Memorandum

ARUP

To	James Hinkamp Tony Coe	Date	March 23, 2017
Copies		Reference number	243381/VP
From	Michael Iswalt Vanessa Peers	File reference	
Subject	Lafayette Downtown Congestion Study: Multi-Criteria Analysis – Revised Results		

1 Introduction

The Lafayette Downtown Congestion Study has identified a range of strategies that increase traffic capacity and manage traffic demand by promoting alternatives to single-occupancy vehicle travel. At the Steering Committee meeting on November 17, 2016, the Committee trimmed the Short List of 19 strategies down to 16 strategies. At a more recent Steering Committee meeting on January 26, 2017, the list was further reduced to 15 strategies. The current list of 15 strategies contains seven traffic capacity-enhancing projects and nine demand management projects. This current list was derived using a systematic process that began with a long list of 50 strategies, which were narrowed down and refined using a range of high-level qualitative assessments and detailed traffic analyses. Documentation on the strategy evaluation and the process used to develop the current list of strategies is provided in a series of technical memos and presentations available on the project website: https://lafayettecongestion.com/.

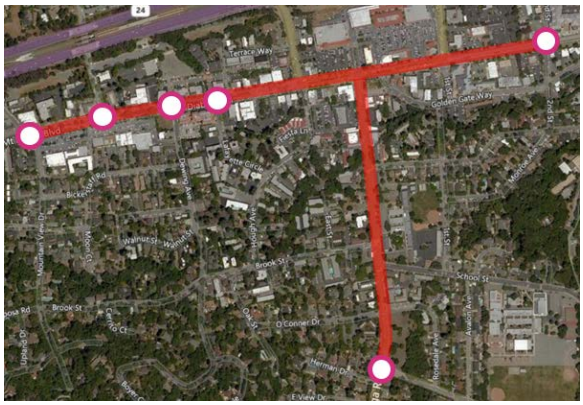
This memorandum provides a multi-criteria analysis of the remaining strategies. The multi-criteria analysis utilizes a diverse array of qualitative and quantitative measures that consider each strategy's impact on congestion and traffic operations, safety, connectivity, quality of the environment, cost, and the potential ease of implementation (e.g., regulatory, environmental, and political considerations).

For each strategy, the traffic operations impacts to the roadway network were determined using traffic modeling software (VISSIM and Synchro). The cost estimates were developed using conceptual designs and calendar year 2016 construction unit costs. Other measures, which include the safety of road users, the safety of pedestrians and cyclists, the quality and livability of the environment within Lafayette, and the ease of implementation are not easily quantified. For these measures, we used professional judgment to assess how each strategy would impact these categories. Comparing the multiple criteria across the strategies provides a broader understanding of the trade-offs and the potential cost-benefit and allows the strategies to be assessed in a more holistic way.

2 Projects

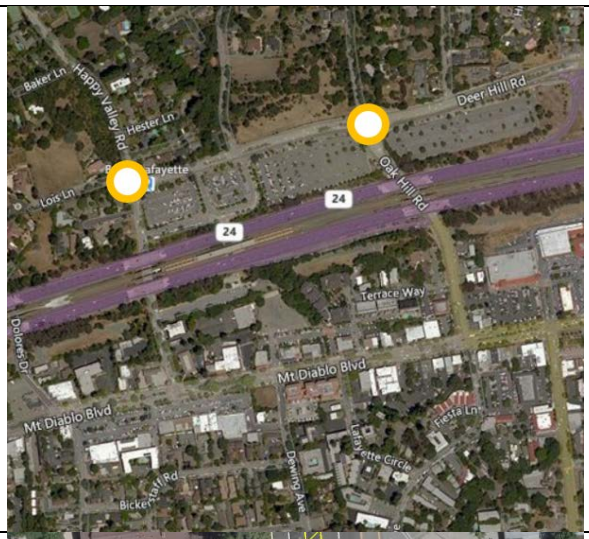
The Short List of 15 projects included in the multi-criteria analysis are presented below.

Capacity-Enhancing Strategies

Smart Corridors Expand the existing coordinated signal system to include the Moraga Road / St Mary's Road intersection and Mount Diablo Boulevard at Lafayette Circle, Dewing Avenue, Happy Valley Road, Dolores Drive/Mountain View Drive and 2nd Street. All of these intersections currently have traffic signals. The Smart Corridors project would integrate these signals into the larger coordinated signal system and implement additional monitoring and adaptive signal technology to improve traffic operations and increase capacity.	
School Street One-Way Westbound Convert School Street to one-way westbound travel from 1st Street to Moraga Road. This one-way pattern would improve circulation around the schools and simplify the signal phasing at the School Street / Moraga Road intersection. These changes would increase capacity and improve traffic operations on Moraga Road. This strategy would also integrate with the School Street Complete Street strategy (below). However, this strategy would divert some traffic onto local residential streets. This design could serve as a near-term, temporary solution until the Brook-School Connection (see below) with two-way traffic flow is constructed. This proposed design does not preclude the Brook-School Connection.	

