City of Santa Barbara
Public Works Department

Interoffice Memorandum

DATE: April 2, 2013

TO: Christine F. Andersen, Public Works Department Director

VIA: Pat Kelly, Assistant Public Works Director/City Engineer

FROM: Derrick Bailey, Supervising Transportation Engineer

SUBJECT: State Route 225 Traffic Operations Review

At its May 21, 2012, meeting, City Council directed staff to study State Route 225 (SR 225) to identify potential traffic and safety operational issues that the City may be faced with upon completion of the relinquishment process.

Council directed staff to address several areas, including:

- Overall corridor safety and opportunities for improvement,
- The effects of recent corridor changes (road diet) on traffic operations,
- A plan for phased pedestrian improvements, and
- Conceptual corridor alterations and the effect on traffic operations.

In addition to these areas, this memo also addresses:

- Other considerations and anticipated needs, and
- Traffic signal warrant analyses.

Figure 1, attached, shows the corridor along with traffic volumes and posted speed limits.

Executive Summary

A crash review of the corridor for the past 10 years revealed that most of the corridor's crash rates are consistent with statewide averages, with the exception of the section between Loma Alta Drive and Rancheria Street, which is much higher than the statewide average.

Six short term safety improvements, illustrated in *Figure 2*, and summarized in *Table 1*, below, are recommended.

Table 1: Recommended Short Term SR 225 Traffic Safety Improvements

Location	Issue	Recommendation	Estimated Cost
Las Positas and Modoc Roads	Broadside crashes (southbound traffic signal violations due to roadway curvature). Poor visibility.	Traffic signal modifications (add southbound far side indication). Vegetation removal (NWC).	$5,000
NB Las Positas Road at Las Positas Place	No left turn lane on high speed roadway	Restripe to include left turn lane	$15,000
NB Las Positas Road at Jerry Harwin Parkway	Incorrect bike lane striping	Correct bike lane striping (bike lane to the right of a right turn lane)	$15,000
Cliff Drive and City College (West) driveway	High side street traffic volumes and delays.	Install traffic signal.	$300,000
Cliff Drive and City College (East) driveway	High crash location	Turn prohibition, traffic signal, or roundabout. Traffic signal could be built in combination with roundabout at Loma Alta.	$1,000 to $1.8 million (very rough estimate)
Montecito and Rancheria Streets	Rear end crashes (eastbound due to roadway curvature). Poor signal visibility.	Traffic signal modifications (add eastbound indication). Vegetation removal.	$5,000
NB Las Positas at Veronica Springs	Traffic Signal Visibility	Vegetation removal	-
Montecito Street between Cliff Drive and Rancheria Street.	Rear end crashes, left turn crashes	Study alternatives, including EB left turn lane at Rancheria, turn prohibitions at Cliff/Montecito, and lane reconfiguration.	$50,000 to $100,000
Total Potential Costs			$391,000 to $2,240,000 (Depending on City College East Driveway solution)

In August 2011, a road diet was applied to SR 225 between Meigs Road and Loma Alta Drive. Historically, this section of SR 225 has seen a high number of single vehicle crashes and crashes involving parked vehicles. Although there is a limited amount of "after" data, it appears as though the crash and injury rates have decreased. A spot speed study performed by staff suggests that prevailing speeds continue to reflect the posted speed limit (40 mph).

The community has expressed a desire for improved pedestrian crossing conditions. Due to high operating speeds, inexpensive treatments such as signs and markings will not be effective. More substantial improvements that include curb extensions, median refuge islands, pedestrian activated flashers, and pedestrian hybrid beacons will be required to provide improved pedestrian crossing conditions. The cost per location will be between $160,000 and $300,000, depending on site specific configuration. Five new installations, when combined with existing traffic signals, would result in one-quarter mile crossing spacing and would cost about $900,000.

The community has also expressed a desire for other improvements to Cliff Drive, including a pedestrian scramble crossing at Meigs Road, and extending the road diet west past Mesa Lane. The pedestrian scramble crossing will cause most traffic movements to operate at a level of service "F", and actually increase delay for pedestrians. Extending the road diet is possible, but will require traffic signal phasing and striping changes at Meigs Road to mitigate delays caused by the loss of a traffic lane. Extending the road diet though Mesa Lane would cause significant delay to east and westbound movements during peak periods.

Other operational issues and potential future expenditures have been identified, including:

- A guard rail may need to be installed in the future on Las Positas Road. There currently does not appear to be a vehicle departure crash problem on Las Positas Road; however, in January 2012, there was a fatal single vehicle crash where the vehicle crashed into a tree. Another crash of this type could indicate the beginning of a trend. A 500-foot long guard rail would cost about $60,000.
- At some point in the future, the City will be responsible for adding bicycle detection equipment at the seven signalized intersections, at a cost of about $20,000 per intersection ($140,000 total).
- The City may receive requests for pedestrian countdown timers. Installation cost would be about $14,000.
- Several years ago, CalTrans installed ADA access ramps along the corridor. However, sidewalk-driveway crossings were not addressed. The City has identified about 95 potential driveways that do not meet ADA cross slope requirements. These driveways will have to be upgraded as part of the next full depth overlay, or added to the City's backlog. The cost per driveway upgrade will be about $5,000.

Analysis

Crash Analysis

The crash and injury rates for SR 225, in its entirety, are higher than the statewide average for similar facilities. Those corridor rates are skewed by the high rates between Loma Alta Drive and Rancheria Street. *Table 2*, below, presents some high level statistics on crash data over the last ten years. Caution should be used in interpreting these results. In urban areas, a higher than average crash rate does not mean the entire corridor experiences operational issues. In order to identify and address specific crash problems, patterns must be identified, typically at specific locations.

Table 2: State Route 225 Summary Crash Data

	10 Year (05/02 to 04/12)	3 year (05/09 to 04/12)	1 year (05/11 to 04/12)	Statewide Average*
Crash Rate (per million vehicle miles)	2.28	2.10	2.28	1.35 to 1.89
Injury Rate (per million vehicle miles)	1.59	1.36	1.40	.56 to .79
Total Crashes	540	149	54	-
Total Injuries	374	98	32	-
Total Fatalities	5	1	1	-

* Depending on segment.

