

IV. ROADS AND INTERCHANGES

Level of Severity Criteria

Methodology

The ability of roads to carry vehicular traffic depends on several factors. The number of travel lanes, the nature of topographic features, the presence and width of roadway shoulders, and the number of other vehicles all affect the capacity of roads. The 2000 Highway Capacity Manual, published by the Transportation Research Board, sets standards for these and other factors which determine traffic "Levels of Service" (LOS) ranging from level "A" to "F." They are defined as follows:

- LOS "A"** Free flow: Unlimited freedom to maneuver and select desired speed.
- LOS "B"** Stable flow: Slight decline in freedom to maneuver.
- LOS "C"** Stable flow: Speed and maneuverability somewhat restricted.
- LOS "D"** Stable flow: Speed and maneuverability restricted. Small increases in volume cause operational problems.
- LOS "E"** Unstable flow: Speeds are low; freedom to maneuver is extremely difficult. Driver frustration is high during peak traffic periods.
- LOS "F"** Forced flow: Stoppages for long periods. Driver frustration is high at peak traffic periods.

Level of Service is a useful measure of the relationship between the volume of traffic on a given roadway and the capacity of the roadway to operate safely and efficiently. San Luis Obispo County has established LOS "C" as the threshold for the acceptable operation of roadways and interchanges in rural areas and LOS "D" in urban areas. When a roadway or interchange is projected to operate below these Levels of Service, the County initiates a process to identify, design, fund and construct the necessary improvements to ensure an acceptable LOS is achieved and maintained.

Level of Service is used by the RMS to determine the criteria for the recommended Levels of Severity, as follows:

ROADS

Level of Severity	Roads, Circulation Criteria
I	Traffic volume projections indicate that Level of Service "D" would be reached within five years.
II	Traffic volume projections indicate that Level of Service "D" would be reached within two years.
III	Traffic volume projections indicate that the road or facility is operating at Level of Service "D."

INTERCHANGES

Level of Severity	Highway Interchange Criteria
I	Traffic volume projections indicate that Level of Service "D" would be reached within 10 years.
II	Traffic volume projections indicate that Level of Service "D" would be reached within five years.
III	Traffic volume projections indicate that the interchange is operating at Level of Service "D."

Recommended Levels of Severity for County Maintained Roads

The RMS considers only those roads under County jurisdiction. State highways, roadways under the exclusive jurisdiction of cities, and private roads are not evaluated in this report.

For County maintained roads, the Public Works Department maintains an ongoing traffic count program to monitor traffic levels of service. The following table summarizes the levels of service for roadways in the RMS.

Table IV-1 -- Existing (2014) and Future Peak Hour Volumes For RMS Roadway Segments					
Roadway	Location	LOS "D" Volume	Peak Hour Volumes		
			2014	2016	2019
Avila Beach Drive	West of San Luis Bay Drive	1280	1160	1207	1281
Corbett Canyon Road	North of Arroyo Grande City Limits	909	291	303	321
Halcyon Road	North of Camino del Rey	898	481 ²	520	552
Halcyon Road	South of Arroyo Grande Creek	904	884	920	976
Las Tablas Road	West of Duncan Road	1446	1426	1484	1574
Lopez Drive	South of Orcutt Road	886	320 ²	347	368
Los Berros Road	South of El Campo Road	978	527	548	582
Los Osos Valley Road	West of Foothill Boulevard	1475	1427	1485	1576
Los Ranchos Road	West of Highway 227	968	355 ²	384	408
Main Street (Cambria)	East of Pine Knolls Drive	1440	703	731	776
Mission Street	North of Highway 101	974	442	460	488
Nacimiento Lake Drive	East of Chimney Rock Road	902	400	416	442
O'Connor Way	North of Foothill Road	1084	355	369	392
Paso Robles Street	East of Highway 1	970	107 ²	116	123
Price Canyon Road	South of Highway 227	995	908 ²	983	1043
Ramada Drive	South of Highway 46	978	547	569	604
South Bay Boulevard	South State Park Road	967	1135	1181	1253
South Ocean Avenue	North of 13th Street	965	439	457	485
Tank Farm Road	West of Highway 227	1152	1896	1973	2093
Tefft Street	West of Mary Avenue	2815	1057	1100	1167
Vineyard Drive	West of Highway 46	905	214	223	236
Vineyard Drive	West of Highway 101	1160	804	836	888

Source: San Luis Obispo County Department of Public Works, 2014

1. Volumes that exceed Level of Service "D" are shown in bold.
2. 2012 count data used.

Based on the traffic volumes summarized in the table above, the following roads are expected to experience levels of service that meet the RMS criteria for Levels of Severity:

Table IV-2 -- Summary of Recommended Levels of Severity -- Roads		
Roadway Segment	Community/ Planning Area	Recommended Level of Severity
Avila Beach Drive west of San Luis Bay Drive	Avila Beach	I
Price Canyon Road south of Highway 227	South County Planning Area	
Halcyon Road south of Arroyo Grande Creek	Oceano	II
Las Tablas Road west of Duncan Road	Templeton	
Los Osos Valley Road west of Foothill Boulevard	San Luis Obispo/Los Osos	
South Bay Boulevard south of State Park Road	Los Osos	III
Tank Farm Road west of Highway 227	San Luis Obispo	

Each of these road segments is discussed below and shown in their regional context on Figures IV-1, IV-2 and IV-3.

