

# Los Banos State Route 152 Comprehensive Operational Study June 2015

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# 1. Introduction

Implementation of the State Route (SR) 152 bypass of the City of Los Banos, delayed due to shortfalls in funding, requires an effort to address conditions on the existing alignment that continues through the City. Past commercial and residential development along the corridor hamper expansion of the facility to address current traffic volumes, while new development traffic and access points create additional conflict points and longer signal queues. Additional challenges arise in the geometrics of intersections with some local streets not laid out in grid pattern, resulting in askew intersections.

The route, while not technically a "Main Street" highway, passes through the City linking new housing development, large commercial enterprises, schools, and small business roughly parallel with the older downtown area. It also carries regional/interregional commercial, agricultural, and recreational traffic through to, and from, the central coast and southern San Francisco Bay area to SR 99 and beyond.

The study will seek to identify feasible operational treatments that will meet the needs of the people in Los Banos for a traversable multimodal facility and the near term needs of the interregional traveler for a route that is efficient without a degradation in safety. Caltrans is committed to supporting and encouraging multimodal and "active" transportation (human-powered), a healthy alternative to traveling in a vehicle by accommodating and enhancing connectivity for pedestrians and cyclists. Through Intelligent Transportation Systems (ITS) and operational improvement strategies, we can better operate and manage the current transportation system, restore lost capacity by improving throughput, reduce congestion and delay, and improve travel-time

reliability in a cost effective manner. The planning, hardware acquisition, and maintenance for multimodal integration of technology, data communication inter-operability, real-time data monitoring, and timely, accurate user information are included. The recommended strategies are intended to:

1. **Increase safety** – *preventing or reducing accidents and improving emergency response communications*
2. **Improve Operational Performance** – *maximizing capacity by improving throughput*
3. **Enhance Mobility and Convenience** – *reducing congestion*
4. **Improve Environmental Outcomes** – *reducing fuel consumption and emissions*
5. **Boost Productivity and Economic Growth** – *reducing travel times and fuel costs*

Finally, the study will facilitate the development of an investment strategy by identifying and prioritizing ITS and operational improvements along the route that are mutually beneficial to the interregional traveler and the City.

## 2. Existing Corridor Conditions

### Route Features and Classification

Within Merced County, SR 152 is comprised of two facilities—expressway for the route outside of the City of Los Banos, and conventional highway within the City limits. SR 152 (Pacheco Boulevard) within the City of Los Banos is currently comprised of four lanes and two-way left turn lane (TWLTL) for much of the segment, with multiple access points (stop-controlled intersections, and driveways), and has thirteen signalized intersections. Posted speed limits vary from 30 to 50 miles per hour (MPH). The portion of SR 152 that is expressway is, for the most part, access-controlled with fewer access points, and a posted speed limit of 55 MPH.

SR 152 is a principal arterial on the National Highway System (NHS), on the Freeway Expressway System, and the Interregional Road System (IRRS). It is a Surface Transportation Assistance Act (STAA) and Terminal Access truck route on the National Network.

Peak hour Level of Service (LOS) for the Los Banos segment is currently F. The expressway segments (outside of Los Banos) have an LOS above the concept LOS of C. By 2030, only one of the expressway segments will exceed the concept LOS.

Existing route facility features through the City are summarized in Table 1, page 3.

### Deficiencies and Needs on SR 152 within the City of Los Banos

Caltrans designated SR 152 as a high emphasis route on the IRRS with the intent to provide an expressway interconnection to urban places since 1996. The Los Banos Bypass Project (Bypass) addresses this goal. With funding shortfalls, and delays to implementation, interim solutions consistent with community visions and input are desired.

The current configuration of SR 152 in Los Banos is inimical to Caltrans commitment to complete streets and active transportation alternatives by having facilities that serve all travel modes including bicycle, pedestrian, and transit. The travel way is overcommitted to travel by automobiles and trucks at expense of cyclists, and pedestrians. Narrow shoulders (shoulder width is variable) along with high traffic volumes does not encourage the use of bicycles on SR 152 through Los Banos. Intermittent sidewalks along with crosswalks of seventy-five feet or longer present little incentive to travel by foot. Both bicycle and pedestrian LOS (obtained by ARTPLAN 2012) for the segment average an LOS of F.

Transit service along the corridor fares better, in part because of the proximity and extent of service hours produce an overall LOS of E (obtained by ARTPLAN 2012). This in part reflects available ridership and demand, and should improve as transit demand and ridership increases.

**Table 1. Summary Conditions**

St to St	PM	# of Lanes	Median	Parking	Bike Lane	Transit Stop	Sidewalk	Frontage LU	Access Pts.
College to Badger Flat	17.79/18.882	4	Partial	Off St.	No	Yes, off route	No	Ag, Open Space, Commercial	10 N, 10 S
Badger Flat to Ortigalita	18.882/19.268	4	Yes, raised	Off St.	No	Yes, off route	No N, Yes S	Ag, Open Space N Commercial S	6 N, 4 S
Ortigalita to W. I St.	19.268/19.618	4	At grade up to 19.364	Off St.	No	No	Yes, S to 19.481	Ag, Open Space N Commercial S	2 N, 6 S
W. I St. to Maryland	19.618/19.781	4	No	Off St.	No	No	Yes to 19.629	Commercial N/S	9 N, 9 S
Maryland to Iowa	19.781/19.830	4	No	Off St.	No	No	Yes N/S	Commercial N/S	5 N, 4 S
Iowa to Souza	19.830/19.901	4	No	Off St.	No	No	Yes N/S	Commercial N/S	5 N, 5 S
Souza to Paradise	19.901/19.930	4	No	Off St.	No	No	Yes N/S	Commercial/ Residential	2 N, 3 S
Paradise to Illinois	19.930/19.970	4	No	Off St.	No	No	Yes N/S	Commercial/ Residential	2 N, 4 S
Illinois to Arizona	19.970/20.028	4	No	Off St.	No	No	Yes N/S	Commercial/ Residential	4 N, 4 S
Arizona to Nevada	20.028/20.090	4	No	Off St.	No	No	Yes N/S	Commercial	5 N, 3 S
Nevada to California	20.090/20.186	4	No	Off St.	No	No	Yes N/S	Commercial/ Residential	4 N, 4 S
California to Center	20.186/20.253	4	No	Off St.	No	No	Yes N/S	Commercial/ Residential	3 N, 2 S
Center to 4 <sup>th</sup>	20.253/20.289	4	Yes, raised	Off St.	No	No	Yes N/S	Commercial	3 N, 3 S
4 <sup>th</sup> to 6 <sup>th</sup> St.	20.289/20.420	4	At grade	Off St.	No	No	Yes N/S	Commercial	5 N, 7 S
6 <sup>th</sup> to 7 <sup>th</sup> St.	20.420/20.590	4	None	Off St.	No	No	Yes N/S	Open N Commercial/ Residential S	4 N, 10 S

**Table 1. (continued)**

St to St	PM	# of Lanes	Median	Parking	Bike Lane	Transit Stop	Sidewalk	Frontage LU	Access Pts.
7 <sup>th</sup> (Ped. OC) to 9 <sup>th</sup> St.	20.598/20.749	4	None	Yes, S	No	No	Yes N/S	Commercial/ Park	3 N, 4 S
9 <sup>th</sup> to 10 <sup>th</sup>	20.749/20.870	4	None	Off St.	No	No	Yes N/S	Commercial	6 N, 7 S
10 <sup>th</sup> to J St.	20.870/20.916	4	None	Off St.	No	No	Yes N/S	Commercial	1 N, 4 S
J to 11 <sup>th</sup> St.	20.916/20.990	4	None	Off St.	No	No	Yes N/S	Commercial	4 N, 7 S
11 <sup>th</sup> to I St. & H St.	20.990/21.058	4	Yes, raised	Off St.	No	No	Yes N/S	Commercial/ Residential	4 N, 3 S
Los Banos H St. and I to 13 <sup>th</sup>	21.058/21.176	4	None	Off St.	No	No	Yes N/S	Commercial	3 N, 4 S
13 <sup>th</sup> to JCT SR-165	21.176/21.272	4	Yes, raised	Off St.	No	No	Yes N/S	Commercial	6N, 3 S
SR-165/Los Banos & RR Xing to Miller	21.272/21.610	4	Yes, partial raised	Off St.	No	Yes, off route	Yes N/S	Commercial	9 N, 10 S
Miller Ln. LT to Tanner Rd. RT.	21.610/21.680	4	Yes, raised	Off St.	No	No	Yes N/S	Commercial/ Residential	3 N, 5 S
Tanner Rd. RT. to Place Rd. RT.	21.680/21.761	4	Yes, raised	Off St.	No	No	Yes S	Commercial	1 N, 2 S
Place to Nickel	21.761/21.795	4	Yes, raised	Off St.	No	No	Yes N/S	Commercial/ Residential	1 N, 2 S
Nickel to Ward	21.795/22.252	4	Yes, raised and at grade	Off St.	No	Yes, off route	Yes, N to Ward; S to PM 21.977	Commercial/ Residential	8 N, 7 S
Ward to San Luis Canal	22.252/22.998	4	None	Off St.	No	Yes, off route	Yes, N PM 22.753 to 22.998; S to 21.977	Open Space/ Commercial	9 N, 9 S
San Luis Canal to Santa Fe	22.998/23.915	4	Expressway	Off St.	No	No	Yes, N PM 22.998 to 23.106	Residential/ Commercial/ Open Space	10 N, 5 S

### 3. Planned Corridor Improvements

#### Land Use

##### ***Merced County General Plan***

The Merced County General Plan designates land along SR 152 as Agricultural (A) up to Interstate (I)5 and Foothill Pasture (FP) from I-5 to Santa Clara County. The County defers to the City of Los Banos land use planning for area within their sphere of influence. Outside the City limits, the predominately rural context is intensively cultivated in A, and very low density, less intensive grazing land in FP.

