# Regional High Injury Network (HIN)

Toolbox Training

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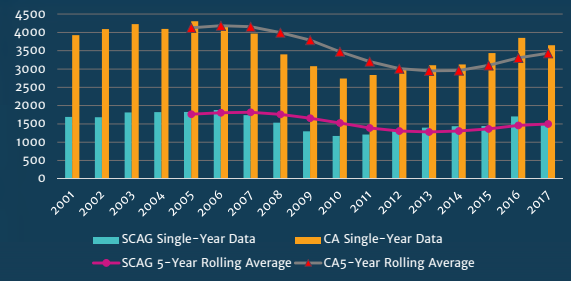
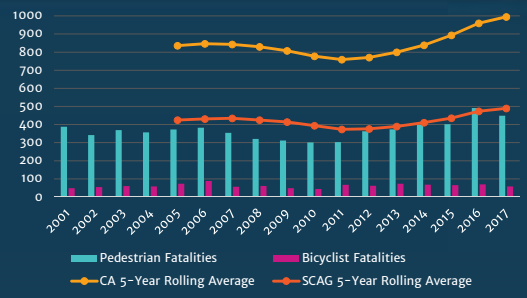
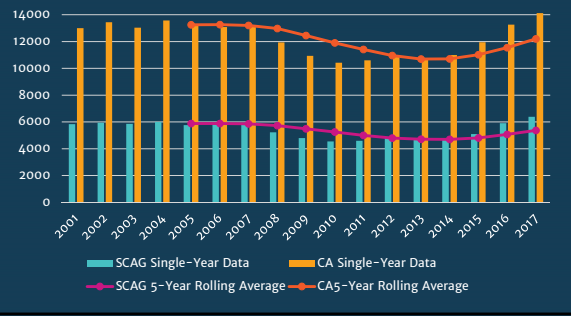
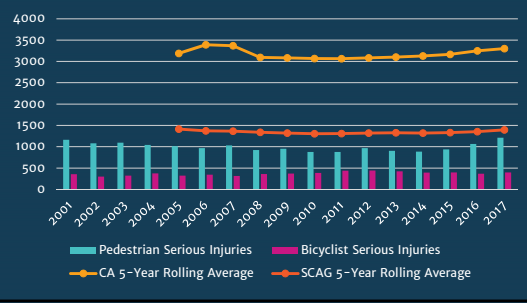
## Review Crash Trend



## Review Crash Trend

2017 1,500

2016 1,500 PEOPLE DIE EVERY YEAR FROM COLLISIONS

2017 5,400

2016 5,200 PEOPLE SUSTAIN SERIOUS INJURIES EVERY YEAR FROM COLLISIONS

2017 136,200

2016 136,000 PEOPLE SUSTAIN INJURIES EVERY YEAR FROM COLLISIONS

2017 280

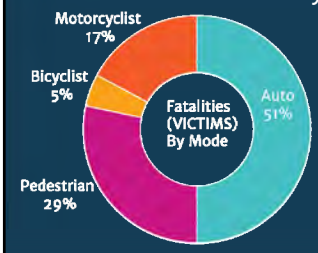
270 COLLISIONS OCCUR PER DAY ON THE STREETS