Figure IV-1 – RMS Roads Recommended Levels of Severity – North County

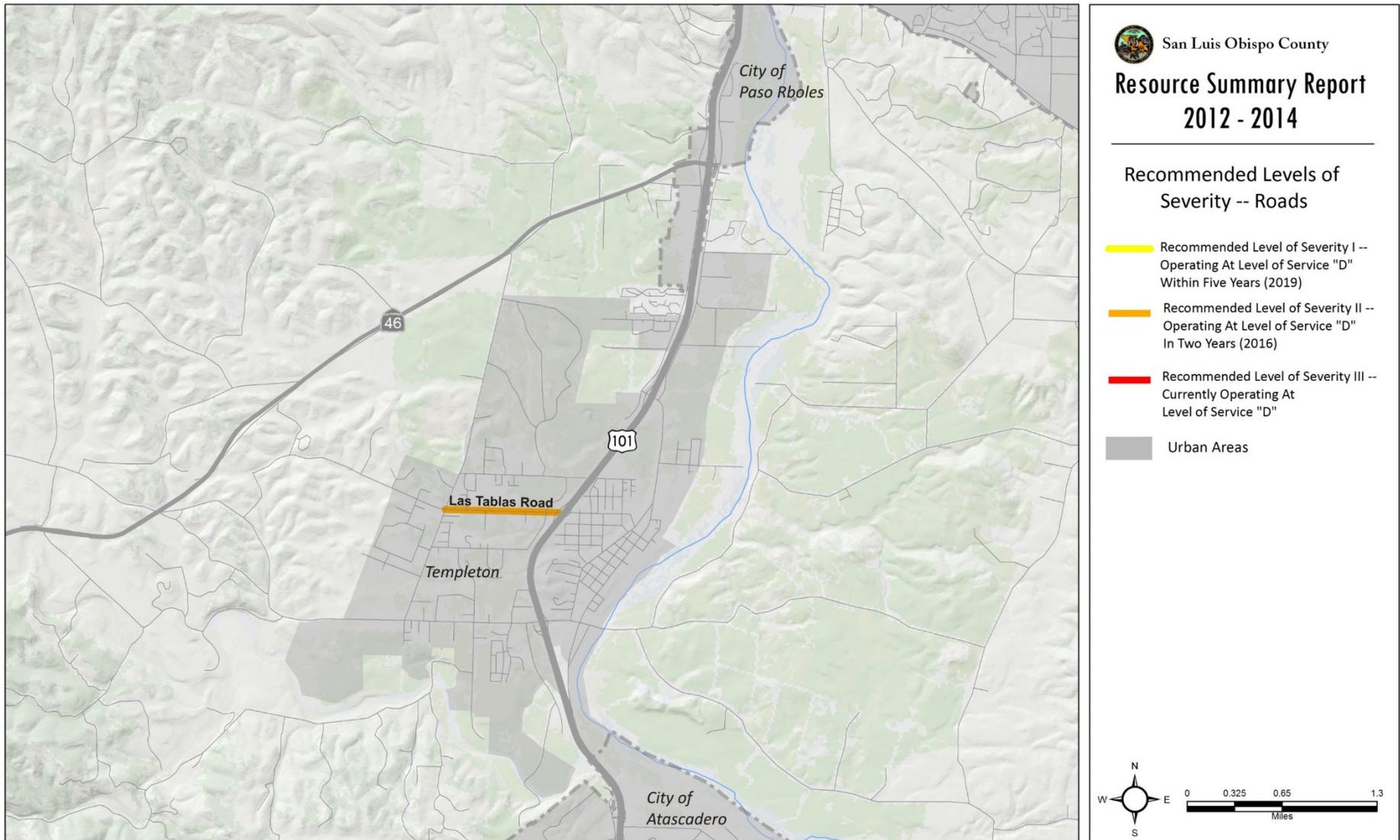


Figure IV-2 – RMS Roads Recommended Levels of Severity – Los Osos/San Luis Obispo Area