2nd NBR turning lane at Mt Diablo Boulevard and Moraga Road (No North-South Crosswalk at the east leg) Provide a second northbound right-turn from the middle lane at the Moraga Road / Mount Diablo Boulevard intersection and remove the north-south crosswalk on the eastern leg of the intersection. These changes would increase capacity for the critical northbound right-turn, which would reduce queuing and improve traffic operations along Moraga Road. The crosswalk needs to be removed to avoid conflicts between turning drivers and pedestrians. Several alternatives that considered other lane configurations, signal phasing, and crossing options were evaluated but eliminated from consideration.	
Southbound left-turn lane at Moraga Road and Moraga Boulevard Provide a left-turn lane at the southbound approach of the Moraga Road / Moraga Boulevard intersection, while maintaining two southbound and northbound travel lanes. The turn lane would remove 6-7 on-street parking spaces on the west side of Moraga Road. The turn lane will provide an area for vehicles to line up and not block southbound traffic as they wait to make a left-turn. This will increase capacity and improve traffic operations on Moraga Road.	

Memorandum

Signalize the intersections of Deer Hill Road and Oak Hill Road and Deer Hill Road and Happy Valley Road Traffic signals at these intersections will improve traffic operations and provide an enhanced environment for pedestrians using the crosswalks. Roundabouts were also evaluated but eliminated from consideration because they would not likely provide sufficient traffic capacity.	
Brook-School Connection Realign Brook and School Streets to create a single intersection at Moraga Road with a southbound left-turn pocket. Consolidating the two intersections at Brook and School Street to one and providing the left-turn pocket improves traffic operations on Moraga Road, Brook Street, and School Street. The Masonic Lodge property would need to be acquired and the building demolished. Also, a few on-street parking spaces on the south side of School Street would need to be removed.	

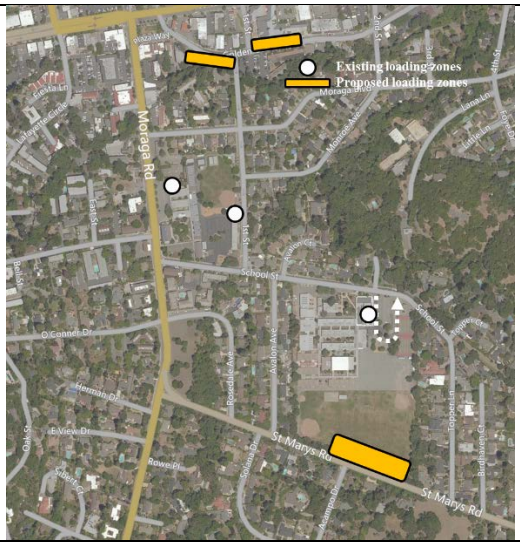
Northbound Moraga Road Connector

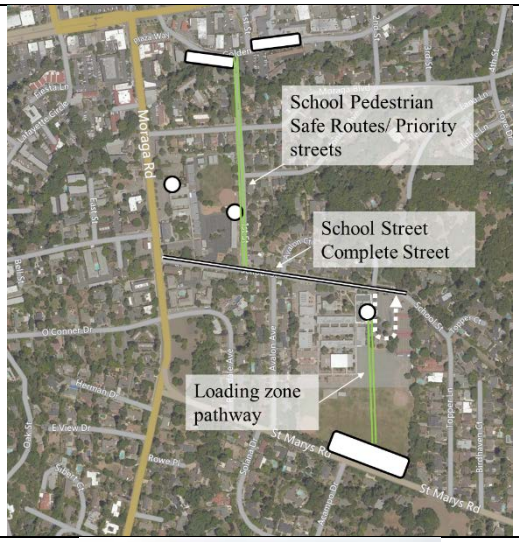
Extend Moraga Road north of Mount Diablo Boulevard through the shopping center, between Safeway and McCaulou's, to connect with 1st Street opposite the State Route 24 eastbound on-ramp. This connector would operate one-way northbound only. This project would provide a direct connection for traffic heading to the freeway, which redistributes traffic from key segments of Mount Diablo Boulevard and 1st Street. This would improve traffic operations through the Downtown "Y". This project is only required in the long-term if population and employment growth exceed certain targets and if the redevelopment of the shopping center presents an opportunity.