Aside from farm to market activity, especially dairy, very little local traffic is generated in these land use designations. Minimum parcel size in A is 20 acres, and in FP, 160 acres (20-40 if previous zoning was A), minimizing access points along the route. Most of the pass through traffic is either travel to and from the City of Merced for services, or interregional, traveling to and from the South Bay Area and coast.

##### ***Los Banos General Plan (LBGP)***

Existing developed land uses along SR 152 are a mix of commercial, single-family residential, and vacant land. Agricultural land use occupies a majority (70%) of the acreage within the planning area. Single/Multi-family residential land use is a distant second at less than 10%, followed by Commercial/Industrial at 4%. In the incorporated area, less than 16% is agricultural, with housing at 32% and 9% Commercial/Industrial.

Future land use along SR 152 in Los Banos is designated primarily Commercial along the frontage, with low and medium residential behind the

commercial (see Map 1 next page). New development along the route consists of, primarily, commercial with a concentration of business development on the west end of town. At build-out, Agriculture at 22% remains the predominant land use, with Single/Multi-family residential comprising 12% of the land area and Commercial/Industrial 14%. 30% of the land area is undesignated but assigned "Other" and is presumed to include parks, roadways, and rail line.

Guiding policies in the Land Use Element reflect the City's desire for a pattern of growth that protects agricultural lands and its small town character, sustainability, and requires development mitigation for the costs of infrastructure, services, and transportation facilities. Implementing actions for community design policies specific to the SR 152/Pacheco Blvd. corridor are:

*LU-I-12 Promote pedestrian-oriented development in selected areas, including downtown, neighborhood centers, and Pacheco Boulevard corridor.*

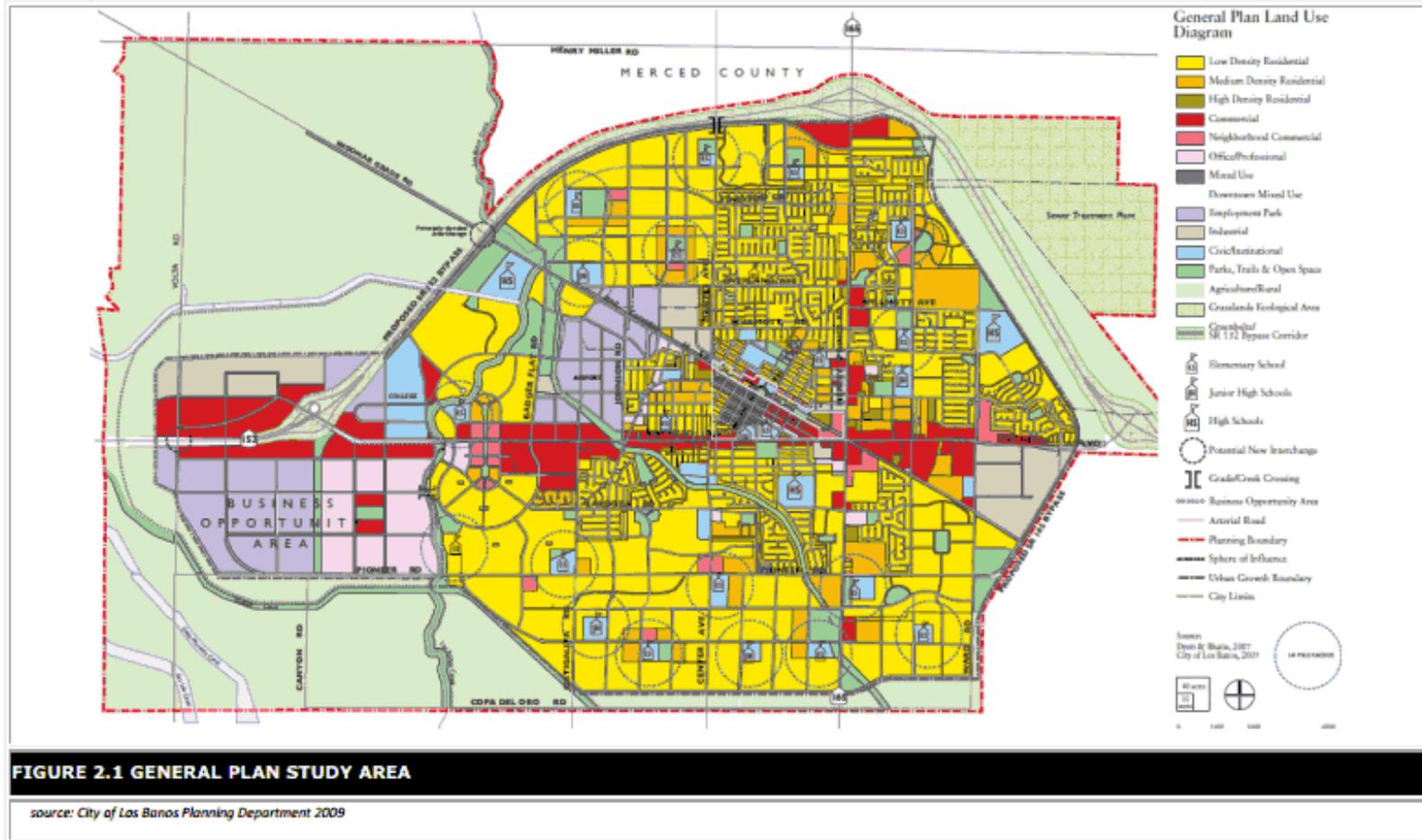
*LU-I-13 Require street trees on all public street frontages and adopt street guidelines that specify preferred species, spacing requirements and planting guidelines in coordinating with the Urban Tree Foundation.*

*LU-I-14 Establish a distinct design character for Pacheco Boulevard with signage, landscaping, designer poles, and other visual cues to provide a celebrated entrance into the City.*

*LU-I-18 Ensure that developments incorporate safety concerns into the site, circulation, building design and landscaping plans through the design review process.*

The subarea serves as a regional retail center accessible to local and regional shoppers on both sides of the corridor. The Plan seeks to phase out industrial and warehouse sites and relocate them to industrial and employment parks. It also seeks to minimize curb cuts along East Pacheco Blvd., requiring site access from side streets, if possible.

# Map 1. Los Banos General Plan Land Use



## Transportation

Several studies address current and future conditions on SR 152 within Los Banos.

### **1. *City of Los Banos Traffic Model and Transportation Master Plan (Master Plan, Prism Engineering, May 5, 2010)***

The *Master Plan* was developed to allow for evaluation of traffic operations and intersection turning movements at the micro-level of analysis, with the intent of developing a mitigation fee program presumably to partially fund local street intersection improvements with, or without, the Bypass. The traffic model employed attempted to develop a traffic scenario for the year 2030 with or without the Bypass. For 2025, the report has Pacheco Blvd. at LOS F without the Bypass (Although data is provided for LOS at intersections in Table 3.2 on page 18 of the *Master Plan*, this is presumed to be segment LOS). Proposed mitigation would be a widening to a six lane facility, for which there is no available right of way set aside for expansion in the urban corridor. Encroachment by commercial land uses renders expensive, and likely infeasible, the purchase of additional right of way.

A license plate survey estimated that 22% of total traffic found entering Los Banos on SR 152 on the City's western limits passed through the City to its eastern limits, but that this traffic was disproportionately trucks (69% of total traffic volume). A license plate survey for west bound traffic is not reported. Mitigation for future traffic impacts at intersections only considers the presence of the Bypass.

### **2. *2030 Merced County General Plan (Mintier and Harnish, December 10, 2013)***

The policies and mitigation reported for the Circulation Element of the *2030 Merced County General Plan (GP)* would apply to portions of SR 152 adjacent to the City of Los Banos, and possibly those land uses within the City's sphere of influence. *Policy CIR-1.5* identifies a minimal roadway LOS of 'C' for rural, and 'D' for urban areas and of connectors between urban areas. *Policy CIR-1.7* identifies a commitment to developing alternative transportation modes with new development. *Policy Cir-1.22* reports intent to develop new urban streets within urban communities in conformity with complete streets criteria (further elaborated in *Goals Cir-3, Cir-4, and Cir-5*). No specific discussion for Los Banos was identified.

### **3. *Regional Transportation Plan (RTP) 2014-2040 Sustainable Communities Strategy for Merced County (Merced County Association of Governments (MCAAG), 2014)***

The *RTP* contains policies consistent with the Circulation Element of the *GP*. A map of the regional road system on page 29 of the *RTP* shows the layout of the northern Bypass alternative. Two stages of the Bypass development are discussed on page 34, segment 1 and segment 2, as Tier 1 projects (financially constrained). A commitment to fund and implement Tier 1 projects is given on page 35. The Bypass is included as a component of corridor preservation (page 38) specific to the new alignment (this list includes projects not included in the Tier 1 and Tier 2 lists). A discussion on Active Transportation is provided (pages 51-56). Mention is made of the

*Los Banos Bicycle Plan (2006)*, however, bikeways are only mapped for the City of Merced. Projects and needs particular to any other jurisdiction are left unspecified.

A discussion of Sustainable Communities Strategy is provided (pages 60-64) that identifies county-wide expenditures for transit (\$326 million) and non-motorized transportation (\$110 million) under all scenarios, but does not specify allocations (For bicycle paths, these may be included in the *Merced County Regional Bicycle Transportation Plan (2008)* which identifies a priority project for SR 152 to create a Class II Bike Lane from Mercey Springs Road (SR 165) to the Main Canal: for transit, *San Joaquin Valley Express* (Nelson and Nygaard Consulting, 2009) indicates plans for a transit center in Los Banos, and a transit market from Los Banos to San Jose/Silicon Valley by 2030).