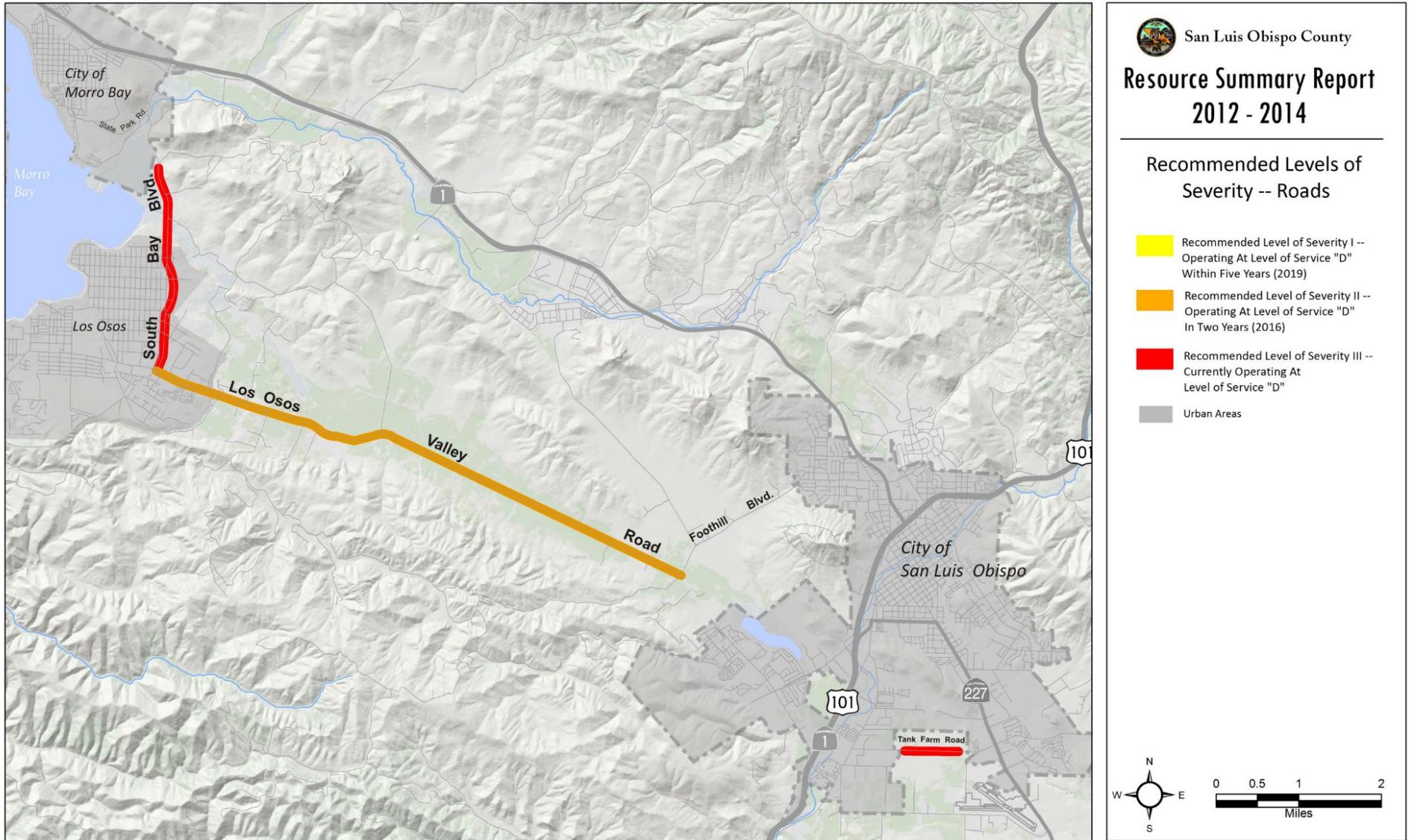
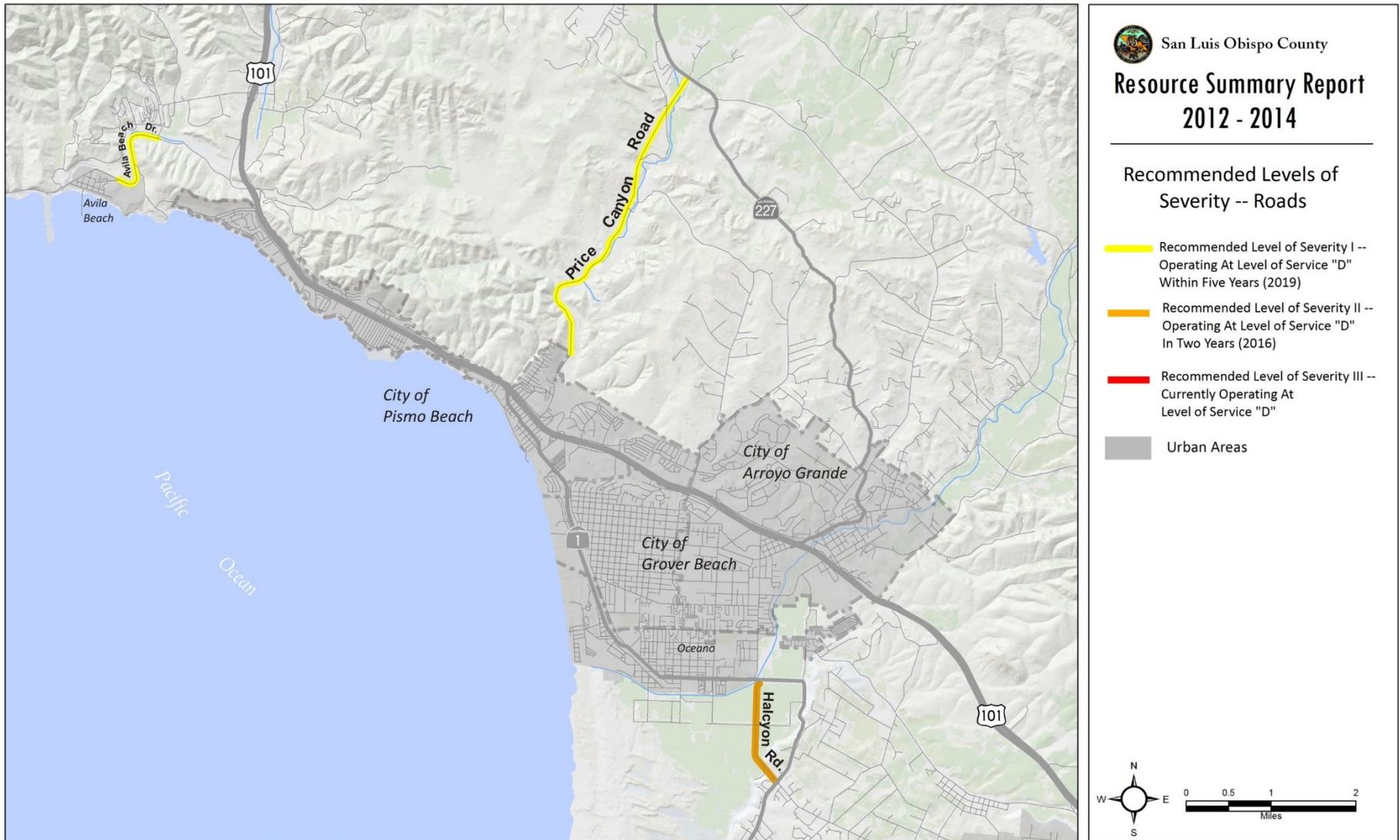
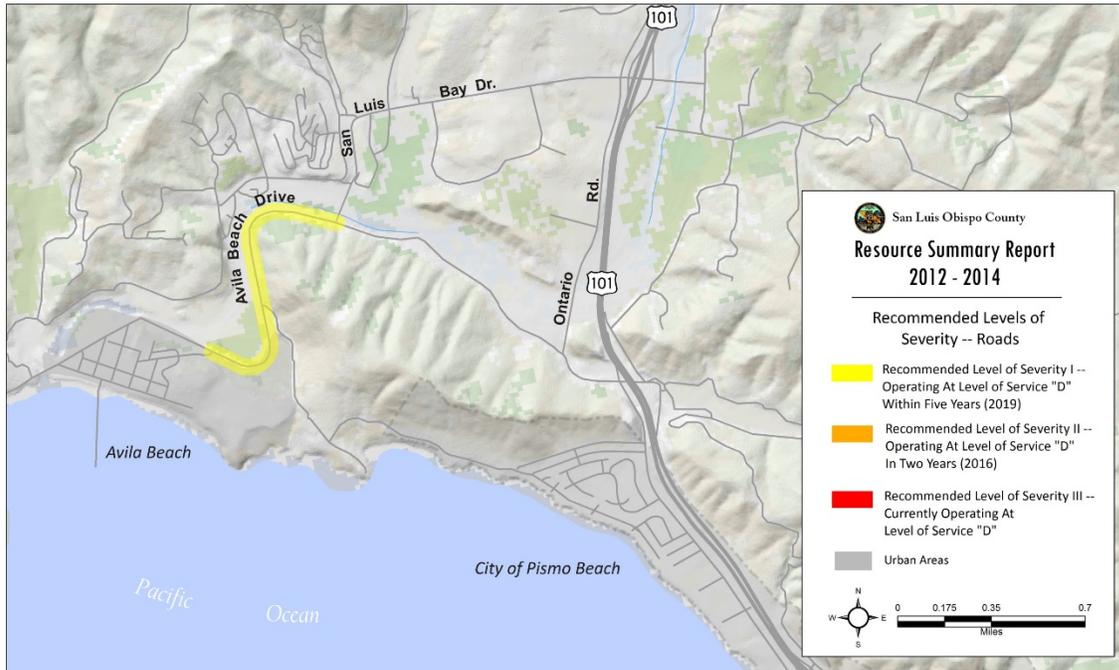