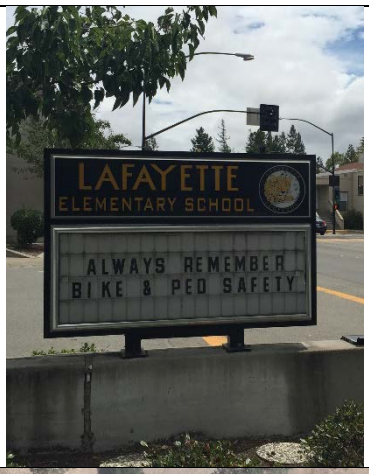
Demand Management

Additional School Pick-up & Drop-off Zones

Introduce two new pick-up and drop-off zones at Golden Gate Way and St Mary's Road. The new zones provide additional options for parents to drop-off children that could divert some vehicle trips from critical segments of Moraga Road.



School Street Complete Street Improvements The School Street Complete Street improvements include a redesign of the street to provide a wide path for pedestrians and cyclists on the north side of the street that connects the Downtown schools and the Lafayette-Moraga Regional Trail. The proposed design would remove some on-street parking. However, parking could be added with a redesign of School Street in front of the Middle School. This proposed design would integrate well with the Brook-School Connection and the School Street One-Way Westbound strategy (described above).	
Student-Pedestrian Safe Routes Create a network of new paths and existing streets, including the School Street Complete Street concept, with enhanced safety measures at key intersections. These Safe Routes provide a seamless network for children and other pedestrians to travel between the schools and the new pick-up and drop-off zones, the Regional Trail, and Moraga Road. These improvements are necessary to support the pick-up and drop-off zones and promote additional walking and cycling around the schools.	
Enhanced School Bus Program Purchase six new buses and expand the existing school bus system to include service to and from Lafayette Elementary.	

Staggered School Times Reduce peak hour demand on Moraga Road by shifting the start time for either Lafayette Elementary or Stanley Middle School. The current proposal would shift the Middle School start time to 9:00 AM. This would shift a significant number of trips during the AM peak hour to a later hour, and thus reduce AM peak hour congestion.	
Mount Diablo Boulevard Road Diet Reduce travel lanes and widen bicycle and pedestrian facilities between Acalanes Road and Risa Road. Two options are being studied with either one or two westbound travel lanes and one eastbound travel lane.	
Regional Trail to BART Connection Improve bicycle and pedestrian facilities and signage between the Lafayette-Moraga Regional Trail and BART and Downtown. This would include the School Street Complete Street, improvements on Brook Street, Hough Avenue, and Lafayette Circle.	
BART Pedestrian Bridge over Oak Hill Road Construct a pedestrian bridge over Oak Hill Road connecting the BART parking lots to the station. A connection to the new path and bridge from Oak Hill Road could also be built to provide another access point to the station. This will reduce potential conflicts between drivers and pedestrians at the existing Deer Hill Road/Oak Hill Road crosswalks and provide a more direct connection to BART for patrons parking at lots east of Oak Hill Road.	

3 Assessment Metrics and Criteria

Multi-criteria analyses (MCA) provide a method for comparing and contrasting a diverse set of strategies. MCA can take into account a broad range of measures, both quantitative and qualitative, that reflect many different aspects of a strategy as well as the values and priorities of the local community. Each of the projects was assessed using the following measures:

Congestion Reduction (LOS/Travel Time)

The congestion reduction potential of each strategy was assessed for both the AM and the PM peak periods. Intersection traffic level-of-service (LOS), travel time, and queuing were measured using microsimulation models developed for the AM and the PM using Synchro/SimTraffic and VISSIM respectively. Each strategy was evaluated independently and with other complementary projects. The detailed traffic results are provided in the August 31, 2016 technical memorandum provided on the project website. ***Per direction from the Steering Committee: this is the most critical metric for gauging strategy effectiveness and is therefore weighted more heavily than other criteria.***

Auto/Truck Safety

The safety for road users, which includes automobiles and trucks, was assessed qualitatively using engineering judgment and best practices research.

Bike/Pedestrian Safety and Connectivity

The safety of bicyclists and pedestrians is critical as these users are the most vulnerable. Providing convenient and safe routes for both cyclists and pedestrians is essential to encourage the shift away from auto travel. These measures were evaluated qualitatively based on existing engineering judgment and best practices research.