#### 4. ***Los Banos 2030 General Plan Circulation Element***

The Circulation Element, like the *LBGP*, describes policies and mitigations for traffic-related impacts to the *LBGP* proposed population growth and land use changes. Specific information may be obtained regarding the SR 152 in Los Banos. Table 4-4 (pages 4-8) summarizes intersection operations for 2006 (Source, Omni Means), and provides planned improvements to the systems limited to increasing capacity (Table 4-5), with Table 4-6 (pages 4-10) summarizing roadway level of service with or without the improvements. What is notable about Table 4-6 is that the roadway level of service without improvements appears to exceed concept LOS for the facility with the exception of the portion of Pacheco Blvd. between Ortigalita Road and 'I' Street which is reported to

operate at LOS F. Much of the model of future conditions anticipates development in the southwest quadrant of the City's sphere of influence (delineated as east of Volta Road, south of Pacheco, west of Los Banos Creek, and north of Pioneer Road or the San Joaquin/Kings River. Information on transit routes and use appears out of date (It reports five fixed route when only three are in operation at present, and no mention of a planned transit center.). The 2006 *Bicycle Plan* is cited. A proposed bike lane is depicted on Figure 4-5 (pages 4-21) that follows Pacheco Blvd. west from the proposed bypass to where it diverges near Ramos Road northwestwards. No pedestrian plan is mentioned. No specific mention of Pacheco is made in the discussion of truck routes and goods movement.

#### 5. ***State Route 152 Transportation Concept Report (2005)***

The document reports a LOS of 'B' on Pacheco Blvd. (Segment 4, Los Banos Creek to Santa Fe Grade) within Los Banos, and does not provide a future facility LOS, but reports the Bypass instead. It reports seven traffic signals along the route. Included is mention of the *Los Banos Access Management Plan* for SR 152 that was executed in 2003. It contains no specific mention of transit, bicycle, or pedestrian projects to address needs affiliated with Pacheco Blvd.

#### 6. ***Los Banos Access Management Plan (LBAMP, 2004)***

The *LBAMP* proposed a coordinated series of operational improvements specific to Pacheco Blvd. and Mercey Hot Springs Road to control traffic movement on SR 152 and SR 165 within the City of Los Banos. The *LBAMP* bases its recommendations

on the traffic study performed for the Bypass. The *LBAMP* proposes installation of raised median barriers; several traffic signals beyond the six or seven that were originally present; converting intersections to right in, right out; creating stop controlled intersections on feeder streets intersecting the State highways; signal synchronization; and provides design criteria for both highways. Uniform standards for driveway access and

interval are not provided, and are to be addressed on a case by case basis in an encroachment permit review process.

The *LBAMP* is subject to update and revision with the updates of the *LBGP*. Based upon review, many of the proposed improvements have yet to been performed.

### Planned and Programmed Projects

Few projects are planned (see Table 2) for the route due to the need for an alternative alignment to meet concept LOS, design standards, and multimodal needs. Interim improvements are planned to address Americans with Disabilities Act (ADA) access (Tables 3 and 4).

**Table 2. Planned and Programmed Projects**

Post Mile	Location	Description
R0.0-R 40.8	SR-152 to Madera County line at various locations	ADA Curb Ramp Minor Sidewalk ramps
R22.3-R 25.8	From e/o Santa Fe Grade Rd. to SR-165 s/o Henry Miller Rd.	Los Banos Bypass Phase I - New Four Lane Expressway
16.0-R 26.2	From w/o Volta Rd. to SR-165 s/o Henry Miller Rd.	Los Banos Bypass Segment II - New Four Lane Expressway
16.0-26.9	From Santa Clara County line to Madera County line	Los Banos Bypass Segment III - Freeway Conversion with Three Interchanges

**Table 3. ADA Curb Ramps Needs East of SR-165**

ADA Curb Ramp Needs	
Intersection Location	Corner
Badger Flat Road	SW, SE
Ortitalita	SW, SE
West I Street	SW, NW, SE, NE
Maryland Avenue	NE, NW
Iowa Avenue	NW, NE
Paradise Lane	SW, SE
Illinois Avenue	NW, NE
Arizona Avenue	NW, NE
California Avenue	NE
Center Avenue	SW, Mid-block, SE
4 <sup>th</sup> Street	SW, Mid-block, SE, NE
6 <sup>th</sup> Street	SW, NW, SE, NE
7 <sup>th</sup> Street	NW, SW, NE, NW
Ninth Street	NW, NE
S/O 10 <sup>th</sup> Street	SW, SE
J Street	NW, NE
11 <sup>th</sup> Street	SW, SE
H Street	Midblock, NW, NE, Midblock, NE

**Table 4. ADA Curb Ramps Needs West of SR-165**

ADA Curb Ramp Needs	
Intersection Location	Corner
Mercey Springs Road (SR-165)	NW, SW, NE, SE
Place Road (PM 21.739)	NE
Home Depot Entrance	SW, SE
Place Road (PM 21.822)	SE
Shopping Center locations (PM 21.858, PM 21.873)	Mid-Block, Mid-Block
Nickel Street	SW, SE
Shopping Center locations (PM 21.917, PM 21.934)	Mid-Block, Mid-Block
Entrance (PM 22.059 & PM 22.074)	Mid-Block, Mid-Block

## 4. Multimodal Access Issues

### Overview

#### ***Complete Streets Act (AB 1358)***

As cities and counties update their general plan circulation elements, AB 1358 requires them to identify how they will provide for the routine accommodation of all users of the roadway, including pedestrians, bicyclists, individuals with disabilities, seniors and public transit users, in addition to motorists.

#### ***State Complete Streets Policy (DD-64-R1)***

The California Department of Transportation (Department) provides for the needs of travelers of all ages and abilities in all planning, programming, design, construction, operations, and maintenance activities and products on the State highway system. The Department views all transportation improvements as opportunities to improve safety, access, and mobility for all travelers in California and recognizes bicycle, pedestrian, and transit modes as integral elements of the transportation system.

The Department develops integrated multimodal projects in balance with community goals, plans, and values. Addressing the safety and mobility needs of bicyclists, pedestrians, and transit users in all projects, regardless of funding, is implicit in these objectives. Bicycle, pedestrian, and transit travel is facilitated by creating “complete streets” beginning early in system planning and continuing through project delivery and maintenance and operations. Developing a network of “complete streets” requires collaboration among all Department functional units and stakeholders to establish effective partnerships.

### Access Strategy

Access management preserves the functionality of major arterials to safely move traffic at higher speeds. This can be accomplished by increasing the spacing between intersections and signals, employing median treatments and turn lanes, and minimizing driveway access points. Roundabouts can also reduce conflict points and may be appropriate at some intersection locations where there is adequate right of way and under certain conditions. The benefits of these techniques include improved traffic flow, fewer points of conflict and reduced accidents.

Given the available right of way and local context, and the difficulty of closing existing driveways, operational improvements are the most effective way to reduce the impact of congestion and manage the effect of development along the frontage. There are no plans to meet the concept facility by increasing capacity along the existing alignment. Until an alternative route is constructed around the City, access management remains the most important tool to reduce accidents and conflicts points and improve traffic flow.

Access points along the route vary from 20 to 102 per mile (Table 5). In addition to lowering speed and increasing congestion, in general, there is a strong relationship between the number of access points and the number of crashes according to research done by the Transportation Research Board (Table 6). Operation of the existing facility could be enhanced by exploiting all opportunities for consolidation of existing driveways, and the restriction or limiting of new access to help prevent further deterioration. In Chapter 6, the replacement of two-way left turn lanes with medians and providing more opportunities to make U-turns is proposed to alleviate some of the conflict points.

**Table 5. Access Points/Mile**

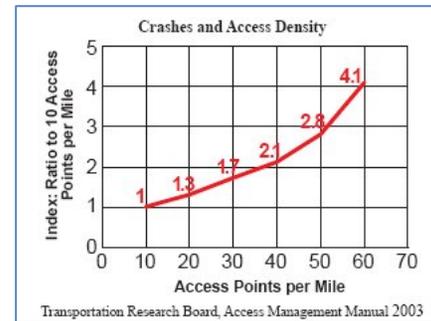
Post Mile	Location	Access Points North/South
17.79-18.82	College to Badger Flat	10 N / 10 S
18.82-19.83	Badger Flat to Iowa	22 N / 23 S
19.83-20.87	Iowa to 10th	46 N / 56 S
20.87-21.795	10th to Nickel	32 N / 40 S
21.795-22.998	Nickel to San Luis Canal	17 N / 16 S

## Network Mobility/Connectivity

Map 2, on the next page, illustrates the existing bicycle, pedestrian, and transit facilities serving the community along SR 152. Although sidewalks are provided along most of the route, the area is not particularly "walkable" due to the scale of commercial development along a principal arterial. The existing commercial area consists of large box stores, and even larger parking lots, as well as strip malls spread out along the corridor. On street bus turnouts are not provided, likely due to the distance of the shopping destination from the street. Transit busses offload in the parking lots, getting passengers closer to their destinations, relieving the need for bus stops or pullouts along the route and the resulting delay to other vehicles.

