

The background is a grayscale photograph of a street scene. On the left, a person in a white jacket is partially visible on a bicycle. In the center, a cyclist wearing a helmet and sunglasses is riding towards the camera. On the right, another cyclist is riding away. A car is parked in the background. A teal circle is overlaid in the center, containing a large white letter 'F' and the text 'BICYCLE COLLISION ANALYSIS'. The word 'APPENDIX' is written in a curved path above the 'F'.

APPENDIX

F

**BICYCLE
COLLISION
ANALYSIS**

Santa Barbara Bicycle Master Plan

Collision Analysis Summary

**Prepared for:
The City of Santa Barbara**

April, 2015

LA14-2731



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INTRODUCTION

Fehr & Peers examined bicycle-involved collisions in the City of Santa Barbara over the period of 2004 – 2013. In total, 1,051 bicycle-involved collisions were reported. The data were sourced from the California Highway Patrol's Statewide Integrated Traffic Records System (SWITRS) and processed by the City of Santa Barbara. The City provided the data to Fehr & Peers in the standard SWITRS tabular format. This non-geocoded format assigns each collision to a nearby intersection or other reference point and, as necessary, includes an offset distance to the exact collision location. 434 collisions occurred at intersections, 197 collisions occurred less than 75 feet from an intersection, and the remaining 420 collisions occurred at midblock locations. Geocoding midblock collisions to their precise locations, using SWITRS offset distance and direction, was not possible within the scope of this project. Therefore, the City and Fehr & Peers focused on mapping collisions that occurred at intersections or less than 75 feet from an intersection. The latter collisions were assigned to their nearest intersection since they can be considered to have occurred within the intersection approach area.

Fehr & Peers created 9 bicycle collision maps:

- All bicycle-involved collisions
- Bicyclist at fault – signalized intersection
- Bicyclist at fault – unsignalized intersection
- Vehicle at fault – signalized intersection
- Vehicle at fault – unsignalized intersection
- Vehicle at fault – dooring (vehicle opened door in path of oncoming cyclist)
- Vehicle at fault – left hook (vehicle made left turn while bicycle proceeded straight in other direction)
- Vehicle at fault – right hook (vehicle made right turn while bicycle proceeded straight in same direction)
- Bicyclist on wrong side of road or traveling on sidewalk

The first map above shows all bicycle-involved collisions regardless of collision type. For the remaining 8 maps, the City of Santa Barbara examined collision factors and classified collisions into the categories listed above. Each of these maps shows a subset of the mappable collisions and is designed to highlight a particular behavior. These maps help identify where specific physical modifications, targeted enforcement, or education may be most beneficial.

The following sections summarize key trends observed on each map.

ALL BICYCLE-INVOLVED COLLISIONS

As noted above, 1,051 bicycle-related collisions were reported in the City of Santa Barbara between 2004 and 2013; 631 occurred at or within 75 feet of an intersection and were mapped. The citywide locations with the highest concentrations of collisions are shown in the table below. Each location experienced 6 or more bicycle-related collisions between 2004 and 2013. Many of these top-collision locations are near freeway ramps or along principal routes between freeways and major activity centers (e.g. Downtown or Santa Barbara City College [SBCC]).

Intersection	Neighborhood	Number of Collisions
De la Vina Street & Mission Street	Downtown	10
Carrillo Street & Highway 101	Downtown/Westside	8
Castillo Street & Montecito Street	Waterfront/SBCC	8
Micheltorena Street & State Street	Downtown	8
Mission Street & Highway 101	Downtown/Westside	8
Carrillo Street & State Street	Downtown	7
Cabrillo Boulevard & Helena Avenue	Waterfront	6
De la Vina Street & Figueroa Street	Downtown	6
De la Vina Street & Victoria Street	Downtown	6

Source: Statewide Integrated Traffic Records System.

BICYCLIST AT FAULT – SIGNALIZED INTERSECTION

78 collisions of this type were reported in the City of Santa Barbara between 2004 and 2013. All occurred at intersections and were mapped. The top 5 locations for collisions of this type are shown in the table below.

Intersection	Neighborhood	Number of Collisions
Alamar Avenue & State Street	Upper State Street	4
De la Vina Street & Mission Street	Downtown	4
Carrillo Street & Chapala Street	Downtown	4
Anacapa Street & Carrillo Street	Downtown	4
Carrillo Street & State Street	Downtown	3

Source: Statewide Integrated Traffic Records System.

BICYCLIST AT FAULT – UNSIGNALIZED INTERSECTION

138 collisions of this type were reported in the City of Santa Barbara between 2004 and 2013. All occurred at intersections and were mapped. The top 5 locations for collisions of this type are shown in the table below.

