growth in the County. The tax could be in the form of a local gas tax, ad valorem tax, or other form of tax.

Private Developers/Exactions

Although none of the potential funding sources identified above are being pursued at this time, at various times in the past the County has used some of these sources to fund specific transportation improvements. For future projects, the most likely source of funding will be private developers. Road standards in the Jefferson County Code require private developers to contribute to off-site road improvements when a new subdivision or other development will significantly increase traffic or otherwise adversely impact the existing transportation system. However, any requirement for privately-funded transportation improvements must be based on a direct nexus or rough proportionality between the level of impacts that will be caused by a development and the level of improvements that are required. Thus any transportation improvements required as a condition of approval for development are unlikely to cover the full cost of the improvements. Creative methods of completing a road project or improvement may be needed in such cases. For instance, the County may be able to contribute to the cost of a road improvement by providing rock and labor if a developer pays for the asphalt.
Section 7
TSP Implementation
TSP Implementation

7.1 IMPLEMENTATION MEASURES

The County has adopted a number of regulations to implement the TSP and its objectives. The regulations are contained in various sections of the 2007 Jefferson County Zoning Ordinance (JCZO) and in the Jefferson County Code. The regulations include road construction, access management, and performance standards that apply both to new roads and to the existing road system. Regulations also include requirements for sidewalks and bicycle facilities.

County Road Design Standards

Road design standards take into consideration road functional and operational characteristics, including traffic volume, capacity and safety. The standards are necessary to ensure that as the road system develops it will be capable of safely and efficiently serving the traveling public while also accommodating the orderly development of adjacent lands. The County’s road design standards are contained in Chapter 12.18 of the Jefferson County Code. Included are standards for the construction of new roads such as minimum right-of-way, travel lane and shoulder widths; maximum grade; and road design and construction standards; as well as access management standards such as intersection and driveway spacing standards.

The road standards vary based on the road’s functional classification. Principal and minor arterial standards are mainly applicable on state facilities that carry the highest volume of traffic. Standards for major collectors, minor collectors and local roads vary depending upon the anticipated average daily traffic (ADT) the road will carry, categorized into high-volume and low-volume. A category for industrial roads is also included within the minor collector and local road standards, which are only applicable to roads within industrial or commercial zones. There are no industrial roads within the county at this time.

Managing access to the road system is necessary to preserve the capacity of arterials and collectors by minimizing the number of points where traffic flow may be disrupted by traffic entering and exiting the road. Access management also enhances safety by minimizing the number of potential conflict points. Access spacing standards for driveways and for new roads accessing existing County facilities are included in the road standards in the Jefferson County Code. Access to state facilities is governed by ODOT based on current access management standards defined in Oregon Administrative Rule (OAR) 734-051 and the Oregon Highway Plan.

The County Code road standards also require the dedication of additional right-of-way or improvements to adjacent roads and intersections when road capacity, traffic flow, public safety or the road surface will be affected by traffic that will be generated by a proposed new development or subdivision. This is in accordance with TSP Strategy 4.2, which requires developers to pay for improvements to the road system that will be needed as a result of increased traffic the development will create.

Intersections

Many of the road projects listed in Section IV involve intersections. The highway project list in Table 4-1 includes a number of projects that will add turn lanes at intersections where there is a
relatively high number of turning movements. These intersection improvements generally will be in conjunction with the closure of other county road access to the highway. Traffic flow and safety will be improved by this combination of reducing the overall number of intersections while improving the intersections that remain open.

Other intersection-related highway projects involve realigning county roads with skewed intersection geometry so that the road will intersect the highway at right angles, which will improve safety.

Road standards contained in the Jefferson County Code have been adopted to improve safety at county road intersections. The standards apply both to the construction of new roads and to the reconstruction of existing roads. The standards require that roads intersect at right angles, require roads located on opposite sides of an intersection to be directly opposite each other, and state that a roundabout may be required if the level of service of an intersection will be less than LOS C.

Modern roundabouts can provide both operational and safety benefits. They provide higher traffic capacity and lower delays than all-way stop intersections or signalized intersections because traffic often does not have to come to a complete stop. They provide traffic calming by slowing the speed of vehicles entering the intersection. They are a feasible design solution when more than four roads intersect or when the intersecting roads do not align or enter the intersection at right angles. Probably the most significant benefit of a roundabout installation is increased safety. Studies have found that single-lane roundabouts operate significantly more safely than two-way stop-controlled intersections, and somewhat more safely than four-way stop controlled intersections. Not only is the frequency of crashes lower, but injury rates are significantly reduced.

Many of the road projects listed in Tables 4-1, 4-2 and 4-3 involve the construction of roundabouts. The County Code road standards authorize the County to require a roundabout at other intersections when warranted by an anticipated increase in traffic from a new subdivision or other development.

Road Performance Standards

The County’s aim is to have all roads and intersections operate at LOS C or better. JCZO approval criteria for conditional use, site plan review, land division, destination resort and zoning map amendment applications require that the development not reduce the performance standards of the transportation facility below this minimum.

7.2 CONSTRUCTION OF PROJECTS

The transportation projects listed in Tables 4-1, 4-2, 4-3 and 5-1 have been identified to address safety, operation, and connectivity needs to improve transportation facilities for various modes of transportation. As indicated in the discussion of funding in Section 6, the County currently cannot fund any of the projects. However, identification of the projects may increase the potential for obtaining state or federal funding. Equally important, the TSP and the transportation improvement projects that have been identified will be considered in the review of applications for subdivisions or other development, in order to ensure that transportation facility needs are addressed as part of the development and overall impacts to existing transportation facilities are minimized.

Pursuant to OAR 660-012-0025(1), adoption of the TSP constitutes the land use decision regarding the transportation projects that involve improvements within or adjacent to an existing road right-of-way. Further refinement planning, including the identification and consideration of alternatives,
alignment, mitigation of impacts, and opportunity for public involvement, will occur prior to
development of the following projects. However, these projects shall not be subject to further
justification with regard to their need, mode, function, or general location.

#13, US 97 Truck Bypass Study

#17, Culver Highway 361/SW Jericho Lane Safety Improvements

#18, US 97/US 26 South Interchange Study

#25, Culver Highway 361/SW Bear Drive Safety Improvements

#33, US 20 Safety Improvements

#42, US 26/US 97 North Interchange Study

#46, Crooked River Ranch Secondary Access Study

#47, SW Eureka Lane Extension

#61 – 64, 66, 67, 70 – 74 and 76, Projects to Accommodate Future Urban Growth.

7.3 AMENDING THE TSP

OAR 660-12-0060(1), which is implemented by Jefferson County Zoning Ordinance Section
803.2(F), requires the County to determine whether an amendment to the Comprehensive Plan or a
land use regulation, including a zone change, would significantly affect an existing or proposed
transportation facility by the end of the TSP 20-year planning period. A plan or land use regulation
significantly affects a transportation facility if it would:

- Change the functional classification of an existing or planned transportation facility;
- Change standards implementing a functional classification system;
- Allow land uses or levels of development that would result in types or levels of travel or
  access that are inconsistent with the functional classification of a transportation facility;
- Allow land uses or levels of development that would reduce the performance of a
  transportation facility below the minimum acceptable performance standard identified in the
  TSP (LOS C); or
- Allow land uses or levels of development that would worsen the performance of a
  transportation facility that is otherwise projected to perform below the minimum acceptable
  performance standard identified in the TSP.

Generally, an amendment does not have a significant effect on a transportation facility if it will not
have the effect of generating more trips than the existing zoning, or if there are adequate existing or
planned transportation facilities to serve uses that could be allowed as a result of the amendment. In
order to show that planned transportation facilities are adequate, funding for the facility must be in place or approved, or be reasonably likely to be provided by the end of the planning period.