Tables 3 and *4,* below, break down the crash rates by segment and by intersection. *Tables 5* and *6*, below, show types of crashes and crash characteristics. Most segments and major intersections are at or below the statewide average. The only significant exception is the segment from Loma Alta Drive to Rancheria Street, which is much higher than the statewide crash rate average.

There have been 146 single vehicle crashes in the last 10 years (59 of which involved crashing into parked vehicles), accounting for over one-quarter of the total crashes. The road diet between Meigs Road and Loma Alta Drive appears to have improved conditions in that section, but additional time and crash data is necessary to make a conclusive decision. Extending the road diet west of Meigs Road is one alternative to reduce single vehicle crashes in that section of the road.

Table 3: State Route 225 Segment Crash Data

From	To	10 yr (05/02 - 04/12)		3 yr (05/09 – 04/12)		1yr (05/09 – 04/12)		Statewide Average	
		Crash Rate	Injury Rate	Crash Rate	Injury Rate	Crash Rate	Injury Rate	Crash Rate	Injury Rate
Rancheria	Loma Alta	14.3	9.42	15.2	3.25	26.0	26.0	1.89	.75
Loma Alta	Meigs	2.21	1.61	1.71	1.18	1.77	0.89	1.89/1.35*	0.75/0.56*
Meigs	Mesa Lane	1.82	1.08	1.42	0.77	2.71	0.77	1.89	0.75
Cliff Drive	Portesuello	0.1	0.2	0.3	0.5	0.75	0.5	1.35	0.56
Portesuello	Modoc	0.1	0.2	0.2	0.3	0.5	0.75	1.35	0.56

*Higher number for four lane configuration (pre August, 2011), and lower number for three lane configuration (post August, 2011)

Table 4: State Route 225 Intersection Crash Data

Intersection	10 yr (05/02 - 04/12)		3 yr (05/09 – 04/12)		1yr (05/09 – 04/12)		Statewide Average	
	Crash Rate	Injury Rate	Crash Rate	Injury Rate	Crash Rate	Injury Rate	Crash Rate	Injury Rate
Castillo/Montecito	.43	.23	.44	.08	.14	.007	.55	.19
Rancheria	.42	.27	.21	.04	.12	.01	.55	.19
Loma Alta	.60	.34	.48	.14	.57	.07	.55	.19
Meigs	.60	.37	.57	.12	.16	.06	.55	.19
Mesa Lane/Flora Vista	.45	.36	.41	.03	.15	0	.55	.19
Cliff Drive/Las Positas	.30	.10	.48	.03	.24	0	.25	.08
Portesuello	.26	.21	.35	.09	.17	0	.55	.19
Modoc	.59	.42	.57	.10	.45	0	.55	.19

Table 5: Types of Crashes

Type of Crash	10 yr (05/02 - 04/12)	3 yr (05/09 – 04/12)	1yr (05/09 – 04/12)
Broadside	149	43	14
Head On	53	14	10
Other	28	8	3
Single Vehicle into Parked Vehicle	59	11	6
Rear End	121	41	8
Side Swipe	43	22	10
Single Vehicle/Hit Object	87	22	10
Total	540	161	61

Table 6: Crash Characteristics

Type of Crash	10 yr (05/02 - 04/12)	3 yr (05/09 – 04/12)	1yr (05/09 – 04/12)
DUI Related	82	14	3
Pedestrian Involved	13	6	4
Bicycle Involved	35	10	1

Specific Traffic Safety Improvement Opportunities Identified

Loma Alta Drive to Rancheria Street (including City College East driveway)

There are three types of crashes that are happening in this segment contributing to the high overall numbers:

- Angle (broadside) and left turn-head on type crashes at the City College east campus driveway,
- Single vehicle and sideswipe type crashes through the curved section, and
- Angle (broadside) and left turn-head on type crashes at Montecito Street.

If the City takes over SR 225, the City will need to address the Cliff Drive and City College (East) driveway, which lies within this high crash section of SR 225. This driveway is in the middle of a horizontal and vertical curve in the roadway that makes judging gaps in traffic difficult and entering the traffic stream awkward. Based on the crash experience warrant of the CA MUTCD, this location warrants a traffic signal, as 5 correctable type crashes occurred during a recent 12-month period (October 2010 to August 2011).

There are several alternatives to address the crash problems at this location:

- Prohibit egress left turns from City College. This would force all traffic east towards Castillo Street, which creates circulation issues for those drivers that want to travel west.
- Construct a roundabout. The footprint of a multi lane roundabout is large, and constructing a roundabout would be difficult and expensive due to the topography.
- Install a traffic signal. The spacing from Loma Alta is only 300-feet. Good traffic signal spacing on higher speed arterials is at least 800 feet, preferably more. Tightly spaced signals create traffic signal timing challenges, potential for spillback from one intersection to the next, and can confuse drivers because there are too many decisions to make in a short amount of time. The cost of a traffic signal would be much less than a roundabout. One alternative would be to install a roundabout at Loma Alta, and a traffic signal at the City College East driveway. This would likely improve performance at Loma Alta, and would maintain full access at the driveway.

Montecito Street, from Rancheria Street to Cliff Drive, should be studied in further detail. Existing crash patterns include eastbound rear ends, and left turn crashes to/from Montecito Street from Cliff Drive. Possible solutions include creating an eastbound left turn lane at Rancheria Street, which could include lane reconfiguration or spot widening to create room for a left turn lane, and prohibiting left turn access at Cliff Drive/Montecito Street. Because a turn prohibition would result in traffic being forced to use the Montecito Street and Rancheria

Street intersection, the safety impact of the additional traffic to that intersection will have to be further evaluated.

City College West Campus Driveway

Traffic volumes exiting the City College west campus driveway are very high, and side street queues and delays are long during peak periods. A traffic signal would improve operations, improve safety and provide a crossing location for pedestrians. A traffic signal warrant analysis is discussed later in this memo.