Intersection	Neighborhood	Number of Collisions
Carrillo Street & Highway 101	Downtown/Westside	6
De la Vina Street & Figueroa Street	Downtown	5
Las Positas Road & Modoc Road	Las Positas/Westside	3
Bath Street and Carrillo Street	Downtown	3
Canon Perdido Street & De la Vina Street	Downtown	3

Source: Statewide Integrated Traffic Records System.

VEHICLE AT FAULT – SIGNALIZED INTERSECTION

63 collisions of this type were reported in the City of Santa Barbara between 2004 and 2013. All occurred at intersections and were mapped. The top 5 locations for collisions of this type are shown in the table below.

Intersection	Neighborhood	Number of Collisions
Mission Street & Highway 101	Downtown/Westside	5
Micheltorena Street & State Street	Downtown	4
Cabrillo Boulevard & State Street	Waterfront	4
De la Vina Street & Mission Street	Downtown	3
Hope Avenue & State Street	San Roque	2

Source: Statewide Integrated Traffic Records System.

VEHICLE AT FAULT – UNSIGNALIZED INTERSECTION

125 collisions of this type were reported in the City of Santa Barbara between 2004 and 2013. All occurred at intersections and were mapped. The top 5 locations for collisions of this type are shown in the table below.

Intersection	Neighborhood	Number of Collisions
Modoc Road & Portesuello Avenue	Las Positas	5
De la Vina Street & Victoria Street	Downtown	5
Modoc Road & Palermo Drive	Las Positas	3
Castillo Street & Micheltorena Street	Downtown	3
Cabrillo Boulevard & Helena Avenue	Waterfront	3

Source: Statewide Integrated Traffic Records System.

VEHICLE AT FAULT – DOORING

74 collisions of this type were reported in the City of Santa Barbara between 2004 and 2013. 29 occurred at or within 75 feet of an intersection and were mapped. The top 5 locations for collisions of this type are shown in the table below.

Intersection	Neighborhood	Number of Collisions
De la Guerra Street & State Street	Downtown	3
Figueroa Street & State Street	Downtown	2
Anacapa Street & Canon Perdido Street	Downtown	2
Allaire Street & Quinientos Street	Eastside	1
Anacapa Street & Sola Street	Downtown	1

Source: Statewide Integrated Traffic Records System.

VEHICLE AT FAULT – LEFT HOOK

64 collisions of this type were reported in the City of Santa Barbara between 2004 and 2013. 48 occurred at or within 75 feet of an intersection and were mapped. The top 5 locations for collisions of this type are shown in the table below.

Intersection	Neighborhood	Number of Collisions
Mission Street & Highway 101	Downtown/Westside	3
Modoc Road & Portesuello Avenue	Las Positas	3
De la Vina Street & Micheltorena Street	Downtown	2
Haley Street & State Street	Downtown	2
Modoc Road & Palermo Drive	Las Positas	2

Source: Statewide Integrated Traffic Records System.

VEHICLE AT FAULT – RIGHT HOOK

92 collisions of this type were reported in the City of Santa Barbara between 2004 and 2013. 60 occurred at or within 75 feet of an intersection and were mapped. The top 5 locations for collisions of this type are shown in the table below.

Intersection	Neighborhood	Number of Collisions
Cabrillo Boulevard & State Street	Waterfront	3
Cabrillo Boulevard & Milpas Street	Waterfront	2
Castillo Street & Micheltorena Street	Downtown	2
Hope Avenue & State Street	San Roque	2
Milpas Street & Montecito Street	Eastside	2

Source: Statewide Integrated Traffic Records System.

BICYCLIST ON WRONG SIDE OF ROAD OR TRAVELLING ON SIDEWALK

127 collisions of this type were reported in the City of Santa Barbara between 2004 and 2013. 73 occurred at or within 75 feet of an intersection and were mapped. The top 5 locations for collisions of this type are shown in the table below.

