

**Bike Collisions
on the
Pacific Coast Highway
(RT-1)
3 County Detail:
Los Angeles, Orange, San Diego
2004-2015**

Data compiled from CHP SWITERS Traffic Database

Revised 1/2014 Refresh 2010-2013 to 4q13

Revised 4/2014 Refresh 2001-2013 to 1q14

Revised 7/2014 Refresh 2011-2014 to 2q14

Revised 10/2014 - refresh 2011-2014 to 3q14

Revised 1/2015 Refresh 2012-2014 to 4q14

Revised 4/2015 - refresh 2012-2015 to 1q15

Revised 10/2015 - refresh 2013-2015 to 3q15

Revised 1/2016 - refresh 2013-2015 to 4q15

THE Pacific Coast Highway aka:

Pacific Coast Hwy

PCH

Hwy 1

RT-1

Coast Hwy +(W, E, N, S)

RT-101 in parts of San Diego County

as entered in the SWITRs database by the reporting agency

RT-1 Review - 3 Counties

All 1,765 Collisions Involved a Bike:

- 12.1% = Hit & Run, or 215 collisions
- 7.9% = Alcohol Involved, or 140 collisions
- 3.6% = "Dooring", or 65 collisions
- Riders: 29 Dead - 1,682 Injured
- Pedestrians: 0 Dead - 24 Injured
- Motorcyclist(s): 0 Dead - 14 Injured
- 1,720 Degrees of Injury:
 - Severe Visible Complaint of Pain
 - 161 1,030 562

This report follows and expands on items presented in the RT-1 Overview covering 3 Counties hosting their segment of the Pacific Coast Highway in Southern California: Los Angeles, Orange, and San Diego.

Data obtained from SWITRs on 1/1/2016

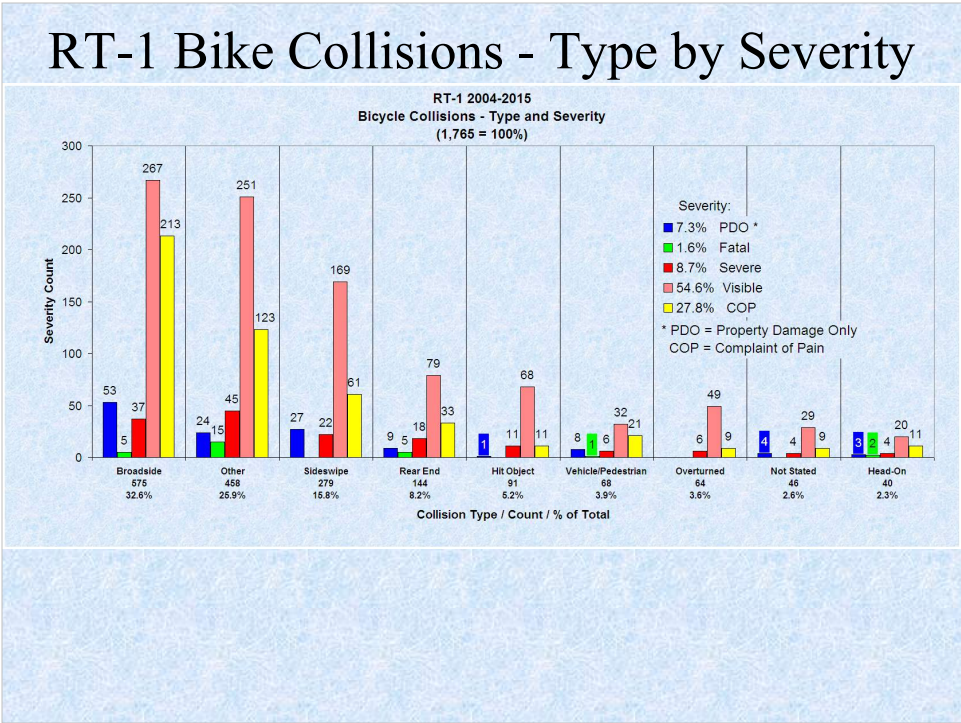
Any collision that involved a bicycle that generated a police report in San Diego, Los Angeles, or Orange County and contained in the SWITRs database is reflected in this presentation.

That means car vs bike, bike vs bike, bike vs pedestrian, bike vs fixed / movable object, bike vs animal, etc. and vice-verse.

Collisions result in: loss of life, debilitating injuries, damage to property, costs to responders, and costs to survivors.

Identifying trends and developing counter measures to their causes will make life more enjoyable and profitable for all.

Each "slide" has underlying detailed analysis available on request.



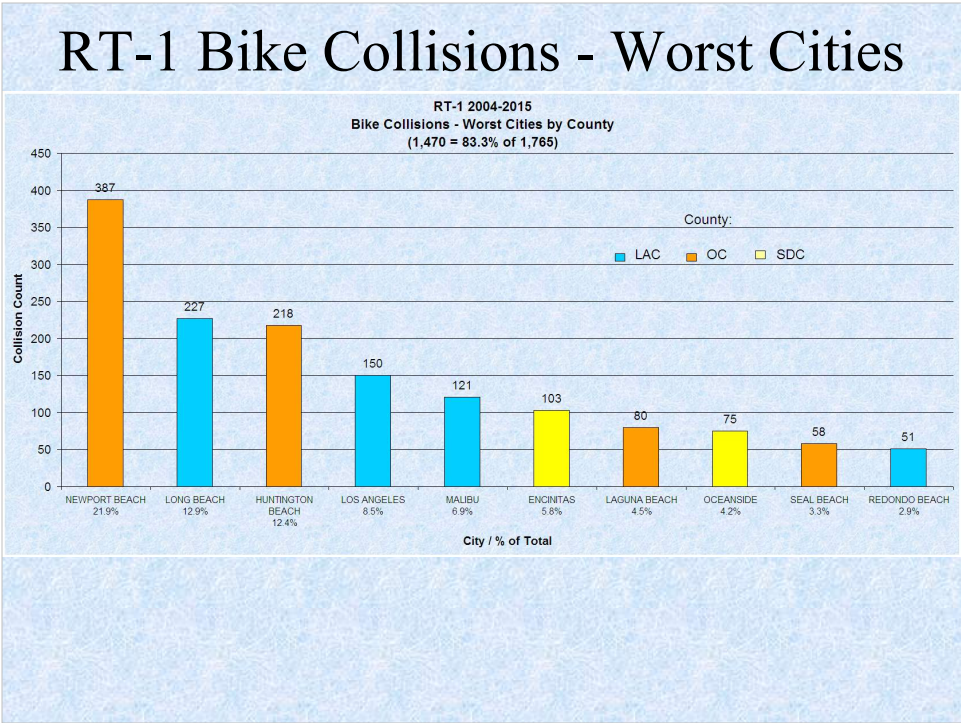
9 of 9 types of bike collisions on RT-1 are shown with the counts and degree of injury for the people involved in the 3 Counties for 2004-2015.

Almost 29% are defined as "other" or "not stated", meaning over 25% of collision type data is undefined.

It will be hard to develop countermeasures for collisions of this type - whatever they are.

Note: For fatalities the count is 27 while the sum is 29. This is due to 2 people dying in 1 collision.

Understanding what types of collisions bikes are involved in is a key step in developing effective means of reducing their causes.



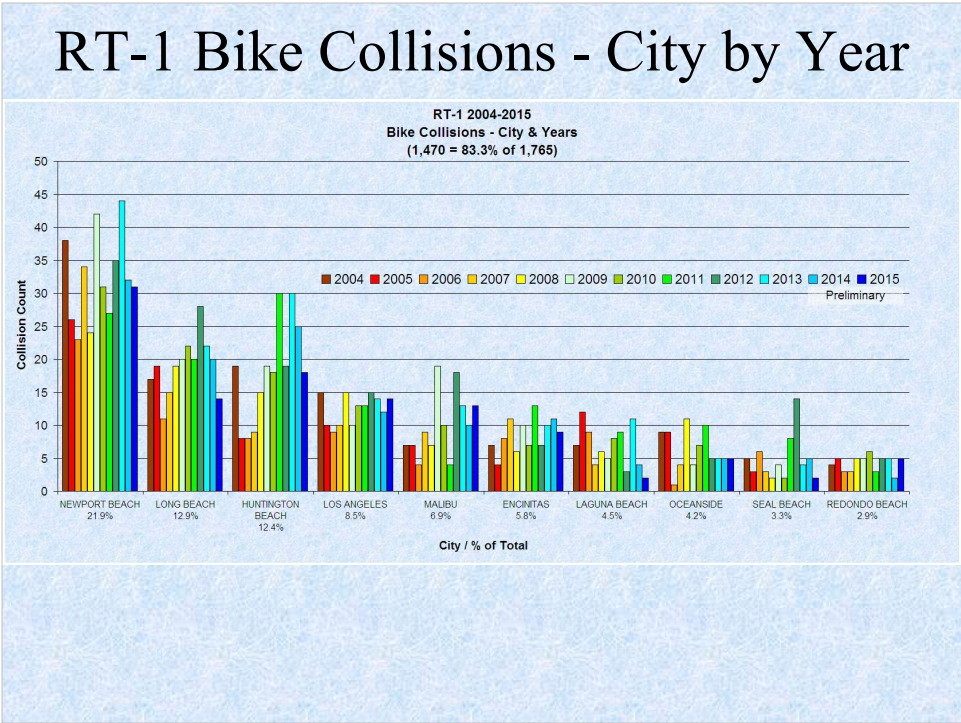
1,470 or 83.3% of 1,765 total RT-1 bike collisions are shown by the 10 Cities with the highest count of bike collisions on RT-1 which makes them the "worst" to travel safely on 2 wheels in the 3 County area.

Their respective percentage of the total is also provided with color coding for their County.

Newport Beach is the clear "winner" for hosting the vast majority of bike collisions earning it the "3 County Crown City & Collision Capital of RT-1" title.