While bicycle travel is not prohibited, the facility lacks the width needed to provide dedicated bike lanes. Although there are many local bike routes, none parallels the corridor due to side street alignment. It is suggested that the City provide a means to get across the town from east to west and connect with the State highway where there is room

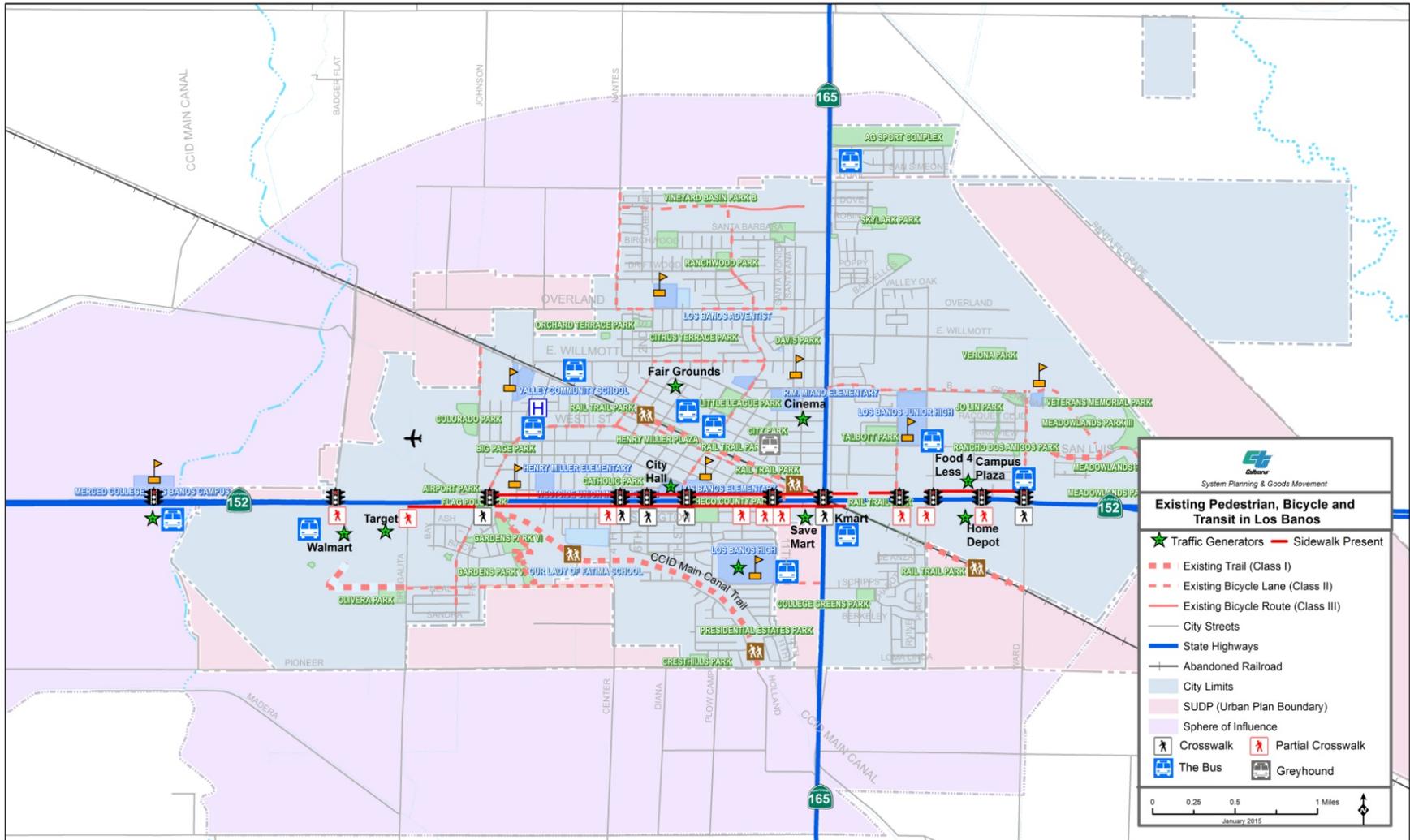
**Table 6. Crashes and Access Density**



for a dedicated bike lane. Otherwise, bicycles will have to occupy a lane as a vehicle, according to AB 1371, known as the Three Feet for Safety Act. The law requires motor vehicle drivers passing a bicycle that is proceeding in the same direction to pass with no less than three feet between any part of the vehicle and any part of the bicycle or driver. If this is not possible, the motor vehicle must slow down and pass when no danger is present. A car or truck following a bicycle will further slow traffic operating at or near the speed limit to that of the bicycle, as under congested conditions, there will be little opportunity to move into another lane.

Numerous signalized intersections and crosswalks allow cars, bikes and pedestrians to traverse the highway. Additional overcrossings should be provided in areas with the greatest concentration of foot traffic, especially school routes. Although not popular with walkers because of the extra effort required to elevate above the street, ADA compliant designs have ramps that are easier to negotiate for all age groups.

Map 2. Existing Bicycle, Pedestrian, and Transit Facilities



## 5. Street Design and Caltrans' Standards

For State Highways, the accepted design criteria are contained in the *Highway Design Manual (HDM, Sixth Edition)*. These design criteria are meant to fulfill State and federal guidelines, while fulfilling complete streets and active transportation policies. Table 7 below compares the physical dimensions of Pacheco Blvd. to the highway design standards laid out in the current *HDM*. For most of the criteria listed, Pacheco

Boulevard meets or exceeds these criteria with two exceptions: shoulder width of 8 feet is desirable for bicycle lane accommodation, while the current facility only provides 3; and, the radius required for 'U' turns needs to be 50 feet or greater, but is less than 50 feet in most locations.

**Table 7. Design Standards**

Configuration	Caltrans' Design Standards*	Existing Facility
Travel Lane Width	12' min.	12'
TWLTL Width	14' min.	14'
Raised Curb Median Width	14' min.	14'
Shoulder Width (bike lane accommodation)	8'	3'
Sidewalk Width	5' /planting strip, 6'/contiguous curb	None or 5'-8'
Corner Bulb-outs	4' min.	NA
U-turn Radii	50'	<50'
Mid-block Pedestrian Crossing	signalized	None
Bike Lane	5' min.	NA
Design Speed/ Speed Limit	[PM 18.8-19.6, PM 21.8-22.31] 50	45
Design Speed/ Speed Limit	[PM 19.6-21.8] 40	35
Roadside Trees- more than 4" dbh	30' from traveled way FWY/EXWY, 20' HWY <35mph-- 18" from curb, or barrier	Various locations
Median Trees- more than 4" dbh	Posted speed: <35 mph-- 5' from curb, or barrier <45 mph--barrier, >45 mph--not allowed	None

\*Table 7 summarizes design standards and is intended to be a rough guide for considering roadway design options. For a complete discussion of standards, alternative treatments, and exceptions, please consult the latest edition of the *Highway Design Manual*.

## 6. Corridor Operations and Management

### Overview

Proposed traffic improvements coupled with incident warning systems are intended to improve the passage of traffic under high volume conditions, or to allow efficient management of traffic under adverse conditions such as accidents or poor weather conditions. The intent is to maintain or reduce existing traffic congestion and to improve safety conditions along the corridor until the Bypass may be completed.

Benefits from these improvements can be measured in reductions of travel time, fuel consumption, air pollutant emissions reduction, and costs to the users of the system. The specific goals are to

- minimize stops and delays
- minimize queue lengths
- provide adequate crossing time for bikes and pedestrians
- improve the reliability of interregional travel
- reduce the impact of traffic incidents

Specific treatments include raised medians, limiting access, facilitating U-turns, consolidating crosswalks, optimizing signal timing, enhancing walk-ability for all pedestrians, identifying alternate bicycle routes, and incorporating appropriate ITS elements.

Costs estimates for a raised median/intersection widening, if broken up by intersection, would be in the range between \$280,000 and \$1 Million (Minor A–mid range). Driveway closure would likely be under \$280,000

(Minor B–low range), and all driveway improvements could be combined into one single project. Combining two or more intersection improvements along with raised median, project costs would easily rise into the \$1 Million range (Major–high range).

To prioritize the operational improvements from high to low for effectiveness and cost it is suggested that the highest priority would be signal timing adjustment to get the most benefit out of the existing signal system with little to no investment. The next highest priority would be installation of raised median combined with intersection widening as they would have to be completed simultaneously. Finally, a consolidation of driveways would be addressed.

Alexander Skabardonis presented a paper at the 80<sup>th</sup> Annual Transportation Research Board Meeting, *ITS Benefits: The Case of Traffic Signal Control Systems (2001)*, which found an estimated benefit to cost ratio of 17:1, from an evaluation of optimizing traffic signal timing plans, coordinating traffic signal control, and implementing adaptive signal control at locations through the State of California. This was done for the Fuel-Efficient Traffic Signal Management Program (FETSIM) between 1983 and 1993, and involved 163 local agencies and 334 projects. Although somewhat dated, the research suggests a very favorable return on investment for projects of this type, as well as an average of 7.7 percent drop in travel time, 13.8 percent reduction in delay, 12.5 percent reduction in stops, and 7.8 percent decline in fuel use.

## Proposed Improvements

### ***Roadway Design Elements***

District 10 Office of Traffic Operations explored various proposals along SR 152, within the City, which will help improve traffic operations of intersections along this route. A range of alternatives have been listed based on location and range from little or no improvement to intersection reconstruction. Most of the proposals will help improve traffic flow by reducing the number of vehicle conflicts at intersections and driveways and maximizing signal timing throughout the segment. These include optimizing and coordinating traffic signal timing, modifying pavement striping, closing/restricting certain driveways that are redundant, unnecessary, or significantly affect traffic operations, constructing raised medians, and intersection widening to accommodate u-turns.

The locations and potential improvements are listed below:

- 1. Between Badger Flat Road (PM 18.882) and Ortigalita Road (PM 19.268)**
  - Modify the existing pavement marking in the eastbound direction to convert the eastbound trap lane to a right turn lane
- 2. Between Ortigalita Road (PM 19.268) and West I Street (PM 19.618)**
  - Raised median to begin 500' east of S. Ortigalita Road (PM 19.364) and end at West I Street.