Las Positas Road and Modoc Road

At Las Positas Road and Modoc Road, there have been 16 angle crashes involving southbound vehicles, and three involving northbound vehicles in the past 10 years. Due to the curvature in the road, indications may be difficult to see. Far side indications, and a southbound traffic signal warning sign will provide earlier warning to approaching drivers.

A significant amount of vegetation on the northwest corner should be removed. This will improve southbound traffic signal visibility. This vegetation currently blocks the view of southbound to westbound right turners looking at southbound pedestrians stepping off the curb.

Montecito Street and Rancheria Street

At Montecito Street and Rancheria Street, there have been six rear end collisions and seven left turn head-on crashes involving eastbound vehicles in the past 10 years. An additional far side indication will improve signal visibility at the curve. Ultimately, an eastbound left turn lane would be the most preferable alternative.

Vegetation trimming is required on the northeast corner. This will improve visibility of the westbound traffic signal indications.

Las Positas Road and Jerry Harwin Parkway

CalTrans has placed a bike lane to the right of the northbound right turn lane, which creates a conflict point. The MUTCD prohibits this configuration. This striping should be changed to reduce liability exposure for the City.

Las Positas Road and Las Positas Place

At this location, there is no dedicated northbound left turn lane. Left turning traffic must wait for a gap in oncoming traffic in the northbound through lane. With a speed limit of 55mph, this creates the potential for severe rear end crashes. There appears to be enough room to stripe a short northbound left turn lane, removing this conflict.

Vegetation Removal

In addition to the recommended vegetation removal at Las Positas and Modoc Roads, and Montecito and Rancheria Streets, vegetation should be trimmed back on northbound Las Positas Road at Veronica Springs to improve traffic signal visibility.

Road Diet Before/After Comparison

In August 2011, a road diet was applied to SR 225 between Meigs Road and Loma Alta Drive. Historically, this section of SR 225 has seen a high number of single vehicle crashes, and crashes involving parked vehicles. A limited amount of post-road diet crash data is available, and it is too early to determine if the road diet will have a lasting effect on safety. However, early results are encouraging. *Table 7*, below, presents crash data for pre- and post-road diet implementation.

A spot speed study performed by staff suggests that prevailing speeds continue to reflect the posted speed limit (40 mph), which was last certified by CalTrans in 2007.

Table 7: State Route 225 Road Diet Analysis (Meigs Road to Loma Alta Drive)

	Pre-Road Diet (05/02 to 07/11)	**Post-Road Diet (08/11 to 04/12)**
Crash Rate (per million vehicle miles)	2.31	.94
Injury Rate (per million vehicle miles)	1.72	.23
Total Single Vehicle Crashes	54	1
Average Annual Single Vehicle Crashes	5.83	1.33

Pedestrian Enhancement Treatment Analysis

City Council directed staff to identify phased pedestrian crossing enhancements. The community has called for these improvements, particularly in the segment between Mesa Lane and Loma Alta Drive. Providing safe pedestrian crossing locations are particularly challenging on wide, high speed facilities such as SR 225.

Traffic engineering staff analyzed existing traffic speeds on this segment of SR 225, and found that 85th percentile speeds are about 45 mph. Considering these traffic speeds, extreme caution should be taken before establishing new pedestrian crossing locations because of the following:

- At 45mph, it takes drivers 360' to stop their vehicle.
- At 45mph, pedestrians are not likely to survive a collision. Establishing a crosswalk encourages pedestrian movements across vehicle paths.
- At 45mph, drivers can travel almost one-quarter mile in the same time it takes a pedestrian to cross Cliff Drive.
- At 45mph, a driver's cone of vision tends to narrow, and instead of focusing on side street traffic and pedestrians, drivers are focused further down the road. At slower speeds, drivers are much more likely to notice activity adjacent to the street.

To provide enhanced pedestrian crossing locations, there are limited alternatives available due to traffic speeds. These include:

- Pedestrian hybrid beacons (also known as HAWK's) can be used at mid-block locations only, and with locations that have expected usage of at least 20 pedestrians during peak hours.
- A combination of enhanced crosswalk features to increase driver awareness of the crossing location, control traffic speeds, and reduce pedestrian exposure to traffic. This type of treatment would include curb extensions, a median refuge island, and pedestrian activated flashers (at crosswalk and in advance).

Lower cost alternatives such and signs and pavement markings alone will not be effective in improving pedestrian crossing safety given the high traffic speeds.

Three concepts for pedestrian crossing treatments are attached in *Figures 3* through *5*. The community will likely have suggestions for the best place to locate enhanced crossings. Based on observations done while performing this review, the highest pedestrian crossing demand appears to be the area just west of City College.

Figure 3 illustrates a mid block crossing, utilizing curb extensions, a median refuge island, and a pedestrian hybrid beacon. Pedestrian hybrid beacons are only approved for use at

mid-block locations (not near side streets or major driveways). The estimated cost per installation is $300,000.

Figures 4 and *5* illustrate enhanced pedestrian crossing concepts for Santa Cruz Boulevard and Oliver Road. Other locations may be more preferable. These crossing concepts include curb extensions, a median refuge island, and pedestrian activated flashers. Due to potential conflicts with driveways and left turn access, not all intersections will accommodate this configuration. The estimated cost per installation is between $160,000 and $180,000, depending on site specific conditions.

Staff identified five potential locations for enhanced pedestrian crossing treatments that will result in crossing spacing of about one-quarter mile, as illustrated in *Figure 6*. The community will likely have opinions as to the priorities, and perhaps identify other locations. The cost for these five enhanced crossing locations will be about $900,000. The improvements could be constructed at once, or phased and prioritized based on community feedback. These locations are conceptual, and a thorough location-specific engineering analysis should be completed prior to moving forward with any improvements.

Safety grant money is not likely to be available for these improvements, as there have been few pedestrian involved crashes. Grants are evaluated based on past crash history.

It is recommended that MTD be consulted in identifying enhanced crossing locations so that bus stop locations and potential relocations can be coordinated to maximize safety for transit users, who typically have to cross the street on either their arrival or departure.

Conceptual Corridor Alterations

Several ideas have been put forth to alter the characteristics of the corridor.