Figure IV-3 – RMS Roads Recommended Levels of Severity – South County



Avila Beach Drive West of San Luis Bay Drive



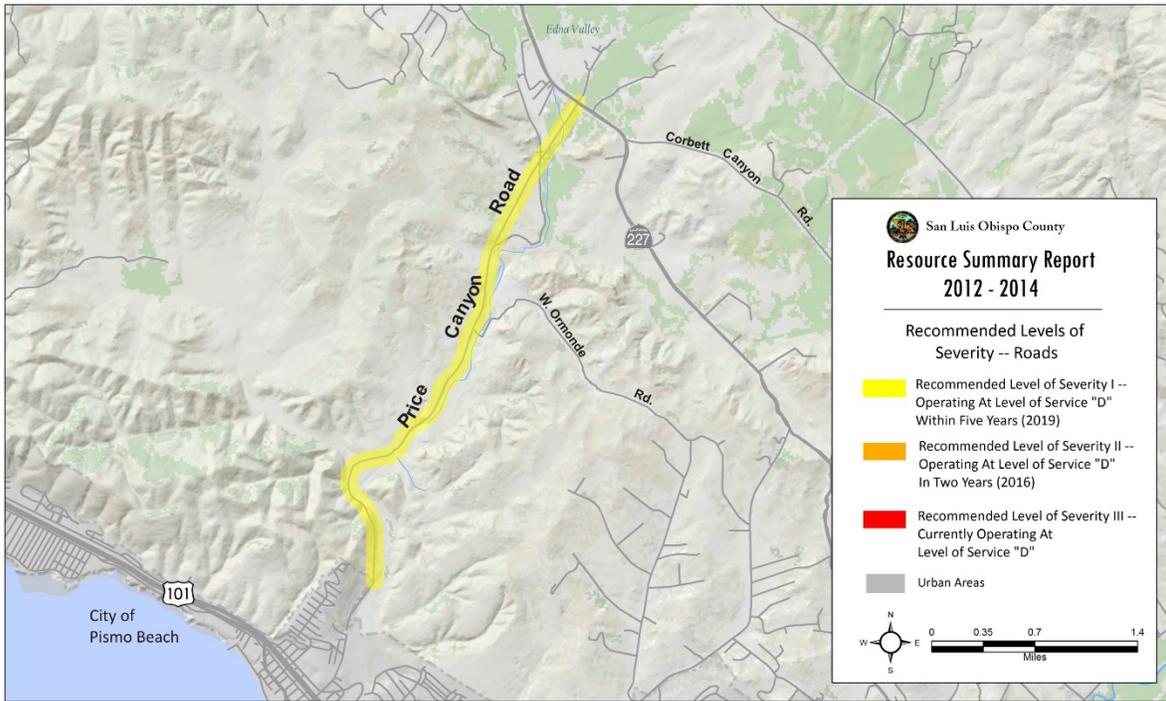
Roadway	Location	LOS "D" Volume	Peak Hour Volumes		
			2014	2016	2019
Avila Beach Drive	West of San Luis Bay Drive	1280	1160	1207	1281

Source: San Luis Obispo County Department of Public Works, 2014

1. Volumes that exceed Level of Service "D" are shown in bold.

Avila Beach Drive traffic volumes rose significantly over previous years, likely due to PGE Diablo Canyon outage operations. Public Works will continue to monitor volumes on the roadway to see if they return to historic levels. The Avila Valley Circulation Study recommends shoulder widening for Avila Beach Drive; however, no funding is currently available for the project. The projection of traffic volumes for Avila Beach Drive indicates Level of Service "D" will be reached in five years. **Recommended Level of Severity I.**

Price Canyon Road South of Highway 227



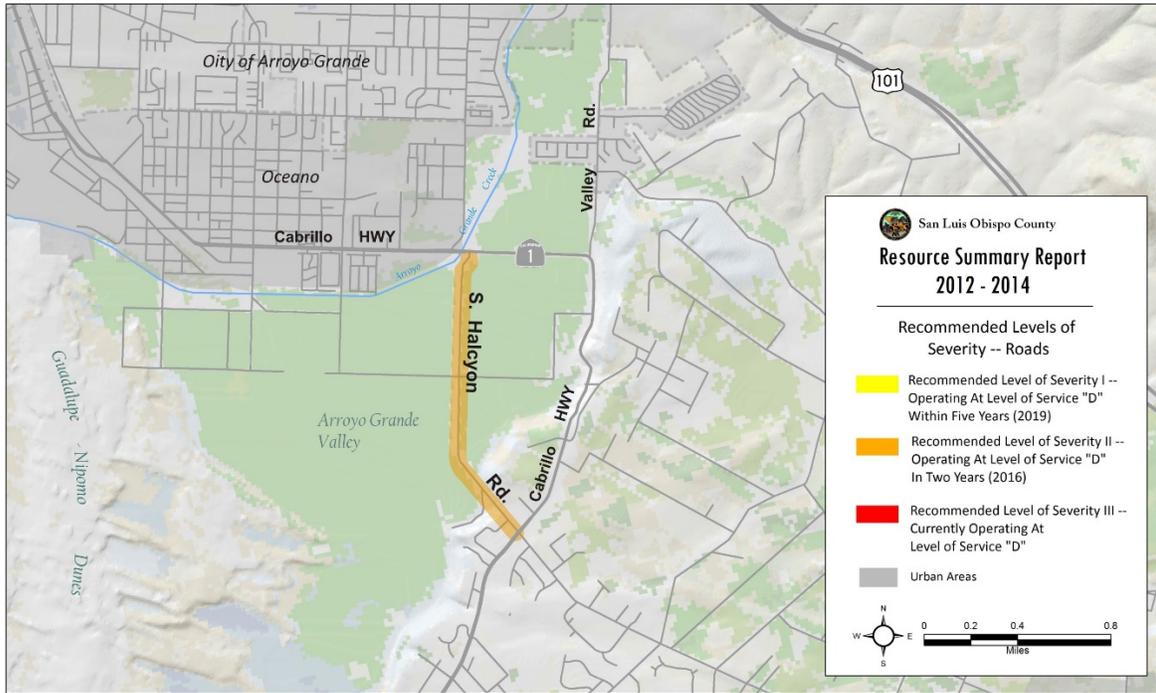
Roadway	Location	LOS "D" Volume	Peak Hour Volumes		
			2014	2016	2019
Price Canyon Road	South of Highway 227	995	908 ²	983	1043

Source: San Luis Obispo County Department of Public Works, 2014

1. Volumes that exceed Level of Service "D" are shown in bold.
2. 2012 count data used.

The Public Works Department is currently working on a project to complete shoulder widening between State Highway 227 and Ormonde Road. Construction is anticipated to begin in 2015. The projection of traffic volumes for Price Canyon Road indicates Level of Service "D" will be reached in five years. **Recommended Level of Severity I.**

Halcyon Road South of Arroyo Grande Creek



Roadway	Location	LOS "D" Volume	Peak Hour Volumes		
			2014	2016	2019
Halcyon Road	South of Arroyo Grande Creek	904	884	920	976

Source: San Luis Obispo County Department of Public Works, 2014

1. Volumes that exceed Level of Service "D" are shown in bold.

Public Works is pursuing funding for shoulder widening on the grade. The projection of traffic volumes for Halcyon Road indicates Level of Service "D" will be reached in two years. **Recommended Level of Severity II.**