Parking Impact

Many of the strategies involve the removal of on-street parking spaces. The removal of parking is often the only way to reallocate road space to bike lanes and sidewalks without physically widening the road. This measure indicates the number of parking spaces removed.

Environmental/Utility Impacts

This measure considers each strategy's effect on the environment and utilities. Environmental concerns would include elements such as air quality, noise, stormwater, biological resources, etc. The utilities include water provided by the East Bay Municipal Utilities District (EBMUD), electricity provided by Pacific Gas & Electric (PG&E), as well as local stormwater and sewer systems.

Ease of Implementation

The ease of implementation considers the potential regulatory, political, design and engineering challenges associated with each strategy. This measure also captures if the strategy would have property impacts or require additional right-of-way. A qualitative assessment was performed using our understanding of engineering design in similar areas, California State law and environmental regulations under the California Environmental Quality Act (CEQA), and existing regulatory rules.

Cost

High-level conceptual cost estimates were developed for each strategy based on our understanding of each strategy, the local context, the initial conceptual designs, and engineering unit cost estimates.

Urban Design

Preserving Lafayette's existing character, ensuring that it remains walkable, bike-friendly, and appealing, and promoting attractive urban design are all important considerations. Therefore, any strategies that could make the area feel less welcoming, unfriendly to pedestrians or bicyclists, or detract from Lafayette's historic character were considered to have a negative impact, while any strategies that enhanced the livability of the area were seen to have a positive impact. ***Per direction from the Steering Committee: we are keeping Urban Design for discussion purposes only and are not including it in the composite scoring.***

4 Multi-Criteria Analysis

For each measure, the assessment utilizes a five-point "Consumer Reports" style rating with a numerical equivalent from "Low" (score of 1) to "High" (score of 5) performing, with neutral in the middle (score of 3). These are presented below:

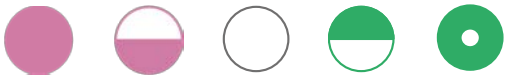
Low Neutral High

The detailed analysis table with the scoring is attached as an appendix.

The Steering Committee provided direction on how to aggregate and weight the ratings into a composite score. To reflect the importance of congestion reduction, this measure is assigned a weighting of three (3), while the other qualitative measures (auto/truck safety, bike/pedestrian safety and connectivity, parking and environmental/utility impacts) are collectively assigned a weighting of one, except for Urban Design which is used for qualitative discussion purposes only. Ease of implementation and cost are not included in the composite scoring and are reported separately.

The final summary table includes the weighted score for congestion reduction, the composite score for the qualitative ratings and the overall composite score that adds the congestion and the qualitative

scores. The table below summarizes the metrics used to develop the scoring and the detailed table attached to this memorandum.

Metric	Description	Score Range (LOW to HIGH)		
		 1 2 3 4 5		
Congestion Reduction	To what degree would the strategy reduce congestion within the study area?	Worsens congestion	No improvement in congestion	Improves congestion
Auto/Truck Safety	To what degree does the strategy provide safe and comfortable facilities for autos and trucks?	Degrades safety	No improvement in safety	Improves safety
Bike/Pedestrian Safety and Connectivity	To what degree does the strategy provide safe and comfortable facilities and enhanced connectivity for cyclists and pedestrians?	Lacks adequate safety provisions and does not improve the user experience	Does not improve on the current bike/pedestrian safety and connectivity	Provides substantial safety features and creates an excellent user experience
Parking	To what degree does the strategy increase or decrease parking supply?	Decrease in parking	No change in parking	Increase in parking
Urban Design	To what degree will the strategy impact the character, livability, and urban design of Downtown?	Degrades urban design	No improvement in urban design	Enhances urban design
Environmental / Utility Impact	Will the strategy have environmental (air quality, noise, stormwater) or utility (water, sewer, electricity) impacts?	A high potential for utility impacts and/or negative environmental impacts	No environmental or utility impacts	Minimal potential for utility impacts and/or positive environmental impacts
Ease of Implementation	What challenges (regulatory, political, engineering, etc.) will impact the implementation of each strategy?	Significant implementation challenges	Modest implementation challenges	Few implementation challenges
Estimated Cost	Includes capital costs, construction costs, and soft costs for each strategy.	**$ 2016 Dollars**		

The composite score was used to rank the projects using the methodology described above. The final scoring matrix and the detailed table is attached as an appendix.