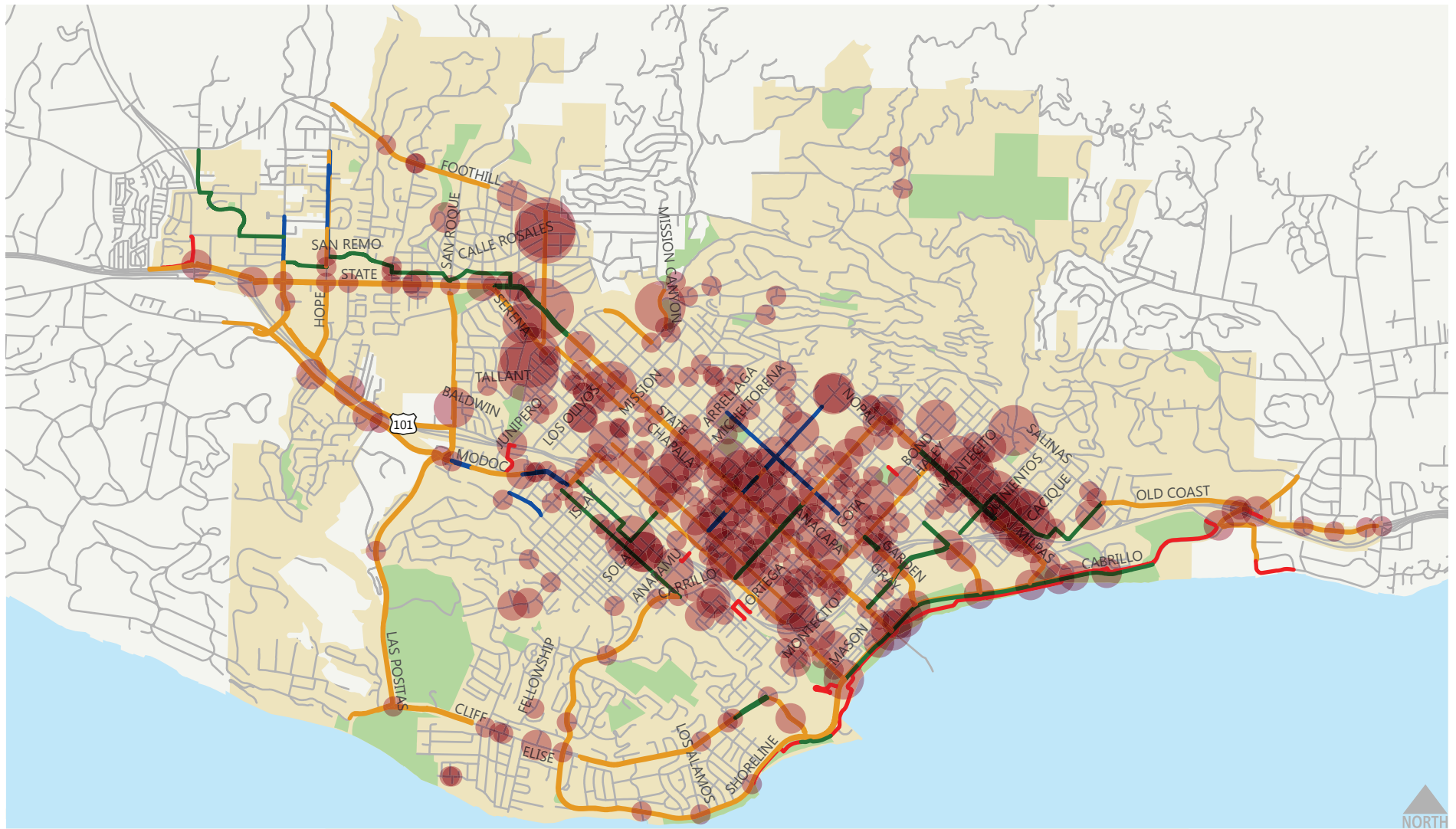
Intersection	Neighborhood	Number of Collisions
Carrillo Street & Highway 101	Downtown/Westside	4
Castillo Street & Montecito Street	Waterfront/SBCC	4
Calle Cesar Chavez & Yanonali Street	Waterfront	2
De la Guerra Street & Milpas Street	Eastside	2
Milpas Street & Highway 101	Eastside/Waterfront	2

Source: Statewide Integrated Traffic Records System.

CONCLUSIONS

In reviewing the 10-year bicycle-involved collision history for Santa Barbara, the following themes emerge:

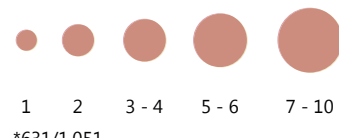
- The majority of bicycle-involved collisions were reported in the greater Downtown Area and on the Eastside, which may be explained by generally high bicycle use in these areas
- Intersections near freeway ramps tended to experience higher collision rates on average, which likely corresponds to higher traffic volumes at these locations
- Of the various collision types, Bicyclist at Fault – Unsignalized Intersection (138 incidents) and Bicyclist on Wrong Side of Road or Travelling on Sidewalk (127 Incidents) were the most commonly reported
- Vehicle at Fault – Signalized Intersection (63 incidents) and Vehicle at Fault – Left Hook (64 incidents) were the least reported collision types
- Vehicle at Fault – Left Hook, Vehicle at Fault – Right Hook, and Vehicle at Fault – Dooring collisions tended to be less clustered. In other words, it was less likely for multiple collisions of these types to occur at a single location.