Effective safety awareness campaigns should start with these Cities to have the greatest and most immediate "impact" on reducing bike collisions with special attention to Newport Beach.

Understanding where bike collisions happened is the key step in developing effective means to reducing their causes.



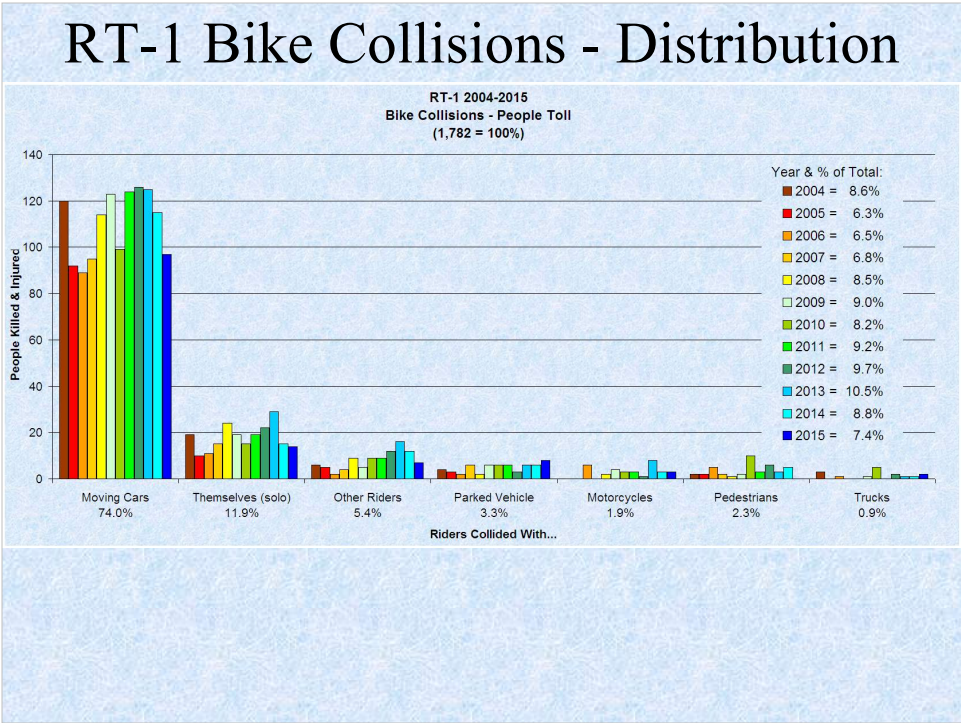
This chart shows the total count and percentage for the 10 Cities ("Top 10") with the highest bike collision count on RT-1 in the 3 County area.

For more perspective and insight, the "Top 10" contributed 1,357 or 83.0% of 1,634 total bike collisions on RT-1 in the 3 County area from 2004-2014, down 0.2% from the last overview, and are just above their average of 82.9% for 2004-2014.

For 2015, the "Top-10" are running at 86.3% with 113 of 131 RT-1 totals. This is 4.10% above their average of 82.9% for 2004-2014.

The least the "Top-10" contributed over the previous 11 years was 74.3% of the RT-1 total in 2008, with the maximum at 87.2% in 2007.

Understanding where, when, and how bike collisions happen is a good step in reducing their causes.



For the 3 County area, bike collisions on RT-1 were between people on bikes, people on other bikes, people driving motor vehicles, pedestrians, and of all things; parked cars! 6 collisions are not shown due to being undefined.

1,782 people were killed or injured in 1,765 bike collisions with almost 75% of those deaths and injuries between bike riders and car drivers.

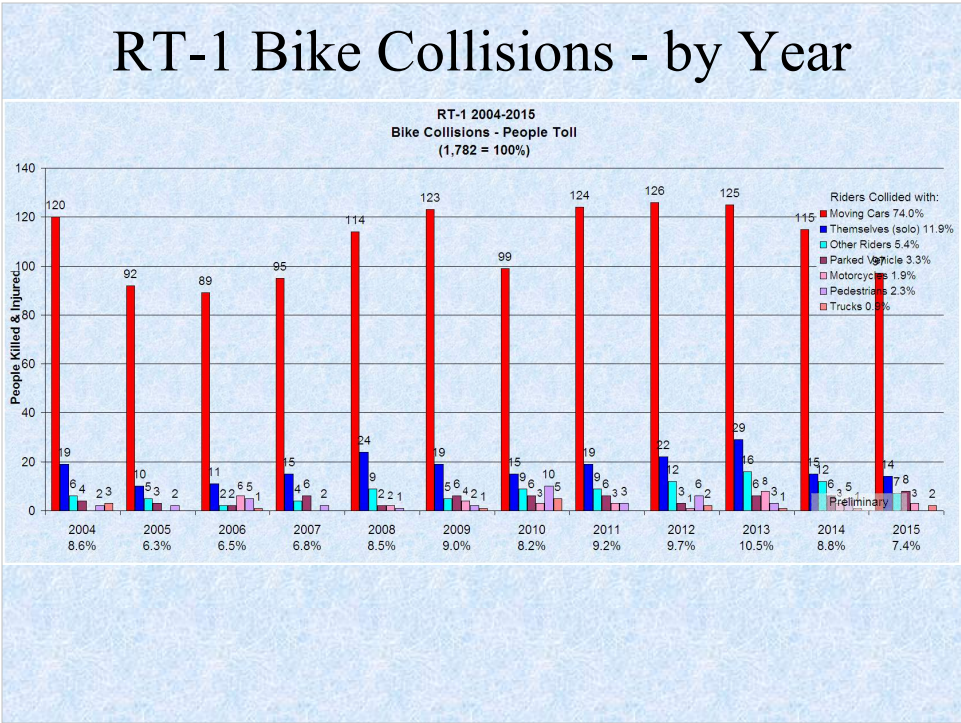
Why should this be?

212 people or 12% were injured in solo bike crashes which might indicate poor roadway design or infrastructure issues if those collisions were localized to specific areas of RT-1. These collisions did not involve parked cars.

1 person died and 95 people were injured by riders colliding with other riders possibly due to roadway debris, failure to "watch your wheel", or mechanical issues leading to a collision.

Riders colliding with parked cars may indicate improper roadway design to accommodate safe travel for bike riders or incidents of riders being "doored" by drivers opening their doors into the path of on-coming riders.

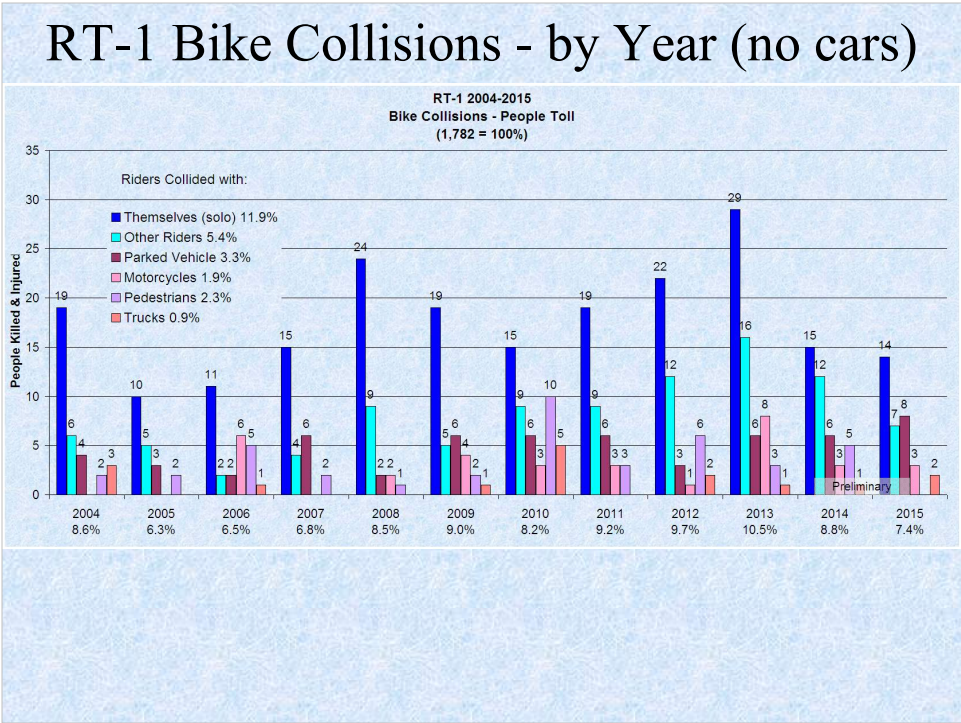
Comparing the types of collisions to the physical location of where they occurred may identify infrastructure issues to which effective countermeasures can be developed and measured.



This chart is the same as the previous with the axis reversed in order to see the collision carnage distribution over time.

The high number of bike / moving car collisions do not indicate a negative trend over time so a lot of work needs to be done to understand how, where, and why these collisions occur in order to increase roadway safety for all.

Data is still in-flowing for 2014 and 2015 so expect these counts to increase at the next update.