Las Tablas Road West of Duncan Road



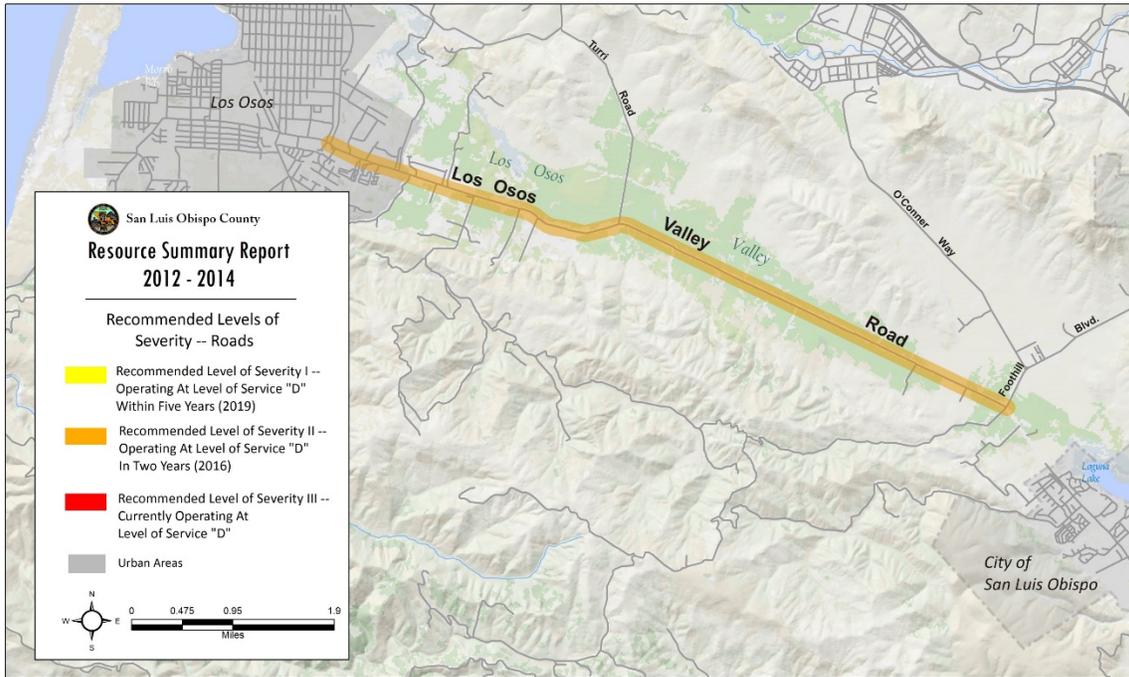
Roadway	Location	LOS "D" Volume	Peak Hour Volumes		
			2014	2016	2019
Las Tablas Road	West of Duncan Road	1446	1426	1484	1574

Source: San Luis Obispo County Department of Public Works, 2014

1. Volumes that exceed Level of Service "D" are shown in bold.

The Templeton Circulation Study recommends widening Las Tablas Road to five lanes for one quarter mile west of US Highway 101. The project would be funded by regional transportation funds. The signalized intersections at Bennett Way and the Highway 101 ramps are expected to operate at LOS C or better under buildout conditions. However, the projection of traffic volumes for Las Tablas Road indicates Level of Service "D" will be reached in two years. **Recommended Level of Severity II.**

Los Osos Valley Road West of Foothill Boulevard



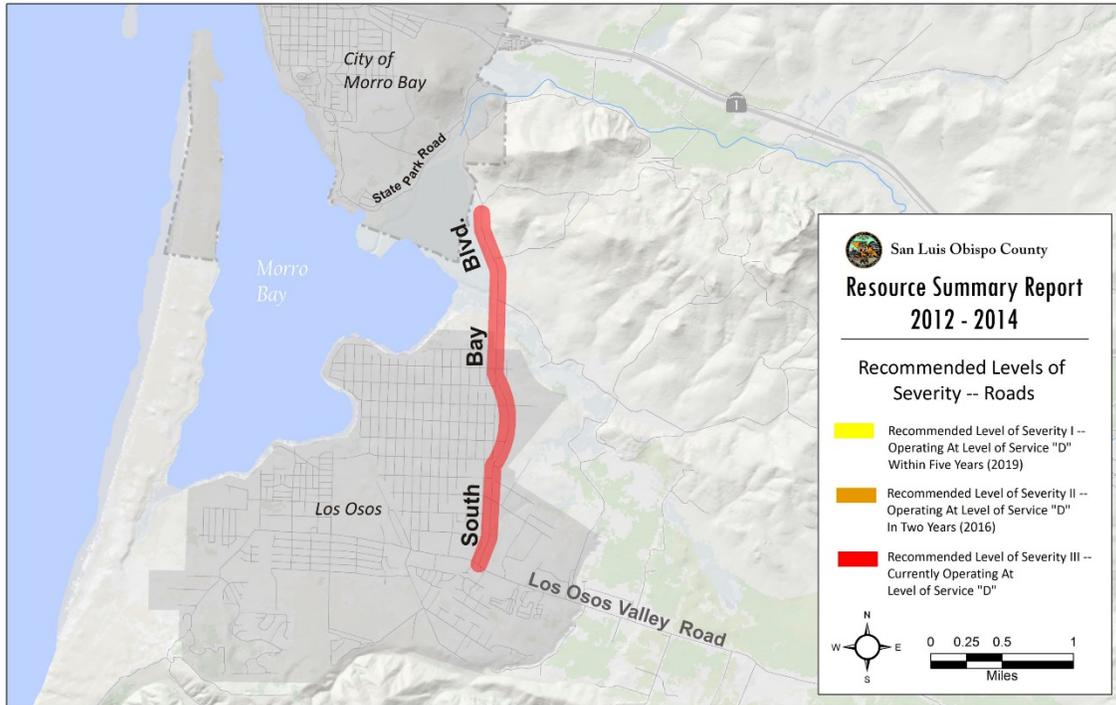
Roadway	Location	LOS "D" Volume	Peak Hour Volumes		
			2014	2016	2019
Los Osos Valley Road	West of Foothill Boulevard	1475	1427	1485	1576

Source: San Luis Obispo County Department of Public Works, 2014

1. Volumes that exceed Level of Service "D" are shown in bold.

The Los Osos Circulation Study recommends widening Los Osos Valley Road to four lanes; however, traffic impact fees which would fund the project are not being generated due to the prohibition on new development in much of Los Osos. As a result, there is no funding currently available for the project. The projection of traffic volumes for Los Osos Valley Road indicates Level of Service "D" will be reached in two years. **Recommended Level of Severity II.**