- On the south side (shopping center with 3 existing driveways), close westerly driveway, convert middle driveway to right in/out, and exclude left out on easterly driveway (left in only).
- 3. West I Street (PM 19.618)**
    - Widen NW and SE corners to accommodate U-turns
    - NE corner, close westerly driveway
  - 4. West I Street (PM 19.618) to Maryland Avenue (PM19.781) north side T**
    - Raised median with back-to-back left turns
  - 5. Maryland Avenue (PM19.781) north side T**
    - Widen NW corner to accommodate U-Turns
  - 6. Illinois Avenue (PM 19.970) north side T to Arizona Avenue (PM20.028) north side T**
    - Raised median with back-to-back left turns
  - 7. Arizona Avenue (PM20.028) north side T**
    - Widen NW corner to accommodate U-turns
  - 8. Arizona Avenue (PM20.028) north side T to Nevada Street (PM20.090) 4 legged**
    - Raised median with back-to-back left turns

**9. Nevada Street (PM 20.090)**

- Widen NW corner to accommodate U-turns

**10. 4<sup>th</sup> Street (PM 20.289)**

- Widen SE corner to accommodate U-turns

**11. 4<sup>th</sup> Street (PM 20.289) to 6<sup>th</sup> Street (PM 20.420)**

- Raised median with back-to-back left turns

**12. 6<sup>th</sup> Street (PM 20.420)**

- Widen NW corner to accommodate U-turns

**13. 9<sup>th</sup> Street (PM20.749) north side T**

- Cul-de-sac, traffic to use J Street

**14. Driveway approximately 200 feet east of SR-165/152 (PM 21.385) to Miller Lane (PM21.610)**

- Construct raised median, left turn into shopping center on NE corner to remain

**15. Miller Lane (PM21.610) north side T**

- Widen NW corner to accommodate U-turns

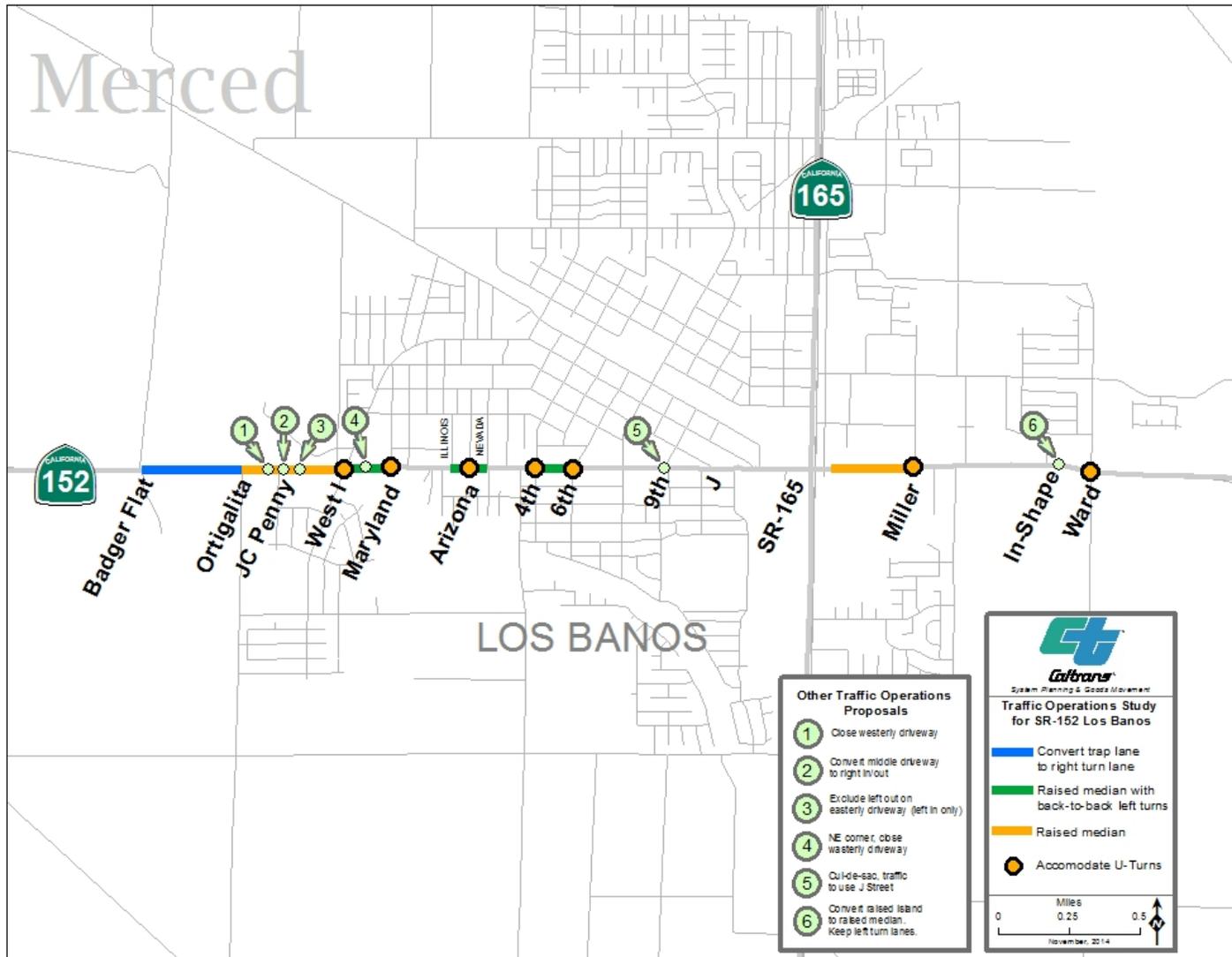
**16. Driveway approximately 400 feet west of Ward Road (PM 22.174) to Ward Road (PM 22.252)**

- Convert painted raised island to raised median, left turn into shopping center on the north, to remain, and left turn into Rancho Drive to remain.

**17. Ward Rd (PM 22.252)**

- Allow WB U-turns, currently they are prohibited

Map 3. Proposed Operational Improvements (Median and Turn Lanes)



### ***Signal Timing Optimization and Coordination***

Optimization and coordination of the signalized intersection helps manage the demands of vehicles and pedestrians in an optimal manner and is the most cost effective way to improve traffic flow, as no upgrades are necessary. In addition, signal coordination improves the traffic flow on a corridor by synchronizing the start of the “green light” so that a group of vehicles, or platoon, can travel together through a series of signals with minimal or no stopping. This least restrictive timing has the following advantages:

- Improves traffic flow through a group of signals
- Reduces the overall delay time at an intersection
- Reduces motorist frustration by reducing stops and delay
- Reduces response time for bus service and emergency vehicles
- Lowers air pollution/vehicular emissions
- Reduces gasoline consumption

### ***Access Control and Raised Medians***

In addition to signal timing optimization and coordination, there are access management strategies that can significantly improve the operations of the corridor. A very effective strategy consists of managing the number and location of access points that cause mainline traffic flow interruption. A conflict point is described as the point at which a roadway user can cross, merge, and diverge with another roadway user. A four-legged intersection has as many as 32 conflict points. This number is greatly reduced by the installation of a raised median to restrict certain left turn movements. With a lower number of

conflict points, drivers have less trouble maneuvering through traffic and have less difficulty entering the roadway.

Driveway turning movements can be restricted by replacing the existing TWLTL with a raised median. Driveway restriction is a proven and effective way to reduce conflict points and can be done with minimum disruption to existing access. Managing driveway access may cause minor inconvenience to a few vehicles, however, it will help reduce the number of conflict points, which in turn improves traffic operations for the majority of the vehicles using the facility. In addition, the removal of unnecessary driveways, especially those that are close to the influence area of an intersection and other nearby driveways, helps reduce the number of decisions a driver must make. This is especially important as drivers not only need to be aware of other vehicles, but also bicyclists and pedestrians. Good access management practices will help improve operational performance and improve overall safety.

Based upon the *California Manual on Uniform Traffic Control Devices (CA-MUTCD, 2012 Edition)*, a condition for installing raised medians to replace TWLTLs is when average daily traffic (ADT) exceeds 20,000 vehicles. Currently, SR 152 has a capacity at, or higher than, the threshold. A study conducted in La Grande, Oregon, with an average annual daily traffic (AADT) of 17,200 (5 lanes), demonstrated that operations deteriorate as the driveway density increases, which in turn causes the number of accidents to rise and based on the Transportation Research Board’s (TRB) *National Cooperative Highway Research Program (NCHRP) Report 420*, most studies, and the models derived from them, also suggest that safety is improved where physical medians replace TWLTL’s.

Raised medians have a number of advantages over TWLTLs:

- reduce the number of head on, angle, left turn and right turn crashes, as the number of conflict points are reduced
- restrict certain movements into and out of driveways to improve operations
- raised medians improve average speeds for through traffic and have delays similar to TWLTL's

Driveway consolidation is another method of avoiding conflicts on the corridor reducing the need for drivers to slow down or stop for multiple entry points, improving overall operations and reducing delay. *On* multilane roads, speeds drop 0.25 mph per access point and speeds can be up to 10 mph lower for every 40 access points per mile.

The removal of driveways is especially important at locations where the driveway is located within the influence area of a signalized intersection. Such access points are detrimental to the operation of the signal, negatively impacting the overall intersection operation by disrupting traffic flow, affecting platooning and the overall synchronization of the signal system. As a result, the overall traffic throughput is decreased and the removal of such driveways should be a priority.

The implementation of raised medians is not possible without providing U-turns at signalized intersections. Various intersections have been identified as good candidates for widening to accommodate U-turns for segments where raised medians have been proposed. Although a wider facility is needed to accommodate the turning vehicles, and parking areas may need to be reduced, the provision of U-turns at signalized

intersections, along with raised medians, result in improved operations and lower accident rates than TWLTLs and prohibited-left-turn corridors.