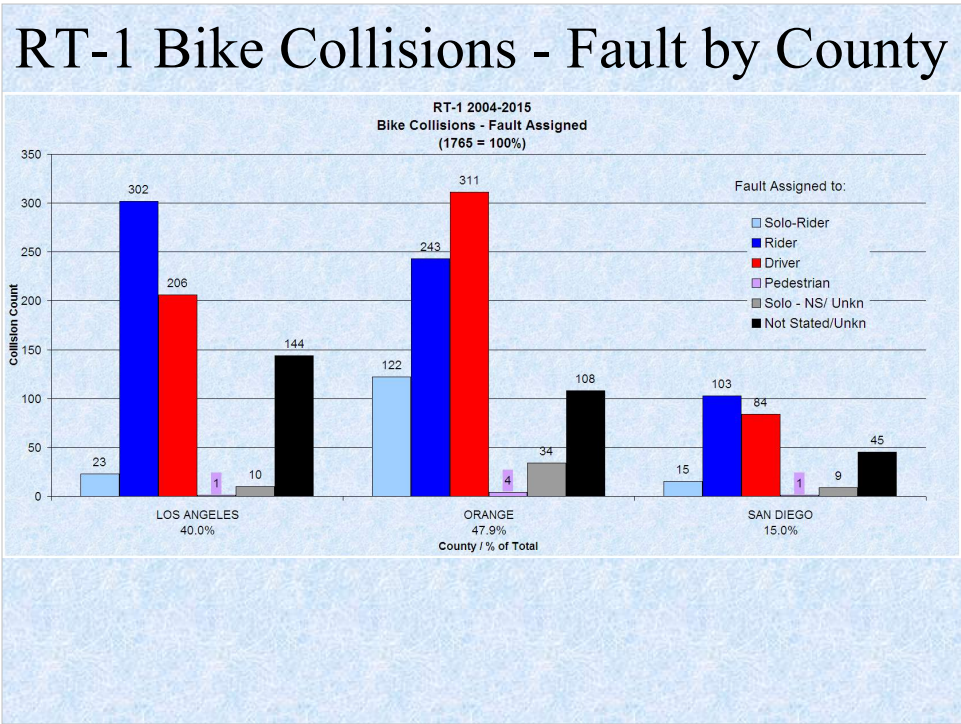


This chart is the same as the previous with the cars removed in order to better see the collision carnage distribution over time.

Without the suppression of moving cars as seen in the previous chart, this chart makes clear the shocking revelation that the highest number of bike collisions on RT-1 in the 3 County area after motor vehicles are bike riders themselves!

Whether solo (by themselves) or by crashing into their fellow riders, roughly 17% of all bike collisions on RT-1 in 3 Counties are at the hands of people on bikes.

Data is still in-flowing for 2014 and 2015 so expect these counts to increase at the next update.



Fault for 1,765 bike collisions on RT-1 in 3 Counties are shown here by County and collision counts by parties at fault for each County.

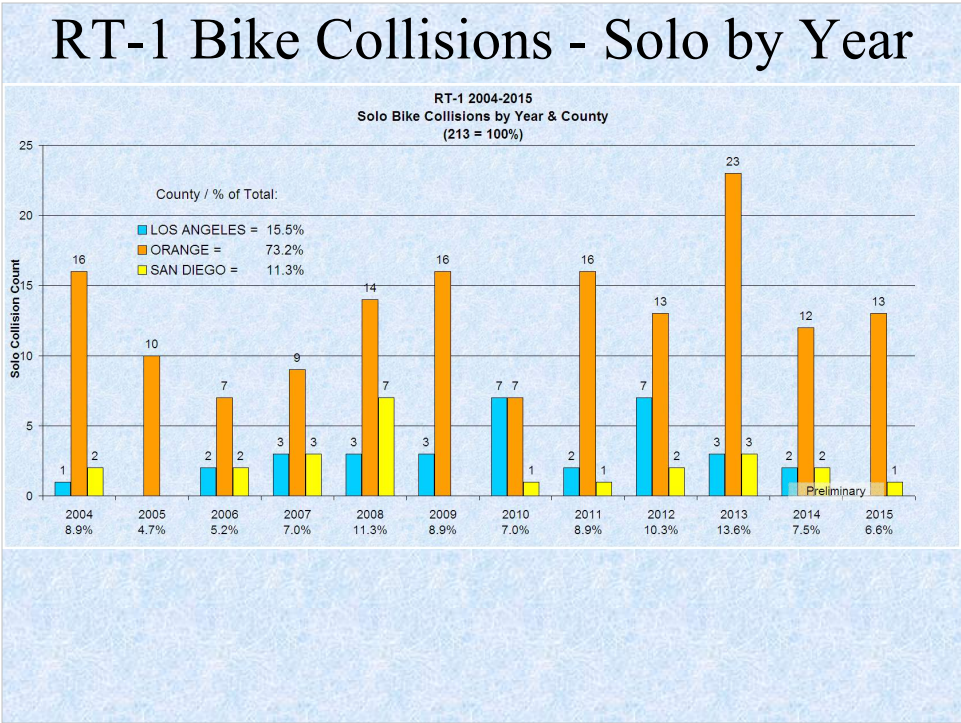
Orange County appears to find more drivers than riders at fault, while Los Angeles and San Diego Counties clearly find more fault with riders for causing the collision.

For some reason, Los Angeles County has the highest number of undefined fault for bike collisions.

Pedestrians were at fault in 6 bike collisions with 4 of those coming from Orange County. This would be significant only if those collisions happened in a very localized area. Further analysis could reveal whether this is true or not.

Since bike riders were found at fault by the reporting agencies in the majority of collisions in the 3 Counties, it appears bike riders are not the victims of a marauding car culture gone mad and bent of their destruction as some would have you believe.

Could bias on the part of reporting agencies factor into the fault assignment?



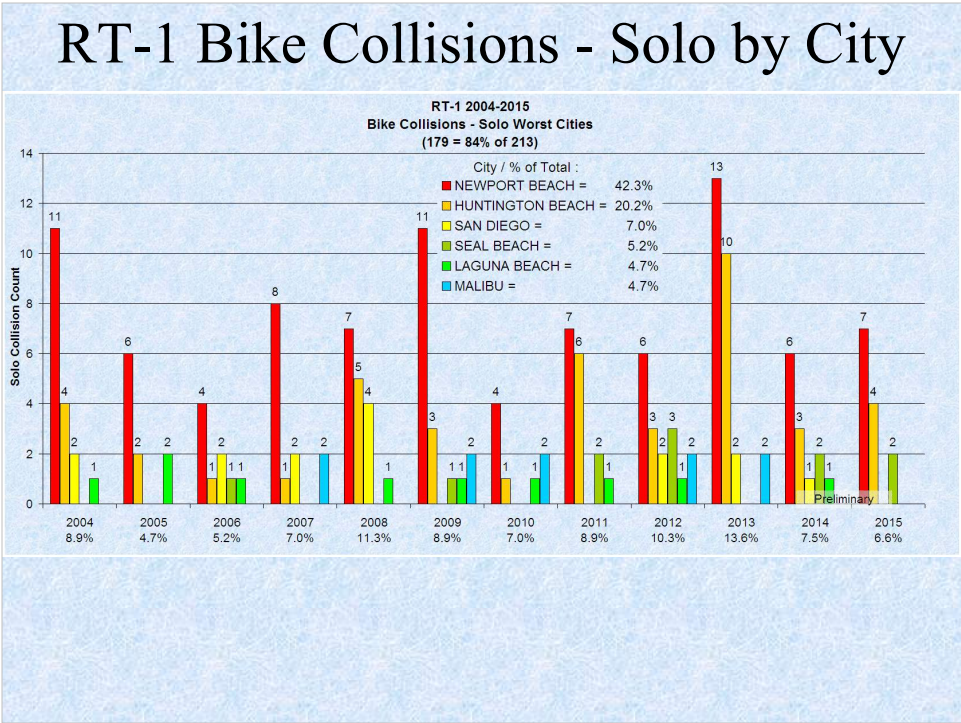
Note: Car on bike collisions were covered in another report - thus we turn our attention to the 2nd largest source of bike collisions: solo riders.

213 Solo bike collisions that happened on RT-1 in the 3 County area are shown here. 212 injuries were reported as a result of these bike collisions.

San Diego County enjoys the least percentage of solo collisions while Orange County captures almost 3/4, with Los Angeles falling in the middle at 15.5%.

What makes one County more prone to solo collisions than others?

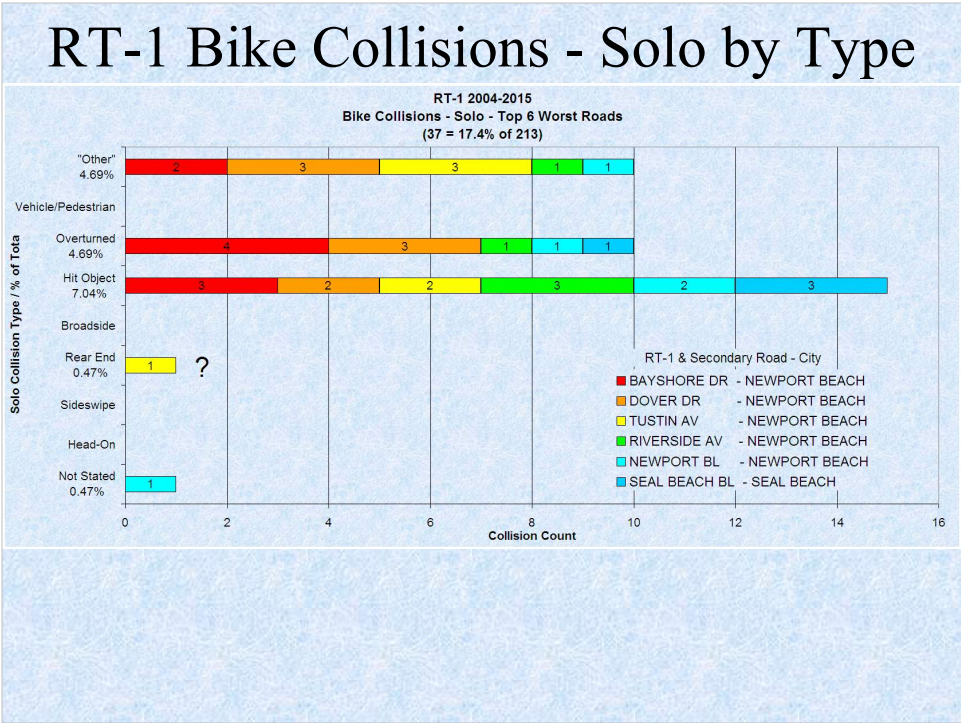
Can solo bike collisions be better localized to learn the causes?