Memorandum

Capacity Enhancing Strategies Summary

Strategy	Congestion Reduction Score (3X weighting)	Qualitative Composite Score (1X weighting)	Composite Score	Ease of Implementation	Cost
New Traffic Signals on Deer Hill Rd	15	3.5	18.5		 $500-750k
Moraga Rd/Moraga Blvd SBL lane	15	3	18		 $50-75k
Brook-School Connection	15	3	18		 $3-4M
MDB/Moraga Rd 2nd NBR	15	2.75	17.75		 $100-200k
Northbound Moraga Rd Connector	15	2.75	17.75		 $20-30M
School Street One-Way Westbound	12	3.5	15.5		 $100-200k
Smart Corridors	12	3	15		 $1-1.5M

Memorandum

Demand Management Strategies

Strategy	Congestion Reduction Score (3X weighting)	Qualitative Composite Score (1X weighting)	Composite Score	Ease of Implementation	Cost
Additional School Loading Zones	12	3.5	15.5		 $200-400k
BART Pedestrian Bridge Over Oak Hill Road	12	3.5	15.5		 $6-8M
Enhance School Bus Program	12	3.25	15.25		 $500,000 (annually)
Staggered School Times	12	3.25	15.25		 <$25k
Regional Trail to BART Connection	9	3.75	12.75		 $50-100k
Student Pedestrian Safe Routes Priority Streets	9	3.5	12.5		 $50-100k
School Street Complete Street	9	3	12		 $500k-1.0M
Mt Diablo Boulevard Road Diet	6	4	10		 $1-2M

APPENDIX

Detailed Scoring Table

Scoring Weight	3	1	1	1	0	1					
Capacity Enhancing Strategies	**Congestion Reduction**	**Auto/Truck Safety**	**Bike/Ped Safety and Connectivity**	**Parking Impact**	**Urban Design**	**Environmental / Utility Impacts**	**Congestion Weighting (3x)**	**Composite for Qualitative Factors (Avg.)**	**Composite Score**	**Ease of Implementation**	**Cost**
New Traffic Signals on Deer Hill Rd	5	4	5	3	3	2	15	3.5	**18.5**	2	4
Moraga Rd/Moraga Blvd SBL lane	5	4	3	2	3	3	15	3	**18**	5	5
Brook-School Connection	5	4	5	2	5	1	15	3	**18**	1	2
MDB/Moraga Rd 2nd NBR	5	4	1	3	1	3	15	2.75	**17.75**	5	5
Northbound Moraga Rd Connector	5	4	5	1	4	1	15	2.75	**17.75**	1	1
School Street One-Way Westbound	4	3	4	4	3	3	12	3.5	**15.5**	4	5
Smart Corridors	4	4	3	3	3	2	12	3	**15**	5	4

Demand Management Strategies	**Congestion Reduction**	**Auto/Truck Safety**	**Bike/Ped Safety and Connectivity**	**Parking Impact**	**Urban Design**	**Environmental / Utility Impacts**	**Congestion Weighting (3x)**	**Composite for Qualitative Factors (Avg.)**	**Composite Score**	**Ease of Implementation**	**Cost**
Additional School Loading Zones	4	4	3	4	5	3	12	3.5	**15.5**	2	4
BART Pedestrian Bridge Over Oak Hill Road	4	3	5	3	5	3	12	3.5	**15.5**	1	1
Enhance School Bus Program	4	4	3	3	3	3	12	3.25	**15.25**	2	4
Staggered School Times	4	4	3	3	3	3	12	3.25	**15.25**	1	5
Regional Trail to BART Connection	3	3	5	3	5	4	9	3.75	**12.75**	5	5
Student Pedestrian Safe Routes Priority Streets	3	3	5	3	5	3	9	3.5	**12.5**	5	5
School Street Complete Street	3	4	5	1	5	2	9	3	**12**	2	4
Mt Diablo Boulevard Road Diet	2	5	5	3	5	3	6	4	**10**	4	4