If it is determined that a proposed amendment or zone change will have a significant effect on a transportation facility, the County must do one of the following:

- Adopt measures to assure that allowed land uses are consistent with the identified function, capacity, and performance standards of the facility;
- Amend the TSP to provide transportation facilities, improvements or services adequate to support the proposed land uses, including a funding plan or mechanism to assure that the facility, improvement or service will be provided;
- Alter land use designations, densities or design requirements to reduce demand for automobile travel and meet travel needs through other modes;
- Amend the TSP to modify the planned function, capacity or performance standards of the transportation facility; or
- Provide other measures as a condition of approval for development, such as require the developer to make transportation improvements.

However, an amendment can be approved if a transportation facility is already performing below LOS C or will not be consistent with the identified function, capacity or performance standard for the facility by the end of the planning period, and the development will mitigate impacts to the transportation facility in a manner that avoids further degradation to the performance of the facility.

The TSP is an element of the Jefferson County Comprehensive Plan. Any proposal to amend the TSP shall be processed in the same manner as an application to amend the Comprehensive Plan, and shall be subject to the approval criteria contained in the Comprehensive Plan for a text amendment. However, Appendix II, the Coordinated Human Services Transportation Plan, and Appendix III, the Jefferson County Code road standards, are separate documents that are included in the TSP for reference purposes only. A Comprehensive Plan amendment is not required to amend these documents, nor will changes to these documents be considered an amendment of the TSP.
Appendix I

Plan and Policy Review
Plan and Policy Review

Several jurisdictions own, manage, and/or operate the transportation facilities serving Jefferson County. The Oregon Department of Transportation (ODOT), which has jurisdiction of the state highway system, has developed statewide plans for specific transportation modes, a statewide transportation improvement program, and specific area studies. The county has adopted relevant planning documents, including the Comprehensive Plan and Zoning Ordinance. Transportation plans for individual cities were also reviewed. Plans and policies developed at the federal, state, regional, and local levels directly impact transportation planning in Jefferson County. Although each document that was reviewed contains many policies, only the most pertinent policies and information are summarized here.

The following summarizes the major documents reviewed during the development of the TSP.

Federal
- Safe, Accountable, Flexible, and Efficient Transportation Equity Act - A Legacy for Users (SAFETEA-LU) and implementing regulations (23 CFR 450 and 49 CFR 613)

State/ODOT
- Transportation Planning Rule (OAR 660-12)
- Oregon Transportation Plan (1992)
- Oregon Highway Plan (1999)
- Oregon Public Transportation Plan (1997)
- Access Management Rule (OAR 734-051)
- Safety Priority Index System (SPIS)
- Freight Moves the Oregon Economy (1999)
- Jefferson County Facility Community Impact Study, Oregon Department of Corrections (Draft #2, 1999)
- Oregon Bicycle and Pedestrian Plan (1995)
- Oregon Aviation Plan (2000)
- Oregon Rail Plan (2001)

Jefferson County
- Jefferson County Comprehensive Plan (1981)
The documents reviewed for this project were relevant to the TSP process in varying degrees. The key documents and elements from this review are described below:

FEDERAL

The Safe, Accountable, Flexible, and Efficient Transportation Equity Act - A Legacy for Users (SAFETEA-LU), legislation that renews the nation’s surface transportation law (TEA-21) through fiscal year 2009, was signed into law in August 2005. Federal transportation planning requirements, such as those specified in SAFETEA and its implementing regulations, are addressed through state and local plans. Previously, TEA-21 funds and federal forest receipts have been the primary state and federal transportation funding sources; TEA-21 funds transit and roads. TEA-21 also made discretionary funds available for eligible projects along highways designated as National Scenic Byways, All-American Roads, or State scenic byways. FHWA administers this funding program, soliciting applications once a year, and makes funds available to ODOT.5

STATE OF OREGON

The Oregon Transportation Plan (OTP) (1992) is a policy document developed by ODOT in response to federal and state mandates for planning for the future of Oregon’s transportation system. The OTP is intended to meet statutory requirements (ORS 184.618(1)) to develop a state transportation policy and comprehensive long-range plan for a multi-modal transportation system that addresses economic efficiency, orderly economic development, safety, and environmental quality. The OTP consists of two elements: the Policy Element and the System Element. The Policy Element defines goals, policies and actions for the state for the next 40 years. The Plan’s System Element identifies a coordinated multi-modal transportation system, to be developed over the next 20 years, which is intended to implement the goals and policies of the Plan.

The 1999 Oregon Highway Plan (OHP), an element and modal plan of the state’s comprehensive transportation plan, guides the planning, operations, and financing of ODOT’s Highway Division. Policies in the OHP emphasize the efficient management of the highway system to increase safety and to extend highway capacity, partnerships with other agencies and local governments, and the use of new techniques to improve road safety and capacity. These policies also link 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 Oregon Public Transportation Plan (1997) forms the transit modal plan of the Oregon Transportation Plan. The plan contains goals, policies, and strategies relating to the whole of the state’s public transportation system. The plan is intended to provide guidance for ODOT and public transportation agencies regarding the development of public transportation systems.

Oregon Administrative Rule 734-051 (Access Management) defines the State’s role in managing access to highway facilities in order to maintain functional use and safety and to preserve public investment. The provisions in the OAR apply to all roadways under Oregon State jurisdiction within Jefferson County, and govern the issuance of permits for public and private accesses onto state highways. The access management rules include spacing standards for varying types of state roadways. It also lists criteria for granting right of access and approach locations onto state highway facilities. The rules promote the protection of emerging development areas, rather than the retrofit of existing built-up roads, and include spacing standards for the different types of state highways. The access management rules also include provisions for commercial centers, urban business areas, and special transportation areas discussed in the OHP.

The US Highway 97 Corridor Strategy – Madras-California Border (1995) addresses the US 97 Corridor, stretching 199.8 miles from the Highway 26 intersection in north Madras to the Oregon/California border. Only Segment 1 of this defined Corridor lies in Jefferson County. Segment 1 is approximately 26.6 miles in length. It begins at the north junction of U.S. 26 in Madras and ends at the Prineville junction of U.S. 97 and OR 370 (O’Neil Hwy).

The objective of the Corridor Strategy is to determine relevant policies applicable to the corridor and to formulate objectives that attempt to balance various modes of transportation with the needs, issues and unique features of the Corridor. The six underlying strategy themes identified during the strategy development process include enhancing safety, facilities management and improvement, intermodal connections, interpretive opportunities and preservation of environmental quality, economic development, and partnering (p.5, p.41). These strategies were taken into consideration in the development of the TSP to ensure compliance.

The stated purpose of the Biggs Junction-Madras (US 97 North) Corridor Plan (2002) is to “establish both short and long-term management direction for all modes of transportation in the corridor and to make major transportation tradeoff decisions.” The US Highway 97 Corridor between Biggs Junction and Madras stretches 91.94 miles from the junction of US 97 with I-84 at the Columbia River to the US Highway 26 intersection in north Madras. Prioritized improvements to corridor facilities and system and management decisions identified in the corridor plan are intended to provide the basis for updating the Statewide Transportation Improvement Program (STIP). The Plan states that through local transportation system planning, such as the TSP update, ODOT and local governments in the corridor will cooperatively work together to ensure that city and county comprehensive plans and implementing ordinances achieve corridor plan management objectives.