South Bay Boulevard South of State Park Road



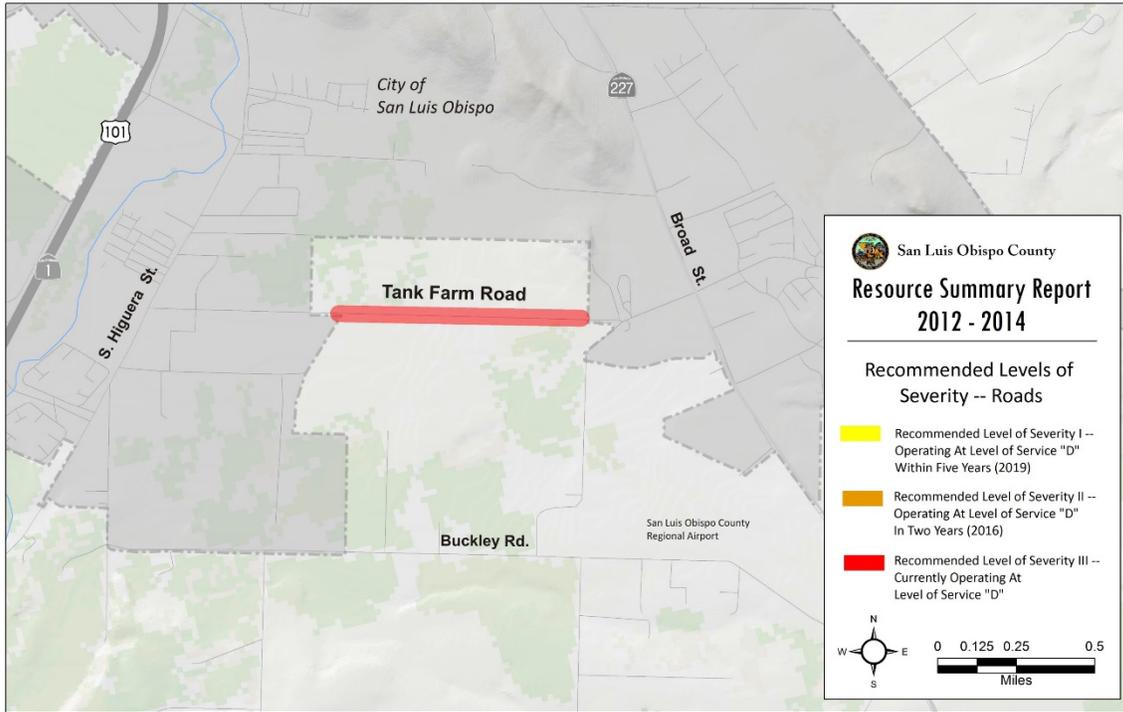
Roadway	Location	LOS "D" Volume	Peak Hour Volumes		
			2014	2016	2019
South Bay Boulevard	South State Park Road	967	1135	1181	1253

Source: San Luis Obispo County Department of Public Works, 2014

1. Volumes that exceed Level of Service "D" are shown in bold.

The Los Osos Circulation Study recommends widening South Bay Boulevard from Los Osos Valley Road to the Urban Reserve Line. Funds from Los Osos Road Improvement Fees are necessary to fund the widening; however, traffic impact fees which would fund the project are not being generated due to the prohibition on new development in much of Los Osos. As a result, there is no funding currently available for the project and the current traffic volumes indicate South Bay Boulevard is currently operating at Level of Service "D". **Recommended Level of Severity III.**

Tank Farm Road West of Highway 227



Roadway	Location	LOS "D" Volume	Peak Hour Volumes		
			2014	2016	2019
Tank Farm Road	West of Highway 227	1152	1896	1973	2093

Source: San Luis Obispo County Department of Public Works, 2014

1. Volumes that exceed Level of Service "D" are shown in bold.

The City of San Luis Obispo is planning to widen this portion of Tank Farm Road to four lanes as part of the Airport Area Specific Plan. In the meantime, current traffic volumes indicate Tank Farm Road is currently operating at Level of Service "D". **Recommended Level of Severity III.**

Other Roadways

All other roadway segments monitored for the RMS are expected to operate at Level of Service "C" for the foreseeable future.

Levels of Severity for HWY 101 Interchanges

The following table contains Levels of Service for existing conditions (2014) and buildout conditions for Highway 101 interchange operations in the Avila Beach, South County and Templeton areas. The analysis was derived from area Circulation Studies which are typically updated every five (5) years. The objective of the Circulation Studies is to forecast future capacity demands on the transportation system and to identify the roadway improvements necessary to correct deficiencies. A key element of the studies is defining the necessary Capital Improvement Program (CIP) project and development of Road Improvement Fees (RIF) to support the program. The studies are located at:

<http://www.slocounty.ca.gov/PW/Traffic/TrafficStudies.htm>.

The interchange analysis assesses conditions over a 10-year period because improvements to the operation or efficiency of an interchange can take between 10 and 20 years to coordinate with Caltrans, acquire right-of-way, complete construction documents, secure funding and seek stakeholder buy-in. Therefore, it has been prudent for Public Works to plan for these kinds of improvements under conditions estimated to occur at buildout of the General Plan. County Public Works is currently working on the Avila Valley and South County Travel Demand Model and Circulation Study updates which will be completed in Fiscal Year 2014-15. The Templeton Travel Demand Model and Circulation Study may be updated in 2015.

Table IV-3 -- RMS Interchanges Levels of Service					
US 101 Interchange	Existing Levels of Service		Buildout Levels of Service		Source
	SB Ramps	NB Ramps	SB Ramps	NB Ramps	
State Highway 46 West	D	B	F	F	2009 Templeton Circulation Study
North Main Street	F	E	F	F	
Las Tablas Road	B	B	B	B	
Vineyard Drive	E ¹	D ¹	B	B	
San Luis Bay Drive	TBD	TBD	B	B	2007 Avila Valley Circulation Study
Avila Beach Drive	TBD	TBD	B	B	
Los Berros/Thompson	C	D	F	F	2006 South County Circulation Study
Willow Road	TBD				
Tefft Street	E	C	F	F	
US Highway 166	D	C	F	F	

Source: San Luis Obispo County Department of Public Works, 2014

Notes for Table IV-2:

1. The existing Level of Service at the interchanges improved to LOS "C" or better following completion of the Vineyard Interchange Project in 2009.

Based on the traffic volumes summarized above, the following interchanges are expected to experience Levels of Service that meet the RMS criteria for Levels of Severity:

Table IV-4 -- Summary of Recommended Levels of Severity – Highway 101 Interchanges		
Interchange	Community/ Planning Area	Recommended Level of Severity
State HWY 46 West, SB ramps	Templeton area	III
North Main Street SB and NB ramps	Templeton	
Los Berros Road/Thompson Road NB ramps	South County	
Tefft Street SB ramps	Nipomo	
US HWY 166 SB ramps	South County	

Each of these interchanges is discussed below.

The following interchanges are projected to operate at LOS C or better for the foreseeable future:

Las Tablas Road

A widening and signalization project was completed at the interchange in 2006.

Vineyard Drive

The existing LOS E/D shown in the table was mitigated with the completion of the Vineyard Drive Interchange Project in 2009.

San Luis Bay Drive

The existing conditions analysis was not completed in the 2007 Circulation Study due to bridge construction over San Luis Creek which affected vehicle patterns. A 5-year circulation study is currently being prepared.

