



Solano Travel Safety Plan

2016





Solano Travel Safety Plan

January 13, 2016

Solano Transportation Authority (STA)

Solano County, California

STA Member Agencies

City of Benicia

City of Dixon

City of Fairfield

City of Rio Vista

City of Suisun City

City of Vacaville

City of Vallejo

County of Solano



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Executive Summary

The Solano Travel Safety Plan (Safety Plan) has been updated by the Solano Transportation Authority (STA) and staff from our member agencies (Benicia, Dixon, Fairfield, Rio Vista, Suisun City, Vacaville, Vallejo, and the County of Solano). The plan identifies locations where local agencies may potentially implement treatments and/or redesign streets to reduce the frequency and severity of collisions on local streets and roads throughout Solano County. The Safety Plan will guide the STA when prioritizing funding for plans, programs, and projects in the goal to reduce fatalities and severe injuries on our roadways.

The Safety Plan documents work completed since the last Solano Travel Safety Plan was updated in 2005, and sets new priorities to actively secure funding to implement new safety projects.

Each year over the last 10 years (2005-2014) on all roads and highways in Solano County, an average of over 2,500 people were injured in over 4,700 collisions. On local roads alone, each year an average of over 1,350 people were injured in nearly 2,500 collisions. Motor vehicle collision victims and their families, their employers, and society at large are affected in a number of ways: directly by injuries, lost work time and the cost of vehicle repair or replacement; and indirectly through traffic congestion, environmental damage and emotional distress. It is to help alleviate or eliminate these impacts that STA and its member agencies are updating this plan.

1. Introduction

Preamble

The 2016 Solano Travel Safety Plan (Safety Plan) addresses the safety of all people traveling on local streets and roads in Solano County, roads which are under member agency control. The California Department of Transportation (Caltrans) operates and maintains the State Highway System which includes Interstate Routes 80, 505, 680, and 780, and State Routes 12, 29 (Sonoma Boulevard), 37, 84 (River Road), 113 (1st Street), 128, and 220. The Solano County Sheriff's Office enforces traffic laws and responds to reported traffic collisions in the unincorporated areas of Solano County while local police departments cover their respective cities.

The Safety Plan documents 45 safety-related projects completed since the most recent plan update in 2005, lists 76 locations of current priority project locations, and proposes next steps in improving safety throughout the County. The Safety Plan will guide STA in preparation for future funding opportunities that may become available to address various locations throughout Solano County where local agencies may potentially implement treatments and/or redesign streets to reduce the frequency and severity of collisions.

For the purposes of the 2016 Solano Travel Safety Plan, the term safety is defined to include incidents on the public roadway system that result in physical harm, property damage or environmental damage for all system users such as pedestrians, bicyclists, transit riders, motorists, and commercial vehicle operators ⁽¹⁾. The Safety Plan does not address incidents on private property, or those involving air, rail or water transportation.

1998 and 2005 Solano Travel Safety Plans

STA adopted its first Solano Travel Safety Plan in 1998. In 2005, the STA updated the 1998 Solano Travel Safety Plan. The 2005 Solano Travel Safety Plan utilized reported collision data between 1998 and 2004 to identify motor vehicle crash rates for 63 local intersections (per million entering vehicles); collision rates for 13 state and interstate roadway segments (per million vehicle miles), including types of collisions (sideswipe, rear end, and fixed object); bicycle and pedestrian crash rates (per 1,000 population); recently completed or funded but not-yet-completed projects at the 63 local intersections; safety-related projects on state and interstate roadways; continuous California Highway Patrol (CHP) enforcement programs; and potential funding sources for future safety-related projects. Between 2005 and 2015, the 2005 Solano Travel Plan was used to identify and help fund projects to improve safety throughout Solano County.

2016 Solano Travel Safety Plan

The 2016 Safety Plan departs from the methodology used in the 2005 Solano Travel Safety Plan primarily due to a lack of recent and comprehensive motor vehicle volume count data, which is required for determining collision rates. Instead, this plan utilizes the engineering judgement and collected data of local agency staff members and incorporates reported collision data from state resources to identify locations included in this Safety Plan.

Solano County Collision Safety

Motor vehicle collision victims and their families, their employers, and society at large are affected in a number of ways: directly, by injuries, lost work time and the cost of vehicle repair or replacement, and indirectly through traffic congestion, environmental damage and emotional distress. It is to help alleviate or eliminate these impacts that STA and its member agencies are updating this plan.

Financial Impact

Every year in Solano County dozens of people are killed and thousands of people are injured in reported vehicle collisions. That is not the entire picture, as it is estimated that over half of all non-injury crashes and about a quarter of all non-fatal injury crashes are not reported to police⁽²⁾. Even if an individual has not directly been injured by a traffic collision, every person has a one in 112 odds of being involved in a fatal collision in their lifetime³. A person is three times more likely to be involved in a fatal collision than being assaulted with a firearm⁽³⁾.

Using the methodology introduced in National Highway Traffic Safety Administration's (NHTSA) "The Economic and Societal Impact of Motor Vehicle Crashes"⁽²⁾, the estimated economic costs of all reported motor vehicle collisions in Solano County were estimated to be \$150 million in 2014 (in 2010 dollar values). The economic cost for collisions on local roads only is estimated to be \$78 million in 2014 (in 2010 dollar values). Society at large or people not directly involved in car crashes paid over three quarters of the cost primarily through insurance premiums, travel delay, fuel usage, and taxes. Figure 1 below highlights the estimated economic impact of motor vehicle collisions in Solano County between 2005 and 2014.

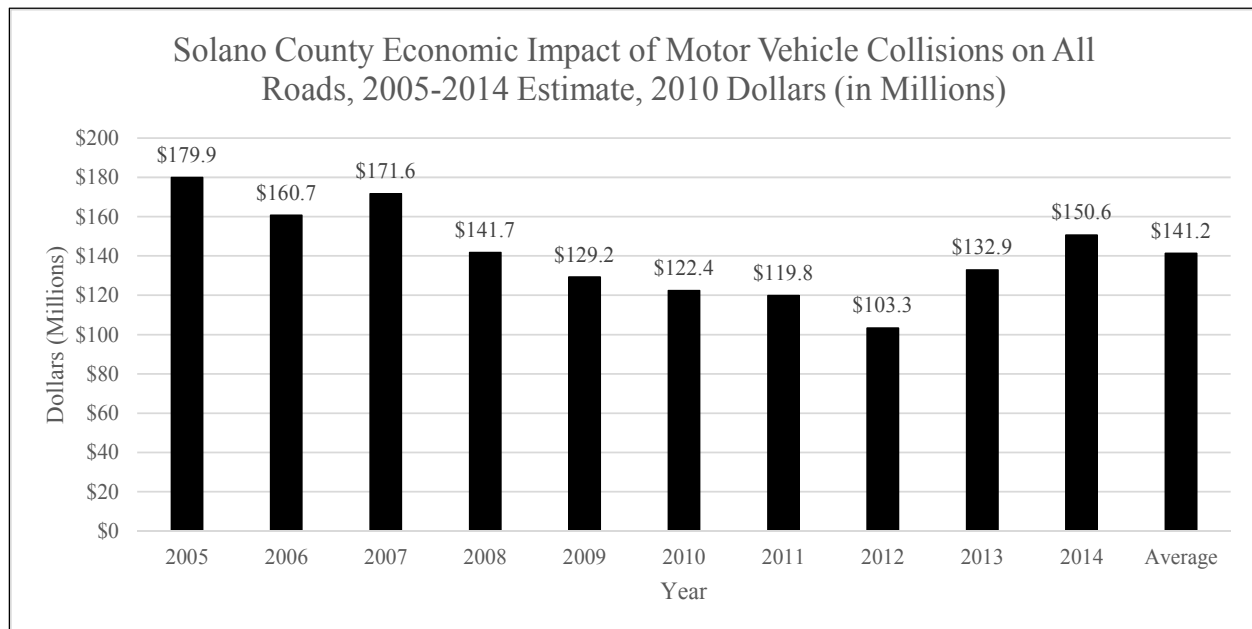


Figure 1. Solano County Economic Impact of Motor Vehicle Collisions on All Roads, 2005-2014 Estimate, 2010 Dollars (in Millions)^(2, 4)

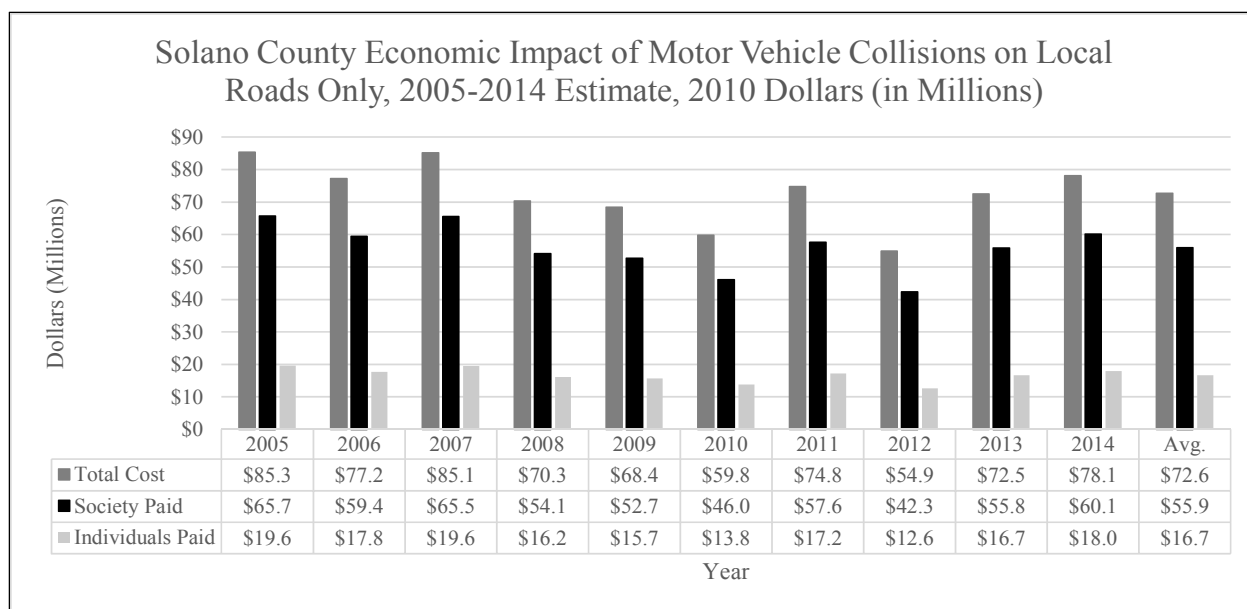


Figure 2. Solano County Economic Impact of Motor Vehicle Collisions on Local Roads Only, 2005-2014 Estimate, 2010 Dollars (in Millions) ^(2,4)

Vehicle Hours of Delay

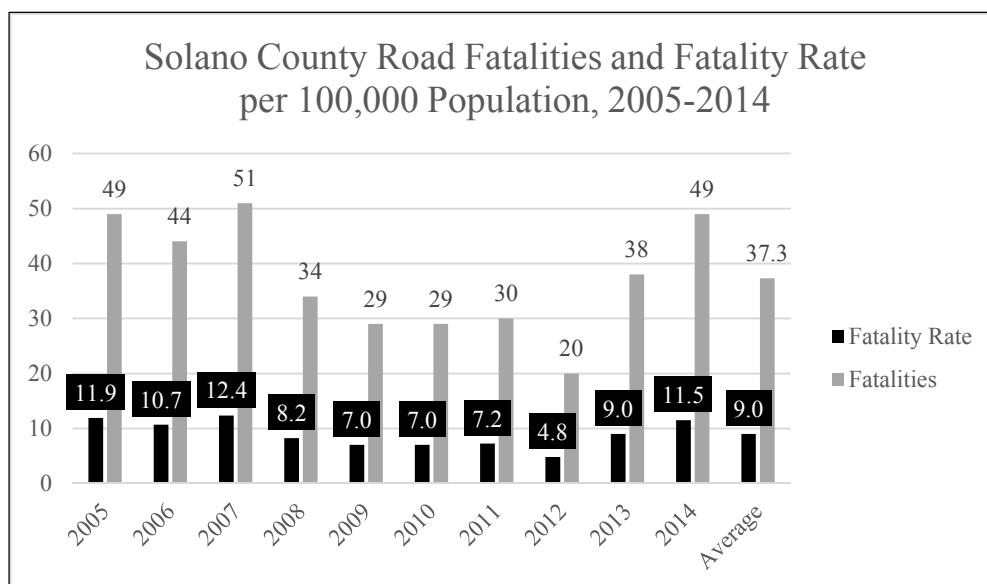
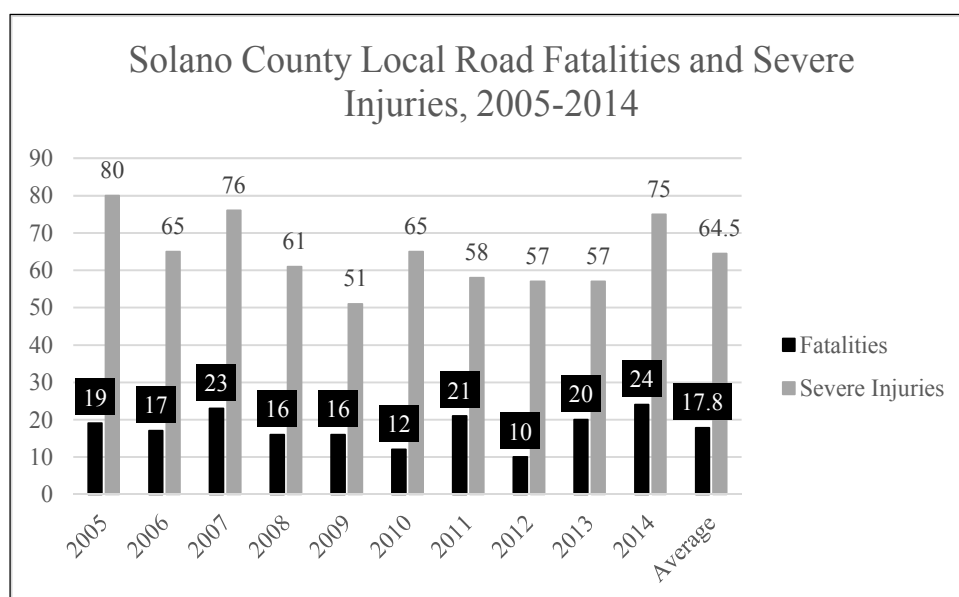
Vehicle collisions not only have a financial impact, they also contribute to time delay due to congestion on our roadways. Motor vehicle crashes result in significant time delays to other motorists who are inconvenienced by lane closures, police, fire, or emergency services activity, detours, and general traffic slowdowns resulting from rubbernecking and chain reaction braking. This results in a significant time penalty for those affected, which can be valued based on wage rates and the value people place on their free time². In addition, it is not uncommon to have additional crashes in the traffic backed up behind the initial incident.