## **CROSSWALKS**

Reducing the number of crosswalks per intersection on SR 152 will help reduce conflicts and at signalized intersections will allow for more green time (approximately 30 seconds) to be allocated to vehicles. It is recommended that crosswalk configuration be modified at the following intersections:

- 1. West I Street (PM 19.618), existing crosswalk on all 4 sides**
  - Remove westerly crosswalk
- 2. 4<sup>th</sup> Street (PM 20.289), existing crosswalk on all 4 sides**
  - Remove easterly or westerly crosswalk
- 3. 7<sup>th</sup> St (PM 20.590) existing crosswalk on all 4 sides and pedestrian overcrossing**
  - Remove easterly or westerly crosswalk

The safest way to allow connectivity across the highway is with pedestrian overcrossings. These are especially prudent in areas where there are residential neighborhoods on one side of the route and schools on the other such as 4th and 11th Streets.

Map 4. Proposed Operational Improvements (Crosswalks)



## ***Intelligent Transportation Systems (ITS)***

As traffic volumes increase and congestion becomes more prevalent, the use of ITS to manage corridors becomes more important. ITS elements use sensing and communication to send and receive real-time information between vehicles, infrastructure, centralized transportation operation and management centers. This information can be used to develop operational strategies for use on existing transportation facilities. Upgrading infrastructure can be costly and can affect the environment, so employing ITS elements and using existing infrastructure is a cost effective way to improve the transportation system so that maximum benefit can be attained. ITS elements that would be beneficial to this segment include:

- Changeable Message Signs (CMS)
- Highway Advisory Radio (HAR)
- Closed Circuit Television (CCTV)
- 511 Service
- Weather Stations
- Traffic Monitoring Stations (TMS)
- Extinguishable Message Signs (EMS)
- Fiber optic lines
- Maintenance Vehicle Pullouts (MVP)
- Roadside Weather Information System (RWIS)

Specifically, the Traffic Management Branch recommends two CMS units, two CCTV cameras, two MVPs, eight TMSs, and one RWIS in each direction on the existing SR 152 corridor within Los Banos. Together, these elements make up an Automated Warning System (AWS)

comprised of a total of four CMS units, four CCTV cameras, four MVPs, sixteen TMSs, and two RWISs for both directions. Specific locations of these elements are to be determined during the project development process, as the project scope and configurations are defined.

The benefits of implementing these ITS elements are:

1. to provide real-time video feedback of traffic conditions and weather conditions to our Traffic Management Center (TMC) for better traffic and roadway monitoring;
2. to provide real-time messaging to the travelling public traffic and weather conditions allowing system users the ability to plan accordingly to avoid incidents or congested areas, reducing traffic delay or prevent secondary accidents;
3. help TMC respond to incidents and congestion more quickly and dispatch traffic management (TMT)/emergency response teams, or CHP to remove incident's elements from the roadway to reduce potential congestion, or shorten congestion time;
4. and to enhance the highway operations to full capacity.

## ***Traffic Signal System***

There are thirteen signals along SR 152 through Los Banos. Locations and configuration are listed in Table 8 on the next page. Only the signals at 4<sup>th</sup>, 6<sup>th</sup> and 7<sup>th</sup> streets are coordinated. There are no fixed time signals on this corridor. All are traffic responsive.

As noted previously, the optimization and coordination of signals is the most cost effective way to improve traffic flow, reducing travel time and emissions on the route. However, coordination only works when vehicle platoons can move with minimal egress and ingress along the route. A signal engineer visits/observes signals at least once per year to ensure that the signal timing plans are reflective of current traffic conditions. At the present time, it appears that there is no consistent congestion occurring and public complaints are minimal.

Signal timing has been optimized as much as possible through the corridor, given the existing equipment. In order to maintain performance, it is essential that all signal loops are working so that signal controllers can properly detect vehicles. Loop failure due to various causes is an ongoing problem in many areas.

Interconnecting the signals via hard-wire/fiber-optic or through a wireless method, allows the controllers to synch their clocks automatically, as the clocks on the signal controllers have a tendency to drift over time leading to the coordinated signals getting out of synch. It will cost approximately \$15 per foot to install signal interconnect cable between adjacent signals along the corridor plus another \$5,000 in State-furnished parts to complete.

In addition, extending system communication to the intersections via wireless modem or DSL, at a cost of \$1,000 to \$3,000 per location, allows remote trouble shooting of signal timing issues, enhancing signal functionality and reliability. Installing cameras and communication equipment at each intersection, at a cost of approximately \$9,000 per

intersection, is also recommended to allow for expedient visual review of reported signal complaints.

In the future, traffic adaptive signal timing may be considered. The City of Stockton is currently testing a traffic-adaptive control system through a grant from the Federal Highway Administration (FHWA) on select corridors in the City. The pilot study will determine whether the investment confers appreciable benefits to the corridor under study. Traffic-adaptive systems look to be the future for signal control but are currently not an option that Caltrans has at its disposal. The system is very costly, uses proprietary software, and must be integrated with Caltrans-developed signal timing software.

An option may be to utilize ACS Lite, a scaled down version of FHWA's ACS software, designed to monitor and evaluate traffic conditions and provide refinements to signal timing on a cycle by cycle basis; and is intended to be the low cost solution that adjusts traffic signal timing for real-time traffic conditions in small to medium sized communities.

Synchronizing the corridor will help achieve better traffic flow. However, signal timing can only do so much. Operational improvements recommended by Traffic Operations and Traffic Safety are essential to enhanced performance. As stated above, "...modifying pavement striping, closing/restricting certain driveways that are redundant, unnecessary, or significantly affect traffic operations, constructing raised medians and widening to accommodate u-turns," are needed in addition to signal timing to improve traffic flow.

**Table 8. Signals and Controller Types**

#	County	Route	Post Mile	Cross Street	Controller	Detection Type
1	MER	152	17.790	College Entrance	2070	Loops
2	MER	152	18.800	Badger Flat Road	2070	Loops
3	MER	152	19.260	Ortitalita Road	2070	Loops
4	MER	152	19.650	West I Street	2070	Loops
5	MER	152	20.330	4th Street	170	Loops
6	MER	152	20.450	6th Street	170	Loops
7	MER	152	20.590	7th Street	170	Loops
8	MER	152	21.058	H Street and I Street	2070	Loops
9	MER	152	21.270	Mercy Springs Road	170	Loops
10	MER	152	21.650	Miller Lane	170	Loops
11	MER	152	21.760	Place Road	170	Loops
12	MER	152	21.950	Home Depot	170	Loops
13	MER	152	22.220	Ward Road	170	Loops

**ITS ELEMENTS**

It is recommended to deploy the following ITS elements on SR 152 and SR 165 in order to improve mobility and safely by reducing traveler delay, improving travel time reliability and reducing collisions:

1. Install two Type 500 Changeable Message Signs (CMS) for eastbound and westbound traffic. The CMS units should be placed strategically approximately ½ mile outside the City limits to take advantage of detour options in case of incidents. The system will advise motorists of traffic and weather conditions that might affect their trip in advance of any unfavorable corridor traffic conditions within the City.
2. Install eleven Traffic Monitoring Stations (TMS) at half mile intervals on SR 152 within the limits of the City of Los Banos. The stations will be used to automate the proposed CMSs via the Caltrans Automated Warning System (CAWS), collect valuable traffic volume data for the Traffic Census program, and report speed data to the Performance Measurement System (PeMS).
3. Install a Roadside Weather Information System (RWIS) which utilizes meteorological measurement sensors to detect conditions such as fog, rain and wind. The RWIS will use this

information to automatically trigger the CMSs, through CAWS, to warn motorists of adverse weather conditions.

4. Install a complete Highway Advisory Radio (HAR) system which will include a HAR located at the junction of SR 152 and SR 165 and four Extinguishable Message Signs (EMS). Two EMS units will be installed on SR 152, one for eastbound traffic, west of the junction, and one for westbound traffic east of the junction and two EMS units will be installed on SR 165, one for northbound traffic south of the junction, and one for southbound traffic north of the junction.
5. Install five Closed Circuit Television (CCTV) cameras at one mile intervals on SR 152. The CCTV cameras will provide real-time feedback to Traffic Management Center (TMC) operators to visually verify incidents detected through TMSs and reported by CHP or other sources, and monitor the congestion queue development during incident management. The CCTV cameras reduce the time that the TMC operators require to verify an incident and best determine/dispatch the type of response needed.
6. Upgrade thirteen existing signals to current District 10 standard. It is also recommended to repair damaged loop detectors, install Type 2070 controllers, add CCTV cameras for surveillance, install interconnect cables between signals for coordination and install adaptive system, when approved for use.

## ***TRAFFIC MANAGEMENT***

The proposed ITS elements in this corridor will significantly enhance transportation system operations efficiency and improve mobility. Real-time speed and weather information collected via ITS elements is processed by Performance Measurements Systems and Intelligent Roadway Information System. This information is used to automatically activate Changeable Message Signs to provide motorists with roadway and travel information. This will assist with incident management or direct traffic to alternative routes when needed. In addition, ITS elements provide TMC operators with valuable information to immediately dispatch the appropriate response from maintenance crews, TMT, emergency response teams, and/or the CHP.

For traffic management purposes, the specific recommendations are to install two CMSs, two CCTV cameras, two maintenance vehicle pullouts (MVPs), eight TMSs, and one RWIS in each direction on the existing SR 152. The combination of these elements is called an Automated Warning System (AWS). AWSs are intended to be utilized during the pre and post bypass build-out for the purposes of building an integrated smart highway system so that the highway system will ultimately function as a unit to improve traffic operations to full use or at full capacity, utilizing the newest ITS devices currently available.