Cliff Drive/Meigs Road intersection:

- One idea put forth is to reduce the number of lanes approaching the intersection, and decrease pedestrian crossing distances. Conceptually, this configuration could be implemented without reducing overall intersection performance if right turn lanes are preserved, and sight lines improved so that left turn phasing can be altered.
- Another idea put forth is to create an exclusive pedestrian phase (scramble crossing). This type of traffic signal phasing would increase delay for vehicles by about 50% (most movements would operate at a level of service "F"), and overall delay to most pedestrians would increase due to the extremely long cycle length required to accommodate all the different movements. Increased delay can have a negative impact on safety as intersection users become impatient or encourage traffic to divert,

which can cause safety issues on other streets. Pedestrian delays would see more of an improvement if the existing split phasing can be eliminated.

Extending the road diet west Beyond Meigs Road

- This would require the reduction of one eastbound and one westbound lane at the Cliff Drive/Meigs Road intersection. As discussed earlier, conceptually, this configuration could be implemented without reducing overall intersection performance, if right turn lanes can be preserved, and sight lines improved so that left turn phasing can be altered.
- The road diet could be extended west of the Mesa Lane/Flora Vista traffic signal; however east and westbound movements will experience a significant increase in delay during peak hours. The complex traffic signal phasing required due to the offset intersection requires allocation of a significant amount of green time to the side streets, which reduces efficiency of the major movements.

Other Considerations/Anticipated Needs

In addition to the traffic signal upgrades already identified to bring the seven traffic signals on SR 225 into the City's traffic signal system, staff anticipates receiving requests for bicycle detection and pedestrian countdown timers along the route. Video bicycle detection at these seven intersections will cost about $140,000, and countdown timers will cost about $14,000.

Several years ago, CalTrans installed access ramps along corridor. Staff identified approximately 95 sidewalk-driveway crossings that were not upgraded, so an ADA accessible pathway does not exist on all sidewalks. Upgrading these driveways will have to be addressed at some point in the future, either at the time of the next full depth overlay, or by adding these locations to the City's backlog. Cost per driveway will be approximately $5,000, or $475,000 total.

In January 2012, there was a fatal single vehicle traffic crash on Las Positas Road involving a vehicle crashing into a tree. Although there does not appear to be a safety issue or trend, another crash of this type could require the City to consider some type of roadside barrier or guard rail. A 500-foot long standard guard rail in the vicinity of the fatal crash would cost about $60,000. Decorative guard rails could cost double to triple that amount.

Traffic Signal Feasibility Analysis

In addition to the analysis of crash data, traffic volume and delay data was collected and analyzed for potential traffic signals at all side streets. All side streets that have higher traffic

volumes or crash frequencies were investigated. The results of this effort are summarized in *Table 8*, below.

Table 8: Traffic Signal Feasibility Results Summary

Intersection	Meets Warrants?	Traffic Signal Recommended?	Comments
Cliff Drive and City College (East)	Yes	Maybe	Other alternatives should be considered first, including a roundabout or a turn prohibition.
Cliff Drive and City College (West)	Yes	Yes	High side street traffic volumes and delays.
Cliff Drive and Oceano Avenue	No	No	None.
Cliff Drive and La Marina	Yes	No	Traffic volume warrants were met, but crash history is low, and delay would likely increase. Overall traffic operations would not be improved.
Cliff Drive and Lighthouse Road	Yes	No	Traffic volume warrants were met, but crash history is low, and delay would likely increase. Overall traffic operations would not be improved.

Detailed traffic signal warrant analyses were performed, and are documented separately from this memo.

Conclusion

If the City takes over SR 225, the City will likely have to deal with a number of operational issues that were not previously identified. Recommended short term traffic safety improvements are summarized in the following table:

Location	Issue	Recommendation	Estimated Cost
Las Positas and Modoc Roads	Broadside crashes (southbound traffic signal violations due to roadway curvature). Poor visibility.	Traffic signal modifications (add southbound far side indication). Vegetation removal (NWC).	$5,000
NB Las Positas Road at Las Positas Place	No left turn lane on high speed roadway	Restripe to include left turn lane	$15,000
NB Las Positas Road at Jerry Harwin Parkway	Incorrect bike lane striping	Correct bike lane striping (bike lane to the right of a right turn lane)	$15,000
Cliff Drive and City College (West) driveway	High side street traffic volumes and delays.	Install traffic signal.	$300,000
Cliff Drive and City College (East) driveway	High crash location	Turn prohibition, traffic signal, or roundabout. Traffic signal could be built in combination with roundabout at Loma Alta.	$1,000 to $1.8 million (very rough estimate)
Montecito and Rancheria Streets	Rear end crashes (eastbound due to roadway curvature). Poor signal visibility.	Traffic signal modifications (add eastbound indication). Vegetation removal.	$5,000
NB Las Positas at Veronica Springs	Traffic Signal Visibility	Vegetation removal	-
Montecito Street between Cliff Drive and Rancheria Street.	Rear end crashes, left turn crashes	Study alternatives, including EB left turn lane at Rancheria, turn prohibitions at Cliff/Montecito, and lane reconfiguration.	$50,000 to $100,000
Total Potential Costs			$391,000 to $2,240,000 (Depending on City College East Driveway solution)

New pedestrian crossings should be established with caution due to the traffic speeds on Cliff Drive. These crossings will likely cost approximately $160,000 to $300,000 each. Providing five pedestrian crossings that result in one-quarter mile spacing will cost about $900,000.