Bikeway Type

- Class 1
- Class 2
- Class 3
- Peak Hr.

Collisions



City Limits

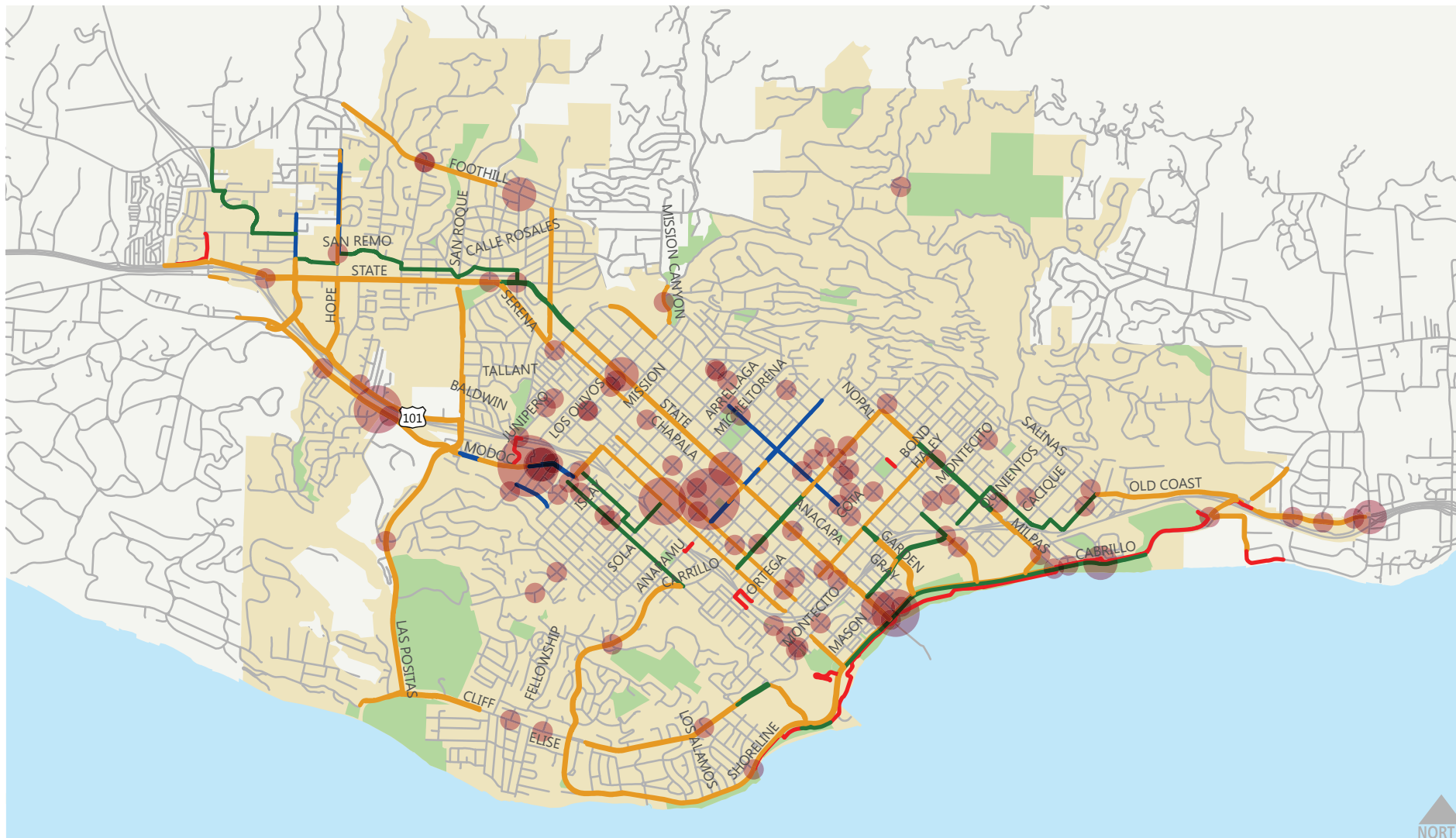


*631/1,051

Total collisions

Mapped collisions
(midblock locations
not shown)

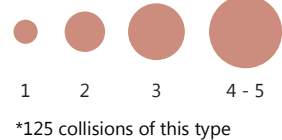
ALL BICYCLE-INVOLVED COLLISIONS (2004 - 2013)



Bikeway Type

- Class 1
- Class 2
- Class 3
- Peak Hr.