Environmental

Traffic crashes also result in wasted fuel, and therefore increased greenhouse gas production, and increased pollution as engines idle while drivers are caught in traffic jams and slowdowns. These impacts affect drivers' transportation costs and negatively impact the health and economic welfare of Solano County and the Nation². Crashes can also spill fuel or other fluids into the environment, and can cause vegetation fires.

Solano County Collision Trend

Figure 3 below highlights Solano County's fatality collision rate from data retrieved from the Statewide Integrated Traffic Records System (SWITRS). Solano County's highest fatal collision rate occurred in 2005 with a steady trend through 2007. A small dip in the trend occurred between 2008 and 2012. In more recent years, the fatal and severe collisions have started to increase closer to the collision rates reported in 2005 and 2006.

Figure 3. Solano County Road Fatalities and Fatality Rate per 100,000 Population, 2005-2014 ⁽⁴⁾Figure 4. Solano County Local Road Fatalities and Severe Injuries, 2005-2014 ⁽⁴⁾

The fatality rate in Solano County varies by year but averaged 8.98 deaths per 100,000 population for the last 10 years ⁽⁴⁻⁶⁾. For comparison purposes, between 2009 and 2013, Solano County's average fatality rate of 7.02 was nearly the same rate (7.03) for the average combined rate of the four adjacent counties (Contra Costa, Napa, Sacramento, and Yolo Counties) ⁽⁴⁻⁶⁾. In 2013 (the most recent year of data) the United States fatality rate was 10.35 ⁽⁷⁾ and California's fatality rate was 7.83 ⁽⁷⁾.

Auto collisions are not accidents that happen randomly without cause. The precise time and location cannot be predicted, but we know:

1. drivers may make poor choices while driving (speeding and otherwise not obeying traffic laws and signs/signals, using cell phones/in-car media dashboards, or drinking and driving);
2. the design of our roadways and adjacent land uses influence how we travel (whether we walk, bike, drive, or ride transit, or whether or not we speed while driving);
3. equipment we use to travel may fail us (brake failure or tire blowouts); and,
4. the environment sometimes makes it more difficult (heavy rain, rising or setting sun).

Most of these issues can be addressed, and the underlying causes can be prevented. The good news is that motor vehicle collisions can be prevented if there is adequate funding and resources, which may allow the collection, management, and analysis of data required to perform advanced road safety analysis.

References

¹ Washington, S., Meyer, M., van Schalkwyk, I., Dumbaugh, E., Mitra, S., & Zoll, M. (2006). *Guidance: Incorporating Safety into Long-Range Transportation Planning*. National Cooperative Highway Research Program: NCHRP 8-44.

Retrieved December 23, 2015 from http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_546.pdf

² Blincoe, L. J., Miller, T. R., Zaloshnja, E., & Lawrence, B. A. (2015, May). *The economic and societal impact of motor vehicle crashes, 2010. (Revised)* (Report No. DOT HS 812 013). Washington, DC: National Highway Traffic Safety Administration.

Retrieved December 23, 2015 from <http://www-nrd.nhtsa.dot.gov/pubs/812013.pdf>

³ National Safety Council, Odds of Dying.

Retrieved October 5, 2015 from <http://www.nsc.org/act/events/Pages/Odds-of-Dying-2015.aspx>

⁴ California Highway Patrol (CHP) Statewide Integrated Traffic Records System (SWITRS). Raw Data. Cities of Benicia, Dixon, Fairfield, Rio Vista, Suisun City, Vacaville, Vallejo, and County of Solano.

Retrieved November 24, 2015 from <http://iswitrs.chp.ca.gov/Reports/jsp/userLogin.jsp>

⁵ State of California, Department of Finance, California County Population Estimates and Components of Change by Year, July 1, 2000-2010. Sacramento, California, December 2011.

Retrieved December 23, 2015 from <http://www.dof.ca.gov/research/demographic/reports/estimates/e-2/2000-10/>

⁶ State of California, Department of Finance, California County Population Estimates and Components of Change by Year, July 1, 2010–2015, Sacramento, California, December 2015.

Retrieved December 23, 2015 from <http://www.dof.ca.gov/research/demographic/reports/estimates/e-2/view.php>

⁷ National Highway Traffic Safety Administration (NHTSA), National Center for Statistics and Analysis, 2013 Traffic Safety Fact Sheet “State Traffic Data”.

Retrieved November 23, 2015 from <http://www-nrd.nhtsa.dot.gov/PUBS/812196.pdf>

2. Projects Completed Since the 2005 Solano Travel Safety Plan

The 2005 Solano Travel Safety Plan listed 63 intersections throughout Solano County as well as various other locations that were determined to have safety-related problems. The table below summarizes changes made to 45 locations since 2005 that were listed in the 2005 plan.

Projects completed since 2005 at locations listed in the 2005 Solano Travel Safety Plan:

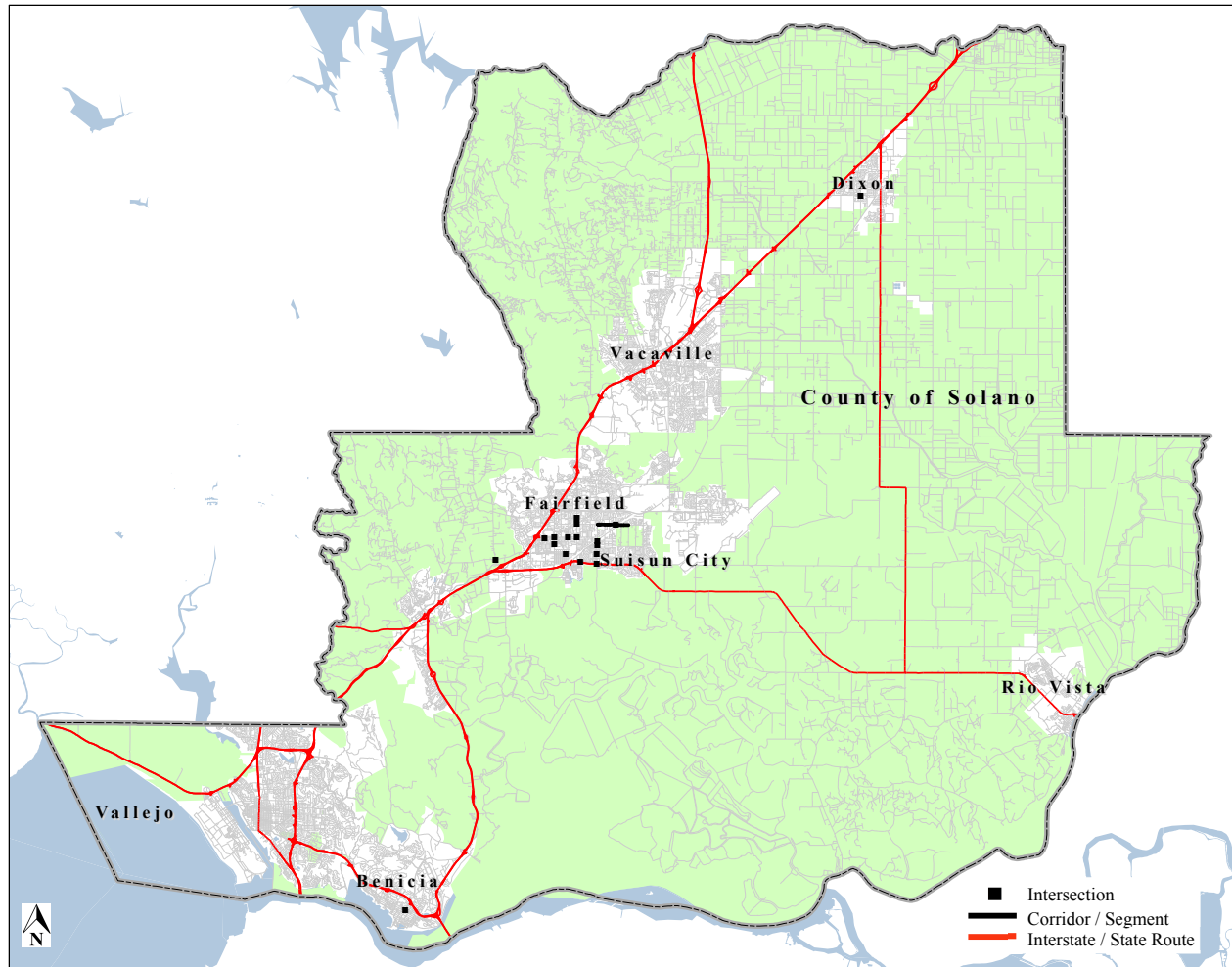
ID	AGENCY	LOCATION	(YEAR OF CHANGE) CHANGES SINCE 2005
1	City of Benicia	East 2nd Street at Military East	(2012) Pedestrian activated flashing no-right-turn sign for motor vehicles installed to allow pedestrians to more safely cross the roadway
2	City of Dixon	Lincoln Street at West A Street	(2008) STOP signs installed, stopping West A Street; crosswalks installed on the north and south legs, crossing Lincoln Street
3	City of Fairfield	Clay Bank Road at East Tabor Avenue	All way STOP signs installed on East Tabor Avenue, at Clay Bank Road as an interim measure. Intersection meets traffic signal warrants
4	City of Fairfield	East Tabor Avenue	Radar speed display signs were installed fronting Grange Middle School and along East Tabor Avenue, intersecting Tolenas Road for Tolenas Elementary (located in Solano County)
5	City of Fairfield	East Tabor Avenue at North Texas Street	Traffic signals retimed on North Texas Street
6	City of Fairfield	Gateway Boulevard at Travis Boulevard	Red light cameras installed and later removed; Traffic signals retimed
7	City of Fairfield	Jefferson Street at Texas Street	Traffic signals retimed
8	City of Fairfield	North Texas Street at Pacific Avenue	Traffic signals retimed
9	City of Fairfield	North Texas Street at Travis Boulevard	Median islands and additional channelization installed
10	City of Fairfield	Pennsylvania Avenue at Travis Boulevard	Traffic signals retimed
11	City of Fairfield	Pennsylvania Avenue at Utah Street	Signal modified to include protected left-turn phases on Pennsylvania Avenue
12	City of Fairfield	Travis Boulevard at Union Avenue	Right-turn lanes installed for eastbound and northbound traffic
13	City of Suisun City	CA-12 at Marina Boulevard	(2015) Traffic signal changes: permitted phasing changed to split phasing (northbound and southbound approaches); upgraded traffic signal poles and mast arms (northeast and southwest corners); additional traffic signal heads installed
14	City of Suisun City	CA-12 at Sunset Avenue	(2015) Traffic signal timing updated for morning, mid-day, and afternoon peak periods along Sunset Avenue
15	City of Suisun City	Pintail Drive at Sunset Avenue	(2015) Traffic signal timing updated for morning, mid-day, and afternoon peak periods along Sunset Avenue

Projects completed since 2005 at locations listed in the 2005 Solano Travel Safety Plan continued:

ID	AGENCY	LOCATION	(YEAR OF CHANGE) CHANGES SINCE 2005
16	City of Suisun City	Railroad Avenue East at Sunset Avenue	(2009) Traffic signal installed; (2015) Traffic signal timing updated for morning, mid-day, and afternoon peak periods along Sunset Avenue
17	City of Suisun City	Railroad Avenue West at Sunset Avenue	(2009) Traffic signal modified; (2015) Traffic signal timing updated for morning, mid-day, and afternoon peak periods along Sunset Avenue
18	City of Vacaville	Alamo Drive at Alamo Lane	(2009) Roadway asphalt concrete (AC) overlay; signs and markings update
19	City of Vacaville	Alamo Drive at Mariposa Avenue	(2009) Roadway asphalt concrete (AC) overlay; signs and markings update
20	City of Vacaville	Alamo Drive at Marshall Road	(2009) Roadway asphalt concrete (AC) overlay; signs and markings update
21	City of Vacaville	Alamo Drive at Merchant Street	(2011) Roadway asphalt concrete (AC) overlay; signs and markings update
22	City of Vacaville	Alamo Drive at Nut Tree Road	(2012) Roadway asphalt concrete (AC) overlay; signs and markings update
23	City of Vacaville	Alamo Drive at Peabody Road	(2009) Roadway asphalt concrete (AC) overlay; signs and markings update
24	City of Vacaville	Allison Drive at East Monte Vista Avenue	(2014) Roadway asphalt concrete (AC) overlay; signs and markings update
25	City of Vacaville	Allison Drive at Elmira Road	(2009) Roadway asphalt concrete (AC) overlay; signs and markings update
26	City of Vacaville	Allison Drive at Nut Tree Road	(2014) Roadway asphalt concrete (AC) overlay; signs and markings update
27	City of Vacaville	Callen Street at East Monte Vista Avenue	(2005) Roadway slurry seal; signs and markings update
28	City of Vacaville	Cliffside Drive at Peabody Road	(2012) Roadway asphalt concrete (AC) overlay; signs and markings update
29	City of Vacaville	Depot Street at Mason Street	(2014) Roadway asphalt concrete (AC) overlay; signs and markings update
30	City of Vacaville	East Monte Vista Avenue at Depot Street / Markham Avenue	(2011) Roadway asphalt concrete (AC) overlay; signs and markings update
31	City of Vacaville	Elmira Road at Nut Tree Road	(2012) Roadway asphalt concrete (AC) overlay; signs and markings update
32	City of Vacaville	Elmira Road at Peabody Road	(2012) Roadway asphalt concrete (AC) overlay; signs and markings update
33	City of Vacaville	Fairview Drive at Nut Tree Road	(2005) Roadway asphalt concrete (AC) overlay; signs and markings update
34	City of Vacaville	Marshall Road at Peabody Road	(2009) Peabody & Marshall Safety Improvements; (2012) Roadway asphalt concrete (AC) overlay; signs and markings update
35	City of Vacaville	Nut Tree Road at Ulatiss Drive	(2006) Roadway asphalt concrete (AC) overlay; signs and markings update