This requires a total of four CMSs, four CCTV cameras, four MVPs, sixteen TMSs, and two RWISs for both directions. Specific locations of these elements are to be determined during the project development

processes when project scope and configuration are defined.

The benefits of implementing these ITS elements are:

1. to provide real-time video feedback of traffic and weather conditions to our TMC for better traffic and roadway monitoring;
2. to provide real-time messaging to the travelling public of traffic and weather conditions so that drivers can plan accordingly to avoid incidents or congested areas, reducing traffic delay, and preventing secondary accidents;
3. to help the TMC evaluate and respond to incidents and congestion events quickly to dispatch CHP, traffic management or emergency response teams to remove incident's elements from the roadway, averting potential congestion or reducing congestion time;
4. and to enhance highway operations to full capacity.

Estimated total cost of the improvements would be about \$2 million broken down as follows:

- 4 CMS units (MVPs included) = \$1.2 million
- 4 CCTV Cameras = \$80,000
- 16 TMS = \$400,000
- 2 RWIS = \$150,000

For the elements mentioned previously in this study, the estimates are:

- 1 HAR = \$75,000
- 4 EMS = \$100,000

### ***TRAFFIC SAFETY***

The latest five year collision history showed that the predominant type of collisions were rear-ends followed by broadsides. Traffic investigations identified speeding as the leading primary collision factor for the rear-end collisions while failing to yield is identified for the broadsides. Congestion was cited as a contributing factor to the rear-end collisions. Latest safety and operational improvements included installation of traffic signals at the intersection with H and I Streets, and at the intersection with Miller Lane; and installation of high visibility crosswalk markings with warning signs for pedestrians.

It is anticipated that the proposed operational improvements for traffic flow will reduce the number of collisions by reducing the number of conflict points and need for drivers to make quick stops. Also, increased speed limit enforcement would help in reducing not only rear-end collisions but other types as well.

## ***INCIDENT RESPONSE***

The Los Banos Police Department handles emergency response issues on SR 152 through the City. If additional response is needed from Caltrans, such as a maintenance crew to clean up a hazardous material spill, the Police Department will contact the District 10 TMC for assistance.

During an incident, once the scope and cause of the incident is determined, a response can be designed and initiated. CCTV can alert the TMC to the problem and help in determine an appropriate response. Other ITS elements can alert motorists to avoid the area. The proposed ITS system improvements work to inform Caltrans of the severity of the event, plan a proper response, clear the accident and any residual material quickly, warn driver's of dangerous conditions and avoidance maneuvers, and to prevent additional accidents. In general, the system improves the response time, closing out the incident safely and rapidly.

## ***AMERICANS WITH DISABILITIES ACT COMPLIANCE***

The Americans with Disabilities Act (ADA) of 1990, along with its implementing regulations, and the California Government Code Sections 4450 et seq, prescribe that facilities shall be made accessible to persons with disabilities. A multimodal roadway network should be able to accommodate pedestrians and is especially important that access is provided to persons with disabilities.

Existing ADA deficiencies or access barriers are identified in the State's ADA Transition Plan or recognized through the grievance process. Access barriers include existing curb ramps lacking a level maneuvering area or landing, ramps or landings missing a detectable warning surface, ramp grades exceeding 8.33%. Also included are sidewalks and driveways which exceed the 2% cross slope required along the pedestrian path. Signalized intersections need Accessible Pedestrian Signals (APS) which enable pedestrians who are blind or visually impaired to safely cross the intersections.

All sidewalks and curb ramps must be designed in compliance with state and federal accessibility standards. Minimum sidewalk clear widths should be free of utilities, furniture, signs and all other obstructions. It is recommended to upgrade the pedestrian facilities along this highway to current ADA standards.

## 7. Needs Assessment and Implementation

### Overview

The City has identified a number of challenges associated with the SR 152 corridor. Congestion, truck traffic, accidents, and pedestrian crossings are the major issues at this time and operations will only deteriorate in the future.

No projects are in the pipeline to address these issues or increase capacity of the route. The Bypass was planned to provide for the increases in interregional traffic and truck movements that could not be accommodated in the amount of right of way available through the City on Pacheco Blvd.. The alternative route would leave the existing corridor a friendlier place for local residents and shoppers to access by car, bike or foot.

While this study has suggested a number of improvements to address these issues, the planning analysis was performed at a very high level, considering the number of intersections, driveways, traffic volume, conflicting movements, and concerns relayed by the City. To move forward, improvements will need to be further refined by additional analysis and modeling and stakeholders input will be needed to further define the problem and determine achievable solutions.

### Critical Needs

As discussed previously in the document, ways to decrease congestion need to be implemented in order to facilitate movement both through the City and in and out of major destinations along, or near, the route. This must be accomplished while allowing pedestrians to move safely across the street. Bicycles will need to be accommodated with a separate facility, as room for a dedicated lane is not available.

Traffic volumes above 20,000 ADT warrant the use of a median rather than a TWLTL to restrict turning traffic to intersections. A median island would make it easier for pedestrians to cross as well, as would pedestrian overcrossings. The number of access points along the route add to the congestion creating conflicting movements and slowing traffic. Some combination of closing unnecessary driveways and consolidating adjacent driveways should be considered, as well as carefully planning new access for future developments.

Although outside the boundaries of this study, non-motorized access to the Community College should be provided. There is no continuous sidewalk leading to the entrance and those on foot have to walk on the dirt shoulder.

## Funding

Raised median/intersection widening, if broken up by intersection, would be in the range between \$280,000 and \$1 Million (Minor A–mid range). Driveway closure would be in the low range, under \$280,000 (Minor B)-all driveway improvements could be combined into one single project. To combine two or more intersection improvements along with raised median, the project would easily rise above the \$1 Million range (Major – high range).

Table 9 gives a rough estimate of the individual project cost and the possible funding source. Projects can be programmed through grants, local general or specific funds, federal, State, or regional funds, depending on availability. Driveway closure or consolidation could be accomplished through a public/private partnership.

When a funding source is offered, projects that are planned and ready to go generally have a better chance of award. To that end, this study is an important first step in funding needed improvements, identifying feasible candidate projects, reaching agreement with stakeholders, pursuing funding sources, and outlining basic needs for further evaluation.

**Table 9. Possible Funding Sources**

	Project	Project Type	Cost Estimate	Agency	Funding Source
1	Badger Flat Rd (PM 18.882) - Ortigalita Rd (PM 19.268)	Modify pavement marking to convert the EB trap lane to a RTL	\$15,000	Caltrans	SHOPP
2	Ortigalita Rd (PM 19.268) - W.'I' St. (PM 19.618)	a. Raised median 500' E. of S. Ortigalita Road (PM 19.364) - W.'I' St. b. S. side (shopping center), close W. DW, mid DW right in/out, exclude left out on E. DW	\$600,000	Caltrans/Local	SHOPP/CMAQ
3	West I Street (PM 19.618)	a. Widen NW and SE corners to accommodate U-turns b. NE corner, close W. DW	\$425,000	Caltrans/Local	SHOPP/CMAQ
4	W.'I' St.(PM 19.618) to Maryland Ave(PM19.781) N. side T	Raised median w/ back-to-back LTs	\$345,000	Caltrans/Local	SHOPP/CMAQ
5	Maryland Ave.(PM19.781) N. side T	Widen NW corner to accommodate U-Turns	\$150,000	Caltrans/Local	SHOPP/CMAQ
6	Illinois Ave.(PM 19.970) N. side T - Arizona Ave.(PM20.028) N. side T	Raised median with back-to-back LTs	\$125,000	Caltrans/Local	SHOPP/CMAQ
7	Arizona Ave. (PM20.028)N. side T	Widen NW corner to accommodate U-turns	\$150,000	Caltrans/Local	SHOPP/CMAQ
8	Arizona Ave.(PM20.028) N. side T - Nevada St.(PM20.090) 4 legged	Raised median with back-to-back LTs	\$130,000	Caltrans/Local	SHOPP/CMAQ
9	Nevada St. (PM 20.090)	Widen NW corner to accommodate U-turns	\$150,000	Caltrans/Local	SHOPP/CMAQ
10	4 <sup>th</sup> St.(PM 20.289)	Widen SE corner to accommodate U-turns	\$200,000*	Caltrans/Local	SHOPP/CMAQ
11	4 <sup>th</sup> St. (PM 20.289) to 6 <sup>th</sup> St. (PM 20.420)	Raised median with back-to-back left turns	\$275,000	Caltrans/Local	SHOPP/CMAQ
12	6 <sup>th</sup> Street (PM 20.420)	Widen NW corner to accommodate U-turns	\$200,000*	Caltrans/Local	SHOPP/CMAQ

**Table 9. Possible Funding Sources (continued)**

	Project	Project Type	Cost Estimate	Agency	Funding Source
13	9 <sup>th</sup> Street (PM20.749) N. side T	Cul-de-sac, traffic to use J St.	\$300,000	Caltrans/Local	SHOPP/CMAQ
14	DW ~ 200' E. of SR165/152 (PM 21.385) to Miller Ln. (PM21.610)	Construct raised median, LT into shopping center on NE corner to remain	\$475,000	Caltrans/Local	SHOPP/CMAQ
15	Miller Ln. (PM21.610) N. side T	Widen NW corner to accommodate U-turns	\$200,000*	Caltrans/Local	SHOPP/CMAQ
16	DW ~ 400' W (PM22.174) of Ward Rd-Ward Rd (PM22.252)	Convert to raised median, LT into shopping center N, and LT into Rancho Dr. to remain.	\$200,000	Caltrans/Local	SHOPP/CMAQ
17	Ward Rd (PM 22.252)	Allow WB U-turns, currently they are prohibited	\$7,500	Caltrans/Local	SHOPP/CMAQ
18	48 ADA curb ramps	ADA	\$600,000	Local	SHOPP/CMAQ
19	Install Accessible Pedestrian Signal	ADA		Caltrans	SHOPP

\*Signalized intersection, minor signal modification will be required

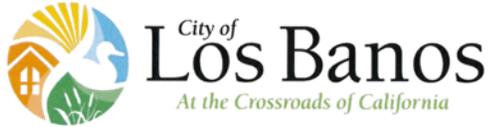
## Prioritization and Implementation

From an engineering perspective, the highest priority improvement would be signal timing adjustment in order to get the most out of the existing signal system with little to no investment. The second phase of projects would entail the installation of a raised median combined with intersection widening, at a significantly higher cost. Many of these projects would have to be completed simultaneously. For example, putting in a median would require a LTL and U-turn capability at an intersection, involving additional right of way and possible driveway relocation. The final phase would be the consolidation of driveways. These proposals would satisfy the goal of improving operations with increasing cost of implementation, both in terms of dollars spent and inconvenience experienced by the residents and businesses.