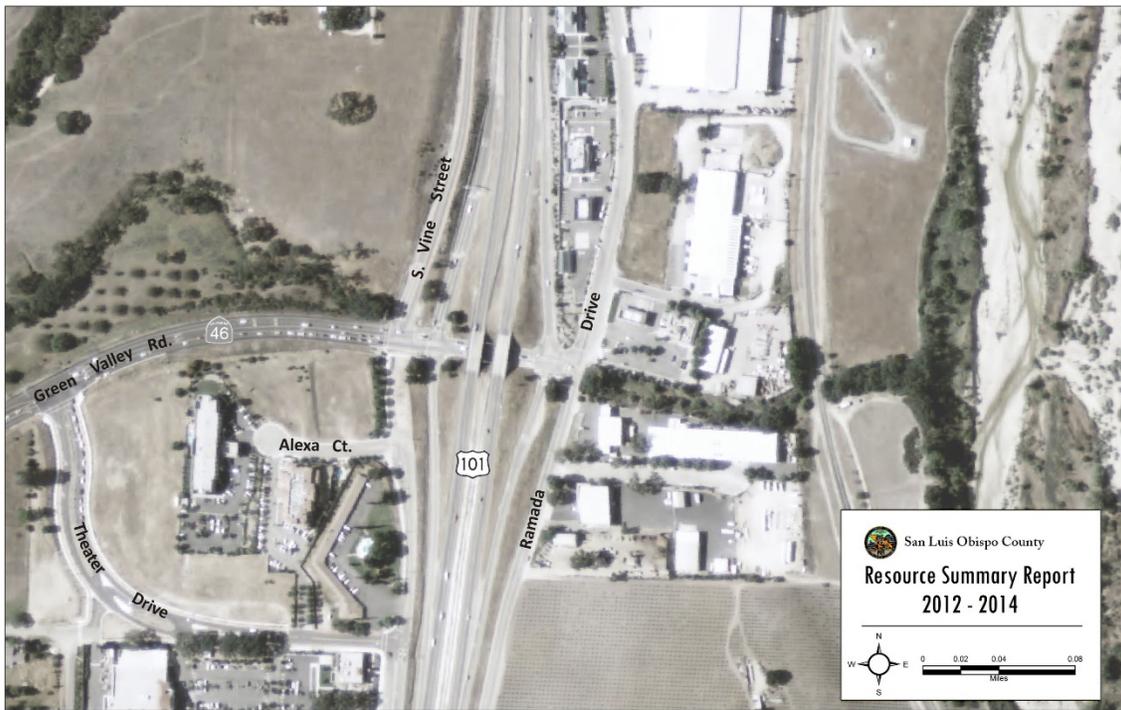
Avila Beach Drive

The existing conditions analysis was not completed in the 2007 Circulation Study due to bridge construction over San Luis Creek which affected vehicle patterns. A 5-year circulation study is currently being prepared. Caltrans will be taking the lead on identifying operational improvements.

Willow Road

Construction of the Willow Road Interchange was completed in late 2012. The South County Circulation Study update currently under preparation will analyze the existing and buildout Levels of Service. It is anticipated that the interchange will operate at LOS C or better based on studies completed prior to project construction.

US Highway 101/State Highway 46 West



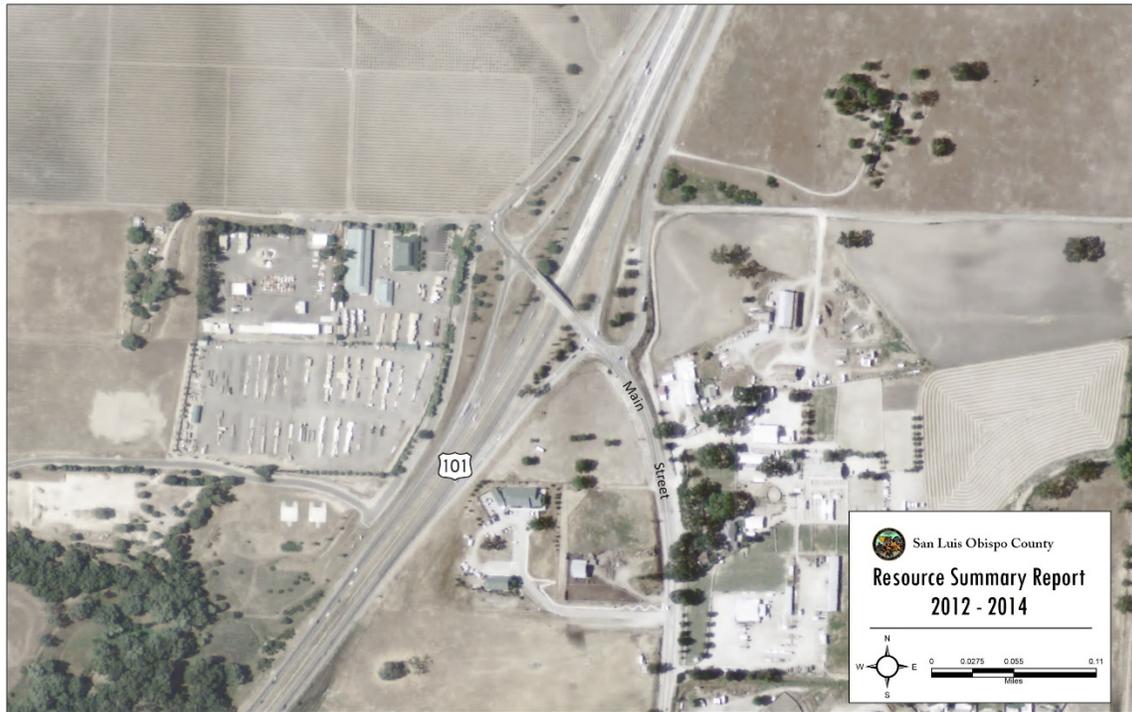
US 101 Interchange	Existing Levels of Service		Buildout Levels of Service	
	SB Ramps	NB Ramps	SB Ramps	NB Ramps
State Highway 46 West	D	B	F	F

Source: San Luis Obispo County Department of Public Works, 2014

The City of Paso Robles relocated Theater Drive, one of the western frontage roads, which has relieved some congestion. The Templeton Circulation Study has identified a CIP to modify the Highway 46 interchange and the program is collecting road impact fees. The City of Paso Robles

is the lead agency for any future interchange projects at this location. In the meantime, the SB ramps continue to operate at Level of Service "D". **Recommended Level of Severity III.**

US Highway 101/North Main Street (Templeton)



US 101 Interchange	Existing Levels of Service		Buildout Levels of Service	
	SB Ramps	NB Ramps	SB Ramps	NB Ramps
Main Street	F	E	F	F

Source: San Luis Obispo County Department of Public Works, 2014

Interchange improvements at this location are included in the Templeton Circulation Study. The Public Works Department is currently completing a study to determine the preferred alternative; however, no funding is currently available for project construction. Public Works is also working toward small operational improvements including the addition of a westbound stop sign on Main Street at Ramada Drive. **Recommended Level of Severity III.**