Here are 6 Cities in the 3 County area with the highest count of solo bike collisions on RT-1 representing 84% of all RT-1 solo bike collisions.

2012 was the only year (so far) that had a solo bike collision in each City the same year.

What makes one City more prone to solo bike collisions than others?

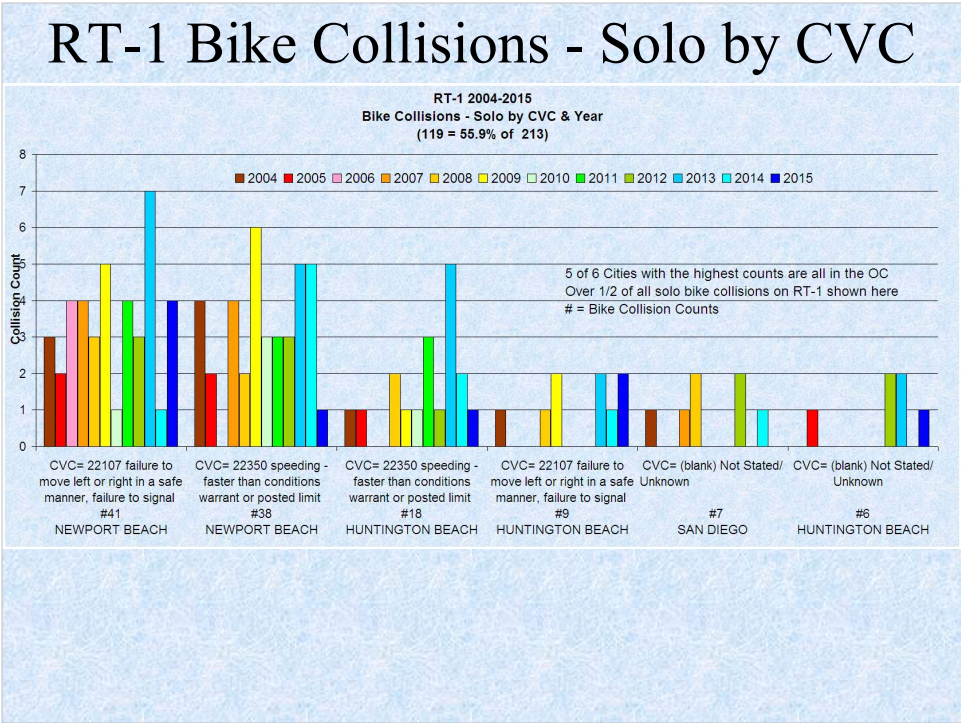


37 or 17% of all solo bike collisions on RT-1 in the 3 County area are shown by the type of collision and the secondary street and City where they happened.

Observant people will notice the question mark by the rear end collision type and ask, "how can a solo rider collision be rear-ended?". Obviously the answer is that they can't, however this is what is contained in the SWITRs database - so the question would better be asked to, and answered by, the reporting agencies in the respective Cities.

After that dubious entry, out of 9 possible collision types; only 2 others provide meaningful insight since 85 or 39.9% of the collisions are undefined.

The majority of solo bike collisions due to hitting an object and / or overturning all happened in Newport Beach suggesting negligent care is taken of RT-1 at or near the intersection of the listed secondary streets.



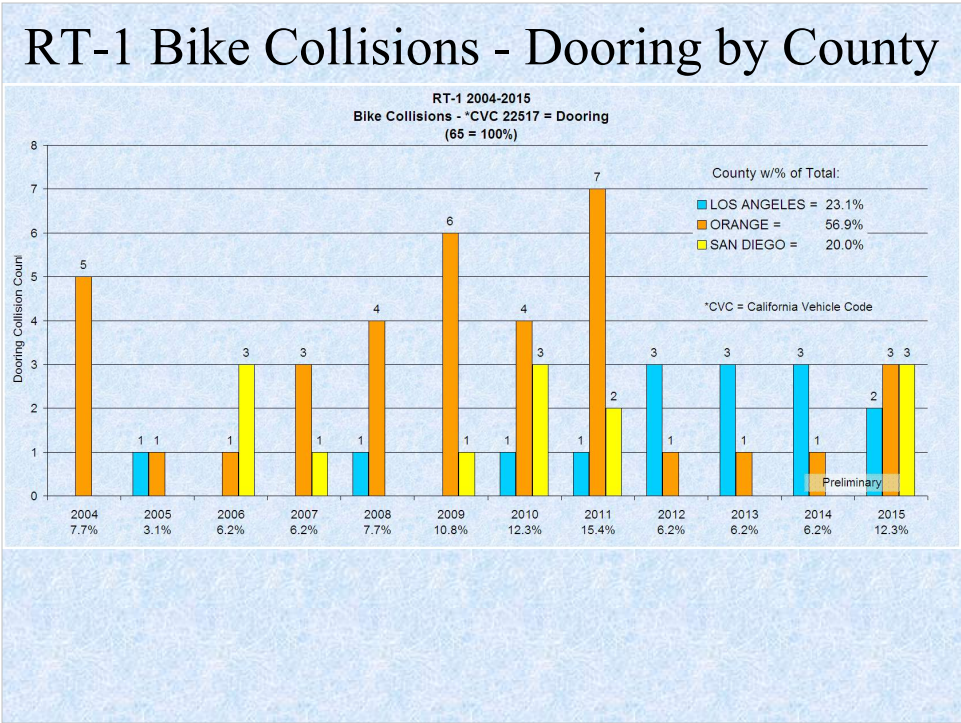
119 or 55.9% of all solo bike collisions on RT-1 in 3 Counties are shown with the California Vehicle Code (CVC) reason for the collision as determined by the reporting agencies with the respective count of collisions under the code and City where they happened.

Additionally, yearly totals are color coded above the CVC entry so that any trends may be detected. There does not appear to be any favorable trends in the Cities of Newport or Huntington Beach in Orange County while the City of San Diego in San Diego County is undetermined thanks to no specific CVC cause cited for the infrequent solo bike collisions that happened there.

Failing to move left or right in a safe manner, failing to signal, and unsafe speed account for the 2 most cited reasons for collisions at 37%.

Based on the type of collisions (hit object, overturned shown previously) this suggests riders are not paying attention to hazards in the roadway and making late defensive avoidance maneuvers and crashing, or are traveling too fast to attempt defensive maneuvers and are crashing because of road hazards.

Solutions here are simple: for riders- mind your wheel and maintain situational awareness; and for Cities: have the roadway properly maintained at all times.



65 dooring collisions on RT-1 in 3 Counties are shown with the total percentage by County in the key and the total percentage listed by year.

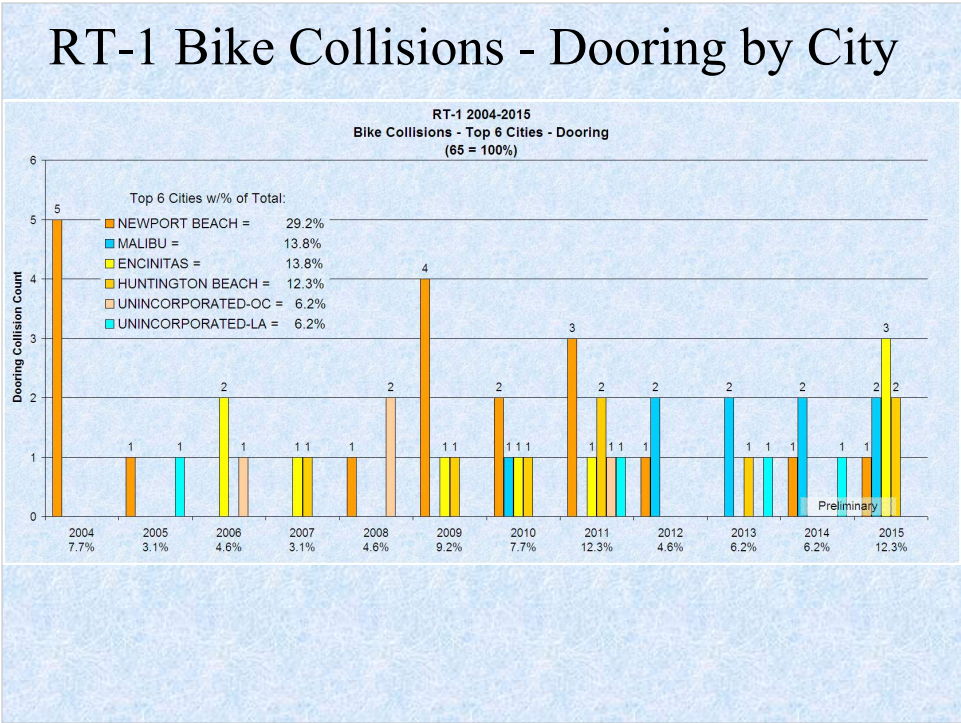
70 people were injured as a result of these collisions.

Roadway design could be a contributing factor to this type of collision by not providing enough space for safe passage by bike.

Los Angeles County has increasing collision counts from 2012 compared to prior years which indicates a problem area that should be addressed.

Orange County appears to be a mess, but counts seem to be decreasing from the high of 7 in 2011. Was there a change in RT-1 design in this County?

The sharp spike in San Diego County for 2015 could indicate a poorly implemented design change which should be looked into by safety engineers, or advocates for roadway safety.