## Conclusion

As each proposal has different costs and benefits to stakeholders, the City held a public meeting on August 19, 2015 to discuss the suggested improvements, identify any other critical needs, highlight the local issues to consider, and solicit comments from the attendees, the majority being business owners along the route. The Staff Report and subsequent resolution are presented in the Appendix documenting the presentation and outcome of that meeting.

8. Appendix—City of Los Banos Public Meeting and City Council Action



## Agenda Staff Report

**TO:** Mayor & City Council Members  
**FROM:** Mark Fachin, P.E., Public Works Director/City Engineer  
**DATE:** August 19, 2015  
**SUBJECT:** Los Banos State Route 152 Comprehensive Operational Study  
**TYPE OF REPORT:** Non Consent Agenda

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### Recommendation:

That the City Council adopts the Resolution approving the 'Draft Los Banos State Route 152 Comprehensive Operational Study', dated June 1, 2015, as prepared by the California Department of Transportation with the following exceptions:

1. The installation of the raised medians as outlined in the draft study is not approved by the City Council
2. All intersection widening improvements to accommodate U-turns are not approved by the City Council
3. The installation of a cul-de-sac on 9<sup>th</sup> Street at the intersection of State Route 152 and 9<sup>th</sup> Street is not approved by the City Council
4. The closing of existing driveways onto State Route 152 is not approved by the City Council

### Background:

California Department of Transportation (Caltrans) has prepared a Draft Los Banos State Route 152 Comprehensive Operational Study, dated June 1, 2015. This study is intended to address the operational treatment of this corridor (Pacheco Boulevard) that will meet the needs of the interregional traveler. Since the Los Banos Bypass has been delayed due to funding shortfalls, Pacheco Boulevard is in need of feasible operational improvements to increase the efficiency and safety of this highway segment.

The recommended improvements in this study are intended to

- Increase safety
- Improve operational performance
- Enhance mobility and convenience
- Improve environmental outcomes
- Boost productivity

The study has recommended the following improvements to the State Route 152 corridor:

1. Signal timing and optimization
2. Signal upgrades
3. Intelligent Transportation System (ITS) consisting of seven (7) elements
  - Changeable message signs
  - Closed circuit television
  - Maintenance vehicle pullouts
  - Traffic monitoring stations
  - Roadside weather information system
  - Highway advisory radio
  - Extinguishable message signs
4. Elimination of one crosswalk at the intersections of I street, 4<sup>th</sup> Street, and 6<sup>th</sup> Street
5. Installation of raised median at the following locations:
  - Between Ortigalita Road and West I Street
  - West I Street to Maryland Avenue
  - Illinois Avenue to Arizona Avenue
  - Arizona Avenue to Nevada Avenue
  - 4<sup>th</sup> Street to 6<sup>th</sup> Street
  - Driveway 200 feet east of SR-165 (Mercey Springs Rd) to Miller Lane
  - Driveway 400 feet west of Ward Road to Ward Road
6. Install intersection widening improvements to accommodate U-turns because of the installation of the raised medians
  - West I Street, widen NW and SE corners
  - Maryland Avenue, widen NW corner
  - Arizona Avenue, widen NW corner
  - Nevada Avenue, widen NW corner
  - 4<sup>th</sup> Street, widen SE corner

- 6<sup>th</sup> Street, widen NW corner
  - Miller Lane, widen NW corner
7. Between Badger Flat Road and Ortigalita Road, modify striping to convert eastbound trap lane to a right turn lane
  8. Driveway closures/modifications at the following locations:
    - Between Ortigalita Road and West I Street, close westerly driveway, convert middle driveway to right in/out and exclude left out on easterly driveway
    - West I Street, close westerly driveway at NE corner
  9. At 9<sup>th</sup> Street, install cul-de-sac
  10. At Ward Road, allow westbound U-turns
  11. Install 48 ADA compliant curb ramps

**Discussion:**

On July 23, 2015, a public meeting was held at the Community Center to discuss this draft study. The meeting was noticed on the City's website, an article was published in regards to the meeting by the Los Banos Enterprise, and 250 individual letters to businesses and residences along Pacheco Boulevard were mailed. Approximately 40 individuals attended the public meeting.

Counting the input at the meeting and correspondence received by staff, over 15 business owners/residents have expressed their concerns in regards to the draft study. The areas of concerns were:

- a) The installation of the raised median would severely impact the businesses along Pacheco Boulevard
- b) The installation of a cul-de-sac at 9<sup>th</sup> Street would impact several businesses and create an unfavorable local street traffic situation
- c) The elimination of existing driveways would impact access to businesses

Due to the citizen input that has been received by staff, the recommendation is that the City Council approves the findings in the Draft Los Banos State Route 152 Operational Study, dated June 1, 2015, with the following exceptions:

1. The installation of the raised medians as outlined in the draft study is not approved by the City Council
2. All intersection widening improvements to accommodate U-turns are not approved by the City Council

3. The installation of a cul-de-sac on 9<sup>th</sup> Street at the intersection of State Route 152 and 9<sup>th</sup> Street is not approved by the City Council
4. The closing of existing driveways onto State Route 152 is not approved by the City Council

**Fiscal Impact:**

The improvements as stated in the Draft Study are to be funded by the State Highway Operations and Protection Program (SHOPP) and the Congestion Mitigation and Air Quality (CMAQ) Program. Funding applications will need to be submitted and individual projects will have to compete for the grants.

**Reviewed by:**

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Steve Carrigan, City Manager

**Attachments:**

Resolution  
Draft Los Banos State Route 152 Comprehensive Operational Study

RESOLUTION NO. 5690

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF LOS BANOS APPROVING THE 'DRAFT LOS BANOS STATE ROUTE 152 COMPREHENSIVE OPERATIONAL STUDY' DATED JUNE 1, 2015, AS PREPARED BY THE CALIFORNIA DEPARTMENT OF TRANSPORTATION WITH THE FOLLOWING EXCEPTIONS: THE INSTALLATION OF THE RAISED MEDIANS AS OUTLINED IN THE DRAFT STUDY IS NOT APPROVED BY THE CITY COUNCIL; ALL INTERSECTION WIDENING IMPROVEMENTS TO ACCOMMODATE U-TURNS ARE NOT APPROVED BY THE CITY COUNCIL; THE INSTALLATION OF A CUL-DE-SAC ON 9<sup>TH</sup> STREET AT THE INTERSECTION OF STATE ROUTE 152 AND 9<sup>TH</sup> STREET IS NOT APPROVED BY THE CITY COUNCIL; AND THE CLOSING OF EXISTING DRIVEWAYS ONTO STATE ROUTE 152 IS NOT APPROVED BY THE CITY COUNCIL

WHEREAS, THE City of Los Banos City Council has reviewed the 'Draft Los Banos State Route 152 Comprehensive Operational Study' dated June 1, 2015, as prepared by the California Department of Transportation; and

WHEREAS, the City of Los Banos has conducted a public outreach effort; and

WHEREAS, a public meeting was held on July 23, 2015, to discuss the Draft Study; and

WHEREAS, based on the public outreach comments, the Public Works Department requests the City Council approve the 'Draft Los Banos State Route 152 Comprehensive Operational Study' dated June 1, 2015, prepared by the California Department of Transportation with the following exceptions:

1. The installation of the raised medians as outlined in the draft study is not approved by the City Council.
2. All intersection widening improvements to accommodate U-turns are not approved by the City Council.
3. The installation of a cul-de-sac on 9<sup>th</sup> Street at the intersection of State Route 152 and 9<sup>th</sup> Street is not approved by the City Council.
4. The closing of existing driveways onto State Route 152 is not approved by the City Council.

NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of Los Banos does hereby approve the 'Draft Los Banos State Route 152 Comprehensive Operational Study' dated June 1, 2015, prepared by the California Department of Transportation with the following exceptions:

1. The installation of the raised medians as outlined in the draft study is not approved by the City Council.
2. All intersection widening improvements to accommodate U-turns are not approved by the City Council.
3. The installation of a cul-de-sac on 9<sup>th</sup> Street at the intersection of State Route 152 and 9<sup>th</sup> Street is not approved by the City Council.

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4. The closing of existing driveways onto State Route 152 is not approved by the City Council.

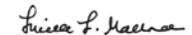
The foregoing Resolution was introduced at a regular meeting of the City Council of the City of Los Banos held on the 19th day of August 2015, by Council Member Faria who moved its adoption, which motion was duly seconded by Council Member Lewis and the Resolution adopted by the following vote:

AYES: Council Member Faria, Lewis, Silveira, Stonegrove, Mayor Villalta  
NOES: None  
ABSENT: None

APPROVED:

  
Michael Villalta, Mayor

ATTEST:

  
Lucille L. Mallonee, City Clerk

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