The Corridor Overview (Section II) includes existing transportation conditions in the corridor (C., Existing Conditions). Under subsection 5.0, the Study states that in 1997 2% of the corridor operated with a moderate level of congestion (V/C ration between 0.80-0.89). The 2% of the corridor that was moderately congested occurred at Biggs Junction (Junction of US 97 with I-84 and US 30) and Madras (Junction of US Highway 97 with US Highway 26). The level of congestion on US 97 was not projected to change through the planning period (p.20). Existing conditions for the Dalles/California Highway, the segment described as US Highway 97 from MP 67.1 at the US Highway 97/197 junction to MP 91.94, and the US Highway 97/26 junction in the City of Madras are
found in Subsection 6.2 (p. 25). The Study concludes that this section of US Highway 97 meets State Highway Design Standards, with the exception of shoulder width, and exceeds the 1999 OHP goal of 90% “fair-or-better” pavement condition.

The Corridor Plan documents that opportunities for bicycle and pedestrian travel are limited to the urban areas of the Corridor. Most of the communities do not have designated bike lanes or a comprehensive system of sidewalks and local streets are used by autos, bicyclist and pedestrians as a shared surface. The Corridor Plan recommends continuing this practice and only adding or replacing sidewalks along US 97 and on local streets that connect residential areas with commercial centers and schools.

The Corridor Plan states that Madras City-County Airport will continue to be a vital component in economic development activities in the region and supports the protection of the airport from encroachment by incompatible land uses.

The Corridor Plan assumes that rural portions of the Corridor will continue in resource uses, e.g. agriculture, with growth generally confined to acknowledged exception areas and existing rural community centers; that all highway uses of US 97 will increase during the 20-year planning period; and that the use of US 97 as a statewide freight route will continue to grow in importance. Highway capital improvement projects identified for construction in the Statewide Transportation Improvement Program (STIP) relating to US 97 are assumed as “Committed” projects in the Corridor Plan.

Key themes reflected in the Corridor Plan that relate to sections of US Highway 97 in Jefferson County include:

- Maintain existing facilities to ensure that they remain safe and functional as the highest priority for the allocation of state and federal resources.
- Maintain overall corridor performance and safety through a combination of increased enforcement, access management, and targeted highway improvements.
- Apply appropriate access management standards consistent with existing and planned land uses.
- Factor environmental conservation into both maintenance practices and improvement projects with the focus to enhance the visual quality of the driving experience, especially within the Journey through Time Scenic Byway segment.
- Encourage transportation-efficient land use patterns by supporting development/redevelopment within existing urban areas and rural development centers.
- Provide no additional expansion of highway capacity, except for climbing and passing lanes to reduce conflicts between freight traffic and other highway users.
- Promote US 97 as a statewide freight route for access to Central Oregon, Washington, Idaho, California, and Nevada.
- Protect and enhance the corridor's scenic values.
- Resolve congestion and safety problems in Biggs Junction and Madras.
- Resolve highway/land use compatibility issues in urban areas and rural service centers.
- Address safety problems at intersections.

The following key management strategies listed under the “Rural Areas” section are applicable to Jefferson County (Section 3.2):
• Small-scale capital improvements, such as climbing and passing lanes, and turn lanes. The Plan includes capital improvements to reduce conflicts between autos and large trucks in the Corridor. This approach will enhance the operational characteristics of the Corridor and make the best use of scarce resources and minimizes environmental impacts.

• Access management plays an important role in the rural areas. With a large number of at-grade intersections through the rural portion of the Corridor, the opportunity exists for conflicts between highway users and cross-traffic and turning traffic. Control of the location and spacing of public and private access to the highway is a critical component in maintaining the operational integrity of the highway.

• Transportation improvements must minimize impact on significant environmental and cultural resources. The potential to impact streams, wetlands, plants, wildlife and archaeological sites is greatest in the rural portion of the Corridor. For this reason, small-scale strategic passing and climbing lane improvements are proposed to minimize impacts.

The Transportation Balance section recognizes that the automobile will continue to be the overwhelmingly dominant mode for moving people in the Corridor due to travel distances between residences and destinations and the absence of transit service (1.1.3). The stated management approach is to focus on management, maintenance, operations and service improvements in the Corridor, rather than modernization and large capital improvements, reduce auto/truck conflicts through the strategic use of passing and climbing lanes, and continue to develop transportation alternatives that reduce reliance on the auto. A general objective is to provide for safe and efficient high-speed continuous flow operation in rural areas (a V/C of 7.0 or less).

US 26 Corridor Study – Heidi Junction-Madras (1990)
As described in the US 26 Heidi Junction-Madras Corridor Study, a corridor study describes the nature and character of the highway by dividing it into small, uniform segments. Each segment is analyzed for traffic mix, capacity, alignment, width, accidents, pavement condition, off right-of-way activities and economic development plans. Highway problems and needs both mid-range (10 years) and long-term (20 years) are identified and specific project strategy recommended. Cost estimates for the identified improvements are provided in this Corridor Study. Concepts to help use funds more effectively and improve highway safety are also introduced. The report is intended to provide a framework to identify existing highway improvements and project future needs to year 2010. Part of Section 6 (OR 216 to Deschutes River) and Section 7 (Deschutes River to Madras) run through Jefferson County.

The goals established in this Corridor Study include:
• Provide minimum lane widths of 12 feet on entire highway.
• Provide minimum paved shoulders of 6 feet on all highway sections with 2,000 or over Average Daily Traffic (ADT) and 3-foot paved shoulders of those sections with less than 2,000 ADT. On bridges provide a usable bridge width of four feet greater than the approach lane width if the ADT is 2,000-4,000 and six feet greater if the ADT is over 4,000.
• Improve and maintain pavement surface to good or better condition.

The Corridor Strategies section (p.10) includes strategies for providing passing lanes and access management (“improving levels of service and increasing capacity must go hand in hand with measures to control access”) in the Corridor. Corridor Analysis (p.14) for Segments 6 (p.38) and 7
(p.42) includes a detailed description of the transportation and facility conditions in the segments and respective tables that summarize improvement needs. The Summary and Conclusions section (p.46) anticipates that development of added passing lanes between Rhododendron and Madras will be one of several major potential modernization and reconstruction projects in the US 26 Corridor.

The **Oregon Highway 26 Corridor Strategy, Clackamas/Wasco County Line (East of Government Camp) to US Highway 97 (Madras) (1995)** is a “public review draft” and is described as the first step in the Corridor Planning process. The document describes the long-term (20-year) transportation improvement and performance objectives along Highway 26 for all modes of transportation along the Corridor. The portion of US Highway 26 within ODOT Region 4 is the subject of this Corridor Strategy and is defined as corridor segments 5, 6, and 7. Part of Section 6 (OR 216 to Deschutes River) and Section 7 (Deschutes River to Madras) run through Jefferson County. The Corridor Strategy is comprised of a series of performance and impact objectives. Transportation performance objectives relate to transportation balance/intermodal connectivity, regional connectivity, highway congestion, facility management, road conditions, and safety. Transportation impact objectives include environmental, social, land use, energy, and economic.

In 1986 ODOT developed the **Safety Priority Index System (SPIS)** to identify potential safety problems on Oregon’s state highways. The SPIS helps to identify areas where funds apportioned for safety issues can be spent in a manner that will achieve the highest benefit. ODOT defines a SPIS site as a 0.10 mile section of roadway that has three or more crashes or one or more fatal crashes over a three year period. The priority index of the roadway segments are based on frequency, severity, and crash rate. The current 2001 – 2003 SPIS rankings show six sites in Jefferson County, one on the Warm Springs Reservation, three within the Madras city limits, and two - US 26 at Dover Lane and US 97 at Milepost 106.00 (between US 97/Culver Highway-SR 361 and SW Monroe Lane) – that are within the unincorporated area of the county.