Projects completed since 2005 at locations listed in the 2005 Solano Travel Safety Plan continued:

ID	AGENCY	LOCATION	(YEAR OF CHANGE) CHANGES SINCE 2005
36	City of Vallejo	Admiral Callaghan Lane at Tennessee Street	Left-turn pockets with raised medians installed for all approaches; roadway repaved
37	City of Vallejo	Alameda Street at Georgia Street	Road diet implemented (Georgia Street); Designated lane movements striped (Alameda Street)
38	City of Vallejo	Broadway Street at SR37 / Marine World	(2005) Overpass installed over Broadway Street (Caltrans State Route 37 Improvement Project)
39	City of Vallejo	CA-29 / Sonoma Boulevard at CA-37 / Marine World	(2005) Overpass installed over CA-29 / Sonoma Boulevard (Caltrans State Route 37 Improvement Project)
40	City of Vallejo	CA-29 / Sonoma Boulevard at Georgia Street	Traffic signal modified; left-turn pockets installed (Georgia Street)
41	City of Vallejo	Columbus Parkway at Lake Herman Road	Roadway widened to four travel lanes with turning lanes at controlled intersections (Columbus Parkway from CA-37 / I-80 to Springs Road)
42	City of Vallejo	Mariposa Street at Solano Avenue	Median installed at eastbound Solano Avenue; left-turn lanes striped for all approaches
43	City of Vallejo	Oakwood Avenue at Tennessee Street	Left-turn lanes striped for all approaches; (2010) roadway repaved
44	City of Vallejo	Sereno Drive at Tuolumne Street	Left-turn lanes and traffic signals installed (Tuolumne Street)
45	County of Solano	Abernathy Road at Rockville Road	(2006) Roundabout installed

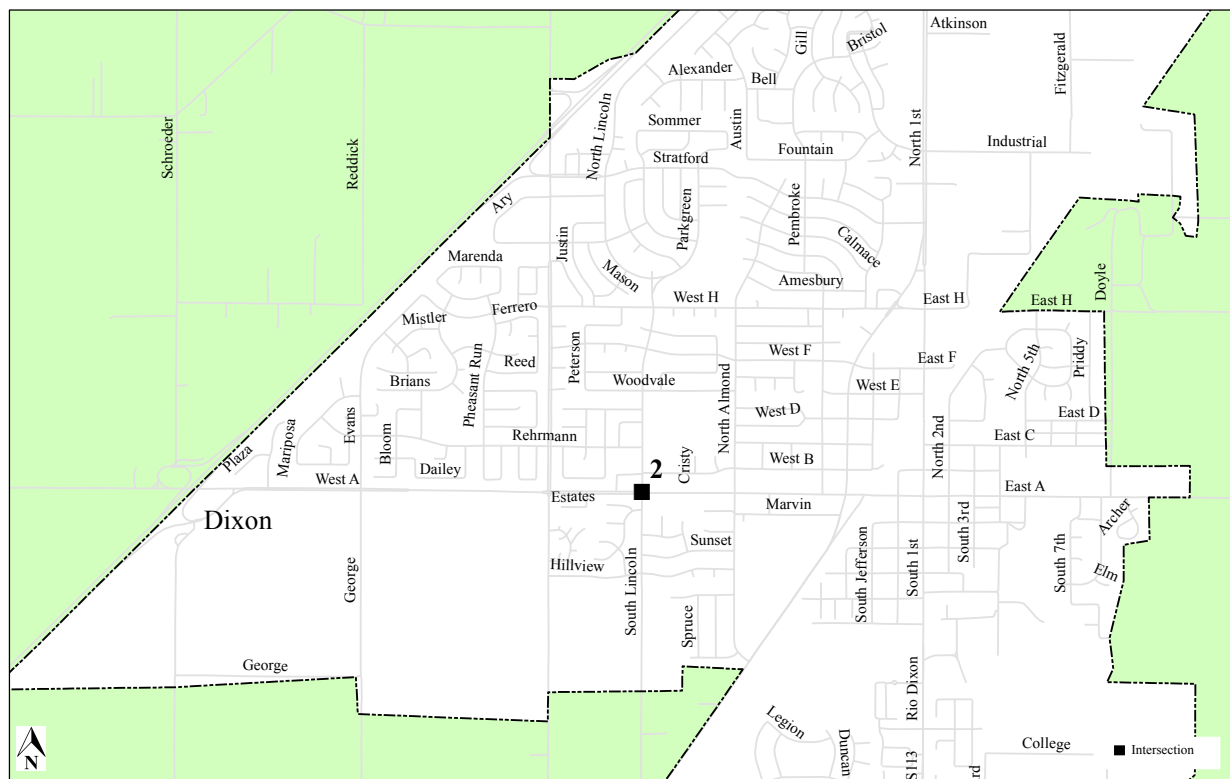


Map 1. Overview Map of All Projects Completed Since the 2005 Solano Travel Safety Plan



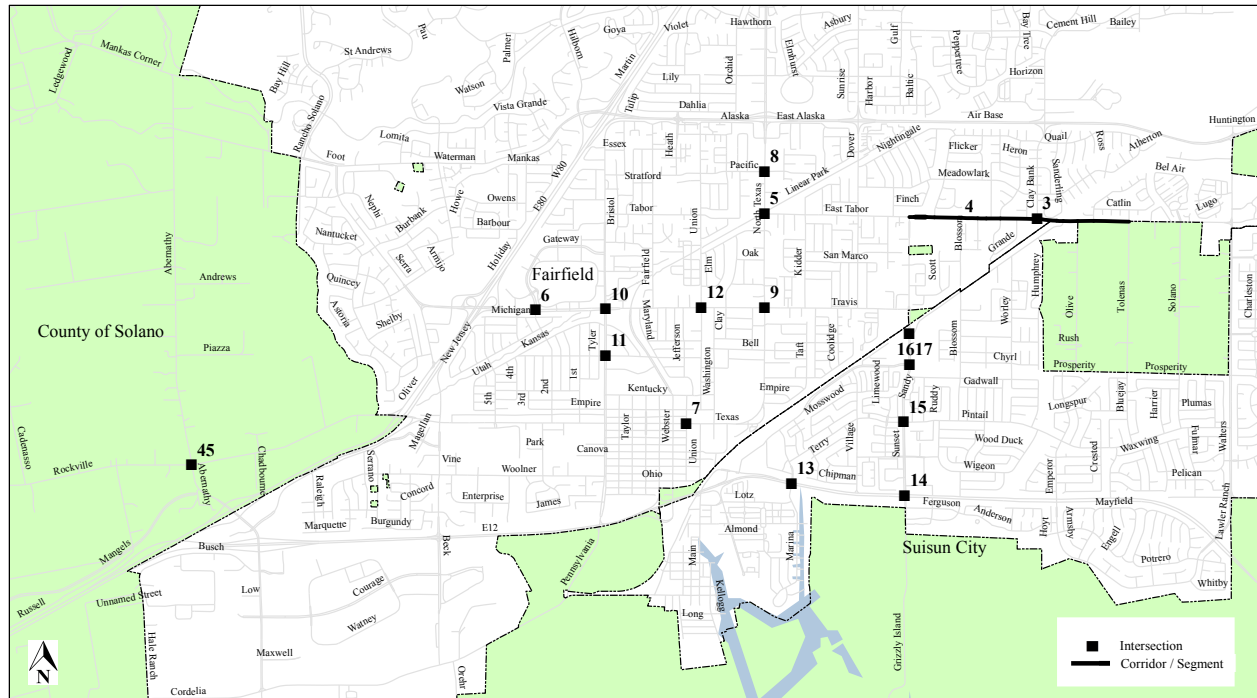
Map 2. City of Benicia Project Completed Since the 2005 Solano Travel Safety Plan

ID	AGENCY	LOCATION
1	City of Benicia	East 2nd Street at Military East



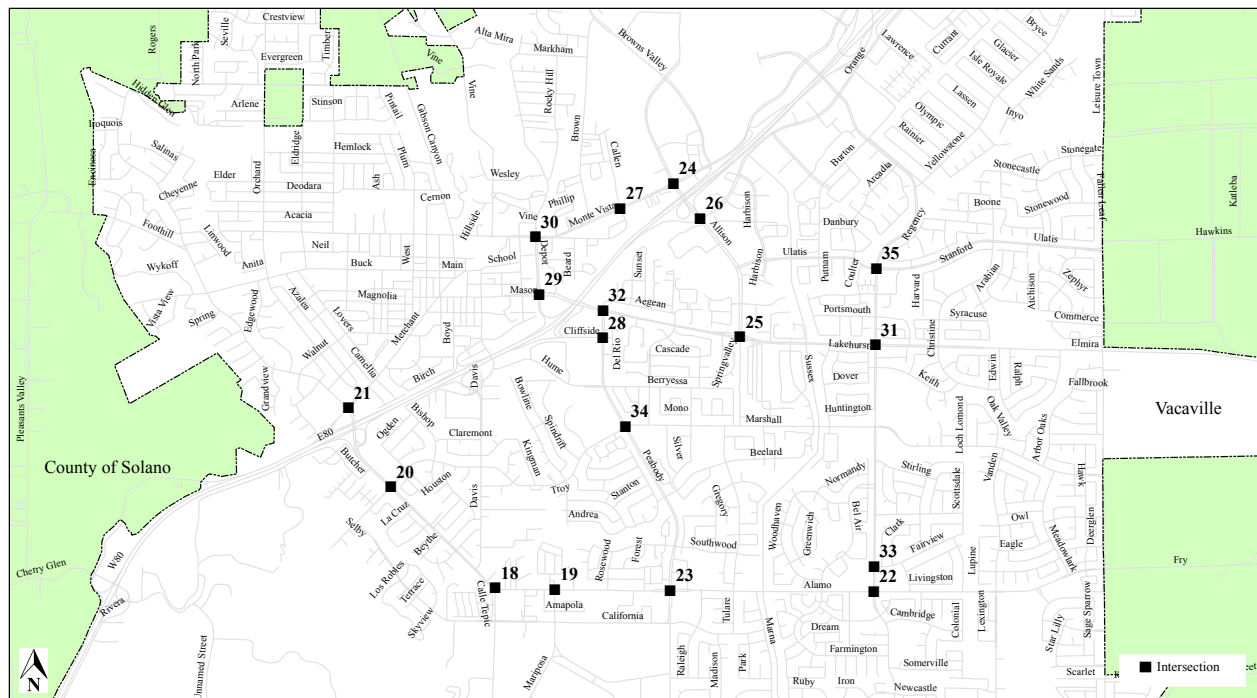
Map 3. City of Dixon Project Completed Since the 2005 Solano Travel Safety Plan

ID	AGENCY	LOCATION
2	City of Dixon	Lincoln Street at West A Street



Map 4. City of Fairfield, City of Suisun City, and County of Solano Projects Completed Since the 2005 Solano Travel Safety Plan

ID	AGENCY	LOCATION
3	City of Fairfield	Clay Bank Road at East Tabor Avenue
4	City of Fairfield	East Tabor Avenue
5	City of Fairfield	East Tabor Avenue at North Texas Street
6	City of Fairfield	Gateway Boulevard at Travis Boulevard
7	City of Fairfield	Jefferson Street at Texas Street
8	City of Fairfield	North Texas Street at Pacific Avenue
9	City of Fairfield	North Texas Street at Travis Boulevard
10	City of Fairfield	Pennsylvania Avenue at Travis Boulevard
11	City of Fairfield	Pennsylvania Avenue at Utah Street
12	City of Fairfield	Travis Boulevard at Union Avenue
13	City of Suisun City	CA-12 at Marina Boulevard
14	City of Suisun City	CA-12 at Sunset Avenue
15	City of Suisun City	Pintail Drive at Sunset Avenue
16	City of Suisun City	Railroad Avenue East at Sunset Avenue
17	City of Suisun City	Railroad Avenue West at Sunset Avenue
45	County of Solano	Abernathy Road at Rockville Road



Map 5. City of Vacaville Projects Completed Since the 2005 Solano Travel Safety Plan

ID	AGENCY	LOCATION
18	City of Vacaville	Alamo Drive at Alamo Lane
19	City of Vacaville	Alamo Drive at Mariposa Avenue
20	City of Vacaville	Alamo Drive at Marshall Road
21	City of Vacaville	Alamo Drive at Merchant Street
22	City of Vacaville	Alamo Drive at Nut Tree Road
23	City of Vacaville	Alamo Drive at Peabody Road
24	City of Vacaville	Allison Drive at East Monte Vista Avenue
25	City of Vacaville	Allison Drive at Elmira Road
26	City of Vacaville	Allison Drive at Nut Tree Road
27	City of Vacaville	Callen Street at East Monte Vista Avenue
28	City of Vacaville	Cliffside Drive at Peabody Road
29	City of Vacaville	Depot Street at Mason Street
30	City of Vacaville	East Monte Vista Avenue at Depot Street / Markham Avenue
31	City of Vacaville	Elmira Road at Nut Tree Road
32	City of Vacaville	Elmira Road at Peabody Road
33	City of Vacaville	Fairview Drive at Nut Tree Road
34	City of Vacaville	Marshall Road at Peabody Road
35	City of Vacaville	Nut Tree Road at Ulatis Drive