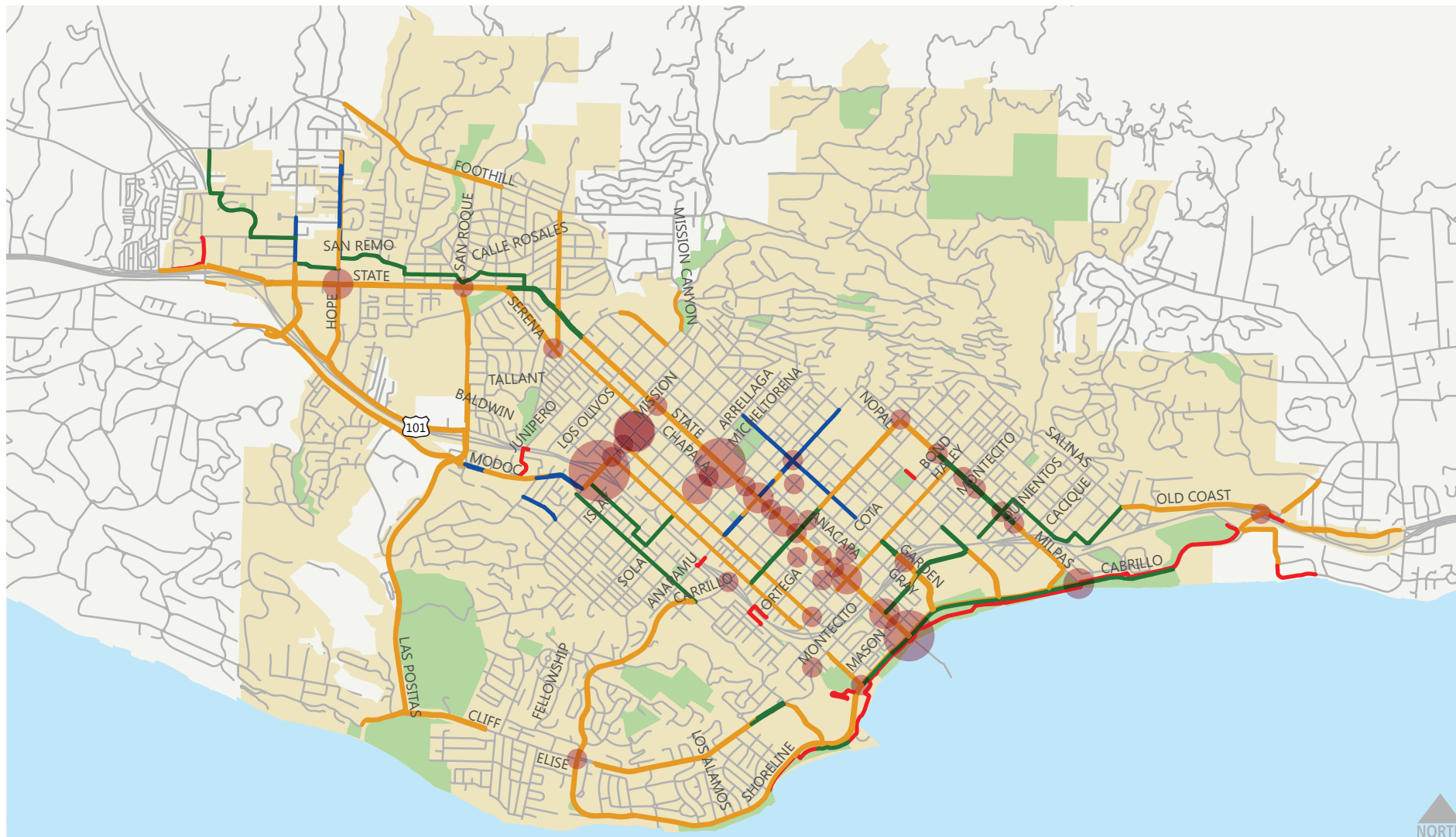
Collisions



City Limits



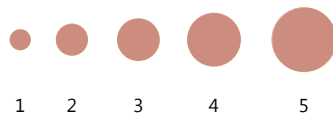
VEHICLE AT FAULT – UNSIGNALIZED INTERSECTION (2004 - 2013)



Bikeway Type

- Class 1
- Class 2
- Class 3
- Peak Hr.