Memorandum

Detailed MCA Table

Strategy	Congestion Reduction	Auto/Truck Safety	Bike/Ped Safety and Connectivity	Parking Impact	Urban Design	Environmental / Utility Impacts	Ease of Implementation	Cost
CAPACITY-ENHANCING STRATEGIES								
New Traffic Signals on Deer Hill Rd	 • Improves traffic operations to LOS C or better under future conditions at Deer Hill Rd/Happy Valley Rd and Deer Hill Rd/Oak Hill Rd	 • Traffic signals should improve traffic flow and have a modest improvement on auto/truck safety	 • Traffic signals would provide protected crossings for pedestrians, especially at Oak Hill Rd	 • This strategy will not impact parking	 • This strategy will not have an effect on urban design	 • The expanded signal infrastructure will require some additional utility infrastructure • The expanded signal infrastructure will not have any environmental impacts	 • The signals will require engineering design and a reconfiguration of some of the intersection approaches	 $500-750k
Moraga Rd/Moraga Blvd SBL lane	 • Provides a southbound left-turn lane to store vehicles at Moraga Rd/Moraga Blvd, which increases intersection capacity and prevents turning vehicles from blocking the southbound through traffic on Moraga Rd	 • The intersection changes should improve traffic flow and have a modest improvement on auto/truck safety	 • This strategy will not have an effect on pedestrian and bicycle safety	 • Removes 6-7 parking spaces • Most of these spaces are underutilized (less than 50% occupied during peak times)	 • This strategy will not have an effect on urban design	 • This strategy will not have an effect on the environment or utilities	 • The SBL lane can be implemented mostly by restriping the intersection and making some modest changes to the signals	 $50-75k
Brook-School Connection	 • Provides a 5% increase in throughput on Moraga Rd and a 10% improvement in travel time	 • The intersection changes should improve traffic flow and have a modest improvement on auto/truck safety	 • The reconfigured intersection provides a single and highly visible crossing for pedestrians and cyclists	 • This strategy results in a minor loss of parking (4-5 spaces)	 • This strategy provides an improved streetscape on Moraga Rd • Provides an opportunity for a park or other gateway feature	 • Would likely require some environmental review under CEQA • The potential environmental impacts are minimal • Relocation of services may be necessary • The amount of impervious space (the existing parking lot) could be reduced	 • Would require the purchase of the Masonic Lodge building • Would also require significant engineering design services	 $3-4M

Memorandum

Strategy	Congestion Reduction	Auto/Truck Safety	Bike/Ped Safety and Connectivity	Parking Impact	Urban Design	Environmental / Utility Impacts	Ease of Implementation	Cost
MDB/Moraga Rd 2nd NBR	• Improves the capacity at MDB/Moraga Rd by 10%, which would reduce traffic congestion and queuing in the northbound direction • Travel times on Moraga Rd would improve by approximately 30%	• The intersection changes should improve traffic flow and have a modest improvement on auto/truck safety	• The removal of the crosswalk would have a significant negative impact on pedestrian circulation	• This strategy will not impact parking	• The removal of the crosswalk would detract from the desire to improve urban design along MDB	• This strategy will not have an effect on the environment or utilities	• The second NBR turn can be implemented mostly by restriping the intersection and making some modest changes to the signals	$100-200k
Northbound Moraga Rd Connector	• Provides a more direct path for traffic headed to SR 24 onramps • Reduces the volume of right turning traffic from Moraga Rd to MDB • Increases capacity as the northbound through movement has more capacity than right turns • Could accommodate a 20% growth in traffic (CCTA-estimated 2040 traffic volumes)	• The NB connector should improve traffic flow and have a modest improvement on auto/truck safety • Would reroute some trucks off of MDB and 1st St	• Pedestrian sidewalk on the eastern leg of Moraga Rd/MDB could remain • Fewer right turning vehicles will result in less pedestrian-vehicle conflicts • The new connector could provide additional pedestrian and bicycle connections	• Reconfiguration of the Whole Foods Center would result in a decrease in parking • The employee spaces behind the center would likely need to be removed to accommodate the roadway	• Introducing a road through the Whole Foods Center would result in higher volumes traveling through the center, which would impact its design and function • However, from the urban design perspective of creating a walkable community, the connector combined with the redevelopment of the site (creating an urban grid with buildings built to the street) would improve on the existing setting	• Would likely require significant environmental review under CEQA • A retaining wall along SR 24 is likely required to accommodate the connector • Location/depth of the EBMUD aqueduct needs to be considered • A new traffic signal at 1st St and the eastbound to SR 24 on-ramp will require some additional utility infrastructure	• Would require land acquisition and reconfiguring of some of the existing buildings • Would likely require the full redevelopment of the Whole Foods site • Would also require significant engineering design services	$20-30M