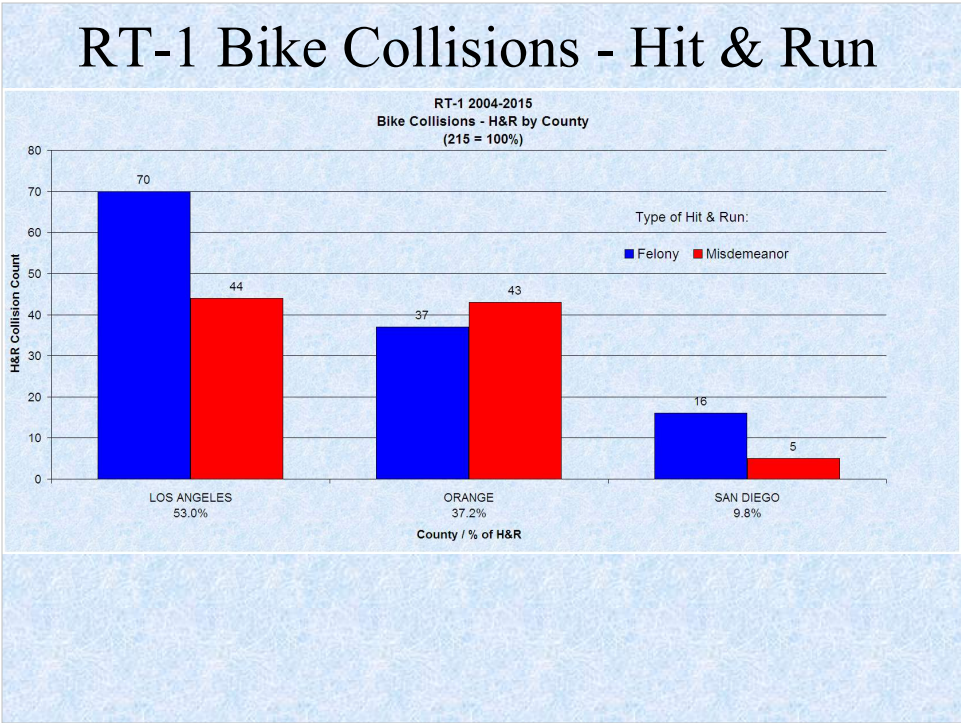
Shown here are the 6 Cities with the highest count of dooring collisions on RT-1 in 3 Counties from 2004-2015.

The percentages shown are relative to the total number of collisions by City and by year.

Newport Beach is the clear "winner", however it appears that Malibu is on the rise with 8 of 9 collisions happening from 2012. This might indicate modifications made to RT-1 in that area which a quick check with the City and Caltrans could confirm or deny.

- Since dooring is one of the most easily avoided collisions:
- the message to bike riders should be to stay out of the door zone and take the lane as necessary,
 - the message to drivers should be to do a mirror and shoulder check prior to opening the door, and
 - the message to designers should be to put safety first and design roadways for all modes of transport.

Data is still in-flowing so expect 2013-2015 to show more increases.



215 Hit and Run bike collisions on RT-1 in the 3 County area are shown here. This chart shows the count and type for the respective Counties where they happened:

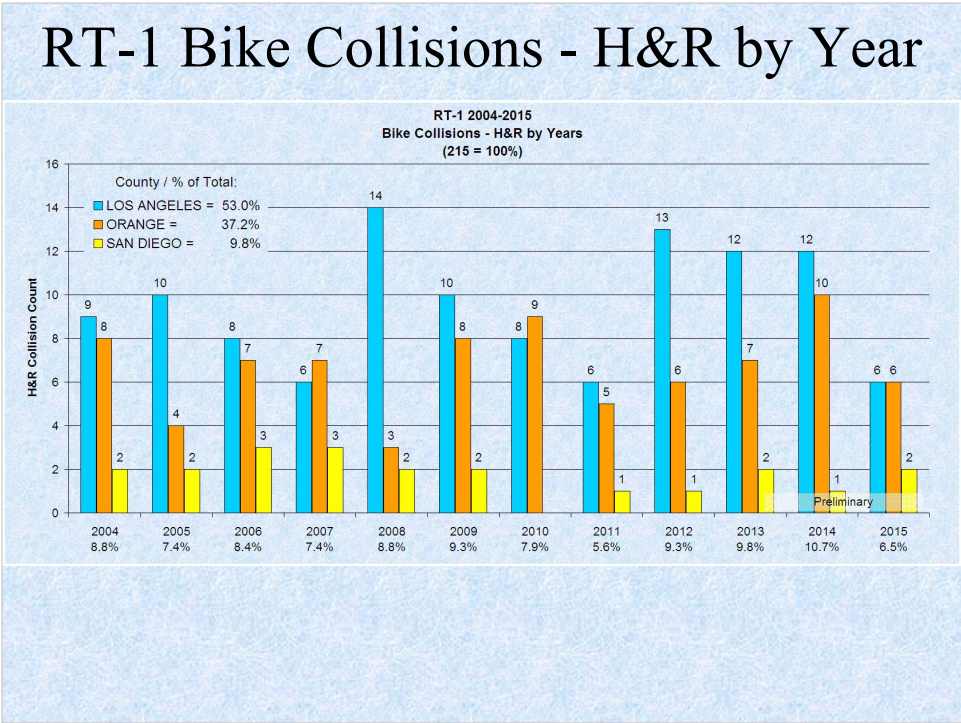
Since Hit & Run collisions were 12% of all bike collisions on RT-1, they merit an extra look.

Table of those killed and injured in hit & run bike collisions on RT-1:

	LOS ANGELES	ORANGE	SAN DIEGO	Total
KILLED	5	3	1	9
INJURED	94	68	17	179
TOTAL	99	71	18	188

The above 188 people represent 10.5% of all fatalities and injuries on RT-1 in the 3 Counties; up 0.1% from the last report.

Understanding where, when, and how hit & run collisions happen is a good step in reducing their causes.



215 hit & run bike collisions on RT-1 in the 3 County area are shown here. This chart also shows the count for the respective Counties where they happened.

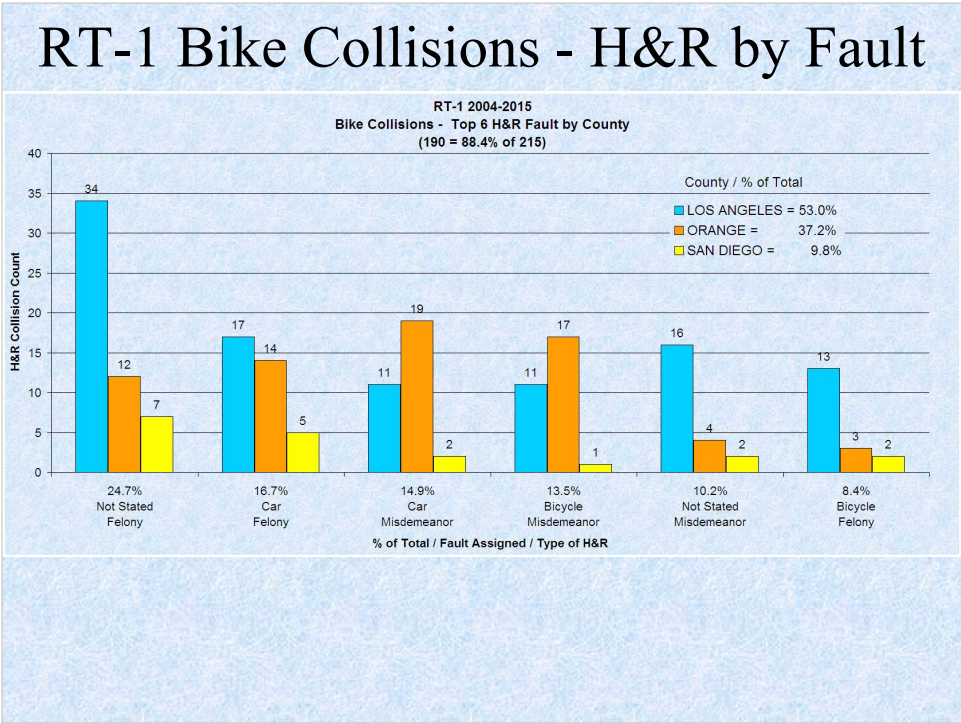
Los Angeles County is the clear leader in hit & run bike collisions with a count of 114 or 53% of the total.

Orange County follows up with 80 collisions or 37.2% to its credit.

San Diego County had 21 collision or 9.8% of the total with none recorded for 2010 which goes to show that achieving zero can be done.

Data is still in-flowing so expect 2013-2015 to show more increases.

Recent fatalities and injuries have not been entered into the database yet and are not reflected here. When they are, the picture could change dramatically.



6 of 16 possible fault categories with the highest count of H&R bike collisions on RT-1 in the 3 County area are shown here. These 6 categories capture 88.4% of all H&R bike collisions on RT-1.

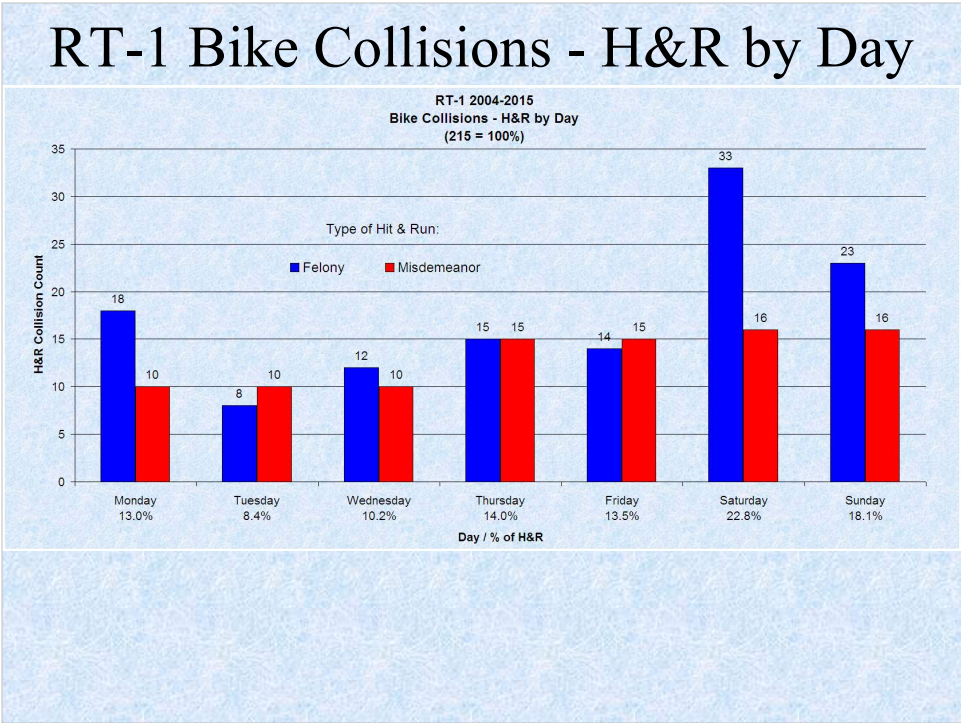
As a County, Los Angeles leads with over 1/2, followed by Orange, with San Diego for the hit / run bike collision podium standings.