US Highway 101/Los Berros Road

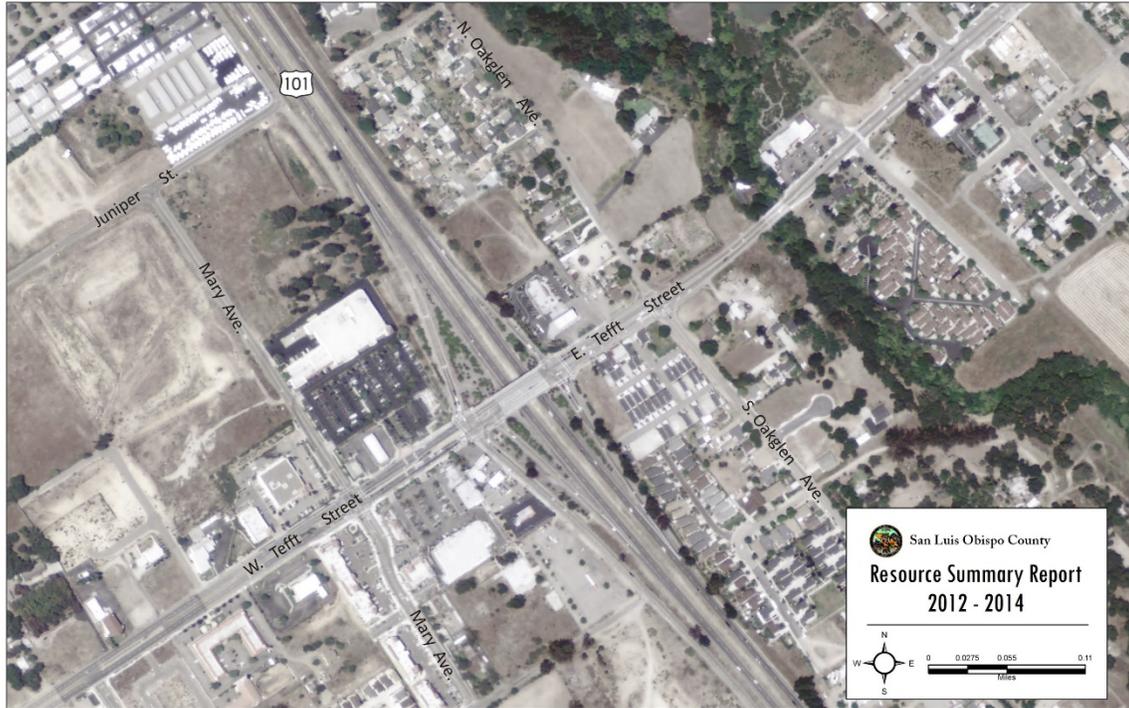


US 101 Interchange	Existing Levels of Service		Buildout Levels of Service	
	SB Ramps	NB Ramps	SB Ramps	NB Ramps
Los Berros/ Thompson	C	D	F	F

Source: San Luis Obispo County Department of Public Works, 2014

Signals at the northbound and southbound ramps are included in the South County Circulation Study. The study is currently being updated and will analyze the existing and buildout Levels of Service at the interchange following completion of the Willow Road Interchange. **Recommended Level of Severity III.**

US Highway 101/Tefft Street



US 101 Interchange	Existing Levels of Service		Buildout Levels of Service	
	SB Ramps	NB Ramps	SB Ramps	NB Ramps
Tefft Street	E	C	F	F

Source: San Luis Obispo County Department of Public Works, 2014

The South County Circulation Study contains projects to relocate the southbound ramps. The study is currently being updated and will analyze the existing and buildout Levels of Service at the interchange following completion of the Willow Road Interchange. **Recommended Level of Severity III.**

US Highway 101/State Highway 166



US 101 Interchange	Existing Levels of Service		Buildout Levels of Service	
	SB Ramps	NB Ramps	SB Ramps	NB Ramps
US Highway 166	D	C	F	F

Source: San Luis Obispo County Department of Public Works, 2014

Coordinate operational improvements with Caltrans; alternatives to consider may include roundabouts. However, no funding is currently available. **Recommended Level of Severity III.**

Summary of Recommended Levels of Severity Summary and Recommended Actions for Roads and Interchanges

The following table provides a summary of the recommended Levels of Severity for roadways and interchanges based on the criteria described above and in Chapter I.

Table IV-5 -- Recommended Levels of Severity For Roads and Interchanges			
Roadway Segment	Community/ Planning Area	Recommended Level of Severity	Recommended Actions
Avila Beach Drive west of San Luis Bay Drive	Avila Beach	I	Monitor Levels of Service on RMS roadways;
Price Canyon Road south of Highway 227	South County		Continue to use area circulation studies to identify roadway improvements necessary to achieve and maintain Level of Service "C" or better on RMS roadways and interchanges;
Halcyon Road south of Arroyo Grande Creek	Oceano	II	Use the area circulation studies to inform the assessment of levels of severity and to recommend action requirements;
Las Tablas Road west of Duncan Road	Templeton		Continue to establish and collect road impact fees (AB 1600 fees);
Los Osos Valley Road west of Foothill Boulevard	Los Osos/San Luis Obispo		Pursue other funding options including (but not limited to) State and federal grants;
South Bay Boulevard south of State Park Road	Los Osos	III	
Tank Farm Road west of Highway 227	San Luis Obispo		
Interchanges	Community/ Planning Area	Recommended Level of Severity	Recommended Actions
State HWY 46 West, SB ramps	Templeton area	III	Monitor Levels of Service on RMS interchanges;
North Main Street SB ramps, NB ramps	Templeton		Continue to use area circulation studies to identify roadway and interchange improvements necessary to achieve and maintain Level of Service "C" or better on RMS interchanges;
Los Berros Road/Thompson Road NB ramps	Nipomo area		Use the area circulation studies to inform the assessment of levels of severity and to recommend action requirements;
Tefft Street SB ramps	Nipomo		Continue to establish and collect road impact fees (AB 1600 fees);
US HWY 166 SB ramps	Nipomo area		Pursue other funding options including (but not limited to) State and federal grants;

The table below compares the recommended Levels of Severity for roads from the 2010-2012 RSR with those recommended for 2012-2014. Roadways shown in bold italics represent changes recommended in 2014. By applying the revised criteria for Levels of Severity described in Chapter I, three new roadways have been added: Avila Beach Drive, Price Canyon Road and Las Tablas Road. Halcyon Road has been revised upward from LOS I to LOS II and Los Osos Valley Road has been revised downward from LOS III to LOS II. Levels of Severity for South Bay Boulevard and Tank Farm Road are unchanged.

Table IV-6 -- Comparison of Recommended Levels of Severity For Roadways 2010-2012 RSR and 2012-2014 RSR		
Recommended Level of Severity	Recommended Roadways 2010-2012	Recommended Roadways 2012-2014
I	Halcyon Road	<i>Avila Beach Drive</i> <i>Price Canyon Road</i>
II	None	<i>Halcyon Road</i> <i>Las Tablas Road</i> <i>Los Osos Valley Road</i>
III	South Bay Boulevard Los Osos Valley Road Tank Farm Road	South Bay Boulevard Tank Farm Road

Changes shown in bold italics.

Interchanges were considered for the first time in the 2010-2012 RSR. The assessment was based on the measured *Levels of Service* for selected interchanges because *Level of Severity* criteria had not been adopted prior to publication. Since that time, Level of Severity criteria were developed and adopted for interchanges and included in this RSR (described above and in Chapter I).