The **Freight Moves the Oregon Economy (1999)** report summarizes a variety of information about issues and needs surrounding the transport of freight by roads, rail lines, waterways, aircraft, and pipelines. The document’s stated purpose is to demonstrate the importance of freight to the Oregon economy and identify concerns and needs regarding the maintenance and enhancement of current and future mobility within the state of Oregon. State Highways 97 and 20 are designated freight routes. The document notes that, in terms of volume of freight moved, “the U.S. 97 corridor is the most important north-south corridor east of the Cascade Mountains (Chapter 2, p. 28).” Corridor planning projects (“ODOT Corridor Planning Corridors,” Figure I-5) listed in this document include Gresham-Madras (US 26), Madras-Biggs Junction (US 97), and Madras-California (Chapter 1, p.22). Corridor plans are intended to be a source of programs and projects included in local and state transportation improvement programs. While no specific recommendations were identified for facilities in Jefferson County, the deficiencies and improvements discussed in this document are pertinent to how freight facilities are addressed in the County’s TSP.

The **Jefferson County Facility Community Impact Study (1999)** was completed for the Oregon Department of Corrections to assess the potential impact of the medium security correctional facility to be located three miles east of Madras. In Section III (Community Development), the major transportation facilities in Jefferson County are identified as Highways 26 and 97, Greyhound bus service, the Madras Airport, and limited freight rail service. A Transportation Impact Analysis was completed as part of this study. The following points summarize the findings of that analysis:

- The analysis assumes that the intersection of US 97 and US 26 will be reconfigured with a new traffic signal.
• All intersections within the study area will continue to operate at an acceptable level of service during peak hours.
• Additional trips generated by the correctional facility will not result in a significant impact on the transportation system.

The **Oregon Bicycle and Pedestrian Plan (1995)** is a modal element of the Oregon Transportation Plan. It contains the standards used on State Highway projects and provides guidance to regional and local jurisdictions for the development of safe, connected bicycle and pedestrian systems. The plan includes two major sections: policies and implementation strategies and design, maintenance, and safety. The policy section contains relevant state and federal laws. The Oregon Bicycle and Pedestrian Plan considers rural highways and county roads suitable for cycling if they have paved shoulders or relatively low traffic volumes. Map 1, Conditions for Bicyclists on Rural Highways, shows that US 97 has four-foot or greater shoulders and that US 26 Madras to Prineville has shoulders less than four feet and an ADT greater than 1,000. Table 7, Standard Rural Highway Shoulder Widths, provides shoulder width recommendations based on roadway type (Rural Arterials, Rural Collectors, Rural Local Routes) and ADT.

The **Oregon Aviation Plan (2000)** identifies a primary state aviation system and system needs. The plan recommends policies to guide the state in protecting, maintaining, and developing the airport system. Jefferson County has two airports, the Madras City-County Airport and the Lake Billy Chinook Airport. As described in the Aviation Plan, the Madras City-County Airport is listed as a “Category 4” in Oregon’s “core system” of airports and the Lake Billy Chinook airport is a “Category 5.” Categorization of airports is based on services and functional roles. Category 1 airports are commercial service airports and provide Oregon’s primary intrastate, interstate, and international connections for commercial passenger and cargo service. These airports accommodate scheduled major/national or regional/commuter commercial air carrier service. Category 4 airports serve the needs of general and business aviation users and activities within the local area. The airports have the airfield facilities and services necessary to accommodate general aviation users, in light single and multi-engine aircraft weighing 12,500 pounds and less. In addition, the Oregon Aviation Plan identifies Category 4 airports as candidates for new instrument approaches facilities because they provide significant local access and have established charter, cargo/express, corporate, or medevac activities. Based on these criteria, the Madras City-County Airport is among those on the list of airports recommended as the highest priority to receive new instrument approaches (Oregon Aviation Plan, p. 45). Identified issues regarding the condition of the facilities at Madras City-County Airport include deficiencies in runway end identifier lights (REILS), visual guidance indicators (VGI), instrument approach, and 24 hour weather, and runway protection zones (Exhibit V-17). Land use compatibility issues (Exhibit V-18) include open land fills, noise issues, and bird migratory areas near the airport. Category 5 airports are located in communities and outlying areas with small or no population within their service area. They can have an important emergency function and many provide access to recreational opportunities in remote areas. These airports have limited services, such as fuel and maintenance facilities, and have taxi-runway systems capable of only limited use general aviation activity. Exhibit V-17, Facility Condition Deficiencies, list the Lake Billy Chinook Airport as having runway protection zones and runway object-free area deficiencies. Land use compatibility issues (Exhibit V-18) include incompatible land uses, open land fills, and bird migratory areas near the airport. The **Madras City-County Airport, Airport Layout Plan Report** more specifically addresses aviation issues in Madras and the county, including an outline for future development and details of an airport layout plan.
The 2001 Oregon Rail Plan addresses both freight and passenger rail transportation. The Plan’s freight element has four major purposes: (1) describe Oregon’s freight rail system in terms of the carriers and the individual properties that make up the state railroad system; (2) describe the commodities transported by rail in Oregon; (3) identify funding needs and potential funding sources for railroads in Oregon; and (4) assess what shippers want from rail service in Oregon.

LOCAL

The Jefferson County Comprehensive Plan contains the official goals and policies that are relevant to land use in the county, and addresses all applicable Oregon Statewide Planning Goals. The goals and policies in the TSP will be the County’s adopted long-range vision for transportation planning and the means of complying with statewide planning Goal 12.

The Jefferson County Zoning Ordinance implements the policies outlined in the Comprehensive Plan, lists the uses permitted in each zone, and the regulations that apply to specific uses and zones.

The City of Madras Transportation System Plan (adopted 1999 and amended in 2003) was designed to guide the management of existing transportation facilities and the design and implementation of future facilities inside the city’s urban growth boundary and adjacent areas that have a strong potential to develop within a 20-year planning period. Where applicable, the County TSP and Madras TSP should be consistent. General Madras TSP policies include identifying transportation needs to accommodate developing or underdeveloped areas (Goal 2), increasing the use of alternate modes of transportation (Goal 3), and enhancing the role of the Madras airport (Goal 4). Additional policies are included under the following categories: Transportation Facility Improvements, Protection of Transportation Facilities, Protect Public Use Airports, Coordinated Review of Land Use Decisions, Impacts of Development Proposals, and Pedestrian and Bicycle Circulation.

City of Culver Comprehensive Plan (1977)
The City of Culver, incorporated in 1946, has a population of approximately 1000 and is located nine miles south of Madras. Culver Highway (Highway 361) leaves Highway 97 at Madras and precedes south through Metolius and Culver before rejoining Highway 97 south of Culver. The City of Culver Comprehensive Plan describes the Culver Highway as a major federal aid secondary highway. With the exception of the Urbanization Policy that requires cooperation between the City and County when the Urban Growth Boundary is amended, the Comprehensive Plan does not contain background statements or policies regarding coordination with the county or the County’s transportation system.

Incorporated in 1913, the City of Metolius is approximately two miles southwest of Madras. In 2005 the population of the City was 804. The City of Metolius Comprehensive Plan (1987) Transportation section notes that the automobile is the principal mode of transportation within the City. Freight is active through the City by truck and rail. The City is also served by the Madras Airport. At the time the Comprehensive Plan was adopted, there were only three paved roads in the City: Butte, 5th and 9th Streets. The lack of paved streets was identified as a problem by city residents (General Discussion section, p. 24). The Comprehensive Plan addresses City/County coordination with regards to areas outside the City limits but within the City’s UGB, and joint City/County adoption of UGB amendments, but does not contain other policies related to the county or the County’s transportation system.
Appendix II

Jefferson County Coordinated Human Services Transportation Plan
(Adopted June 27, 2007 by M-94-07)
Appendix III

County Code Road Standards
(Adopted by Ordinance #O-69-07)
Chapter 12.08

ROAD CREATION

Sections:
12.08.010 Application.
12.08.020 Minimum design standards.
12.08.030 Procedure.