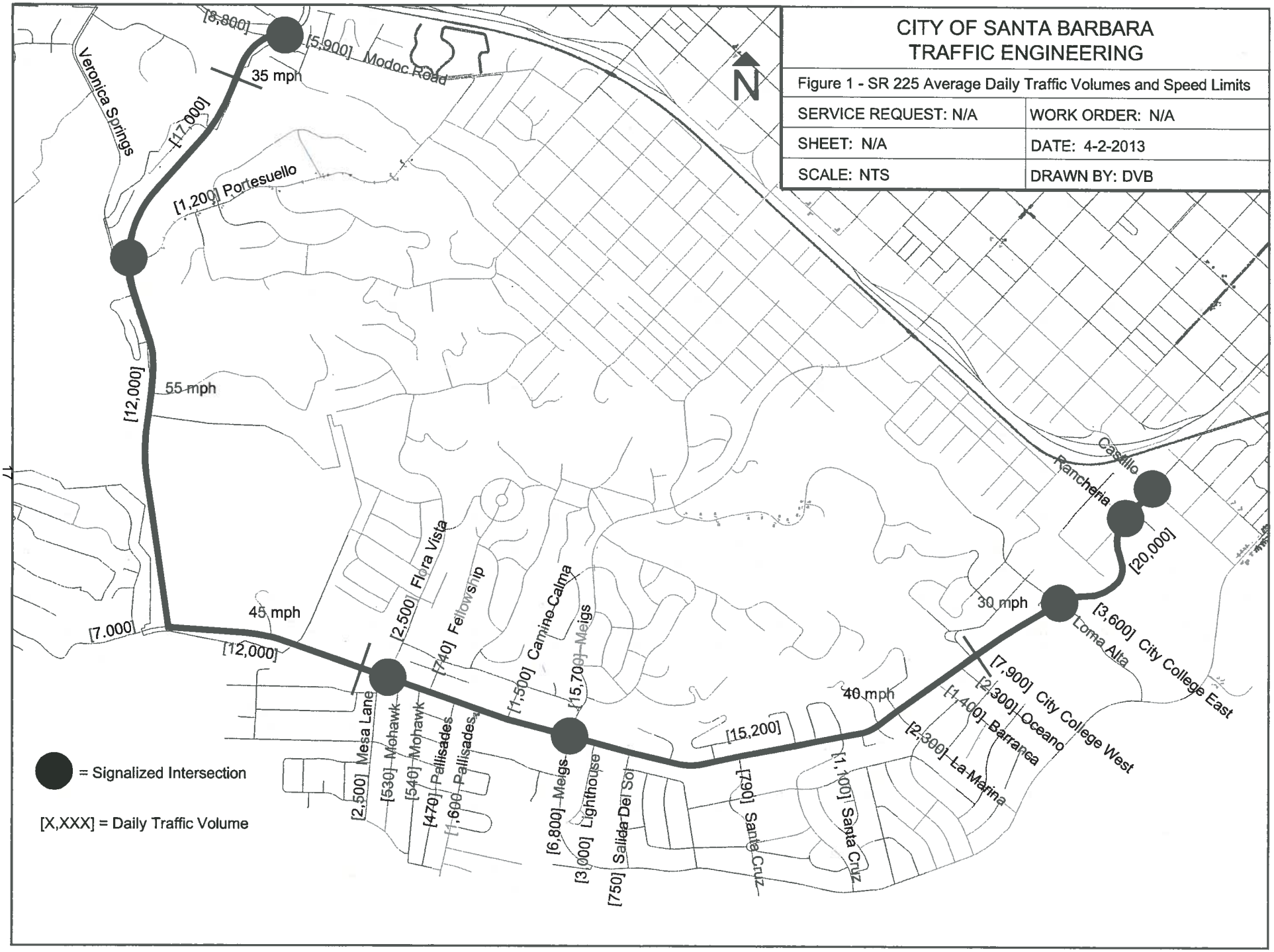
The next scheduled roadway resurfacing project will provide an opportunity for striping modifications, including extending the road diet west beyond Meigs Road. Further investigation to fully quantify and mitigate the impacts of restriping/lane configuration changes is needed.

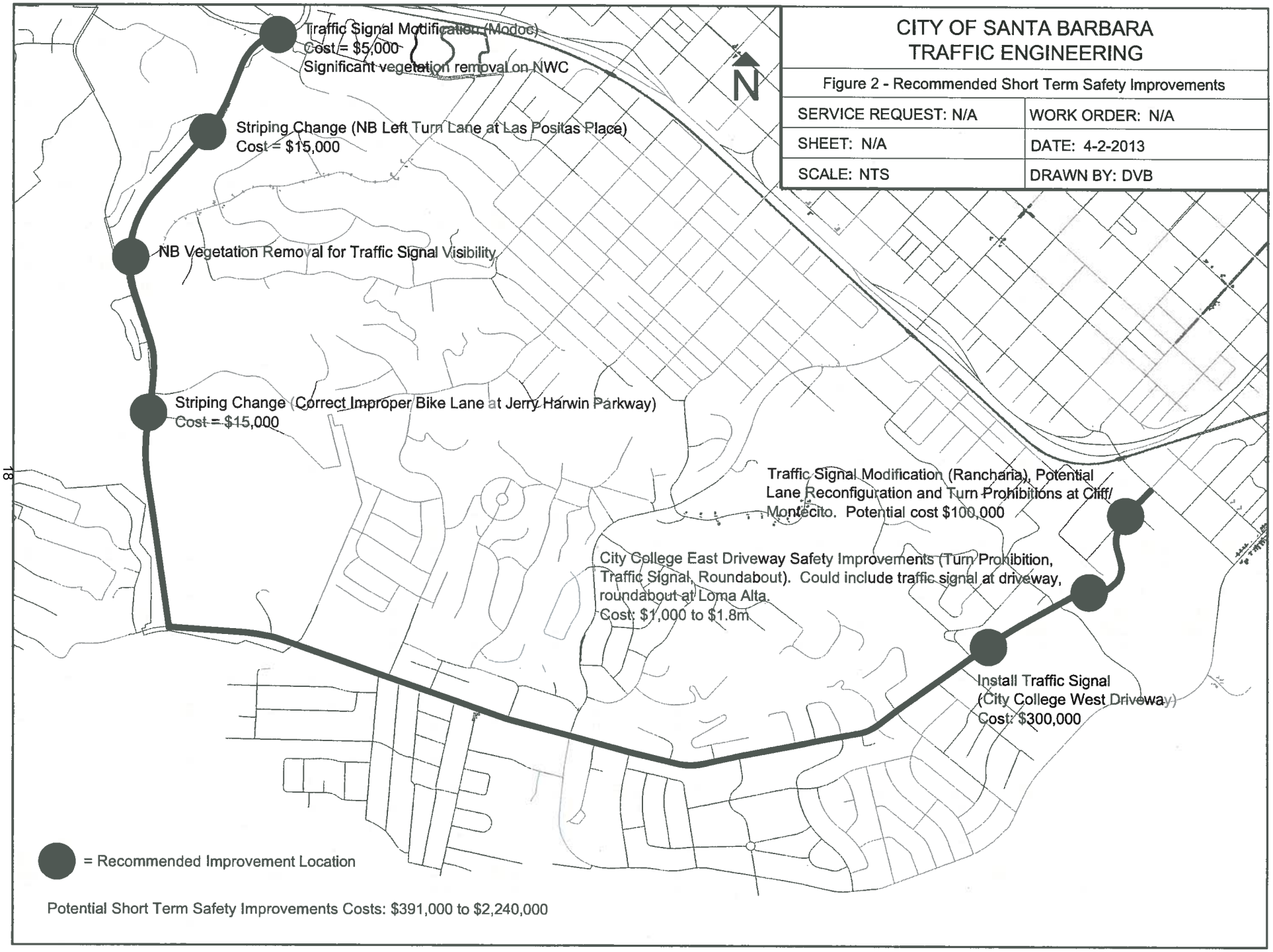
Other operational issues and potential future expenditures have been identified, including:

- A guard rail may need to be installed in the future on Las Positas Road. There currently does not appear to be a vehicle departure crash problem on Las Positas Road, however, in January 2012, there was a fatal single vehicle crash where the vehicle crashed into a tree. Another crash of this type could indicate the beginning of a trend. A 500-foot long guard rail would cost about $60,000.
- At some point in the future, the City will be responsible for adding bicycle detection at the seven signalized intersection, at a cost of about $20,000 per intersection ($140,000 total).
- The City may receive requests for pedestrian countdown timers. Installation cost would be about $14,000.
- Several years ago, CalTrans installed ADA access ramps along the corridor. However, sidewalk-driveway crossings were not addressed. The City has identified about 95 potential driveways that do not meet ADA cross slope requirements. These driveways will have to be upgraded as part of the next full depth overlay, or added to the City's backlog. Cost per driveway upgrade will be about $5,000.

Attachments: Figure 1 – SR 225 Average Daily Traffic Volumes and Speed Limits
Figure 2 – Recommended Short Term Safety Improvements
Figure 3 – Mid Block Pedestrian Crossing Concept
Figure 4 – Santa Cruz Pedestrian Crossing Concept
Figure 5 – Oliver Pedestrian Crossing Concept
Figure 6 – Phased Pedestrian Enhancements

DB/kts


CITY OF SANTA BARBARA
TRAFFIC ENGINEERING
Figure 1 - SR 225 Average Daily Traffic Volumes and Speed Limits
SERVICE REQUEST: N/A
WORK ORDER: N/A
SHEET: N/A
DATE: 4-2-2013
SCALE: NTS
DRAWN BY: DVB
N
[8,800]
[5,900] Modoc Road
35 mph
Veronica Springs
[17,000]
[1,200] Portesuello
[12,000]
55 mph
[7,000]
45 mph
[12,000]
[2,500] Flora Vista
[740] Fellowship
[1,500] Camino Calma
[15,700] Meigs
[2,500] Mesa Lane
[530] Mohawk
[540] Mohawk
[470] Pallisades
[1,600] Pallisades
[6,800] Meigs
[3,000] Lighthouse
[750] Salida Del Sol
[15,200]
[790] Santa Cruz
[1,100] Santa Cruz
40 mph
[1,400] Barranca
[2,300] La Marina
[2,300] Oceano
[7,900] City College West
30 mph
Loma Alta
[3,600] City College East
[20,000]
Rancheria
Castillo
= Signalized Intersection
[X,XXX] = Daily Traffic Volume


CITY OF SANTA BARBARA
TRAFFIC ENGINEERING
Figure 2 - Recommended Short Term Safety Improvements
SERVICE REQUEST: N/A
WORK ORDER: N/A
SHEET: N/A
DATE: 4-2-2013
SCALE: NTS
DRAWN BY: DVB
N
Traffic Signal Modification (Modoc)
Cost = $5,000
Significant vegetation removal on NWC
Striping Change (NB Left Turn Lane at Las Positas Place)
Cost = $15,000
NB Vegetation Removal for Traffic Signal Visibility
Striping Change (Correct Improper Bike Lane at Jerry Harwin Parkway)
Cost = $15,000
Traffic Signal Modification (Rancharia), Potential Lane Reconfiguration and Turn Prohibitions at Cliff/ Montecito. Potential cost $100,000
City College East Driveway Safety Improvements (Turn Prohibition, Traffic Signal, Roundabout). Could include traffic signal at driveway, roundabout at Loma Alta.
Cost: $1,000 to $1.8m
Install Traffic Signal
(City College West Driveway)
Cost: $300,000
= Recommended Improvement Location
Potential Short Term Safety Improvements Costs: $391,000 to $2,240,000