The percentages shown for fault are for the 190 collisions shown relative to the total of 215 hit & run collisions with the counts for each County provided in the chart.

25 collisions are not shown due to being spread out amongst other categories.

The percentages listed in the key are relative to the total count for that County for the 190 collisions shown here, and the 25 that are not.

Knowing who fault was assigned to helps in development of material to educate the target audience in collision prevention.

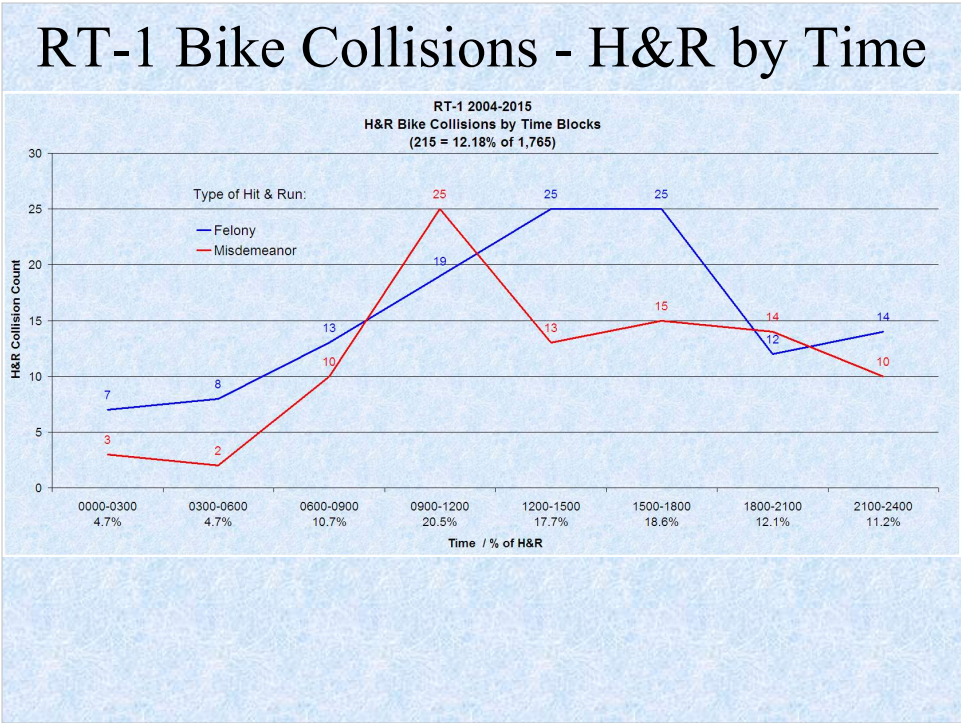


215 aggregated hit & run bike collisions on RT-1 from 2004-2015 in the 3 County area are shown by the number, type of collisions, and the day they happened.

The percentages listed are relative to the total aggregated count of hit & run bike collisions for each day.

Saturdays have the highest count and percentage at 22.8% of hit & run bike collisions for the week in the 3 County area.

The time of collisions, cross street, and County where they happened may provide some clues on where and when proactive prevention measures could be designed, implemented, and measured for effectiveness.



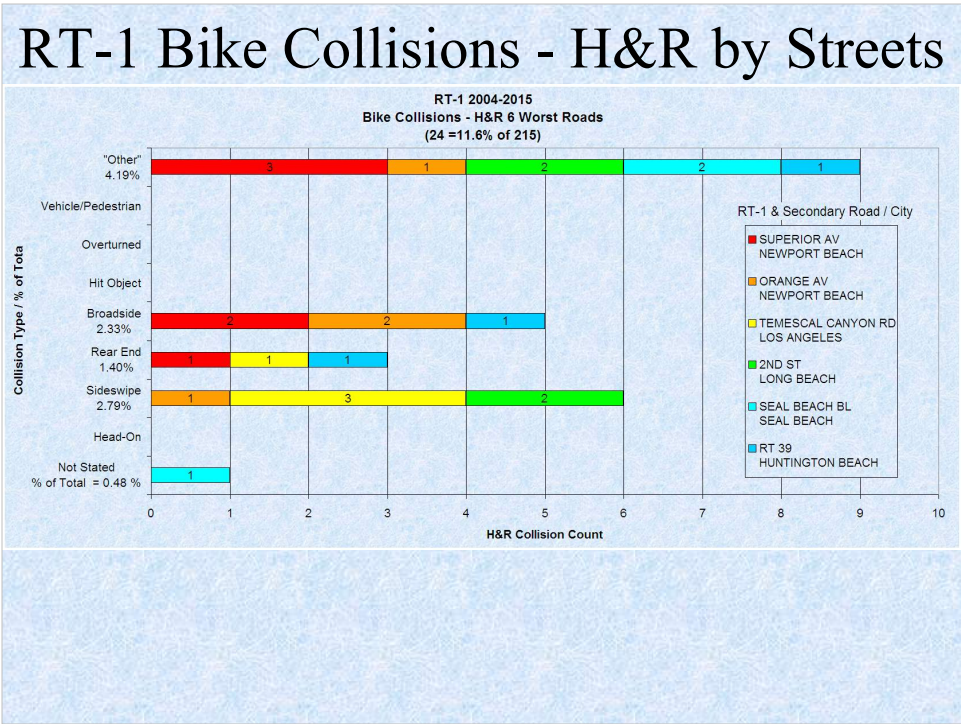
215 aggregated hit/ run bike collisions from 2004-2015 on RT-1 in the 3 Counties are shown in the 3 hour time blocks when they happened.

12% of all bike collisions on RT-1 were hit and run.

Of interest is the fact that the majority of collisions happened during the daylight hours from 6 AM to 6 PM with the peak occurring from 9 AM to noon.

This lays false the urban myth that most hit & run bike collisions happen at night.

75 more hit & run bike collisions happened during the day vs during the night representing an increase of 107%.



Here are the 6 secondary roadways in the 3 Counties with the highest count of hit/ run bike collisions - ie: "worst" (if you're a bike rider) with all 9 types of possible collisions..

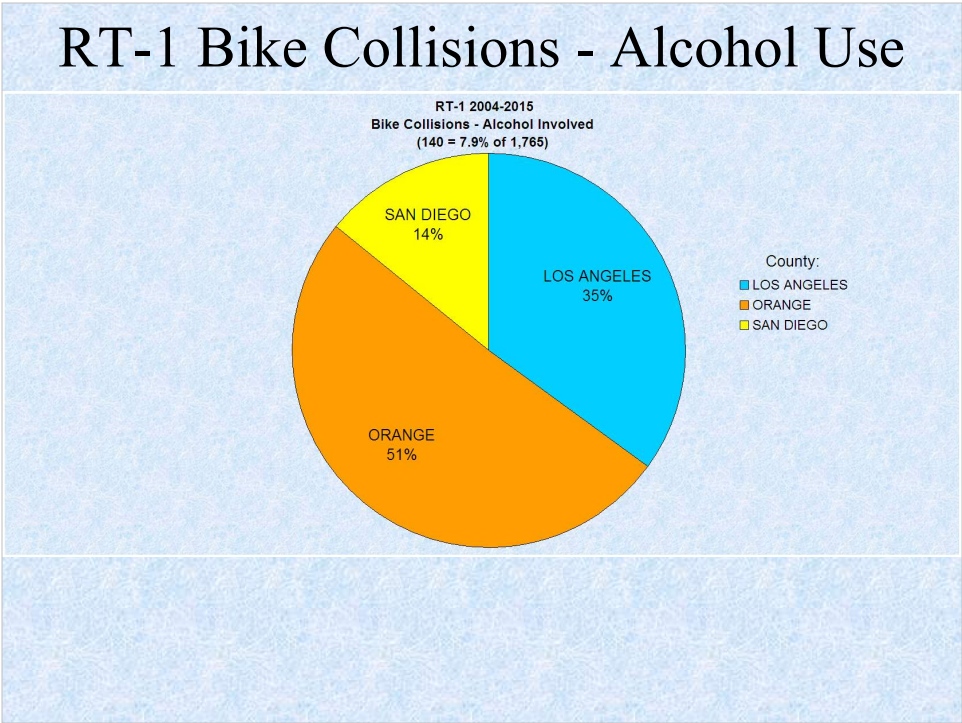
Over 10% of all hit/ run bike collisions are concentrated on these roadways making them ideal candidates for bike safety improvements by identifying and resolving issues leading to those collisions.

Key:

They are ranked starting from the top of the key from worst to just plain bad, which in this case, Superior lives up to its name with 2.9% "winning" the highest bike collision count contest. Focus on rider safety should start on these roadways along RT-1 beginning with Superior. A comprehensive approach must be undertaken to reduce roadway conflict among the various users.

It would be interesting what constitutes an entry in the "other" column - or is it just sloppy reporting. 61 total hit & run bike collisions or 28% of the total were undefined. Countermeasures are hard to develop for collisions of this type.