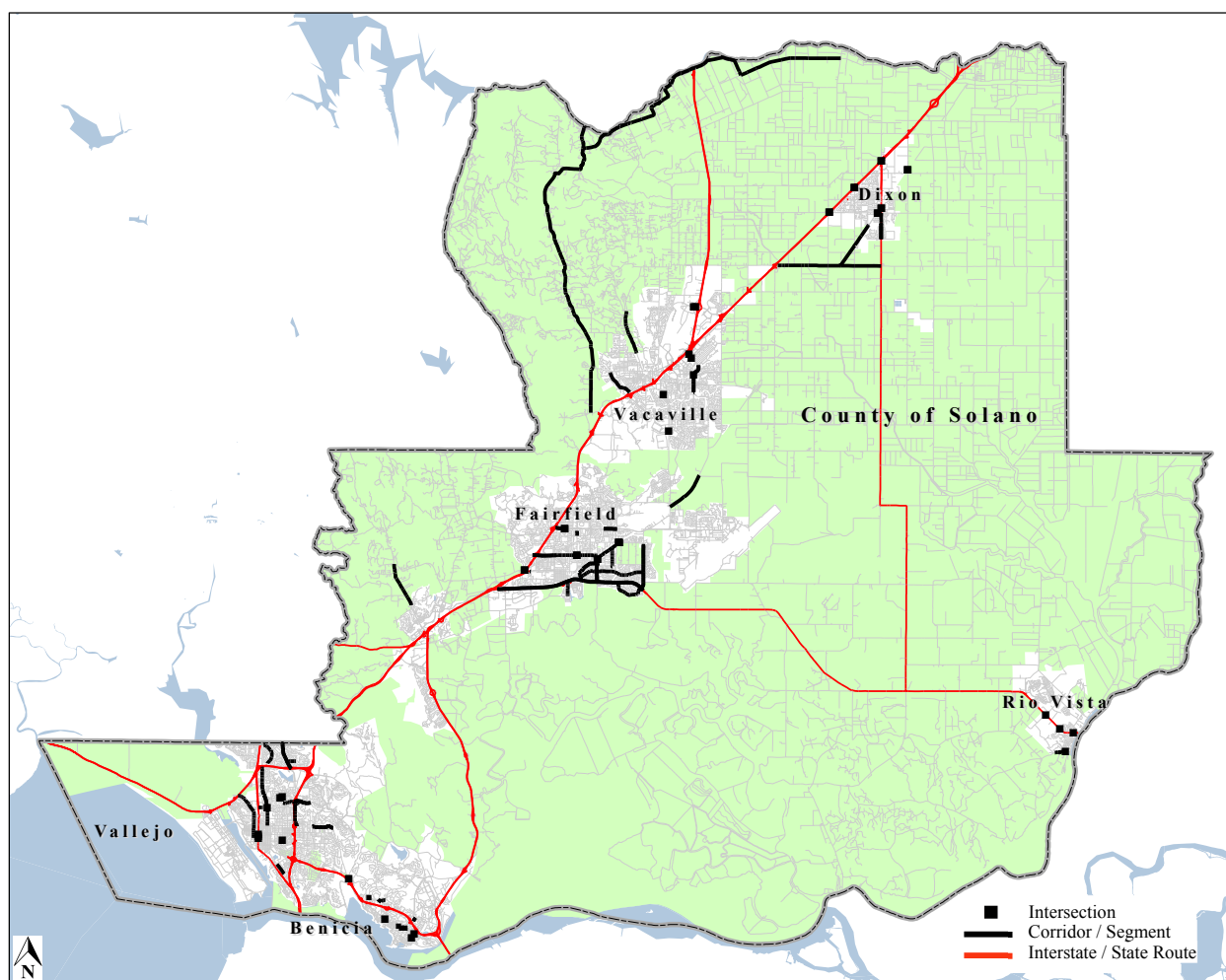
Map 6. City of Vallejo Projects Completed Since the 2005 Solano Travel Safety Plan

ID	AGENCY	LOCATION
36	City of Vallejo	Admiral Callaghan Lane at Tennessee Street
37	City of Vallejo	Alameda Street at Georgia Street
38	City of Vallejo	Broadway Street at CA-37 / Marine World
39	City of Vallejo	CA-29 / Sonoma Boulevard at CA-37 / Marine World
40	City of Vallejo	CA-29 / Sonoma Boulevard at Georgia Street
41	City of Vallejo	Columbus Parkway at Lake Herman Road
42	City of Vallejo	Mariposa Street at Solano Avenue
43	City of Vallejo	Oakwood Avenue at Tennessee Street
44	City of Vallejo	Sereno Drive at Tuolumne Street

3. Priority Locations for Safety Project Development

The 2016 Solano Travel Safety Plan includes 76 locations throughout Solano County that have been identified by local agencies where treatments and/or street redesigns may potentially reduce the frequency and severity of collisions. This section includes the safety analysis performed for each location, proposed changes to locations, and general planning-level cost estimates for the proposed changes.

Locations were identified by the Solano Travel Safety Plan Technical Working Group members using multiple sources of information. Contact member agencies directly for additional information.



Map 7. Overview Map of All Priority Locations for Safety Project Development

City of Benicia

Agency's Processes and Procedures for Identifying Locations

The City of Benicia typically relies on citizens or the City Council to notify City staff of any locations where treatments and/or street redesigns may potentially reduce the frequency and severity of collisions on Benicia's roadways. Traffic safety issues are also brought up through the Traffic Pedestrian and Bicycle Safety (TPBS) Committee which meets quarterly.

City of Benicia priority locations:

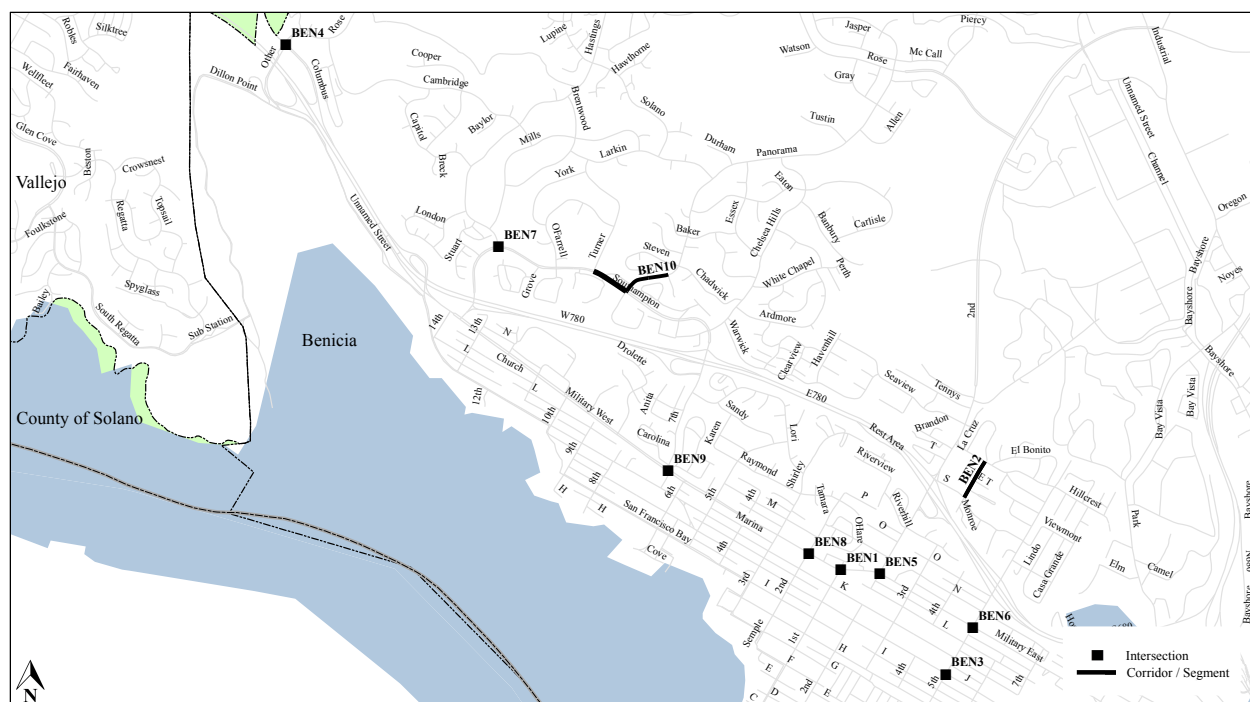
ID	LOCATION_DETAIL	SAFETY ANALYSIS	PROPOSED CHANGES	COST*
BEN1	1st Street at Military	Pedestrian crossing safety	Further detailed analysis needed to determine mitigations	\$
BEN2	3rd Street, from East S Street to Hillcrest Avenue (Robert Semple Elementary School)	Narrow sidewalks and lack of sidewalk in some areas	Widen sidewalks and install new sidewalks where needed	\$
BEN3	5th Street at East J Street (St. Dominic's School)	Pedestrian crossing safety at uncontrolled crosswalk	Install pedestrian-actuated flashing beacon to aid safe crossing.	\$
BEN4	Columbus Parkway at Rose Drive	Unprotected turn phases; High traffic volumes with few gaps for left-turning vehicles	Conduct traffic study; construct traffic signal improvements	\$
BEN5	East 2nd Street at Military East	Pedestrian crossing safety; high turn volumes	Further detailed analysis needed to determine mitigations	\$
BEN6	East 5th Street at Military East	Unprotected turn phases; thru vehicles pass turning vehicles within intersection on all approaches	Conduct traffic study; construct traffic signal improvements	\$\$
BEN7	Hastings Drive at Southampton Road	Pedestrian crossing safety; high speed curve	Further detailed analysis needed to determine mitigations	\$
BEN8	Military West at West 2nd Street	Pedestrian crossing safety; vehicle sight distance	Further detailed analysis needed to determine mitigations	\$
BEN9	Military West at West 7th Street	Substandard intersection geometry	Phase 1 – Construct traffic signal improvements; add left-turn phases on Military West Phase 2 – Conduct traffic study and construct a roundabout	Phase 1 - \$ Phase 2 - \$\$\$
BEN10	Southampton Road / Turner Road, from James Court to Panorama Drive (Benicia Middle School)	Narrow sidewalks and lack of sidewalk in some areas	Widen sidewalks and install new sidewalks where needed	\$

*Total Project Cost Estimate

\$ - Less than \$250,000

\$\$ - Between \$250,000 and \$1,000,000

\$\$\$ - Over \$1,000,000



Map 8. City of Benicia Priority Locations for Safety Project Development

ID	LOCATION
BEN1	1st Street at Military
BEN2	3rd Street, from East S Street to Hillcrest Avenue (Robert Semple Elementary School)
BEN3	5th Street at East J Street (St. Dominic's School)
BEN4	Columbus Parkway at Rose Drive
BEN5	East 2nd Street at Military East
BEN6	East 5th Street at Military East
BEN7	Hastings Drive at Southampton Road
BEN8	Military West at West 2nd Street
BEN9	Military West at West 7th Street
BEN10	Southampton Road / Turner Road, from James Court to Panorama Drive (Benicia Middle School)

City of Dixon

Agency's Processes and Procedures for Identifying Locations

The City of Dixon typically relies on citizens to report to city staff any locations where treatments and/or street redesigns may potentially reduce the frequency and severity of collisions on Dixon's roadways. City staff review requests and make recommendations based on the City of Dixon Resolution 98-36 (Yield and Stop Sign Policy and Warrants) and the most recent version of the California Manual on Uniform Traffic Control Devices (MUTCD). Staff recommendations are then presented to the City of Dixon Transportation Advisory Commission (TAC), formed in 2004, which "shall act as an advisory body to the City Council in all matters relating to traffic, transportation and transit as shall be referred to it."

City of Dixon priority locations:

ID	LOCATION	SAFETY ANALYSIS	PROPOSED CHANGES	COST*
DXN1	1st Street / CA-113 railroad track crossing, from East C Street to East E Street	1st Street is a skewed crossing with high auto traffic and moderate train volume where 2 of the 3 collisions that have occurred since 1976 have involved pedestrians. The grade crossing separates a nearby school from a mainly residential area and a school crossing exists just south of the crossing. 1st street grade crossing currently has no sidewalk or pedestrian improvements, which would be recommended at this crossing based on collision data and the speed of trains (70 mph) as they move over the crossing.	Install gates and improve sidewalk.	\$
DXN2	1st Street / CA-113, from A Street to Parkway Boulevard	Primary route to and from Dixon High School with multiple modes (bicycle, pedestrian, motor vehicle, and large trucks) for different trip purposes (school, work, residential, local land-use access, and pass through) on high speed (45-mph posted) urban/suburban arterial. Multiple intersections along corridor.	Install signal or lighted crosswalk.	\$\$
DXN3	I-80 On and Off Ramps at CA-113	Motor vehicles with varying speeds, lane changes, and turning movements have been observed for traffic exiting and approaching I-80.	Install signal and widen overcrossing.	\$\$\$
DXN4	I-80 On and Off Ramps at Dixon Avenue / West A Street	Motor vehicles with varying speeds, lane changes, and turning movements have been observed for traffic exiting and approaching I-80.	Install signal and widen overcrossing.	\$\$\$

*Total Project Cost Estimate

\$ - Less than \$250,000

\$\$ - Between \$250,000 and \$1,000,000

\$\$\$ - Over \$1,000,000

City of Dixon priority locations continued:

ID	LOCATION	SAFETY ANALYSIS	PROPOSED CHANGES	COST*
DXN5	I-80 On and Off Ramps at Pitt School Road	Motor vehicles with varying speeds, lane changes, and turning movements have been observed for traffic exiting and approaching I-80.	Install signal and widen overcrossing.	\$\$\$
DXN6	Pedrick Road railroad crossing, north of Vaughn Street	Pedrick Road Crossing is recommended for monitoring. It is a skewed crossing with moderate daily auto traffic and fairly low train volume. It is used primarily by locals as a side street and is used heavily by trucks during the harvest months, which makes for a large seasonal peak in traffic that is not necessarily shown in the average daily traffic (ADT) counts. Because of this, it is recommended that more current traffic data be determined including vehicle mix. The crossing has had past issues with drive-arounds and currently has no medians. If peak traffic levels and vehicle usage show that this is a high risk crossing, the crossing should be reevaluated for further improvements, including the installation of medians.	Vaughn Road improvements will eliminate the vehicle traffic between Pedrick Road and Vaughn Road to bypass two railroad crossings	\$\$\$