Strategy	Congestion Reduction	Auto/Truck Safety	Bike/Ped Safety and Connectivity	Parking Impact	Urban Design	Environmental / Utility Impacts	Ease of Implementation	Cost
School Street One-Way Westbound	 • Would result in modest congestion improvements along Moraga Rd under future year conditions by simplifying the signal phasing at School St and removing approximately 50-100 vehicle trips from Moraga Rd during peak hours • This trips are diverted through the neighborhood, which would result in local impacts.	 • This strategy will not have an effect on auto and truck safety	 • Would allow for some reallocation of road space between Moraga Rd and 1st St	 • Could lead to a small increase in parking if diagonal parking is implemented	 • This strategy will not have an effect on urban design	 • This strategy will not have an effect on the environment or utilities	 • Only requires minimal physical improvements to the right-of-way and signals at School St	 $100-200k
Smart Corridors	 • Future adjustments should yield incremental congestion improvements along MDB and Moraga Rd • Recent timing adjustments generated significant improvements in travel time and delay • Increasing the number of coordinated signals will improve progression along both Moraga Rd and MDB • Continuous traffic monitoring and data collection will allow for ongoing signal timing modifications to adjust to changing traffic flows	 • Smart Corridors should smooth traffic flow, which should have a modest improvement on auto/truck safety	 • This strategy will not have an effect on pedestrian and bicycle safety	 • This strategy will not impact parking	 • This strategy will not have an effect on urban design	 • Expanding the coordinated signal system will require some additional utility infrastructure • The expanded signal infrastructure will not have any environmental impacts	 • The Smart Corridors signal enhancements can be implemented relatively easily by upgrading signal controllers and software • The signal interconnect (e.g., the fiber optic connection between signals) would require trenching and some minimal street construction	 $1-1.5M

Strategy (Composite Score)	Congestion Reduction	Auto/Truck Safety	Bike/Ped Safety and Connectivity	Parking Impact	Urban Design	Environment / Utility Impacts	Ease of Implementation	Cost
DEMAND MANAGEMENT STRATEGIES								
Additional School Loading Zones	• Would reduce vehicle trips in the AM and Mid-Day (MD) by 10%. This would result in a reduction in congestion during these periods • No traffic reductions in vehicle trips or congestion are expected in the PM peak hour because it is unaffected by school trips. The PM peak hour is projected to be the most congested in the future	• Removing vehicle trips from Moraga Rd should improve traffic flow and have a modest improvement on auto/truck safety	• School children would need to walk 2-3 extra blocks between the schools and the loading zones • Additional pedestrian improvements would be necessary between the loading zones and the schools. • These improvements are included in the School Street Complete Street and the Safe Routes Priority Streets strategies.	• Loss of 7-8 parking spaces on Golden Gate Way • The St Mary's loading area adds a significant number of parking spaces	• This strategy will enhance the street environment and encourage walking between the schools and the loading zones	• This strategy will not have an effect on the environment or utilities	• The St Mary's Road loading zone would encroach onto the Stanley Middle School playing field • The loading zones can be implemented mostly on school land and using existing on-street parking spaces. • Requires constructing shelters, lighting, and other safety enhancements	$200-400k
BART Pedestrian Bridge Over Oak Hill Road	• Fewer pedestrians traveling through the stop controlled intersection on Deer Hill Rd would allow for a slight improvement in intersection operations	• This strategy will not have an effect on auto and truck safety	• It would create a direct connection between the BART parking lots and reduce the number of pedestrians crossing at the Deer Hill Rd/Oak Hill Rd intersection. This would improve pedestrian safety by reducing potential vehicle-pedestrian conflicts at this intersection	• This strategy will not impact parking	• Encourage more active modes of travel and enhance the livability of the area	• This strategy will not have an effect on the environment or utilities	• Requires significant engineering design services • Would require coordination with BART and Caltrans	$6-8M

Memorandum

Strategy (Composite Score)	Congestion Reduction	Auto/Truck Safety	Bike/Ped Safety and Connectivity	Parking Impact	Urban Design	Environment / Utility Impacts	Ease of Implementation	Cost
Enhance School Bus Program	 • Each additional bus rider can take one vehicle off of the road network, which equates to two peak hour school trips from Moraga Rd and/or School St (one trip entering to drop-off and one trip exiting the school) • Generating 25% school bus mode share at both the Elementary and Middle Schools (from existing 0% and 19%, respectively) would generate approximately 200 new riders. This would remove 200 vehicles (400 vehicle trips) from around the schools • 6% reduction in vehicle trips on Moraga Rd	 • Removing vehicle trips from around the schools should improve traffic flow and have a modest improvement on auto/truck safety	 • This strategy will not have an effect on pedestrian and bicycle safety	 • This strategy will not impact parking	 • This strategy will not have an effect on urban design	 • This strategy will not have an effect on the environment or utilities	 • Encouraging mode shift may be a challenge • High existing ridership indicates strong demand	 $500,000 (annually)
Staggered School Times	 • Spreads out the peak travel demand hour, if either of the school's start time is shifted 30-60 minutes later (to approximately 9:00 to 9:15 AM) • Could generate more trips, if parents have children in both schools and are forced to make two trips instead of one to accommodate the different start times	 • Removing vehicle trips from around the schools should improve traffic flow and have a modest improvement on auto/truck safety	 • This strategy will not have an effect on pedestrian and bicycle safety	 • This strategy will not impact parking	 • This strategy will not have an effect on urban design	 • This strategy will not have an effect on the environment or utilities	 • Achieving consensus from the schools, students and parents may be a challenge • Would require a significant change to the school district's current operation	 <$25k • Would reduce the cost for bus service by approximately $150,000 by saving two of the six buses proposed in the strategy. Fewer buses are required to serve both schools if one bus can take multiple trips. • Could result in some higher school operating costs due to a longer school day between the two schools