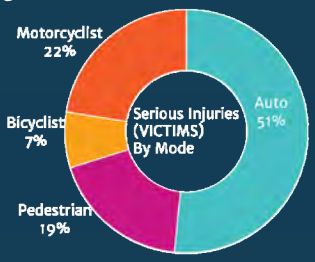
THAT IS ROUGHLY 99,000 PER YEAR 2016

100,000 2017

## Review Crash Trend

FSI by Mode




THE TOP THREE CONTRIBUTING FACTORS FOR ALL COLLISIONS

1 30% UNSAFE SPEED

2 18% AUTOMOBILE RIGHT-OF-WAY

3 12% IMPROPER TURNING

THE TOP THREE CONTRIBUTING FACTORS FOR FATAL COLLISIONS

1 20% IMPROPER TURNING

2 18% PEDESTRIAN VIOLATION

3 17% UNSAFE SPEED

THE TOP THREE CONTRIBUTING FACTORS FOR SERIOUS INJURIES

1 19% UNSAFE SPEED

2 16% IMPROPER TURNING

3 14% DRIVING OR BICYCLING UNDER THE INFLUENCE OF ALCOHOL OR DRUGS

2017 30%

2016 27% OF ALL DEATHS INVOLVE PEOPLE WALKING OR BICYCLING

2017 21%

2016 26% OF ALL PEDESTRIAN-RELATED FATALITY VICTIMS ARE 65 OLDER

2017 40%

2016 42% OF ALL TRAFFIC COLLISION VICTIMS ARE PEOPLE 18-34

## What is an HIN?

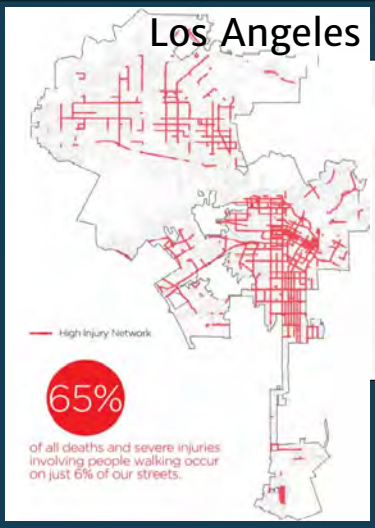
- Stretches of roadways where the highest concentrations of collisions occur on the transportation network
- Typically a subset of the network where the most collisions are occurring (>50%)
- Not an assessment of whether a street or location is dangerous
- Rather, streets with a higher risk of injury than other streets

## Why is SCAG exploring an HIN?

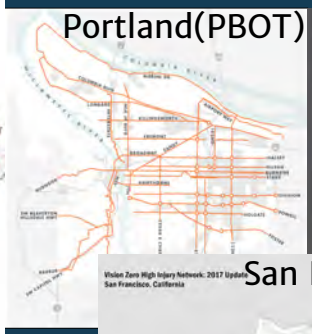
- Inspire more local efforts to develop HINs
- Collectively explore and share best practices for HINs
- Help jurisdictions focus on most challenging areas
  - Implement cost effective countermeasures
  - Coordinate with educational campaigns (e.g., GoHuman)
  - Prioritize investments
- Ultimately, help the region more effectively work towards reducing serious injuries and fatalities (achieving its safety targets)

## Case Studies

Los Angeles




Portland(PBOT)




San Francisco

## HIN Considerations

- How many years of data?
- All collisions or fatal/serious injury collisions?
- Collisions by modes?
- Collisions with child or senior involvement?
- Collisions in communities of concern?
- Collisions by intersection- or corridor-level?

## SCAG Goals for HIN

- Be sensitive to differing county contexts
- Be replicable
- Be quantifiable
- Focus on fatal and serious injury crashes
- Consider all modes of travel, but provide the option for reviewing only auto-auto, auto-bike, auto-pedestrian collisions
- Identify high injury corridors and not only hot spots
- Include segments that are normalized by length (one mile)

## SCAG's Draft Methodology

- Five years of collision data (2010-2014)
- Data sources: SWITRS, TIMS, TomTom
- Only fatal and serious injury collisions
  - Auto - Auto collisions
  - Auto - Pedestrian collisions
  - Auto - Bike collisions
- Analysis of corridors, not intersections
- Normalized by length- one mile
- Excluded freeways
- Assess on county basis vs. entire region (concern about entire focus shifting to one county due to higher numbers)
- No current weighting for collisions involving children/seniors, bicyclists/pedestrians, or occurring in Communities of Concern (only an overlay)

## 5 Step Method

### 1. Collect data

- Collision data – point file
- Street network data – line file

### 2. Prepare Collision data

- Exclude collisions on state highway (select by attributes and export)
- Exclude injury collisions and property damage only collisions

### 3. Prepare Street network data

- Exclude Functional Road classification 1, 2 and 6, 7 (select by attributes and export)
- Dissolve streets to create a line segment (Dissolve)
- Break streets equally by 1 mile