Collisions

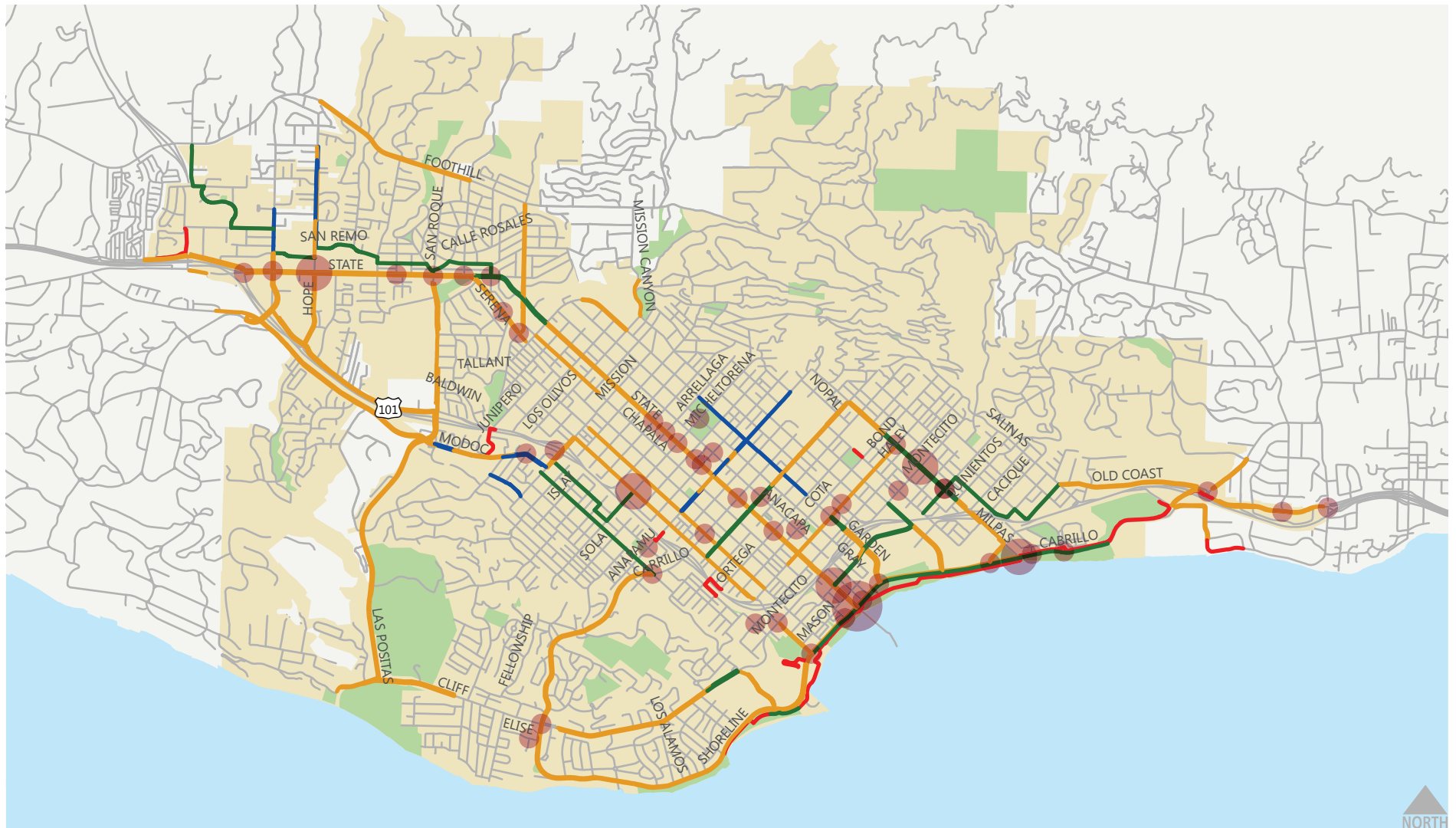


*63 collisions of this type

City Limits



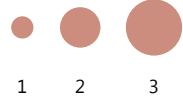
VEHICLE AT FAULT – SIGNALIZED INTERSECTION (2004 - 2013)



Bikeway Type

- Class 1
- Class 2
- Class 3
- Peak Hr.

Collisions



*60/92 collisions

Total collisions

Mapped collisions
(midblock locations
not shown)

City Limits



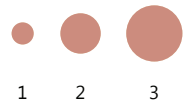
VEHICLE AT FAULT – RIGHT HOOK (2004 - 2013)



Bikeway Type

- Class 1
- Class 2
- Class 3
- Peak Hr.

Collisions



*48/64 collisions

Total collisions

Mapped collisions
(midblock locations
not shown)

City Limits



VEHICLE AT FAULT – LEFT HOOK (2004 - 2013)



Bikeway Type

- Class 1
- Class 2
- Class 3
- Peak Hr.