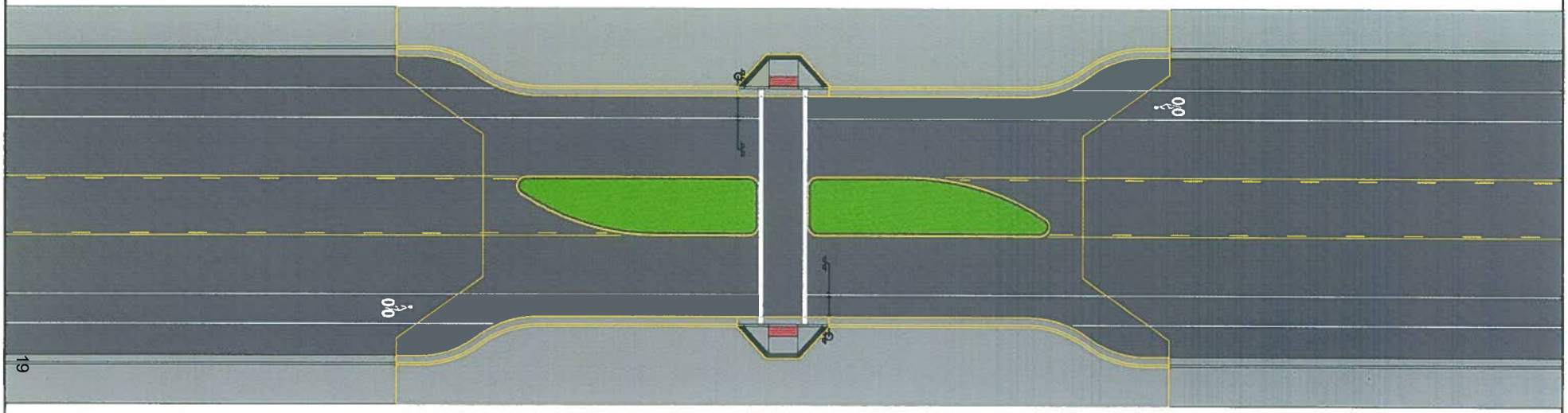


FIGURE 3

MID BLOCK

PEDESTRIAN HYBRID BEACON

DESIGN	DB
DRAWN	MR
CHECKED	DB
DATE	4/1/2013
SCALE	1" = 30'

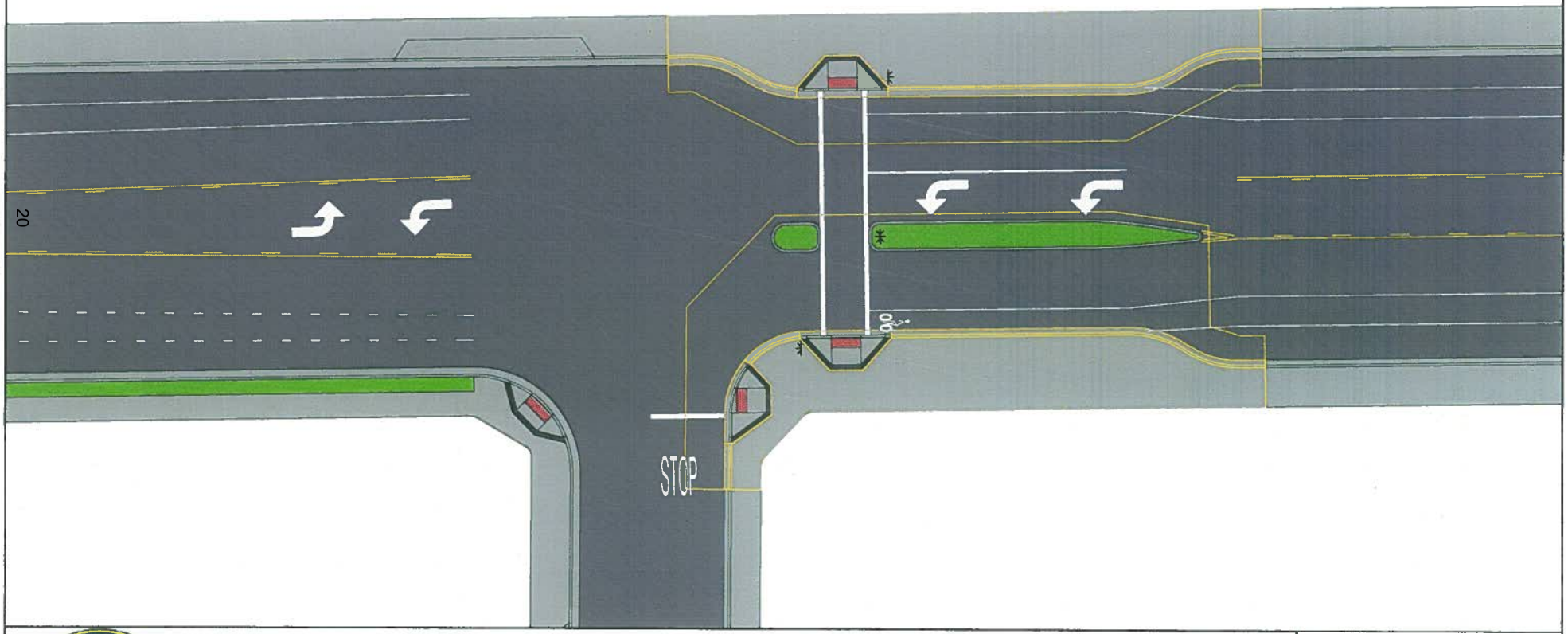


FIGURE 4
SANTA CRUZ
PEDESTRIAN RECTANGULAR FLASHING BEACON

DESIGN	DB
DRAWN	MR
CHECKED	DB
DATE	4/2/2013
SCALE	1" = 30'