12.08.010 Application.
Any person desiring to create a road that will not be part of a subdivision or partition shall make written application to the Community Development department. Said application shall be accompanied by the required information and appropriate filing fee.

12.08.020 Minimum design standards.
The minimum standards of design and improvements for the creation of a road shall be as set forth in this code and shall be in compliance with other applicable road standard regulations and any requirements of the Jefferson County Zoning Ordinance.

12.08.030 Procedure.
A. Upon receipt of written application and appropriate filing fee for creation of a road, the planning director shall refer the proposal to the director of public works for review and recommendation.
B. If access to a county road, local access road or state highway is planned, the necessary permits shall be obtained prior to approval.
C. The director of public works shall report findings and recommendations regarding the proposed road to the planning director.
D. Upon receipt by the planning director of written findings and recommendations from the director of public works the proposal shall be reviewed in accordance with procedures and requirements set forth in the Jefferson County Zoning Ordinance.
Chapter 12.18

ROAD DESIGN STANDARDS

Sections:
12.18.010 Compliance required.
12.18.020 Minimum standards established.
12.18.030 Implementation of requirements.
12.18.040 Additional design requirements.
12.18.050 Approval of variations.
12.18.060 Roads.
12.18.070 Roads within an urban growth boundary.
12.18.080 Roads within one mile of an urban growth boundary.
12.18.090 Existing roads.
12.18.100 Continuation roads.
12.18.110 Limiting access to arterials and collectors.
12.18.120 Minimum right-of-way and roadway width.
12.18.130 Road design.
12.18.140 County Road development requirements.
12.18.150 Local Access Road development requirements.
12.18.160 Private Road development requirements.
12.18.170 Improvement plans.
12.18.180 Horizontal alignment.
12.18.190 Vertical alignment.
12.18.200 Intersections.
12.18.210 Drainage.
12.18.220 Driveways.
12.18.230 Sidewalks.
12.18.240 Bicycle Facilities.

12.18.010 Compliance required.
A. All road design and construction taking place on or intersecting county or local access roads shall be in compliance with the design standards set forth in this chapter. All standards set forth in this chapter apply to new county roads, local access roads, private roads and driveways unless otherwise specified.
B. New roads and improvements to existing roads may be inspected by the Jefferson County public works director or County Engineer for compliance with the standards set forth in this chapter.
C. All engineering and survey stamps required shall be by professionals licensed in the state of Oregon for the engineering and/or survey discipline required.

12.18.020 Minimum standards established.
The design standards contained within this chapter are the minimum standards governing the design of roads and other transportation improvements and facilities.

12.18.030 Implementation of requirements.
It is the duty of the public works director to implement the provisions and requirements of this chapter in such a way as to carry out its intent and purpose.
12.18.040 Additional design requirements.
The public works director may impose additional design requirements as are reasonably necessary to protect the interests of the public. The county reserves the right under ORS 368.036(2) to set lesser standards for work done on local access roads, provided that it is determined to be in the public interest to do so. Reconstruction to full county road standards will be required prior to consideration of acceptance of any road into the county road system.

12.18.050 Approval of variations.
A. The public works director, after consultation with the planning director, may approve variations in the improvement standards of this chapter or allow incremental improvements when circumstances warrant, such as when a road will provide access only for undeveloped parcels in farm or forest use, or when the surrounding road system does not comply with the standards. A variation will only be approved if:
   1. There is no adverse impact to the public in allowing the variations;
   2. The variation promotes the intent and purposes of the standards and is in compliance with all applicable requirements of the Jefferson County Zoning Ordinance; and
   3. There are practical difficulties that will create an unreasonable construction expense. Self-imposed difficulties will not be considered.
   4. The variation will not result in the sacrifice of a significant public benefit.
B. The decision by the public works director to grant or deny a variation of the road standards may be appealed to the Board of Commissioners. A written appeal must be received by the Board of Commissioner’s office within ten days of the date the public works director issues a decision on the proposed variation.

12.18.060 Roads.
A. The location, width and grade of roads shall be considered in their relation to existing and planned roads, topographical conditions, public convenience, safety and the proposed use of land to be served by the roads. The road system shall assure an adequate traffic circulation system for all modes of transportation, including pedestrians, bicycles and automobiles, with intersection angles, grades, tangents, and curves appropriate for the traffic to be carried, considering the terrain.
B. Road development and access onto existing roads shall be in accordance with any adopted Transportation System Plan.
C. Adoption of a road into the county road system shall be at the discretion of the Jefferson County board of commissioners in accordance with ORS 368 and the current Jefferson County zoning ordinance. To be considered for adoption into the county road system, a road or system of roads must be contiguous with the existing county road system through connection with either an existing county or state road and comply to the satisfaction of the Jefferson County public works director, in all respects, to the design standards set forth in this chapter and the construction standards set forth in Chapter 12.20 of this code.
D. Cul-de-sac roads will not be eligible for adoption into the county road system.
E. Roads not accepted into the county road system shall be either public local access roads, or private roads in destination resorts.
12.18.070  **Roads within an urban growth boundary.**

Roads within an urban growth boundary (UGB) or urban reserve shall, at the discretion of the Jefferson County director of public works, conform to the design and construction specifications of the city contained within the UGB boundary, and shall be subject to review and approval of that city’s director of public works and the Jefferson County director of public works.

12.18.080  **Roads within one mile of an urban growth boundary.**

At the discretion of the Jefferson County director of public works, design and construction standards and specifications for roads within one mile of a UGB may be modified to accommodate future reconstruction to city standards. Roads in zones contiguous to the UGB of Madras, Culver or Metolius may be required to be constructed in accordance with Section 12.18.070 if, in the opinion of the director of public works, such roads would become connected to the city road system.

12.18.090  **Existing roads.**

Whenever existing roads, adjacent to or within a tract, are of inadequate width to accommodate the increase in traffic expected from any proposed development, additional rights-of-way to meet current standards may be required. Improvements to adjacent roads and intersections may be required if road capacity, traffic flow, public safety, or the road surface will be directly affected by traffic that will be generated by the proposed development. Any requirement for road improvements or dedication of additional right-of-way will be based on a direct nexus between the level of road impacts that will be caused by the development and the level of road improvements that are required.

12.18.100  **Continuation roads.**

A new road which will constitute the continuation of an existing road shall be aligned so that the centerlines of the new and existing road coincide. Where a straight-line continuation is not possible, the centerline shall be continued by a curve.

12.18.110  **Limiting access to arterials and collectors.**

When an application is submitted to develop or divide a parcel that abuts or contains an existing or proposed collector or arterial road, the County may limit access to the arterial or collector by requiring frontage roads, reverse frontage lots, a non-access reservation along the property line adjacent to the arterial or collector, or other means of preventing or limiting the number of access points onto the arterial or collector.

12.18.120  **Minimum right-of-way and roadway width**

The road right-of-way and roadway surfacing width shall be in conformance with Table A, Minimum Road Design Standards, or as otherwise specified in this Chapter. Additional right-of-way for construction of drainage easements may be required if necessary to contain the limits of cuts, fills and structural improvements.