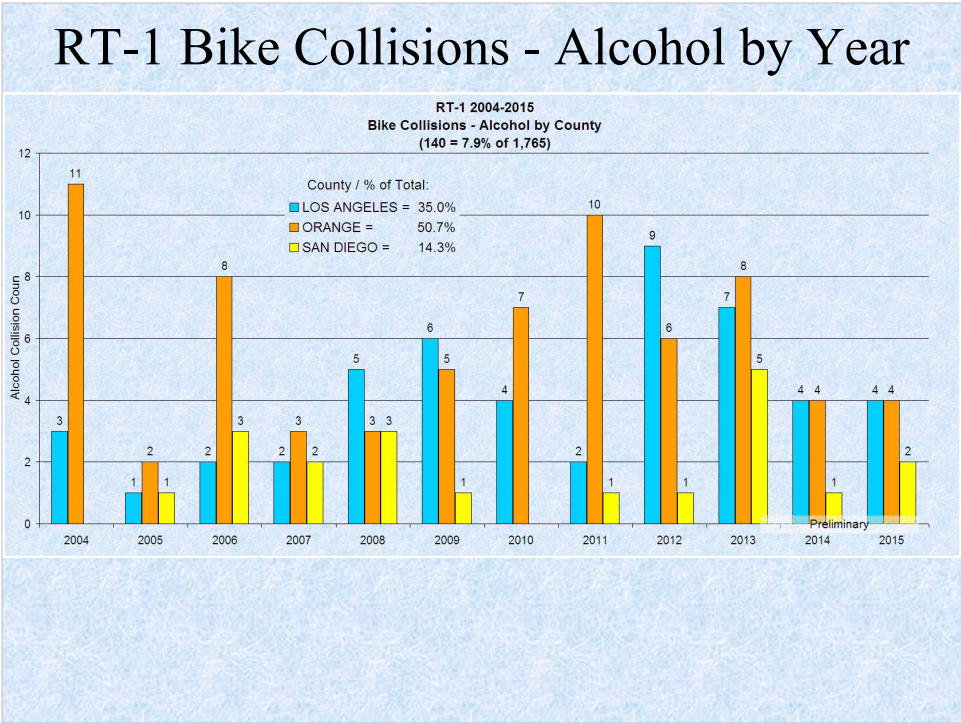
Focus on these roadways will have the greatest positive "impact" on rider safety on RT-1 and the Cities and Counties it passes through.



7.9% of all bike collisions on RT-1 in 3 Counties involve alcohol as shown here. This is down 0.1% from the last report.

3 more alcohol involved bike collisions have been added, so the counts are:

County:	Alcohol Involved
LOS ANGELES	49
ORANGE	71
SAN DIEGO	20
Total	140



140 alcohol involved bike collisions on RT-1 in the 3 County area are shown here. This chart also shows the year, count, and respective Counties where they happened.

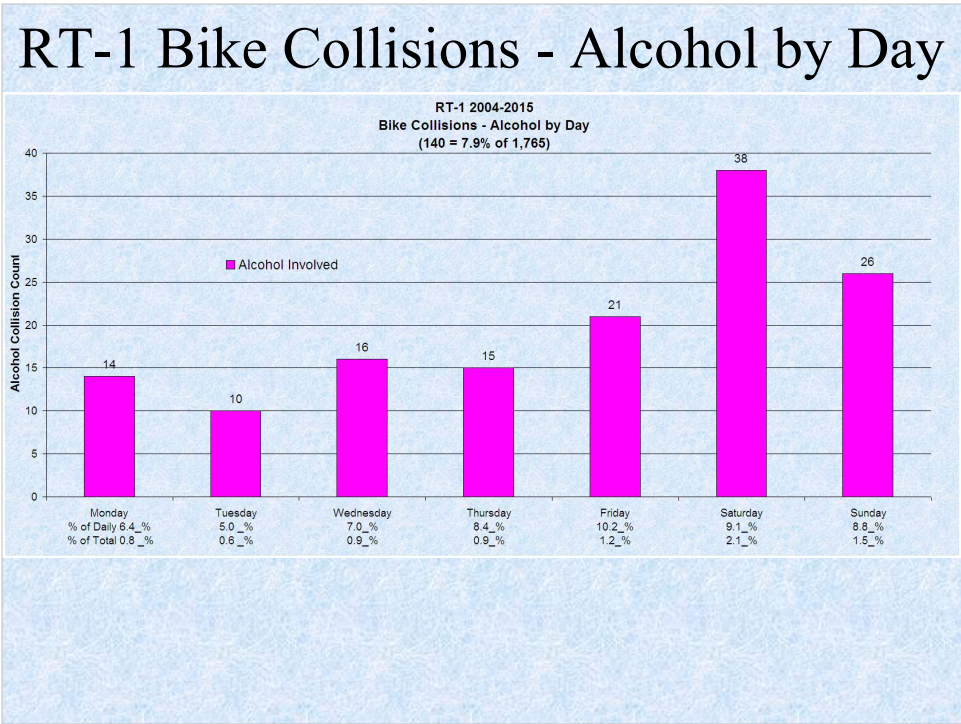
Table of those killed and injured in alcohol involved bike collisions on RT-1:

	LOS ANGELES	ORANGE	SAN DIEGO	Total
KILLED	4	5	2	11
INJURED	44	77	17	138
TOTAL	48	82	19	149

The above 149 people represent 8.4% of all fatalities and injuries on RT-1 in the 3 Counties.

San Diego County provides proof that there can be 365 days without an alcohol involved bike collision as seen for 2004 and 2010.

Data is still in-flowing so expect 2013-2015 to show more increases.



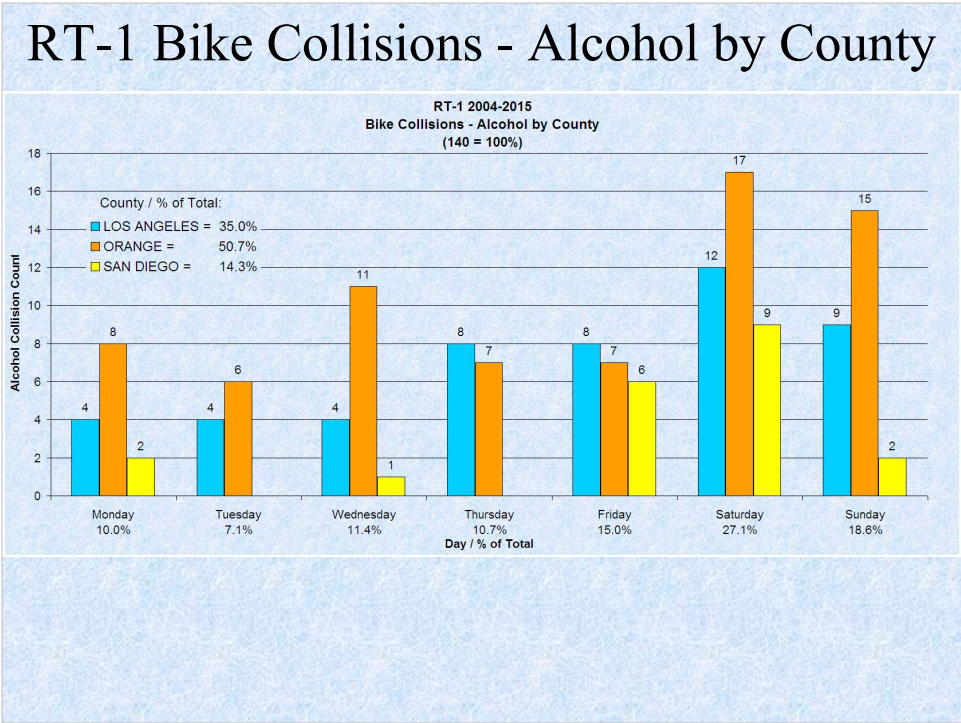
140 bike collisions on RT-1 in the 3 County area involving alcohol use are shown by the number of collisions and the day they happened.

The percentages listed are relative to the total aggregated count of bike collisions for each day, and for the combined years.

What they reveal is Friday has a higher percentage of alcohol involved bike collisions despite the higher counts on Saturdays.

What this means is Saturdays have an even higher count of non-alcohol bike collisions which suggests that bike collisions on Fridays are more likely to involve alcohol than not.

The time of collisions and the County where they happened may provide some clues on where and when proactive prevention measures could be designed, implemented, and measured for effectiveness.



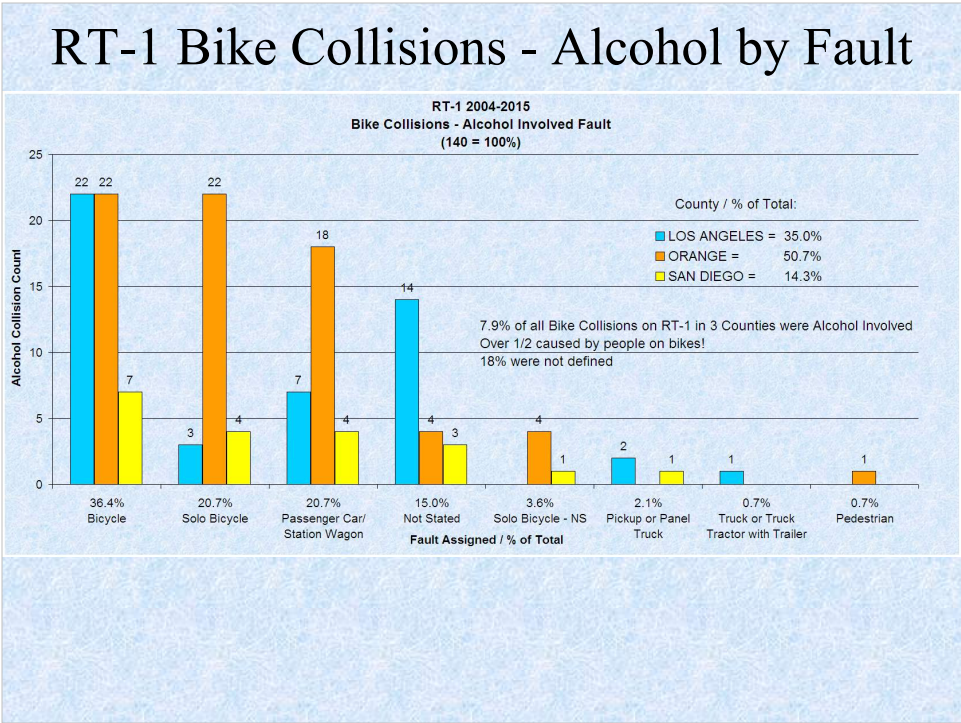
140 bike collisions on RT-1 in the 3 County area involving alcohol use are shown by the number of collisions, the day they happened, and the County they happened in.