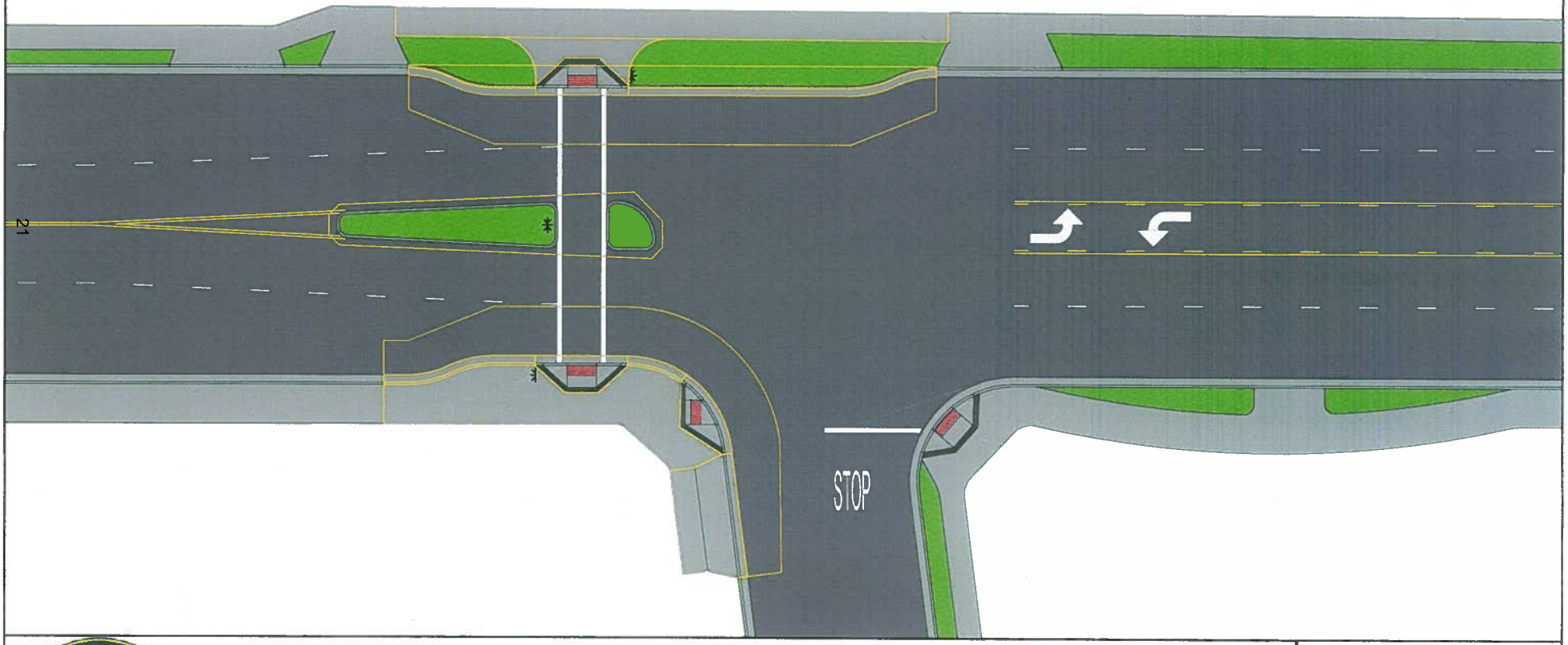
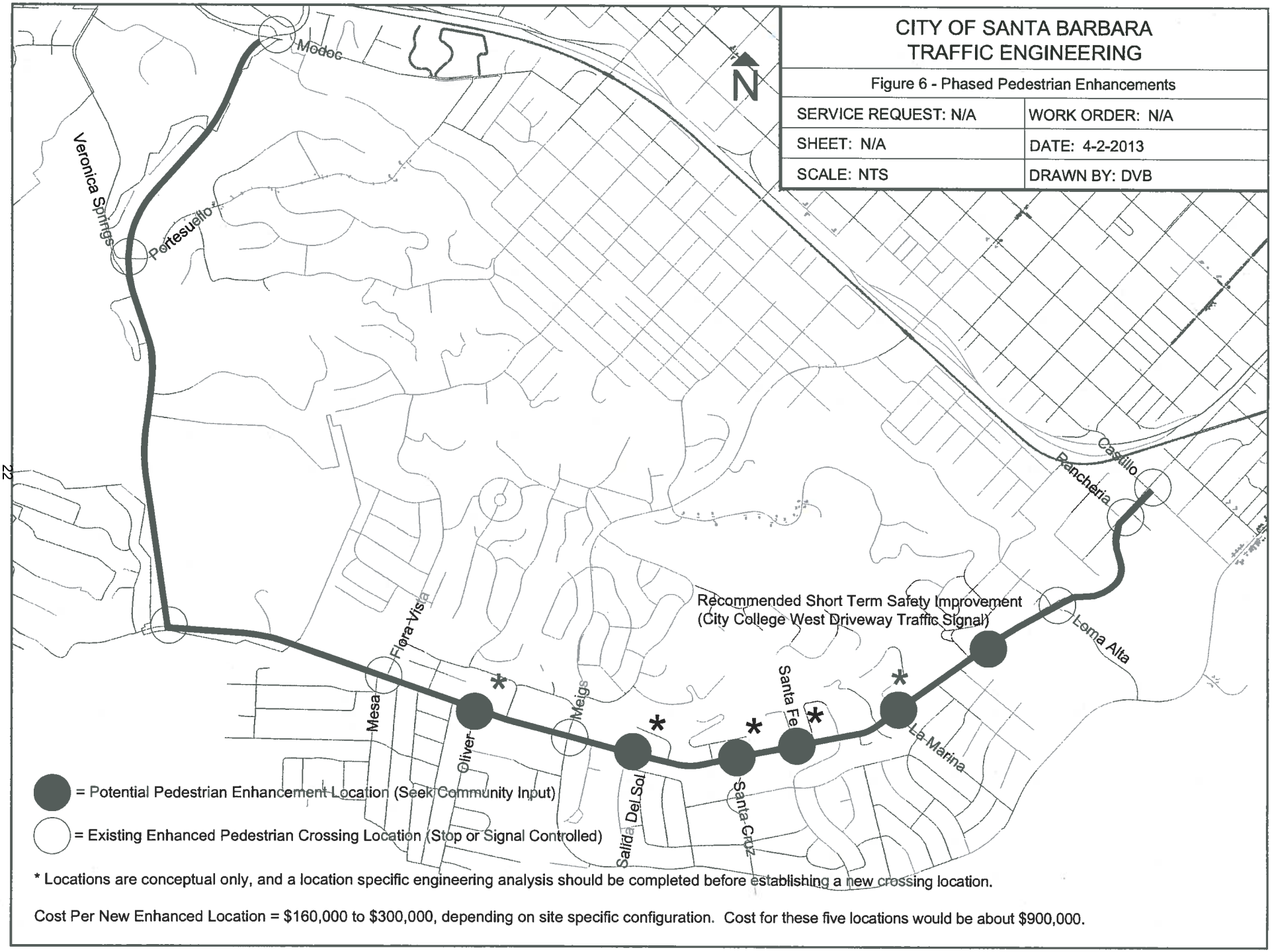


FIGURE 5
OLIVER
PEDESTRIAN RECTANGULAR FLASHING BEACON

DESIGN	DB
DRAWN	MR
CHECKED	DB
DATE	4/2/2013
SCALE	1" = 30'



* Locations are conceptual only, and a location specific engineering analysis should be completed before establishing a new crossing location.

Cost Per New Enhanced Location = $160,000 to $300,000, depending on site specific configuration. Cost for these five locations would be about $900,000.