12.18.130  **Road design.**

A.  Roads shall be designed by a registered professional engineer and shall at a minimum conform to the design standards set forth in Table A, Minimum Road Design Standards and this chapter, and shall otherwise conform to American
Association of State Highway and Transportation Officials (AASHTO) standards. Base rock and pavement dimensions set forth in Table A may be increased by the director of public works if necessitated by anticipated traffic volumes or geotechnical considerations. The public works director may allow lesser structural section if the developer provides a 25 year minimum life design meeting AASHTO or ODOT criteria, developed and stamped by a licensed professional engineer. Such design must be based on geotechnical testing on-site and use traffic loads consistent with the ultimate development of the road system. The adequacy of existing structural sections and the required structural modifications to the existing structural section(s) required to meet a 25 year design life for the ultimate traffic load shall be in accordance with the current edition of the Asphalt Institute Manual.

B. The design of bridges included in the alignment of a road shall be prepared by a registered professional structural engineer and shall at a minimum include a traveled way six feet wider than the road served by the bridge, support a HS20 wheel loading and conform in all other respects to the design standards and specifications for new bridges in the current ODOT design standards. Pedestrian bridges shall have a maximum width of five feet and be designed by a registered professional structural engineer to meet current live and dead load standards for the use proposed. The public works director may impose additional criteria if necessary to accommodate emergency vehicle access, future capacity or other design considerations.

C. Cuts or fills in excess of four feet and steeper than 2:1 slope shall require either a geotechnical report by a registered professional engineer indicating adequate slope stability for the material involved or a retaining structure design prepared by a registered professional engineer to current standards for the materials and methods proposed.

D. All designs prepared in relation to the requirements of this section are subject to the review and approval of the public works director.

12.18.140 County Road development requirements.

A. Construction standards for roads that the Jefferson County Board of Commissioners has agreed to accept into the county road system will be based on the functional classification of the road. New county roads shall comply with the construction standards set forth in Table A, Minimum Road Design Standards and this chapter 12.18, unless the developer submits a design report prepared by a registered engineer proposing alternative specifications that the engineer certifies are equivalent or superior to these standards, and the Public Works Director concurs.

B. Minimum tangent and minimum curve radius shall be in accordance with AASHTO design standards.

C. Additional, higher standards may be required by the Public Works Director when necessary to address heavy traffic demands, geotechnical considerations, environmental requirements or other factors.

12.18.150 Local Access Road development requirements.

A local access road is a public road that is not a county road, city street, state highway or federal road. New local access roads shall be dedicated to the public, but shall be
constructed and maintained by private parties. Development of a new local access road, including surveying, recording of dedication documents, construction, placement of signs, and on-going maintenance are the responsibility of the developer or abutting property owners. County funds may be expended for repair of existing local access roads only in limited emergency circumstances. The County and its officers and employees shall not be liable for failure to improve or repair a local access road.

A. Construction standards for local access roads are the same as the standards for county roads in Section 12.18.140 and Table A, Minimum Road Design Standards.

B. Turnarounds shall be provided every ½ mile on dead-end roads that are more than one mile in length.

C. An Oregon registered professional engineer or engineering geologist shall provide documentation and shall certify that the road was constructed in compliance with the standards in this chapter 12.18 and the road improvement plans approved by the Public Works Director.

12.18.160 Private Road development requirements.

Private roads are allowed only in destination resorts. No County funds will be expended for development, construction or maintenance of a private road, nor will the County or any of its officers or employees be liable for failure to improve or repair a private road.

A. Private roads shall be constructed to meet the standards for county roads in Section 12.18.140 and Table A, Minimum Road Design Standards.

B. An Oregon registered professional engineer or engineering geologist shall provide documentation and shall certify that the road was constructed in compliance with the standards specified in this chapter 12.18 and the road improvement plans approved by the Public Works Director.

C. Private roads may be gated provided the gate is a minimum of 20 feet wide and is constructed in a manner that will allow manual operation by one person. Gates shall not be locked unless equipped with a Knox box purchased from the fire district with keys provided to all emergency service providers.

12.18.170 Improvement plans.

A. Copies of the improvement plans for new or reconstructed roads shall be submitted to the Public Works Department for review. Construction of the road shall not commence until the plans have been approved by the Public Works Director.

B. A complete final set of certified mylar improvement plans and current autocad drawing (.dwg) computer file or other media acceptable to the county engineer shall be approved by the public works director prior to the start of construction or improvement to any road. The improvement plans and dwg file shall become the property of the county and will remain at the community development and public works departments.

C. Each sheet shall be drafted in permanent ink on twenty-four (24) by thirty-six (36) inch Mylar, bear the stamp and signature of the registered engineer, include a title block which shall be located on the bottom edge or at the lower right-hand corner of the sheet and, unless approved by the public works director prior to beginning work:

1. Sheet 1 shall be a cover sheet and shall include:
a. Project title;
b. Location map;
c. Vicinity map;
d. Legend;
e. Signature box with spaces provided for county approval and for approval by all affected cities, utility companies and irrigation districts; and
f. Plan sets including five or more sheets shall include an index on the cover sheet.

2. Line types for existing items shown on the plans shall be dashed lines 0.3 mm in width or less. Line types for design items shall be solid lines 0.5 mm or heavier. Road centerline shall be standard long and short dash line type, 0.7 mm in width.

3. All plan views and maps shall include a clearly marked north arrow.

4. Scales shall be clearly indicated in the title block of each sheet. Detail drawings which are drawn at a scale other than the scale indicated on the sheet shall have the detail title and scale as indicated below:

   (DRAWING)
   Title of Drawing
   Scale 1” = x’

5. Unless approved by the public works director, details, typical sections, materials tables and similar detail drawings shall be drafted on a sheet separate from the title or plan and profile sheets.

6. Plan and profile sheets shall be split horizontally at the midpoint of the usable area outside the title block. Plan view scale shall be fifty (50) feet to the inch, profile view shall be fifty (50) feet to the inch horizontal scale and five feet to the inch vertical scale.

7. Plan views shall show:
   a. Centerline alignment showing point of curvature and point of tangency station, delta, radius, arc length and short tangent for all curves and bearing and distance of all tangents;
   b. Dimensioning necessary to survey and relocate the roadway;
   c. Dimensioned right-of-way lines as shown on the final plat;
   d. Location and description of monuments found or set on the right-of-way line;
   e. Existing easement and recording references;
   f. Type, location and size of all existing and proposed drainage and irrigation structures; and
   g. Location and type of all existing and proposed signs and barricades.

8. Profile views shall show:
   a. Centerline grades and vertical curves, complete with point of intersection elevation and stationing, length of vertical curves and percent grade of vertical tangents;
   b. Original ground at centerline extending five hundred (500) feet past the construction limits and original ground at ditch lines if a significant traverse slope exists;
   c. Curb profiles, where curbs are required;
d. Super-elevation transition diagrams for horizontal curves if curbs are not required; and
e. Type, location, size, flow and finished grade elevations of all existing and proposed drainage, irrigation structures and utilities within the right-of-way.

9. Structural section sheets shall include but not be limited to:
   a. Width, depth and type of base layer(s);
   b. Width, depth and type of paving;
   c. Curbs, if required;
   d. Side slopes;
   e. Ditch section;
   f. Crown slope; and
   g. Utilities.

10. Structural and detail plans of all structures, including, but not limited to, bridges, drainage structures, irrigation structures and sewer lines, stamped by a registered engineer.

11. The developer shall submit, with his proposed improvement plans, an itemized construction cost estimate. This estimate shall include all related roadwork and affected utility installation and/or related relocation.