*Total Project Cost Estimate

\$ - Less than \$250,000

\$\$ - Between \$250,000 and \$1,000,000

\$\$\$ - Over \$1,000,000

City of Dixon priority locations continued:

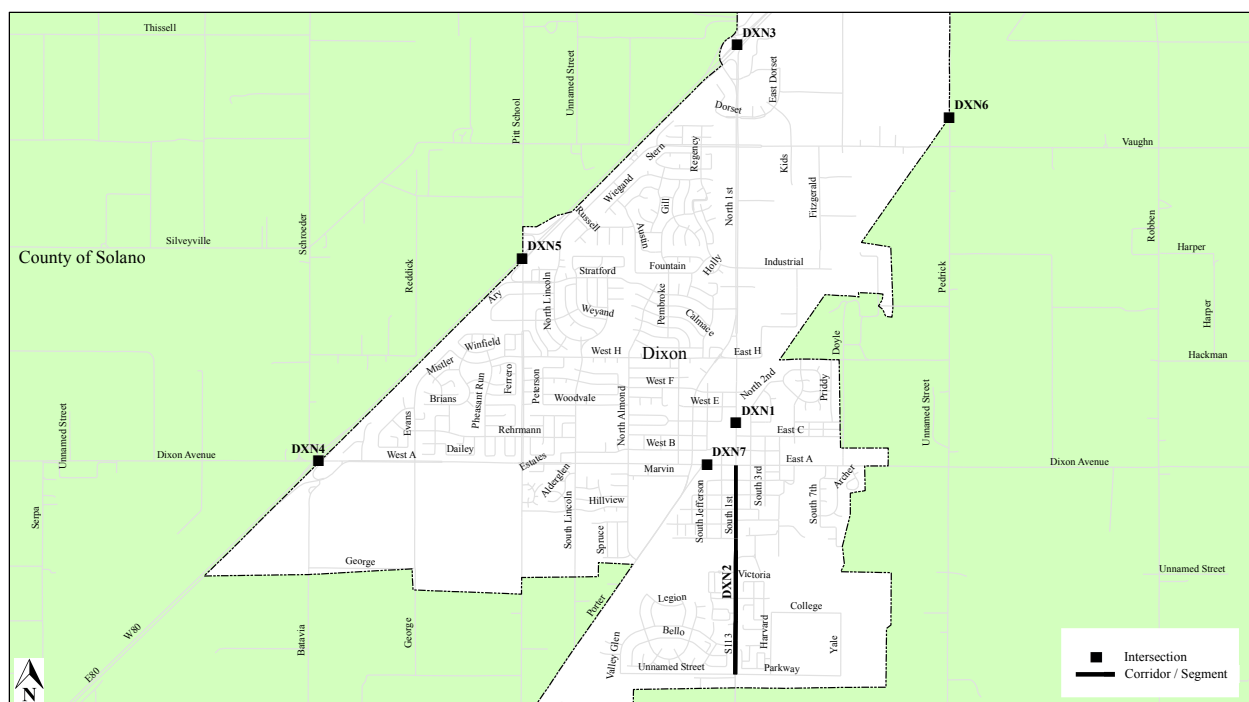
ID	LOCATION	SAFETY ANALYSIS	PROPOSED CHANGES	COST*
DXN7	West A Street railroad crossing, from North Adams Street / Porter Street to North Jackson Street / South Jackson Street	A Street has been a crossing of concern since the 2011 Final Rail Crossing Inventory was written. While there are few recent collisions at the crossing, eastbound queuing is a significant issue and traffic counts are high enough that it is a good candidate for a queue cutter traffic signal. A Street has also been a candidate for a grade separation per the 2011 Final Rail Crossing Inventory. While a grade crossing would eliminate the queuing issue, until the grade separation is complete, queuing will still be an issue. The crossing may also be impacted such that the crossing will have lower peak traffic levels and therefore less queuing once the Parkway Boulevard Grade Separation is complete. Therefore, it is recommended that a queue cutter be installed until a grade separation is implemented. Any increases to the RR signal timing would be at an additional cost.	Short-term: Install a queue cutter traffic signal. Long-term: grade separation.	\$

*Total Project Cost Estimate

\$ - Less than \$250,000

\$\$ - Between \$250,000 and \$1,000,000

\$\$\$ - Over \$1,000,000



Map 9. City of Dixon Priority Locations for Safety Project Development

ID	LOCATION
DXN1	1st Street / CA-113 railroad track crossing, from East C Street to East E Street
DXN2	1st Street / CA-113, from A Street to Parkway Boulevard
DXN3	I-80 On and Off Ramps at CA-113
DXN4	I-80 On and Off Ramps at Dixon Avenue / West A Street
DXN5	I-80 On and Off Ramps at Pitt School Road
DXN6	Pedrick Road railroad crossing, north of Vaughn Street
DXN7	West A Street railroad crossing, from North Adams Street / Porter Street to Jackson Street

City of Fairfield

Agency's Processes and Procedures for Identifying Locations

The City of Fairfield primarily uses reported collision data as well as motor vehicle volume count data to determine locations where treatments and/or street redesigns may potentially reduce the frequency and severity of collisions on Fairfield's roadways.

The City of Fairfield Police Department provides the City of Fairfield Public Works Department with timely motor vehicle collision report information and data, which is entered into a software program (Crossroads Traffic Collision Database).

Crossroads Traffic Collision Database is a software program used by many municipalities to more efficiently and effectively determine where and what type of collisions are occurring, by providing the resources for staff to:

- Manage collision data
- Query data
- Create collision diagrams
- Run reports
- Create graphs and charts

The close working relationship between the Police and Public Works Departments, in conjunction with timely data, allows Public Works staff to identify high-collision locations within a short timeframe following reported collisions, versus solely relying on California Highway Patrol (CHP) Statewide Integrated Traffic Records System (SWITRS) data to be released, which typically lags six or more months behind.

City of Fairfield priority locations:

ID	LOCATION	SAFETY ANALYSIS	PROPOSED CHANGES	COST*
FRFD1	Air Base Parkway at Heath Drive; and Air Base Parkway, from Heath Drive to the I-80 Eastbound Off-Ramp	Midblock, rear-end collisions due to weaving and proximity of the I-80 off-ramp to Heath and the volume of traffic exiting the freeway onto the surface street.	The City has taken some proactive measures including improving visibility of signal faces or adding additional signal faces where the structures can handle the additional load, and improving signal timing. While the signal timing has improved, the extension of Manuel Campos Parkway can provide a significant benefit giving motorists an alternative route. The extension of this roadway is set for 2016/17. This is a developer-driven improvement that has more widespread positive impacts.	\$-\$\$\$

*Total Project Cost Estimate

\$ - Less than \$250,000

\$\$ - Between \$250,000 and \$1,000,000

\$\$\$ - Over \$1,000,000

City of Fairfield priority locations continued:

ID	LOCATION	SAFETY ANALYSIS	PROPOSED CHANGES	COST*
FRFD2	Air Base Parkway, from Clay Bank Road to the pedestrian bridge (mid-point between Clay Bank Road and Dover Avenue)	Midblock, rear-end collisions	Air Base Parkway at Clay Bank are set to be modified to include additional lanes when development reaches established thresholds determined by the City. Furthermore while the signal timing has improved, the extension of Manuel Campos Parkway can provide a widespread benefit giving motorists an alternative route and alleviating some congestion along Air Base Parkway. The extension of this roadway is set for 2016/17. This is a developer-driven improvement that has more widespread positive impacts.	\$-\$\$\$
FRFD3	CA-12, from Pennsylvania Avenue to I-80	SWITRS, 2010-2014. High speed saturated conditions, signals.	Increase capacity. Improve signal timing. Portions of roadway improvements are included in the I-80/I-680/CA-12 project managed by STA.	\$\$\$
FRFD4	East Tabor Avenue railroad track crossing, west of Railroad Avenue	East Tabor Avenue is a crossing with higher than average auto traffic, high train traffic and high train speeds. The crossing had many issues with autos driving around gates in the past, and had medians installed, which have mitigated that issue. Based on recent discussions with the City, there are current issues with students crossing the tracks to get to and from a middle and elementary school. The school district currently provides a crossing guard to assist the students, but no sidewalk or other pedestrian improvements have been implemented.	<p>A California State Rail Grant was implemented at the crossing in 2012 upgrading the signals and installing the median to prevent vehicles from passing.</p> <p>It is recommended that sidewalks be extended on the north side of East Tabor Avenue to the crossing to allow students to safely cross the at-grade crossing, and that protected bicycle facilities be implemented.</p> <p>An ATP grant was submitted in May of 2015 but was not awarded funding. The City will continue seeking alternative funding opportunities.</p>	\$\$\$

*Total Project Cost Estimate

\$ - Less than \$250,000

\$\$ - Between \$250,000 and \$1,000,000

\$\$\$ - Over \$1,000,000

City of Fairfield priority locations continued:

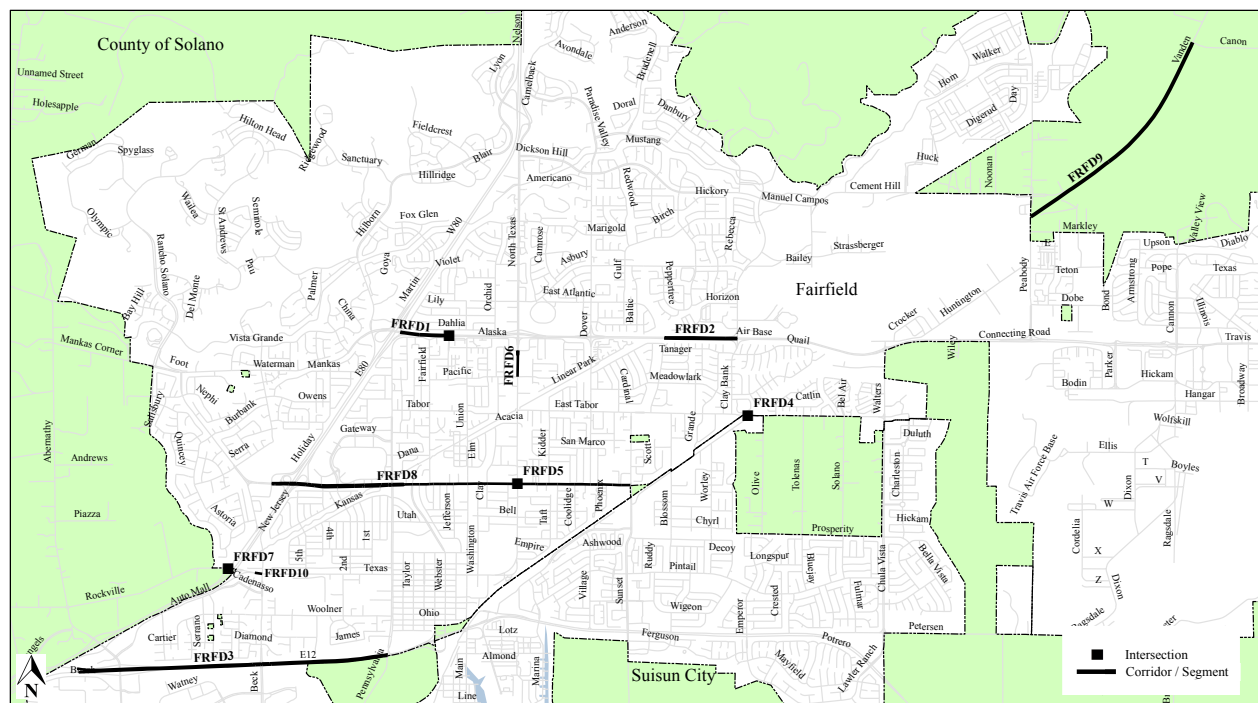
ID	LOCATION	SAFETY ANALYSIS	PROPOSED CHANGES	COST*
FRFD5	North Texas Street at Travis Boulevard	Rear-end, sideswipe, and broadside	Improved channelization. Location needs further studies; however, a new mast arm signal pole was installed on the southeast corner to provide an additional signal face for visibility. Furthermore, signing and striping changes were done. Further studies may be necessary.	\$\$
FRFD6	North Texas Street, from Alaska Avenue to East Pacific Avenue	Midblock, rear-end collisions	Signal timing improvements were implemented in 2012 but need to be revisited. Other possible mitigation is adding an additional signal face at all signalized intersections if pole can handle the additional load.	\$
FRFD7	Oliver Road at Rockville Road / West Texas Street	Left-turn conflicts due to increased traffic volume relating to I-80	Install two-way left-turn lane. Requires coordination with Caltrans. A letter was issued to Caltrans in support for the changes in the lane configuration along the segment. Caltrans responded to the letter and denied the request, indicating that negative impacts would be created on the freeway segment.	\$
FRFD8	Travis Boulevard, from Oliver Road to Sunset Avenue	Midblock, rear-end.	Improved signal timing because of intersection spacing. Continuous improvement in timing will be necessary.	\$
FRFD9	Vanden Road, from Canon Road to Peabody Road	87 total (including 50 injury) collisions reported 2010-2014 along entire corridor (Marshall Road to Peabody Road through the cities of Fairfield and Vacaville, and through unincorporated Solano County).	Widen to 4 lanes with curb and gutter and traffic signals upon completion of the Fairfield/Vacaville Train Station Project expected in 2016/17. Plans for the widening were submitted to Caltrans for review. The project completion will hinge on future funding. Furthermore, the 4 lane cross-section will be matched on the Vacaville portion of the Jepson Parkway as funding becomes available.	\$\$\$
FRFD10	West Texas Street, from I-80 to Beck Avenue	There is a weave issue from the I-80 EB Off-ramp to Beck Avenue.	ATP Safe Routes to Transit project was submitted to modify the I-80 EB off-ramp at West Texas Street to remove the weave that currently exists on West Texas Street and provide a direct access to the Bus terminus. Grant funding was not awarded. The City will continue to seek funding. This project is linked to the future 1200 space parking structure.	\$\$\$

*Total Project Cost Estimate

\$ - Less than \$250,000

\$\$ - Between \$250,000 and \$1,000,000

\$\$\$ - Over \$1,000,000



Map 10. City of Fairfield Priority Locations for Safety Project Development

ID	LOCATION
FRFD1	Air Base Parkway at Heath Drive; and Air Base Parkway, from Heath Drive to the I-80 Eastbound Off-Ramp
FRFD2	Air Base Parkway, from Clay Bank Road to the pedestrian bridge (mid-point between Clay Bank Road and Dover Avenue)
FRFD3	CA-12, from Pennsylvania Avenue to I-80
FRFD4	East Tabor Avenue railroad track crossing, west of Railroad Avenue
FRFD5	North Texas Street at Travis Boulevard
FRFD6	North Texas Street, from Alaska Avenue to East Pacific Avenue
FRFD7	Oliver Road at Rockville Road / West Texas Street
FRFD8	Travis Boulevard, from Oliver Road to Sunset Avenue
FRFD9	Vanden Road, from Canon Road to Peabody Road
FRFD10	West Texas Street, from I-80 to Beck Avenue

City of Rio Vista

Agency's Processes and Procedures for Identifying Locations

The City of Rio Vista primarily uses reported collision data as well as motor vehicle volume count data to determine locations where treatments and/or street redesigns may potentially reduce the frequency and severity of collisions on Rio Vista's roadways.