Collisions

- 1
- 2

*29/74 collisions

Total collisions

Mapped collisions
(midblock locations
not shown)

City Limits



VEHICLE AT FAULT – DOORING (2004 - 2013)



Bikeway Type

- Class 1
- Class 2
- Class 3
- Peak Hr.

Collisions



*73/127 collisions

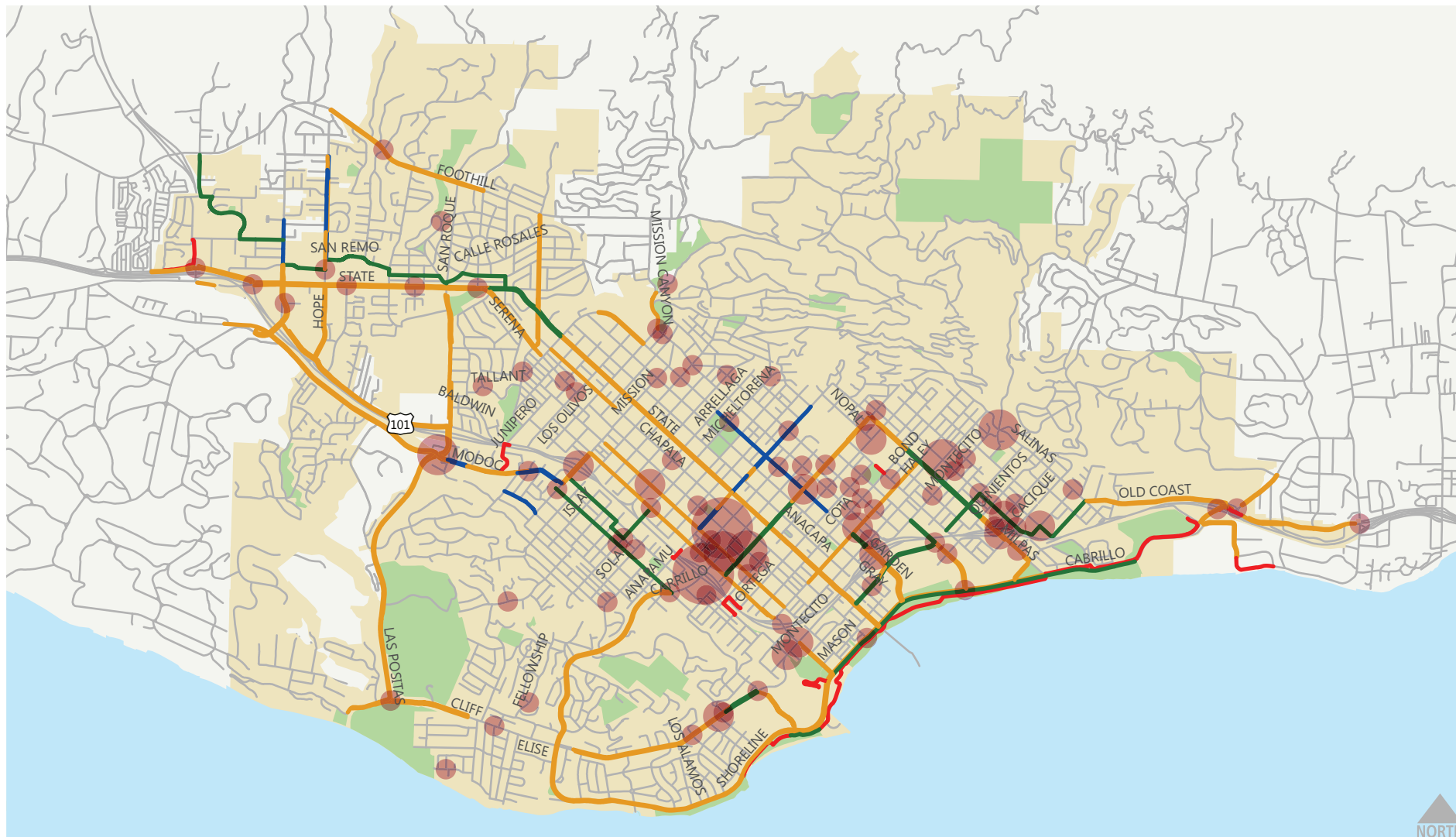
Total collisions of type

Mapped collisions
(midblock locations
not shown)

City Limits



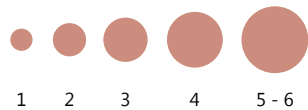
BICYCLIST ON WRONG SIDE OF ROAD OR TRAVELING ON SIDEWALK (2004 - 2013)



Bikeway Type

- Class 1
- Class 2
- Class 3
- Peak Hr.