12. The developer shall submit a traffic control, permanent sign and stripping plan (including all required traffic control signs and road name signs) in accordance with the current edition of MUTCD.

13. Any other information required by the public works director, planning director, county engineer, or hearings body.

12.18.180 Horizontal alignment.
   A. Horizontal curve and tangent design elements shall meet or exceed minimum standards of the current AASHTO specifications.
   B. The centerline of road improvements shall coincide with the centerline of the right-of-way unless an eccentric right-of-way is required to contain the limits of cuts and fills.
   C. Super-elevation shall be designed in accordance with current AASHTO specifications with the maximum super-elevation being six percent.

12.18.190 Vertical alignment.
   A. Vertical curves shall be designed to be consistent with and complimentary to the horizontal curves. Vertical curves shall be designed in accordance with current AASHTO standards.
   B. Maximum percent of grade shall be as shown in Table A, Minimum Road Design Standards. Minimum grade shall be one percent for all roads, unless a drainage plan is submitted to and approved by the public works director.
   C. Angle points shall not be allowed on grade breaks over one percent.

12.18.200 Intersections.
   A. All intersections shall be planned for through traffic on the road with the greatest projected average daily traffic (ADT). The side road shall be at right angles (90 degrees) to the main road unless physical constraints of the site or topography require a lesser angle. In no case shall a new road enter an intersection at an
angle of less than 75 degrees. Horizontal and vertical alignment for an intersection shall be as shown in Drawing No. 2-4.3 of the Jefferson County Standard Drawings.

B. Minimum intersection spacing of new roads shall be in accordance with the access spacing distances specified in Table A, Minimum Road Design Standards. Distances shall be measured between intersection centerlines of the roads. Access to state roads and highways shall be at current ODOT standards and are subject to review and approval by ODOT.

C. Roads located on opposite sides of a through street shall either have their centerlines directly opposite each other or shall meet the minimum access spacing standards specified in Table A.

D. A roundabout may be required when the level of service (LOS) of an intersection will be less than LOS C.

12.18.210 Drainage.

A. Minimum Requirements. Drainage facilities shall be designed and constructed to receive and transport at least a fifty (50) year storm frequency for all surface drainage water coming to and passing through the development. The public works director may require additional capacity if failure of the drainage structure would adversely impact highways, railroads, utilities, or emergency services or facilities. The system shall be designed for maximum allowable development of the drainage area served by the drainage facility.

B. Road culverts shall be corrugated metal pipe with a minimum design life of fifty (50) years. All cross culverts shall be eighteen (18) inches in diameter or larger. Where unusual site conditions warrant and fifty (50) year storm would not cause back flooding, twelve (12) inch diameter culvert may be approved in advance at the discretion of the public works director. Culverts shall be placed in natural drainage areas and shall provide positive drainage. Culverts installed more than ten feet below road grade shall be six inches larger in diameter than otherwise required in this section.

C. Driveway culverts, where required, shall be twelve (12) inches in diameter or larger and shall be sized such that the culvert will not impede the flow of a fifty (50) year storm.

D. The grade line of ditches shall be constructed such that ditches and culverts shall share common flow lines.

E. A minimum of one foot of cover shall be required for all culverts.

F. Culverts over sixty (60) feet in length and/or having over four feet of cover shall be considered storm sewers and shall be designed and installed in accordance with ODOT storm sewer standards.

G. Drainage Plans. A complete set of drainage plans, stamped by a licensed engineer, including hydraulic and hydrologic calculations, shall be incorporated in all road improvement plans.

H. Culverts shall be installed in accordance with ODOT Standard Specifications.

I. Bridges will be designed by a registered professional Structural Engineer in accordance with current AASHTO and ODOT standards and shall include a stamped set of plans and specifications. All bridges shall be designed to receive and transport a minimum 100-year storm frequency of all drainage water coming to the structure at full development of the drainage.
J. All work shall be in accordance with an erosion control plan reviewed and approved by the Oregon Department of Environmental Quality prior to beginning work.

12.18.220 Driveways.

A. Permit required. Access or change in type of access onto a county or local access road shall require a permit from the Community Development Department. Access shall be denied at locations that do not meet minimum sight distance and spacing standards. Proof of legal access, provided by the owner/developer, shall be required for all parcels not fronting directly on a county or local access road.

B. Access Restrictions and Limitations. Driveway access onto arterials and collectors shall not be permitted within one hundred fifty (150) feet of an intersection, or the maximum distance obtainable on the parcel, whichever is less. Driveway access onto minor collectors or local roads shall not be permitted within one hundred (100) feet of an intersection, or the maximum distance obtainable on the parcel, whichever is less.

C. Driveways shall be spaced at least seventy-five (75) feet apart, measured from the centerline of the driveway, except at the bulb end of a cul-de-sac or when an existing lot width is less than seventy-five (75) feet. Driveway spacing shall be in accordance with applicable city standards when the lot is within an urban growth boundary. Loop driveways shall not be permitted on arterials or major collectors. Loop driveways may be permitted on minor collectors or local roads if the interval between the two access points of the loop driveway is at least seventy-five (75) feet, and both access points are at least seventy-five (75) feet from the driveways on adjacent parcels.

D. When a parcel abuts more than one road, access shall be obtained from the road with the lower functional classification unless unfeasible because of topography or other physical feature.

E. Commercial and Industrial Access. Requirements for commercial and industrial access will be determined by the public works director in accordance with Section 12.18.200 of this chapter. Safety improvements, including but not limited to left turn lanes, acceleration lanes, and traffic separation, may be required.

F. Safety improvements, including but not limited to the removal of obstructions or the sloping of cut-banks within the public right-of-way of the parcel served, may be required if deemed necessary by the public works director. The public works director may require that any such improvements within the public right-of-way be done by the county public works department or a licensed contractor. All such work shall be at the sole expense of the landowner. The owner shall be required to post a bond for the cost of such work prior to the beginning of construction.

G. Sight Distance. Sight distance shall meet current AASHTO standards.

H. Access Width. The following are the surface width and grade requirements for private driveways:

<table>
<thead>
<tr>
<th>Type</th>
<th>Width (in feet)</th>
<th>Grade %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>12  20</td>
<td>8   12</td>
</tr>
<tr>
<td>Agricultural</td>
<td>12  40</td>
<td>10   14</td>
</tr>
<tr>
<td>Commercial/Industrial</td>
<td>20  40</td>
<td>6   10</td>
</tr>
</tbody>
</table>
I. Driveway access to within 50 feet of all buildings shall be constructed to the following standards unless a variance has been granted in accordance with Section 426.5 of the Jefferson County Zoning Ordinance:

1. Access roads and driveways serving a single residence shall have a surface width of at least 12 feet. The width shall be increased to a minimum of 14 feet in curves with a centerline radius of less than 150 feet to ensure emergency vehicles remain on an all weather surface. The area extending at least 10 feet from each side of the driveway’s centerline shall be kept clear of obstructions and shall be maintained as a fuel break. Driveways more than 250 feet in length shall include turnouts at 150 foot intervals or lesser distance as needed to allow visibility. Turnouts shall be at least 10 feet in width and 50 feet in length, and shall meet the same load requirements as required by subsection (5).

2. Access roads and driveways serving more than one residence shall have a surface width of at least 20 feet.

3. Commercial or industrial buildings that will have any portion of an exterior wall more than 150 feet from an existing road shall have an emergency vehicle access drive with a surface width of at least 20 feet.

4. A minimum clear height of at least 14½ feet shall be maintained for the entire width of the driveway.

5. Access shall be designed and constructed to maintain a minimum 75,000 pound load carrying capacity. If not designed by an engineer, driveways shall be constructed of a minimum of 5 compacted inches of crushed rock meeting ODOT material standards. The road shall be compacted until a loaded 10 cubic yard dump truck ceases to deflect the road.