### 4. Assign Collision (point) to Street Network (line)

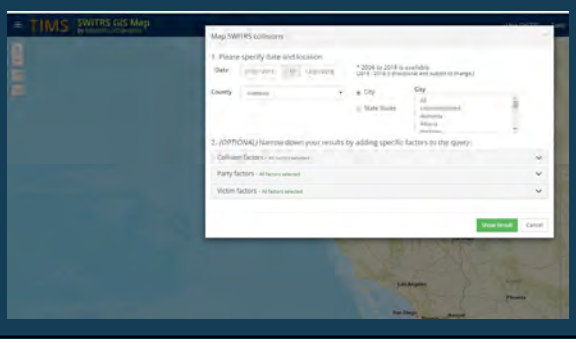
- Use Near tool to transfer points to line

### 5. Symbology

- Identify threshold

## 1. Collect Collision data and Street line data

Collisions: SWITRS, TIMs


Streets: US Census, North America detailed streets


## 2. Prepare Collision data

1. Collect data
   - Collision data – Point file

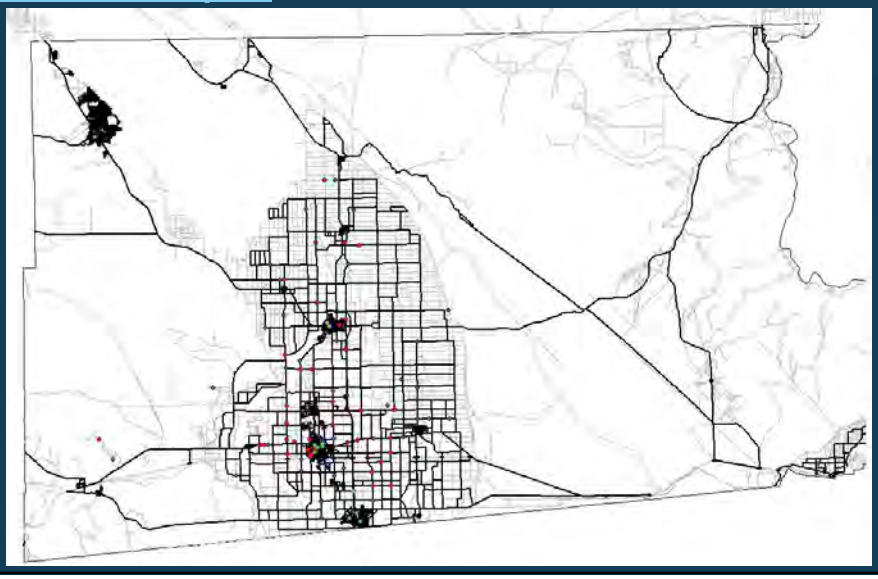
2010-2014 + Collisions not on state highway +

All Fatal and Serious Injury FSI
Auto - Auto
Auto – Pedestrian
Auto - Bike

Data source: SWITRS, TIMS

## 2. Prepare Collision data – Select and Export

GIS tool : Select and Export



## 3. Prepare Street line data –Select and Export

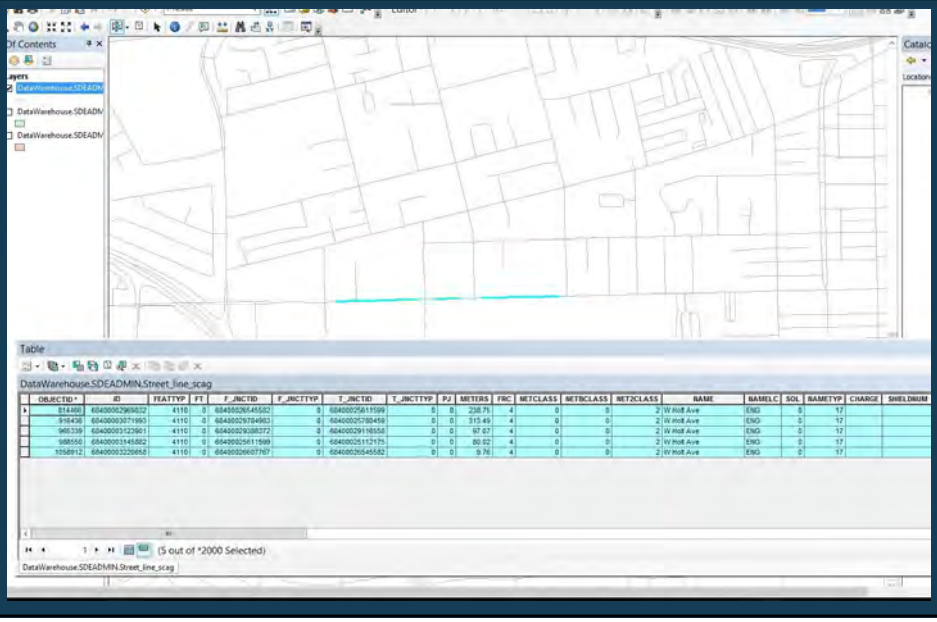
1. Collect data
   - Street network data – line file (TomTom)