Collisions

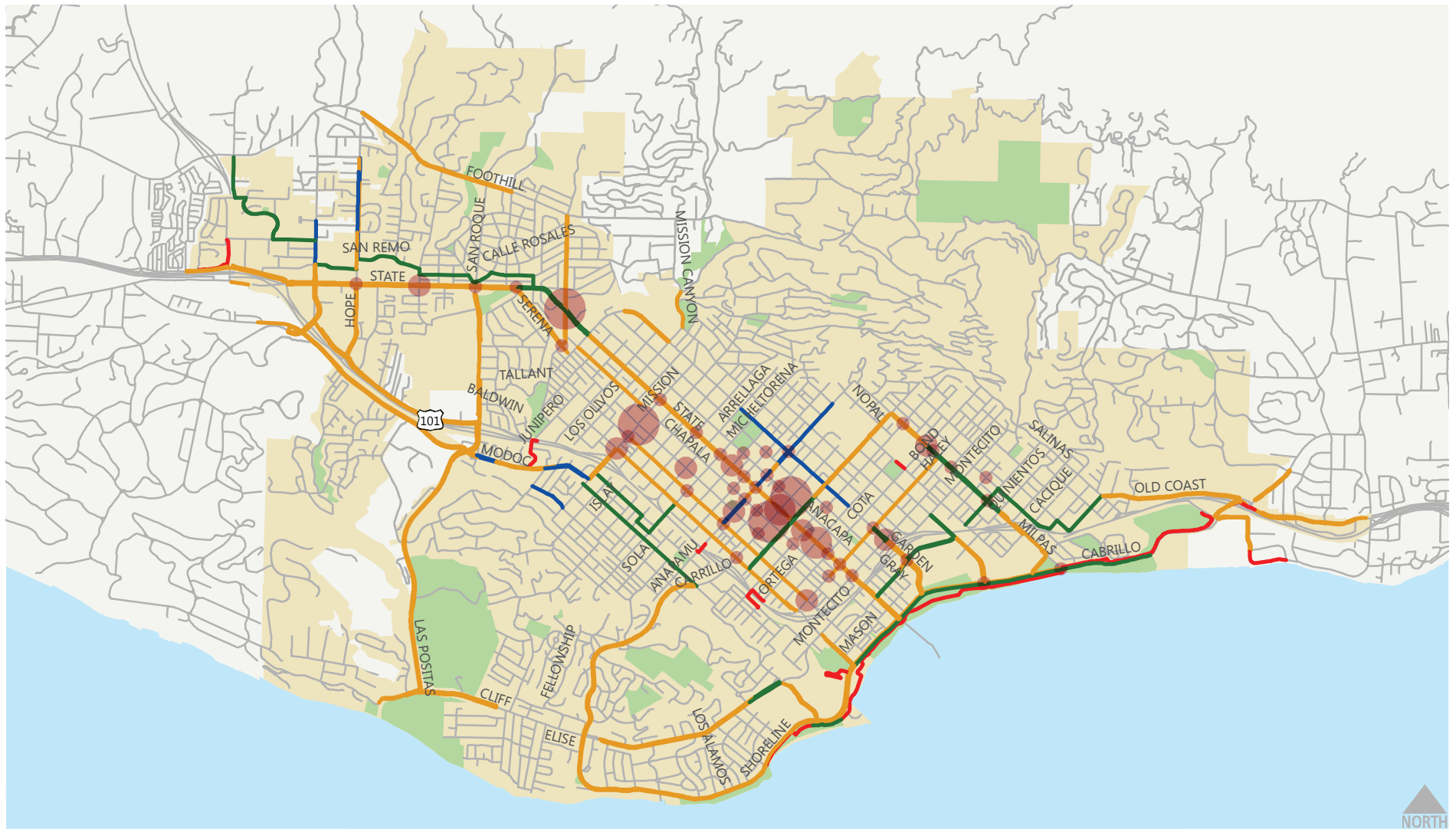


*138 collisions of this type

City Limits



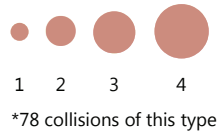
BICYCLIST AT FAULT – UNSIGNALIZED INTERSECTION (2004 - 2013)



Bikeway Type

- Class 1
- Class 2
- Class 3
- Peak Hr.

Collisions



City Limits



BICYCLIST AT FAULT – SIGNALIZED INTERSECTION (2004 - 2013)

COLLISION MAPPING

EXISTING CLASS I & II



EXISTING CLASS I, II & COLLISIONS (2008-2012)



COLLISION MAPPING

EXISTING CLASS I, II + PROPOSED CLASS I, II & BIKE BOULEVARDS