6. Maximum finished grade shall be no greater than 10 percent unless approved by the fire chief. Grade shall not exceed 4 percent in turnarounds. Any portion of the access with a grade greater than 8 percent shall be surfaced with 1.5 inch class C asphalt mix, 0-11 oil mat, or four inch fiber mesh reinforced Portland cement concrete.

7. Curves shall have a minimum centerline radius of 55 feet, including the intersection of a driveway with a public road.

8. Gates shall be a minimum of 20 feet wide, and shall be of a swinging or sliding type constructed of materials that allow manual operation by one person. Electric gates shall be equipped with a Knox box purchased from the fire district.

9. Dead-end access roads and driveways more than 150 feet in length shall terminate in a 120-foot hammerhead, 60-foot “Y” or 96-foot diameter cul-de-sac or alternative turnaround arrangement as shown in the following diagrams. Turnarounds shall also be provided every ½ mile on dead-end access roads and driveways exceeding one mile in length. The turnaround area shall meet the same load requirements as required by subsection (5).
J. Driveways shall be constructed in such a manner that water, aggregate or any other substance that is hazardous to the traveling public will not enter onto the public roadway from the driveway.

K. Driveway entrances shall be shaped to not impede stormwater runoff from the surface of the public road into the drainage system.

L. Drainage shall conform to the requirements of Section 12.18.210.

M. Where a drainage structure larger than five feet in diameter is required, specific design and installation shall be developed by a licensed engineer and submitted to the public works director for approval prior to approval of the access.

12.18.230 Sidewalks.

Sidewalks or walkways shall be included as part of the development of a new road when required by an adopted Transportation System Plan, the Jefferson County Zoning Ordinance, or by city standards when the property is in an urban growth boundary. Sidewalks, crosswalks, islands, curb cuts, and sidewalks at driveway crossings shall be constructed to the standards outlined in the most current edition of the *Oregon Bicycle and Pedestrian Plan* adopted by the Oregon Transportation Commission.

12.18.240 Bicycle Facilities.

Paved shoulders designed for use as bicycle facilities shall be provided as part of the construction or reconstruction of roads. Minimum shoulder widths shall be as shown in Table A. As an alternative, a multi-use path designed for use by bicycles and pedestrians within a right-of-way separate from the road may be provided when approved by the Public Works Director and Planning Director. Bicycle facilities shall be constructed to the standards outlined in the most current edition of the *Oregon Bicycle and Pedestrian Plan* adopted by the Oregon Transportation Commission.
## TABLE A
### MINIMUM ROAD DESIGN STANDARDS
((COUNTY AND LOCAL ACCESS ROADS))

<table>
<thead>
<tr>
<th>Typical ADT (Average Daily Traffic)</th>
<th>Principal Arterial</th>
<th>Minor Arterial</th>
<th>Major Collector High Volume</th>
<th>Minor Collector High Volume</th>
<th>Industrial (°)</th>
<th>Local Road High Volume</th>
<th>Low Volume</th>
<th>Industrial (°)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;7,500</td>
<td>5,500 - 7,500</td>
<td>4,000 - 6,000</td>
<td>2,500 - 4,000</td>
<td>2,500 - 1,200</td>
<td>600 - 1,200</td>
<td>500 - 1,000</td>
<td>150 - 600</td>
<td>0 - 150</td>
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<tr>
<td>Minimum Right-Of-Way Width</td>
<td>☀️ 80 ft.</td>
<td>72 - 80 ft.</td>
<td>72 ft.</td>
<td>60 ft.</td>
<td>60 ft.</td>
<td>50 ft.</td>
<td>50 ft.</td>
<td>72 ft.</td>
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<tr>
<td>Lane Width</td>
<td>12 ft.</td>
<td>12 ft.</td>
<td>11 ft.</td>
<td>11 ft.</td>
<td>14 ft.</td>
<td>11 ft.</td>
<td>10 ft.</td>
<td>14 ft.</td>
</tr>
<tr>
<td>-Minimum</td>
<td>12 ft.</td>
<td>12 ft.</td>
<td>12 ft.</td>
<td>12 ft.</td>
<td>14 ft.</td>
<td>12 ft.</td>
<td>12 ft.</td>
<td>14 ft.</td>
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<tr>
<td>-Recommended</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shoulder Width</td>
<td>6 ft.</td>
<td>6 ft.</td>
<td>4 ft.</td>
<td>4 ft.</td>
<td>8 ft.</td>
<td>3 ft.</td>
<td>3 ft.</td>
<td>8 ft.</td>
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<tr>
<td>-Minimum</td>
<td>8 ft.</td>
<td>6 ft.</td>
<td>6 ft.</td>
<td>6 ft.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>-Recommended</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shoulder Surface</td>
<td>A.C.</td>
<td>A.C.</td>
<td>A.C.</td>
<td>A.C.</td>
<td>A.C.</td>
<td>A.C.</td>
<td>A.C.</td>
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<tr>
<td>Pavement Width</td>
<td>40 ft.</td>
<td>36 ft.</td>
<td>36 ft.</td>
<td>36 ft.</td>
<td>44 ft.</td>
<td>30 ft.</td>
<td>30 ft.</td>
<td>44 ft.</td>
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<tr>
<td>Minimum Access Spacing</td>
<td>1320 ft.</td>
<td>500 ft.</td>
<td>300 ft.</td>
<td>300 ft.</td>
<td>300 ft.</td>
<td>100 ft.</td>
<td>100 ft.</td>
<td>100 ft.</td>
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<tr>
<td>Surface Type</td>
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<td>4&quot; A.C.</td>
<td>4&quot; A.C.</td>
<td>2&quot; A.C.</td>
<td>2&quot; A.C.</td>
<td>2&quot; A.C.</td>
<td>4&quot; A.C.</td>
</tr>
<tr>
<td>Base Depth</td>
<td>10&quot;</td>
<td>10&quot;</td>
<td>10&quot;</td>
<td>10&quot;</td>
<td>10&quot;</td>
<td>8&quot;</td>
<td>8&quot;</td>
<td>10&quot;</td>
</tr>
<tr>
<td>Maximum Grade</td>
<td>8% ②</td>
<td>8% ②</td>
<td>8% ②</td>
<td>8% ②</td>
<td>6% ③</td>
<td>10% ③</td>
<td>10% ③</td>
<td>6% ③</td>
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<td>Applicable Specifications</td>
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<td>☀️ ☀️ ☀️ ☀️ ☀️ ☀️</td>
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<td>☀️ ☀️ ☀️</td>
<td>☀️ ☀️ ☀️</td>
</tr>
</tbody>
</table>

### NOTES:
- Whenever any road is created or upgraded within either the UGB or 1 mile of any incorporated city, the road may be required to be constructed to city standards.
- In unincorporated areas, the County Engineer may recommend City of Madras urban road standards, if deemed appropriate.
  ① Design for Recommended Standard unless approved by the Public Works Director
  ② Pavement width depends on lane and shoulder widths. Turning lanes, when required, will add additional width.
  ③ Grade shall not exceed four (4) percent in turnarounds and within 20 feet of an intersection with a higher classification road.
  ④ Oregon Department of Transportation “Standard Specifications for Highway Construction” and the “Special Provisions” applicable to the project
  ⑤ Principal Arterial roads should meet standards for the corresponding functional classification provided in OAR 734.051 and the Oregon Highway Plan.
  ⑥ Industrial road design standards are only applicable in Industrial or Commercial zones.