Agency's High Priority Locations

City of Rio Vista staff identified high-priority locations based on collision data, motor vehicle volume count data, and staff observations.

City of Rio Vista priority locations:

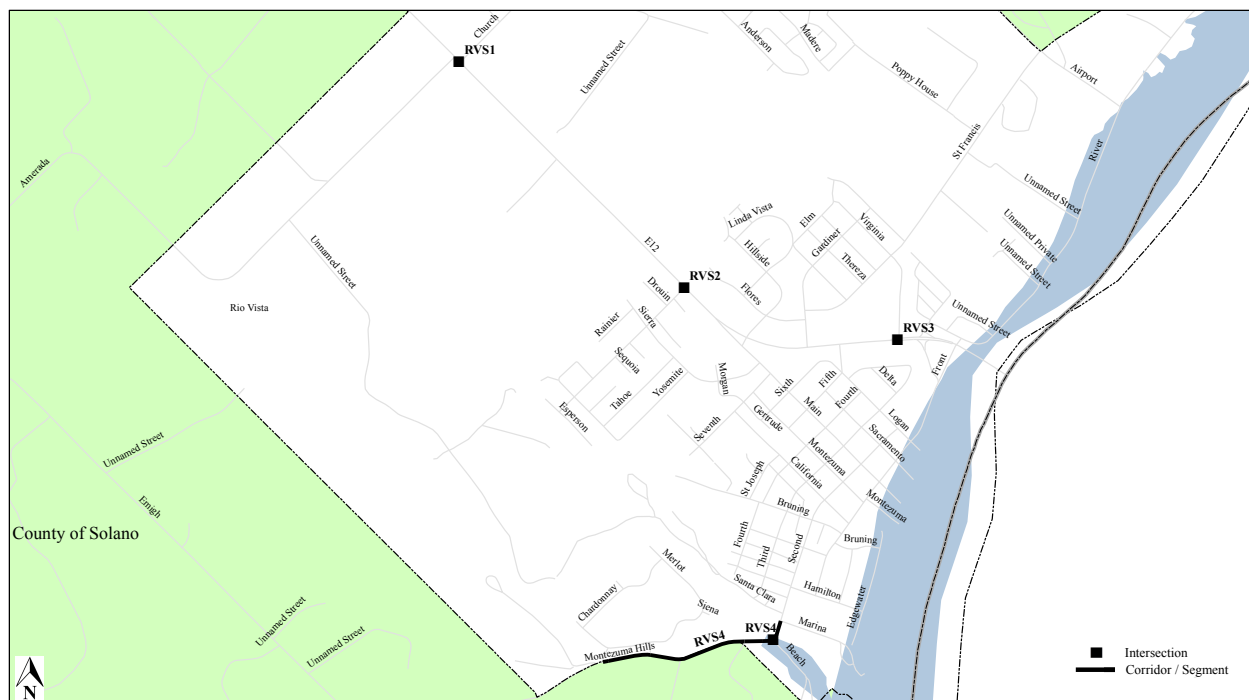
ID	LOCATION	SAFETY ANALYSIS	PROPOSED CHANGES	COST*
RVS1	CA-12 at Church Road	Substandard intersection geometry; Unsafe operating behavior observed; Left-turning and right-turning motor vehicles block throughway traffic, encouraging drivers to attempt to bypass stopped traffic, creating unpredictable and unexpected traffic movements within the intersection and its approaches	Realign roadway.	\$\$\$
RVS2	CA-12 at Drouin Drive	High volume and high speed traffic with few gaps to enter CA-12	Redesign roadway.	\$\$\$
RVS3	CA-12 at Virginia Drive	High volume and high speed traffic with few gaps to enter and exit CA-12; motor vehicle traffic heading westbound on CA-12 observed to travel too fast to negotiate right turn at Virginia Drive	Redesign intersection, part of Caltrans CA-12 project.	\$\$\$
RVS4	Montezuma Hills Road, from Burgundy Way to Marina Way; 2nd Street / Beach Drive / Montezuma Hills Road intersection (Riverview Middle School)	Lack of sidewalk on Montezuma Road, speeding, non-standard intersection geometry (2nd Street / Beach Drive / Montezuma Hills Road), and no direct connection between housing and school.	Design a safe route connecting school and neighborhood directly west of school.	\$\$

*Total Project Cost Estimate

\$ - Less than \$250,000

\$\$ - Between \$250,000 and \$1,000,000

\$\$\$ - Over \$1,000,000



Map 11. City of Rio Vista Priority Locations for Safety Project Development

ID	LOCATION
RVS1	CA-12 at Church Road
RVS2	CA-12 at Drouin Drive
RVS3	CA-12 at Virginia Drive
RVS4	Montezuma Hills Road, from Burgundy Way to Marina Way; 2nd Street / Beach Drive / Montezuma Hills Road intersection (Riverview Middle School)

City of Suisun City

Agency's Processes and Procedures for Identifying Locations

City of Suisun City staff identifies locations through the Suisun City Traffic Committee, which consists of City department heads from the Police Department, Fire Department, Recreation & Community Services Department, Planning Department, and Public Works Department, as well as through citizen reports.

City of Suisun City priority locations:

ID	LOCATION	SAFETY ANALYSIS	PROPOSED CHANGES	COST*
SUIS1	Buena Vista Avenue / Pintail Drive, from Marina Boulevard to Walters Road	Cut-through and/or high-speed traffic conflicts with local land uses serving vulnerable populations	Traffic calming, potentially including pedestrian countdown signals and updating signals	\$\$
SUIS2	CA-12, from Pennsylvania Avenue to east of Walters Road	High volumes, varying speeds, and lane changes with limited intersection and stopping sight distances due to horizontal and vertical curves	Install advance warning devices such as flashing beacons and/or vehicle-activated changeable message sign boards; extend left-turn pockets; left-turn pockets; traffic signal modifications; and overhead pedestrian/bicycle crossings (e.g. at CA-12 and Marina Boulevard)	\$\$\$
SUIS3	Lawler Ranch Parkway, from CA-12 (easterly) to CA-12 (westerly)	Cut-through and/or high-speed traffic conflicts with local land uses serving vulnerable populations	Traffic calming, potentially including pedestrian countdown signals and updating signals	\$\$
SUIS4	Main Street, from CA-12 to Cordelia Street	Cut-through and/or high-speed traffic conflicts with local land uses serving vulnerable populations	Traffic calming, lane reconfiguration, and wayfinding signs	\$\$
SUIS5	Railroad Avenue East at Sunset Avenue	Red-light traffic signal non-compliance for Railroad Avenue East westbound traffic turning left for southbound Sunset Avenue during train traffic activated all-red traffic signal phase	Upgrade signal and equipment to enable westbound left-turn traffic to progress through the intersection when a train is present; widen first 250 feet of Railroad Avenue East, directly east of Sunset Avenue to allow the addition of a left turn pocket on westbound Railroad Avenue East, as well as provide a widened eastbound lane for a more comfortable turning movement from northbound Sunset Avenue to eastbound Railroad Avenue East.	\$
SUIS6	Railroad Avenue East, from Humphrey Drive to Olive Road	Complicated traffic patterns and movements due to close proximity to railroad tracks on Railroad Avenue at East Tabor Avenue	Realign Railroad Avenue from Humphrey Drive to Olive Road	\$\$\$

*Total Project Cost Estimate

\$ - Less than \$250,000

\$\$ - Between \$250,000 and \$1,000,000

\$\$\$ - Over \$1,000,000

City of Suisun City priority locations continued:

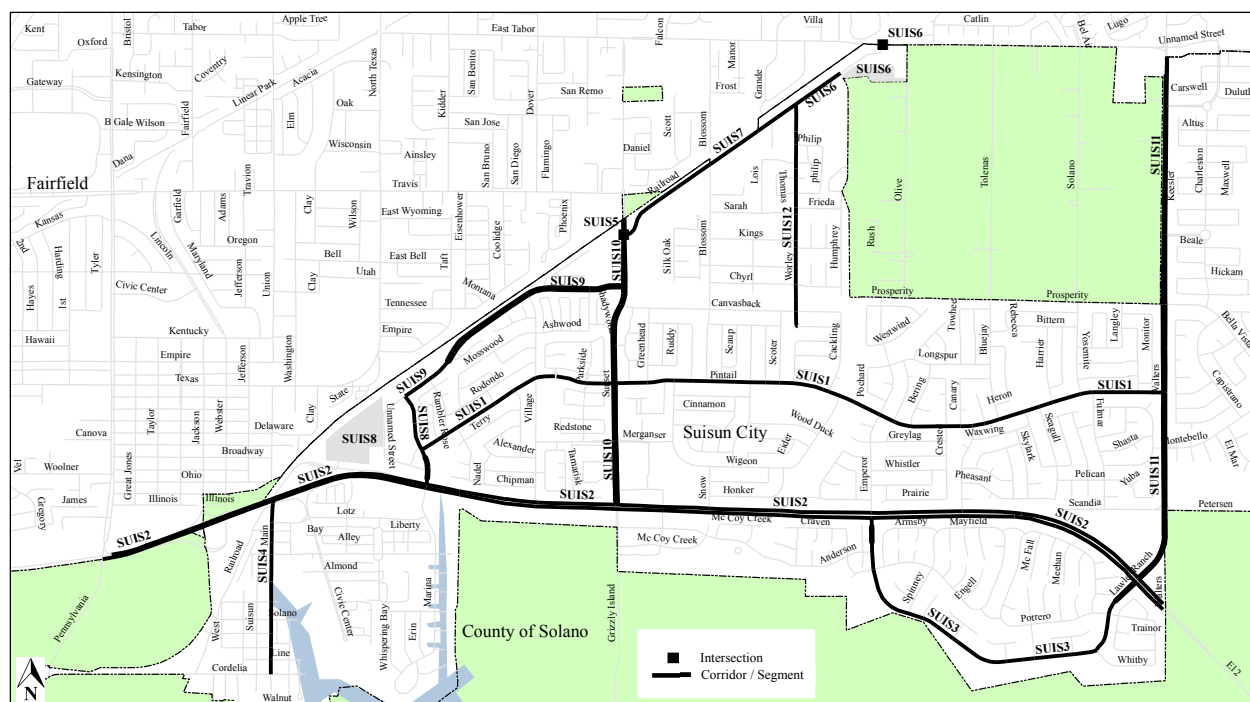
ID	LOCATION	SAFETY ANALYSIS	PROPOSED CHANGES	COST*
SUIS7	Railroad Avenue East, from Humphrey Drive to Sunset Avenue	Cut-through and/or high-speed traffic conflicts with local land uses serving vulnerable populations. Lack of sidewalk.	Widen Railroad Avenue East to include a travel lane and bike lane in each direction, a center left-turn lane, curb/gutter along the north side, and sidewalk along the south side.	\$\$\$
SUIS8	Railroad Avenue West, from CA-12 to westerly terminus (west of Marina Boulevard)	Cut-through and/or high-speed traffic utilizing Marina Boulevard via Railroad Avenue, conflicts with local land uses serving vulnerable populations	Extend Railroad Avenue to the existing westbound State Route 12 on-ramp on Main Street to divert cut-through traffic from Marina Boulevard to Railroad Avenue	\$\$\$
SUIS9	Railroad Avenue West, from Marina Boulevard to Sunset Avenue	Cut-through and/or high-speed traffic conflicts with local land uses serving vulnerable populations. Pedestrian crossing with sidewalk gaps that serve as a route to Crystal Middle School and Armijo High School.	Roadway geometry, traffic calming devices, and/or road diet potentially needed.	\$\$
SUIS10	Sunset Avenue, from the City of Fairfield / Suisun City border to the Solano County unincorporated area / Suisun City border	Cut-through and/or high-speed traffic conflicts with local land uses serving vulnerable populations	Traffic calming, potentially including pedestrian countdown signals and updating signals	\$\$
SUIS11	Walters Road, from CA-12 to City of Fairfield / Suisun City border	Cut-through and/or high-speed traffic conflicts with local land uses serving vulnerable populations	Traffic calming, potentially including pedestrian countdown signals and updating signals	\$\$
SUIS12	Worley Road, from Railroad Avenue East to Tule Goose Drive	Cut-through and/or high-speed traffic conflicts with local land uses serving vulnerable populations	Traffic calming, potentially including pedestrian countdown signals and updating signals	\$\$

*Total Project Cost Estimate

\$ - Less than \$250,000

\$\$ - Between \$250,000 and \$1,000,000

\$\$\$ - Over \$1,000,000



Map 12. City of Suisun City Priority Locations for Safety Project Development

ID	LOCATION
SUI1	Buena Vista Avenue / Pintail Drive, from Marina Boulevard to Walters Road
SUI2	CA-12, from Pennsylvania Avenue to east of Walters Road
SUI3	Lawler Ranch Parkway, from CA-12 (easterly) to CA-12 (westerly)
SUI4	Main Street, from CA-12 to Cordelia Street
SUI5	Railroad Avenue East at Sunset Avenue
SUI6	Railroad Avenue East, from Humphrey Drive to Olive Road
SUI7	Railroad Avenue East, from Humphrey Drive to Sunset Avenue
SUI8	Railroad Avenue West, from CA-12 to westerly terminus (west of Marina Boulevard)
SUI9	Railroad Avenue West, from Marina Boulevard to Sunset Avenue
SUI10	Sunset Avenue, from the City of Fairfield / Suisun City border to the Solano County unincorporated area / Suisun City border
SUI11	Walters Road, from CA-12 to City of Fairfield / Suisun City border
SUI12	Worley Road, from Railroad Avenue East to Tule Goose Drive

City of Vacaville

Agency's Processes and Procedures for Identifying Locations

The City of Vacaville primarily uses data from local Police Department collision reports, as well as motor vehicle volume data to determine locations where treatments and/or street redesigns may potentially reduce the frequency and severity of collisions on Vacaville's roadways. Information received from City Council, Police Department and residents is also considered. The City also uses a Traffic Advisory Committee made up of City Public Works Traffic Engineering, Police Department and School Districts (Vacaville and Travis Unified) staff representatives that meets bimonthly.