Here the percentages listed are relative to the total aggregated count of alcohol involved bike collisions for each day with the count by each County for the day.

The key on the chart provides the overall total percentage of alcohol involved bike collisions for each County.

San Diego County, despite having the highest overall percentage of bike collisions involving alcohol in the 3 County area has the least on RT-1.

Whether by luck or design, their high counts did not happen on RT-1.

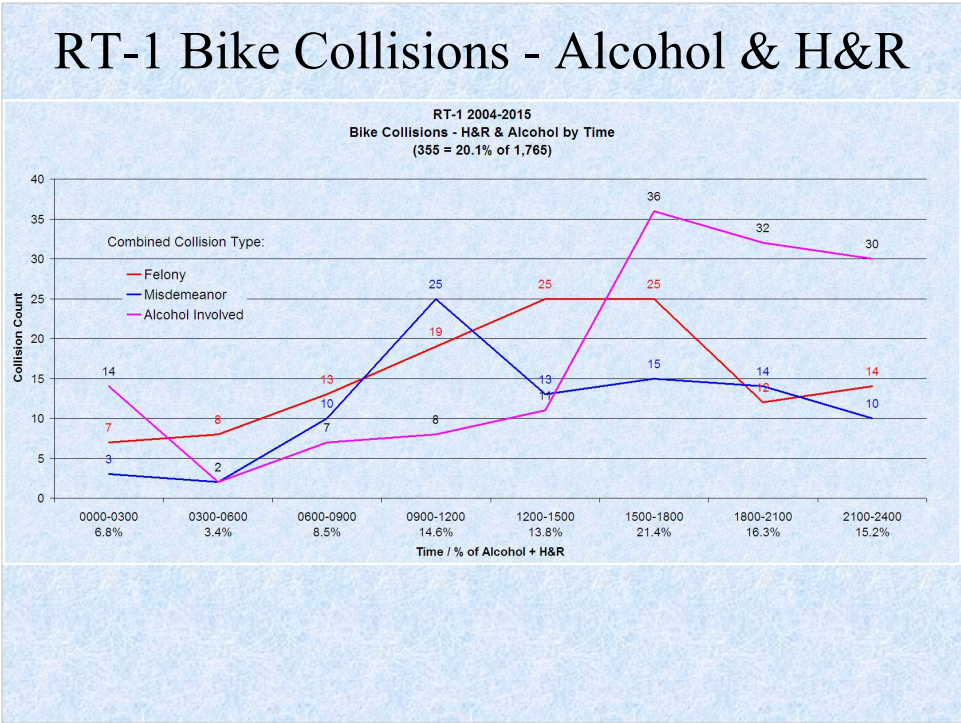


140 Alcohol Involved bike collisions on RT-1 for the 3 County area are shown with the fault assigned by the reporting agencies, and the percentage each contributed to the total.

This chart proves false the myth of drunk drivers causing the majority of bike collisions since over 1/2 of the collisions were attributed to bike riders.

Outreach and educational efforts to the bike riding community could drastically have immediate and measurable positive results.

The 18% of undefined fault is worrisome and could indicate sloppy reporting by the reporting agencies.



This chart overlays the count of alcohol and hit & run bike collisions on RT-1 in the 3 Counties.

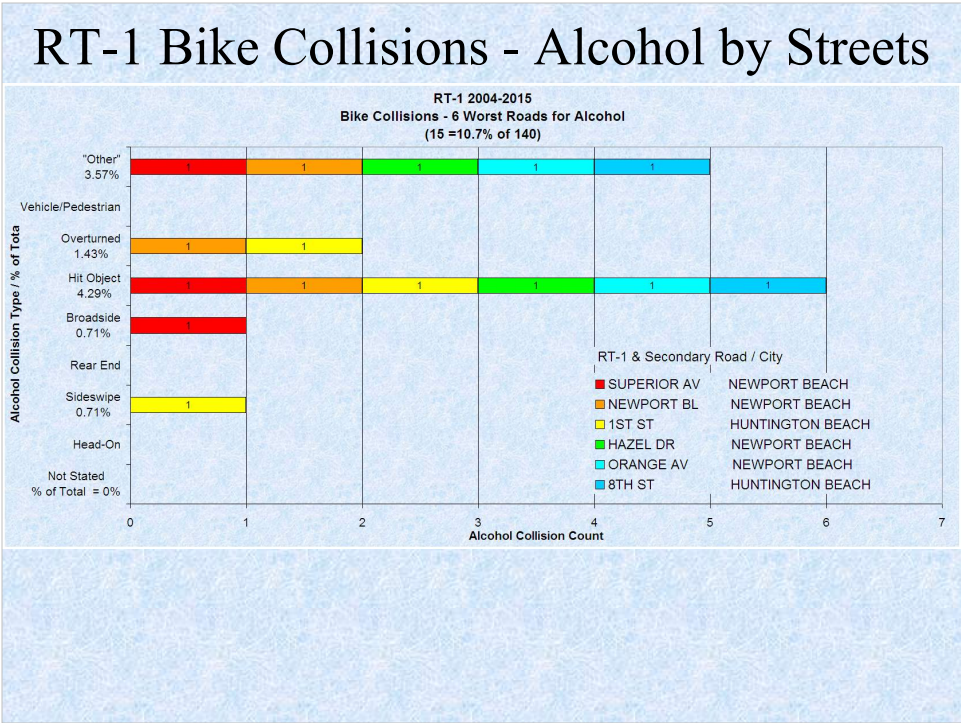
The two types combined represent 20% of all bike collisions on RT-1 in the 3 County area. Correlation may not indicate causation but...

Of interest is the "early" peak in alcohol in the 3-6 PM timeframe not corresponding to a peak in hit/ run collisions.

Also of interest is that both peaks occurring during the morning and late afternoon / evening. This may suggest visibility issues on the part of the bike rider not being able to be seen by a negligent or impaired driver.

Lighting on bikes combined with reflective clothing, vests, and ankle bands may be a good defensive thing for riders to consider especially with the seasonal onset of coastal fog along RT-1.

Blinky vs steady lights attracting drunks will not be debated here!



Here are the 6 secondary roadways in the 3 Counties with the highest count of alcohol involved bike collisions - ie: "worst" (if you're a bike rider) with all 9 types of possible collisions..

Over 10% of all alcohol involved bike collisions are concentrated on these roadways making them ideal candidates for bike safety improvements by identifying and resolving issues leading to those collisions.

Key:
They are ranked starting from the top of the key from worst to just plain bad, which in this case, Superior again lives up to its name with 2.2% "winning" the highest bike collision count contest. Focus on rider safety should start on these roadways along RT-1 beginning with Superior. A comprehensive approach must be undertaken to reduce roadway conflict among the various users.

It would be interesting what constitutes an entry in the "other" column - or is it just sloppy reporting. 41 collisions or 29% of all alcohol bike collisions are undefined. Countermeasures are hard to develop for collisions of this type.

Focus on these roadways will have the greatest positive "impact" on rider safety on RT-1 and the Cities and Counties it passes through.

RT-1 / 3 County - Summary

- 1,765 Bike Collisions : 1,782 People dead & injured
- 22% Hit & Run Collisions happened on Saturday
- 27% Alcohol Collisions happened on Saturday
- Newport Beach = "3 County Crown City & Collision Capital of RT-1"
 - had the highest Alcohol *and* Hit & Run bike collisions in 3 Counties at RT-1 & Superior
 - had the most solo bike collisions with 42.3%
 - had the most riders killed and injured (6 & 401)
 - had the most dooring incidents with 29%

Saturdays were the most dangerous days to ride a bike on RT-1 in the 3 County area from 2004-2015.

Orange County was the most dangerous County with 16 fatalities, and 824 injuries recorded. Newport Beach reigns supreme with the highest fatality and injury count (6 dead, 394 injured) of any other City in the 3 Counties.

Los Angeles County recorded 10 fatalities, and 623 injuries making it relatively safer than Orange, but ahead of San Diego by a considerable margin. The most dangerous City in LA County is Malibu with 5 fatalities and 124 injuries.

San Diego County was much safer with 2 fatalities, and 255 injuries recorded. The most dangerous City in SD County is Encinitas with 1 fatality and 103 injuries.

Rider counts would be a very useful figure for County to County comparison, but they don't exist. When they do, or are available, they will be incorporated into this report.

Safety advocates should pay attention to what's working in San Diego and implement best practices techniques to incorporate those policies and practices into their respective areas of responsibility and influence to improve safety for all roadway users of the great Pacific Coast Highway.

**Bike Collisions
on the
Pacific Coast Highway
(RT-1)
3 County Detail:
Los Angeles, Orange, San Diego

2004-2015
End Slide**

Methodology and caveats are available separately.

Additional detailed analysis of items in this presentation are also available, or can be tailored to specific requirements for any roadway, City, or County in the State of California. Collisions may be examined down to the minute.

2001-2003 data are dropped in this edition, however the original data is archived and can be retrieved if necessary.

The apparent disparity of fatalities and injury totals between some slides is due to aggregated reporting with a focus on bike riders in particular.

For clarity: there were 33 additional injuries which were not bike riders, pedestrians, or motor cycle riders.

The other 33 injuries were drivers and/ or their passengers involved in collisions with bike riders, or the passengers of bike riders (ie:kids in kid seats, trailers, tandem stoker, etc...).