Memorandum

Strategy (Composite Score)	Congestion Reduction	Auto/Truck Safety	Bike/Ped Safety and Connectivity	Parking Impact	Urban Design	Environment / Utility Impacts	Ease of Implementation	Cost
Regional Trail to BART Connection	• This strategy will help promote cycling, which would result in a small decrease in vehicle trips.	• This strategy will not have an effect on auto and truck safety	• This strategy would provide enhanced signage and wayfinding along the route, with targeted improvements at the proposed Brook-School intersection and at locations west of Moraga Rd	• This strategy will not impact parking	• Encourage more active modes of travel and enhance the livability of the area	• This strategy will result in an increase in bicycling and walking, which will have a positive impact on the environment. • Any utility impacts would be minor, as this strategy does not include relocating utilities.	• Easy to implement improvements	$50-100k
Student Pedestrian Safe Routes	• This strategy will help promote cycling, which would result in a small decrease in school-related vehicle trips.	• This strategy will not have an effect on auto and truck safety	• Provides enhanced safety along key walking routes between the schools, major streets, and the proposed school loading zones • Designating priority pedestrian streets is a key element of ensuring the success of the school loading zones • Providing pedestrian safe routes/priority streets will cause fewer vehicle-pedestrian conflicts	• This strategy will not impact parking	• Improves the walkability of the area	• This strategy will not have an effect on the environment or utilities	• Requires minor physical improvements such as intersection bulb-outs, curb extensions, crosswalk improvements, etc.	$50-100k
School Street Complete Street	• This strategy will help promote cycling, which would result in a small decrease in vehicle trips.	• School buses would be less likely to encounter congestion on School St	• The improvements include a wide path protected by a buffer that would enhance safety for pedestrians and cyclists	• Loss of 9 on-street parking spaces • Additional parking could be added on the south side of School St in front of the school administration building with some redesign of their parking lot	• This strategy provides an improved streetscape and enhanced walking and bicycling environment on School St • Landscaping would help beautify the street, improving quality of life for those working, living, and attending school on School St	• Some services, including 4 telephone poles, would likely need to be relocated to ensure a clutter free shared path	• The proposed design would require modest physical improvements: widening the northern sidewalk to create a shared use path, installing a buffer between the shared use path and travel lane and painting high visibility crosswalks • Obtaining consensus on the design could be a challenge	$500k-1.0M

Strategy (Composite Score)	Congestion Reduction	Auto/Truck Safety	Bike/Ped Safety and Connectivity	Parking Impact	Urban Design	Environment / Utility Impacts	Ease of Implementation	Cost
Mt Diablo Boulevard Road Diet	 • Reducing one travel lane in the eastbound direction or one travel lane in both directions would have only a minimal effect on most days, but could have significant effect when an incident occurs on SR 24 and MDB is used as a bypass. • The analysis indicates that removing one travel lane in each direction would not significantly change the LOS. Intersections on MDB would still operate at LOS B with the removal of one travel lane in each direction under future year conditions	 • The reduced lanes as well as the landscaping in the medians and sidewalks will act as a traffic calming strategy, which would reduce the number of cut-through trips from SR 24 and reduce traffic speeds. This would enhance auto/truck safety	 • This strategy will provide greater protection for cyclists and pedestrians • Lower traffic speeds will create an environment conducive to walking and cycling	 • This strategy will not impact parking	 • The median with landscaping and the sidewalks and buffered bike lanes will improve the environment along MDB	 • This strategy will not have an effect on the environment or utilities	 • The road diet can be implemented mostly by restriping MDB and within the existing right-of-way	 $1-2M