City of Vacaville priority locations:

ID	LOCATION	SAFETY ANALYSIS	PROPOSED CHANGES	COST*
VAC1	Alamo Drive, from Merchant Street to Monte Vista Avenue	HIGHEST PRIORITY. Seven (7: 1 in 2015, 6 in 2014) reported collisions and high speeds of motor vehicles on a wider four lane arterial with residential frontage and on-street parking with the presence of a school crosswalk with crossing guard at Edgewood Drive.	Install road diet – one lane in each direction, two-way left turn lane and dedicated bike lane. Maintain on street parking.	\$
VAC2	Crocker Drive / East Monte Vista at Vaca Valley Parkway	Increasing volume of motor vehicles entering and exiting I-505; relatively short intersection spacing with I-505 off-ramp at Vaca Valley Parkway, resulting in unsafe operating behavior	Install roundabout	\$\$\$
VAC3	I-505 Southbound Off-Ramps at Vaca Valley Parkway	Seven (7: 1 in 2015, 6 in 2014) reported collisions and high volumes of motor vehicles with few gaps in traffic for south I-505 off-ramp to Vaca Valley Parkway, in close proximity to nearby signal-controlled intersection west	Install roundabout	\$\$\$
VAC4	Marshall Road at Peabody Road	Twenty-six (26 - 15 in 2013, 7 in 2014, 4 so far in 2015) reported collisions, conflicting movements, limited sight distances, and unsafe operating behavior	Extend existing left-turn pocket; enable a dedicated right-turn movement on approach to the intersection	\$
VAC5	Morning Glory Drive at Peabody Road	Increasing traffic volumes near direct access to elementary school. Four Hour and Interruption Signal Warrants met.	Signalize intersection	\$\$

*Total Project Cost Estimate

\$ - Less than \$250,000

\$\$ - Between \$250,000 and \$1,000,000

\$\$\$ - Over \$1,000,000

City of Vacaville priority locations continued:

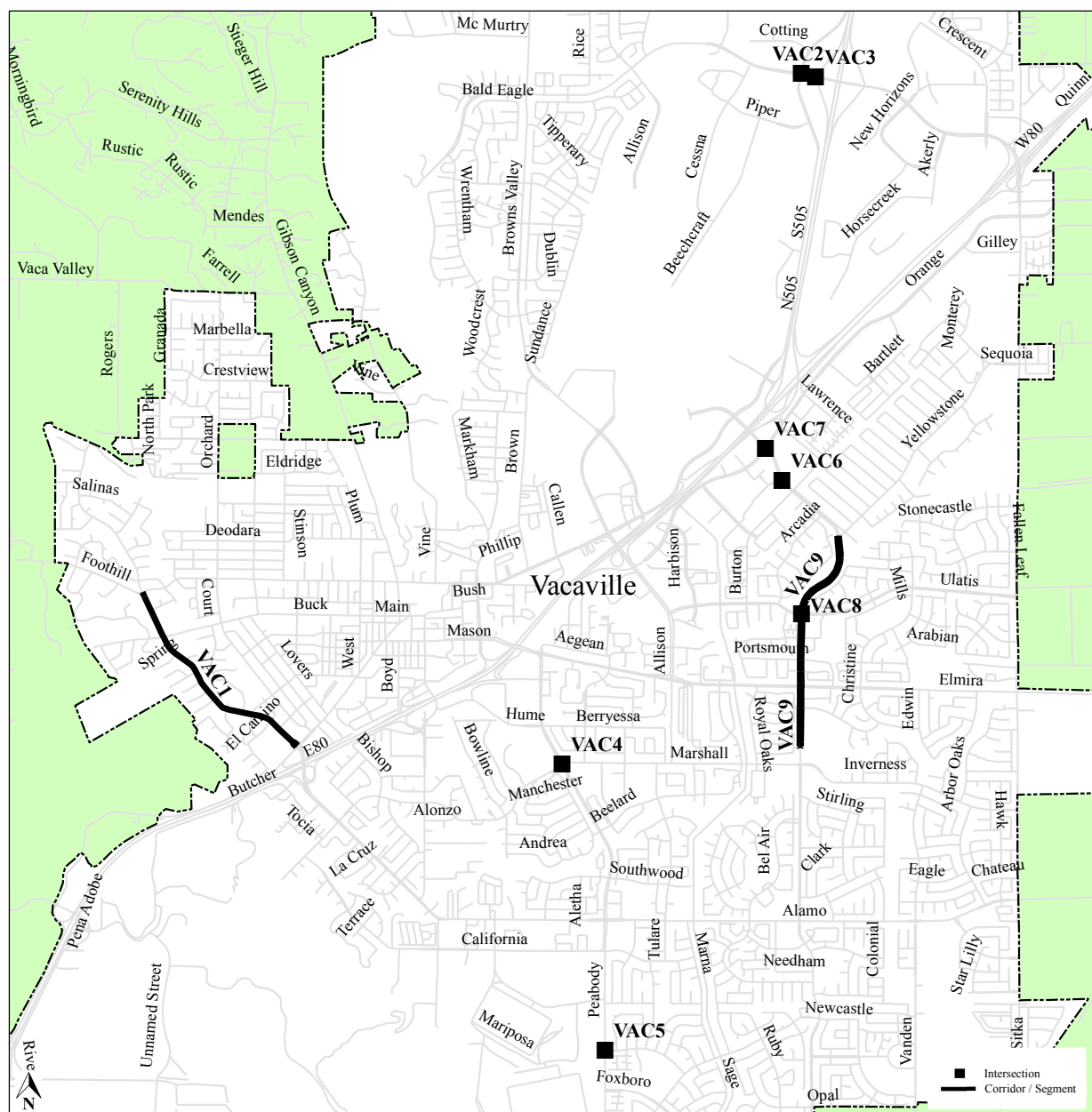
ID	LOCATION	SAFETY ANALYSIS	PROPOSED CHANGES	COST*
VAC6	Nut Tree Road at factory store access intersection (between Burton Drive and Nut Tree Parkway)	Conflicting vehicle and pedestrian movements in an area with much higher pedestrian volumes.	Modify existing signal timing and phasing to enable through / left-turn shared lanes and dedicated right-turn lanes for Nut Tree Road traffic. Consider pedestrian timing and phasing.	\$
VAC7	Nut Tree Road at Orange Drive	Thirty-three (33 - 17 in 2013, 14 in 2014, 2 so far in 2015) reported collisions, conflicting movements, and unsafe operating behavior.	Replace existing reflective markers for the east, north, and south approaches	\$
VAC8	Nut Tree Road at Ulatis Drive	Seven (7 - 3 in 2013, 4 in 2014) reported collisions, conflicting movements, limited sight distances, and unsafe operating behavior.	Extend existing left-turn pocket; remove median island trees	\$
VAC9	Nut Tree Road, from Drake Way to Yellowstone Drive	One fatal injury collision and six severe injury collisions reported 2010-2014.	Further detailed analysis needed to determine mitigations.	TBD

*Total Project Cost Estimate

\$ - Less than \$250,000

\$\$ - Between \$250,000 and \$1,000,000

\$\$\$ - Over \$1,000,000



Map 13. City of Vacaville Priority Locations for Safety Project Development

ID	LOCATION
VAC1	Alamo Drive, from Merchant Street to Monte Vista Avenue
VAC2	Crocker Drive / East Monte Vista at Vaca Valley Parkway
VAC3	I-505 Southbound Off-Ramps at Vaca Valley Parkway
VAC4	Marshall Road at Peabody Road
VAC5	Morning Glory Drive at Peabody Road
VAC6	Nut Tree Road at factory store access intersection (between Burton Drive and Nut Tree Parkway)
VAC7	Nut Tree Road at Orange Drive
VAC8	Nut Tree Road at Ulatis Drive
VAC9	Nut Tree Road, from Drake Way to Yellowstone Drive

City of Vallejo

Agency's Processes and Procedures for Identifying Locations

The City of Vallejo typically relies on citizens to notify City staff of any locations where treatments and/or street redesigns may potentially reduce the frequency and severity of collisions on Vallejo's roadways.

City of Vallejo priority locations:

ID	LOCATION	SAFETY ANALYSIS	PROPOSED CHANGES	COST*
VAL1	Admiral Callaghan Lane, from Redwood Parkway to Tennessee Street	Seven severe injury collisions reported 2010-2014; lack of sidewalk along portions of the roadway.	Further detailed analysis needed to determine mitigations.	\$\$
VAL2	Broadway Street at Valle Vista Avenue	Lack of sidewalk, substandard curb ramps.	Install ADA-compliant curb ramps and new sidewalks between Broadway and Alameda Street.	\$\$
VAL3	Broadway Street, from CA-37 to Tennessee Street	Three fatal injury collisions and eight severe injury collisions reported 2010-2014.	Further detailed analysis needed to determine mitigations.	\$
VAL4**	CA-29 / Sonoma Boulevard at Capitol Street (Lincoln Elementary School)	High speed traffic on Sonoma Blvd. Not a comfortable environment for pedestrians.	Construct bulb outs on all corners at signalized intersections on Sonoma Blvd from Carolina St to Alabama St.	\$\$
VAL5**	CA-29 / Sonoma Boulevard at Carolina Street (Lincoln Elementary School)	High speed traffic on Sonoma Blvd. Not a comfortable environment for pedestrians.	Construct bulb outs on all corners at signalized intersections on Sonoma Blvd from Carolina St to Alabama St.	\$\$
VAL6**	CA-29 / Sonoma Boulevard at Florida Street (Lincoln Elementary School)	High speed traffic on Sonoma Blvd. Not a comfortable environment for pedestrians.	Construct bulb outs on all corners at signalized intersections on Sonoma Blvd from Carolina St to Alabama St.	\$\$
VAL7**	Del Mar Avenue at Las Palmas Avenue (Cooper Elementary School)	Small sidewalk and narrow intersections do not give enough room for pedestrians.	Install traffic bulb-outs at the two listed intersections. Widen sidewalk.	\$\$
VAL8**	Del Mar Avenue at Tuolumne Street (Cooper Elementary School)	Small sidewalk and narrow intersections do not give enough room for pedestrians.	Install traffic bulb-outs at the two listed intersections. Widen sidewalk.	\$\$

*Total Project Cost Estimate

\$ - Less than \$250,000

\$\$ - Between \$250,000 and \$1,000,000

\$\$\$ - Over \$1,000,000

**Received Active Transportation Program (ATP) Cycle 2 funding in 2015 for Safe Routes to School projects.

City of Vallejo priority locations continued:

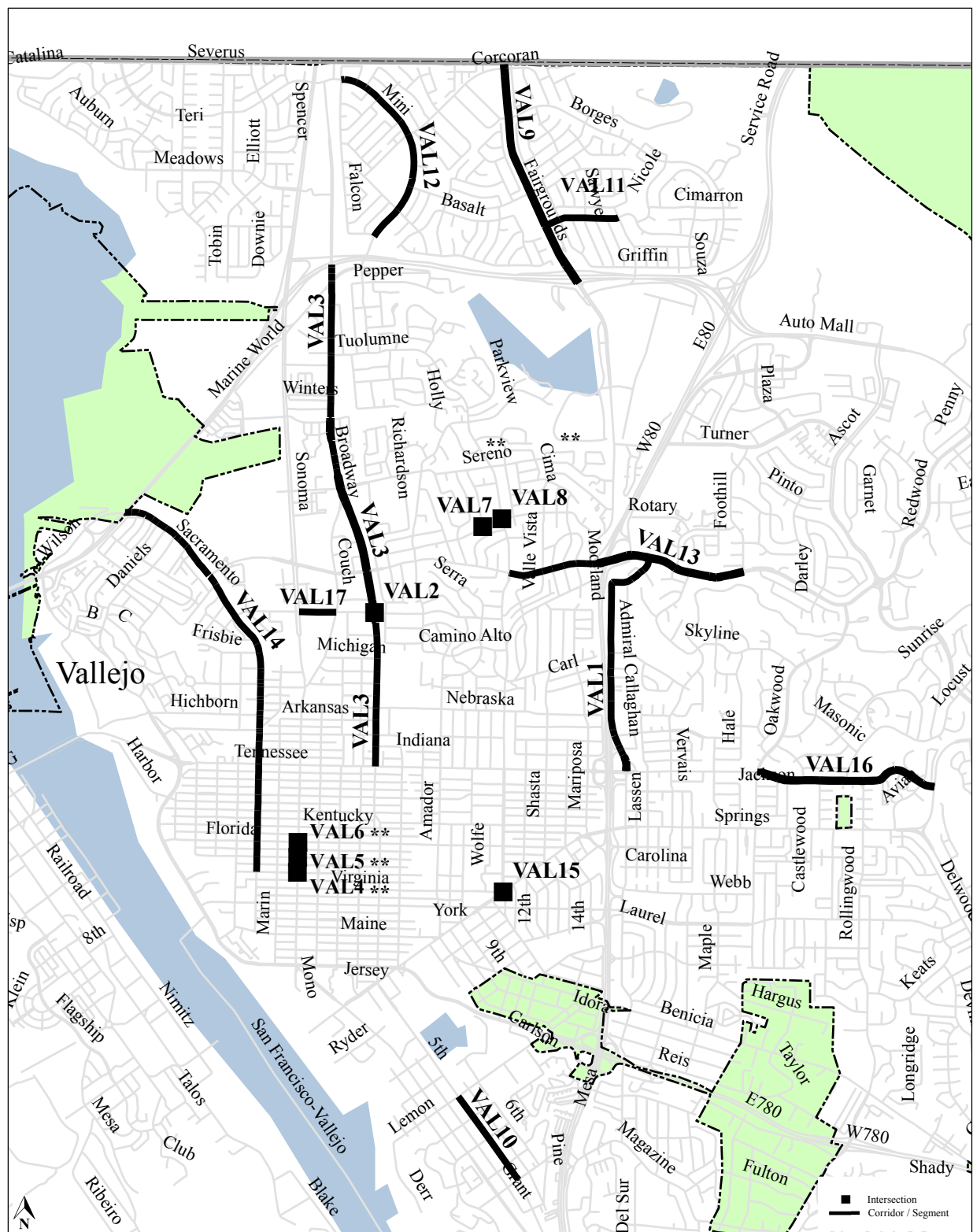
ID	LOCATION	SAFETY ANALYSIS	PROPOSED CHANGES	COST*
VAL9	Fairgrounds Drive from CA-37 to City Limits	Six severe injury collisions reported 2010-2014.	Improve lighting	\$
VAL10	Fifth Street, from Lemon Street to Magazine Street	Unsafe operating behavior (performing "donuts") frequently observed.	Install traffic circle	\$
VAL11	Gateway Drive, from Fairgrounds Drive to Sage Street	Unsafe operating behavior (performing "donuts") frequently observed.	Install traffic circle	\$
VAL12	Mini Drive, from Falcon Drive to Violet Drive	Unsafe operating behavior (performing "donuts") frequently observed.	Install traffic circle	\$
VAL13	Redwood Parkway / Street, from Foothill Drive to Tuolumne Street	Seven severe injury collisions reported 2010-2014.	Further detailed analysis needed to determine mitigations.	\$\$
VAL14	Sacramento Street, from CA-37 to Capitol Street	Substandard roadway lighting (CA-37 to Tennessee Street); Roadway provides more capacity than currently needed given existing traffic volumes, creating long distances for pedestrians to travel across roadway (CA-37 to Capitol Street).	Upgrade poles and luminaries; space installations per current standards (CA-37 to Tennessee Street). Install road diet (CA-37 to Capitol Street); repave roadway.	\$
VAL15	Solano Avenue at Tuolumne / Virginia Streets	Substandard intersection geometry.	Install road diet or signalize intersection	\$\$
VAL16	Tennessee Street, from Columbus Parkway to Oakwood Drive	Roadway provides more capacity than currently needed given existing traffic volumes, creating long distances for pedestrians to travel across roadway.	Install road diet; repave roadway	\$
VAL17	Valle Vista Avenue, from Couch Street and CA-29 / Sonoma Boulevard	Lack of sidewalk. Pedestrians must go around railroad track crossing arms.	Relocate railroad crossing arms to enable construction of sidewalks on both sides of the street.	\$
VAL18	Citywide (Intersections on Principal Arterials & Major Collector Streets)	Limited visibility due to poor lighting	Upgrade illuminated street name sign street lighting to LED lamps at principal arterial and major collector street intersections.	\$

*Total Project Cost Estimate

\$ - Less than \$250,000

\$\$ - Between \$250,000 and \$1,000,000

\$\$\$ - Over \$1,000,000



Map 14. City of Vallejo Priority Locations for Safety Project Development

**Received Active Transportation Program (ATP) Cycle 2 funding in 2015 for Safe Routes to School projects.

City of Vallejo priority locations:

ID	LOCATION
VAL1	Admiral Callaghan Lane, from Redwood Parkway to Tennessee Street
VAL2	Broadway Street at Valle Vista Avenue
VAL3	Broadway Street, from CA-37 to Tennessee Street
VAL4**	CA-29 / Sonoma Boulevard at Capitol Street (Lincoln Elementary School)
VAL5**	CA-29 / Sonoma Boulevard at Carolina Street (Lincoln Elementary School)
VAL6**	CA-29 / Sonoma Boulevard at Florida Street (Lincoln Elementary School)
VAL7**	Del Mar Avenue at Las Palmas Avenue (Cooper Elementary School)
VAL8**	Del Mar Avenue at Tuolumne Street (Cooper Elementary School)
VAL9	Fairgrounds Drive from CA-37 to City Limits
VAL10	Fifth Street, from Lemon Street to Magazine Street
VAL11	Gateway Drive, from Fairgrounds Drive to Sage Street
VAL12	Mini Drive, from Falcon Drive to Violet Drive
VAL13	Redwood Parkway / Street, from Foothill Drive to Tuolumne Street
VAL14	Sacramento Street, from CA-37 to Capitol Street
VAL15	Solano Avenue at Tuolumne / Virginia Streets
VAL16	Tennessee Street, from Columbus Parkway to Oakwood Drive
VAL17	Valle Vista Avenue, from Couch Street and CA-29 / Sonoma Boulevard
VAL18	Citywide (Principal Arterials & Major Collector Street intersections) [not mapped]

**Received Active Transportation Program (ATP) Cycle 2 funding in 2015 for Safe Routes to School projects.

County of Solano (Unincorporated Areas)

Agency's Processes and Procedures for Identifying Locations

Each year after all of the traffic collision reports have been received from the CHP, Solano County performs a systemic evaluation of collision data on the County's 586 miles of unincorporated roads. Each collision is mapped in an ArcGIS layer and corridors or locations where collisions occur at a higher rate or number in comparison to the whole county are identified. Collision maps from previous years are also considered and evaluated. Based on this evaluation, the Traffic Collision Reports are pulled from the County's archive to gain a clearer picture of how the collisions are occurring.

Once County staff understands the limits of the corridor or location under review and has identified the type of collisions, a field inspection is conducted to gather information of site conditions and determine potential safety enhancements. After staff has discussed the location or corridor, the variety of traffic, Average Daily Traffic (ADT), collision type and field conditions, a consensus on which safety enhancement is appropriate based on available funds is selected. Once the safety enhancement is implemented at the location or corridor it is evaluated in subsequent years for effectiveness.

County of Solano priority locations:

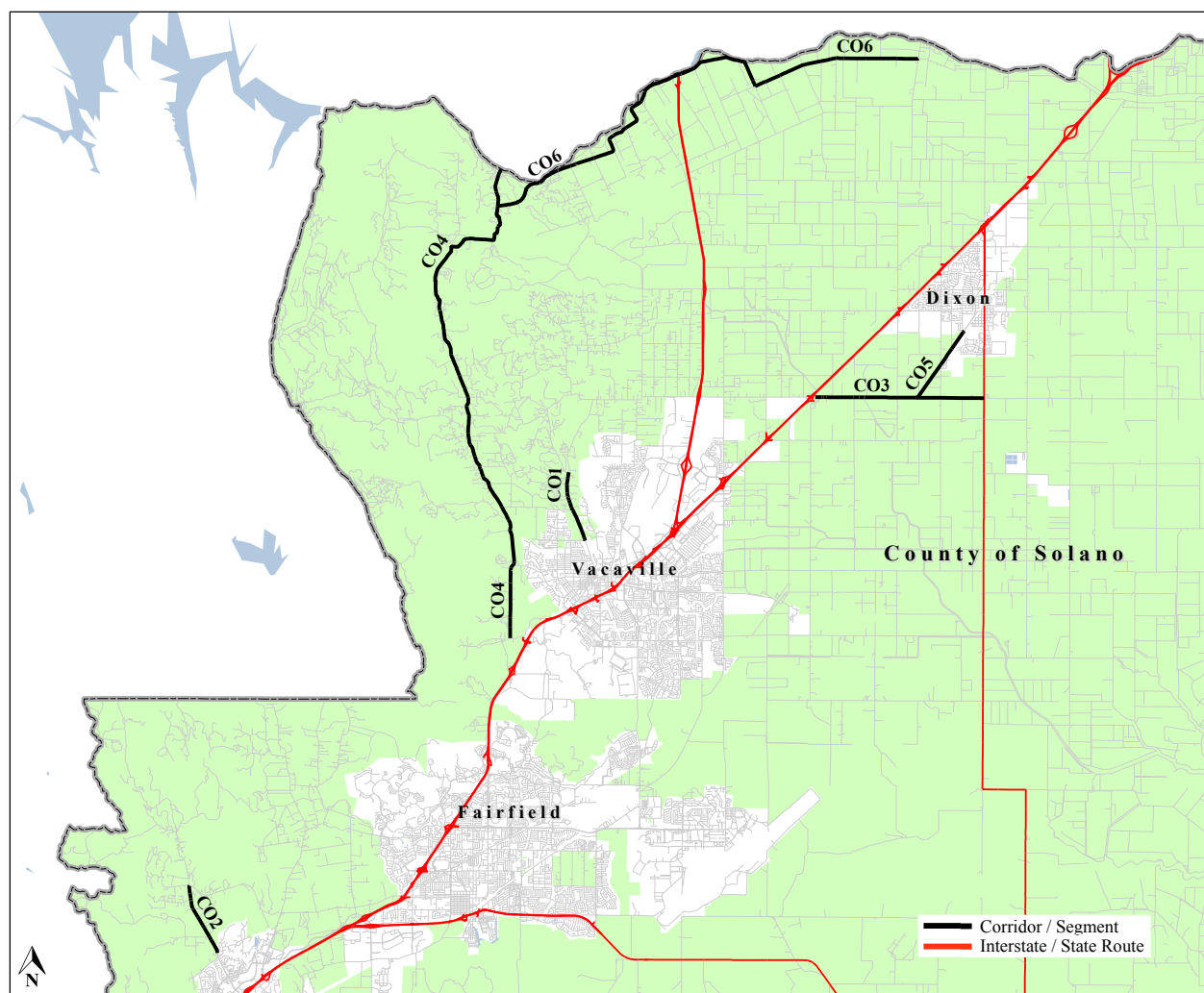
ID	LOCATION	SAFETY ANALYSIS	PROPOSED CHANGES	COST*
CO1	Gibson Canyon Road, from Fruitvale Road to Steiger Hill Road	Two fatal injury collisions and four severe injury collisions reported 2010-2015.	Bring road geometry up to County standard for enhanced width	\$\$\$
CO2	Green Valley Road, from the City of Fairfield city limit to Rockville Road	Substandard roadway, lane, and shoulder widths.	Widen and pave 4-foot shoulders	\$\$\$
CO3	Midway Road, from I-80 to Nunes Road	One fatal injury collision reported 2010-2014.	Widen and pave 4-foot shoulders	\$\$\$
CO4	Pleasants Valley Road, from Cherry Glen Road to the Solano County / Yolo County border	Substandard shoulder widths. Substandard lane widths.	Widen and pave 4-foot shoulders	\$\$\$
CO5	Porter Road, from Midway Road to South Almond Street	Two fatal injury collisions and three severe injury collisions reported 2010-2014.	Widen and pave 4-foot shoulders	\$\$
CO6	Putah Creek Road, from Pleasants Valley Road to Stevenson Bridge Drive	Two fatal injury collisions from 2009 to 2014	Widen and pave 4-foot shoulders	\$\$\$

*Total Project Cost Estimate

\$ - Less than \$250,000

\$\$ - Between \$250,000 and \$1,000,000

\$\$\$ - Over \$1,000,000



Map 15. County of Solano Priority Locations for Safety Project Development

ID	LOCATION
CO1	Gibson Canyon Road, from Fruitvale Road to Steiger Hill Road
CO2	Green Valley Road, from the City of Fairfield city limit to Rockville Road
CO3	Midway Road, from CA-113 to I-80
CO4	Pleasants Valley Road, from Cherry Glen Road to the Solano County / Yolo County border
CO5	Porter Road, from Midway Road to South Almond Street
CO6	Putah Creek Road, from Pleasants Valley Road to Stevenson Bridge Drive

4. Next Steps

This section explores potential improvements in collecting, managing, and analyzing safety-related information that may be incorporated pending additional future funding and resources with the goal to eliminate fatalities and severe injuries on local streets and roads in Solano County. From the FHWA Roadway Safety Data Program:

The effectiveness of safety programs is directly linked to the availability of sound data analysis for informed decisions. Improving data involves identifying and improving data quality, quantity, types, storage, maintenance, accessibility, and use. Enhanced analytical processes use procedures to better identify safety problems and select countermeasures to achieve optimal returns on safety investments. The knowledge base created by these processes and procedures also improves the ability to learn from trends in the data and to recognize the relationships between safety and other issues such as highway design, roadway operation, and system planning ⁽⁸⁾.

The following items may be explored in the near-term:

ITEM	CHALLENGE	POTENTIAL STRATEGY	POTENTIAL OUTCOMES
Motor vehicle collisions are currently hand-written on paper reports by local police departments.	Data is recorded twice (in the field and manually entered into a database), and potentially a third time by Public Works staff, which is labor-intensive and redundant.	Explore software and hardware options that allow police officers to digitally collect and enter data at the site of collision events (i.e. in-car computer and/or handheld electronic device).	Digitizing collision data in concert with an appropriate and optimized database management system (DBMS) may also provide real-time data access to engineers, planners, and project managers.
Reported collision data may not include all data needed to perform safety analysis.	Data-driven safety analysis requires having accurate, complete, and comprehensive data inputs, which are not currently being collected.	Utilize resources such as the Model Minimum Uniform Crash Criteria (MMUCC) and the Model Inventory of Roadway Elements (MIRE) guidebooks, to inventory current data elements collected by police officers at the scene of collision events as well as post-collision data collection needs by engineering, planning, and project management staff.	By reviewing the MMUCC and the MIRE guidebooks, staff may: Standardize a comprehensive list of the most important crash-related data elements; identify a comprehensive listing of roadway inventory data elements that may be necessary for various safety management activities; and prioritize roadway elements for future collection.

⁸ Federal Highway Administration (FHWA) Roadway Safety Data Program (RSDP), retrieved December 23, 2015 from <http://safety.fhwa.dot.gov/rsdp/about.aspx>

Acknowledgements

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