2016 + Functional Road Class 2 to 6,

(Exclude freeways, expressways and trails routes, private roads, alleys) + Dissolve street layer by name and direction to create a single street

Data : Tiger line shape file , North America detailed streets (ESRI)

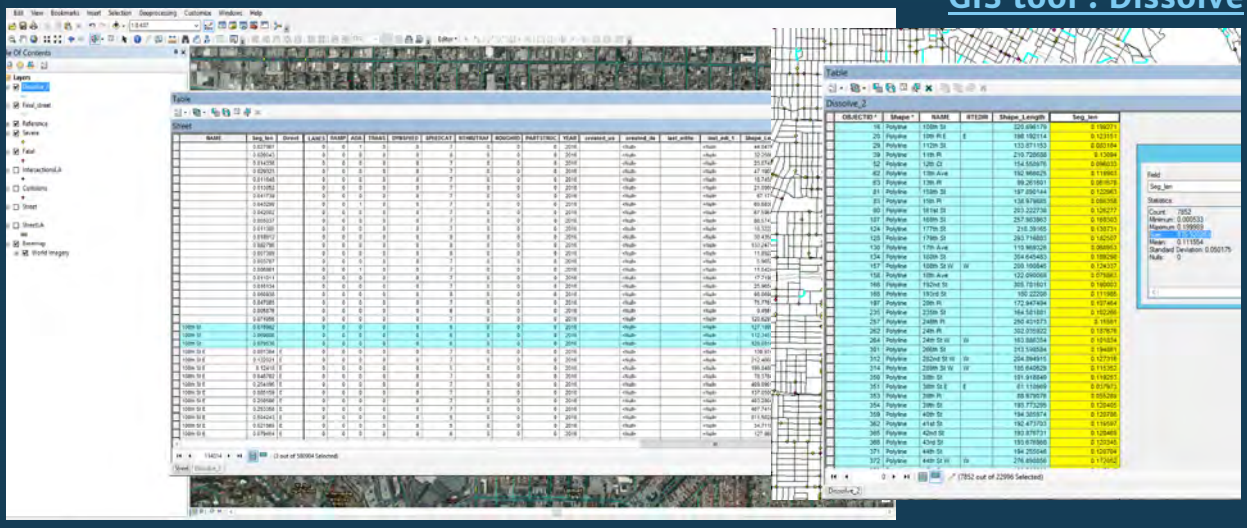
## 3. Prepare Street line data - Dissolve



GIS tool : Dissolve

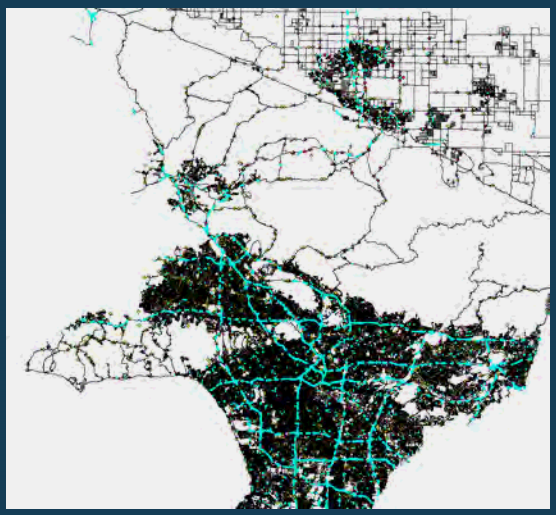
## 3. Prepare Street line data - Dissolve

GIS tool : Dissolve



## 3. Prepare Street line data - Challenges

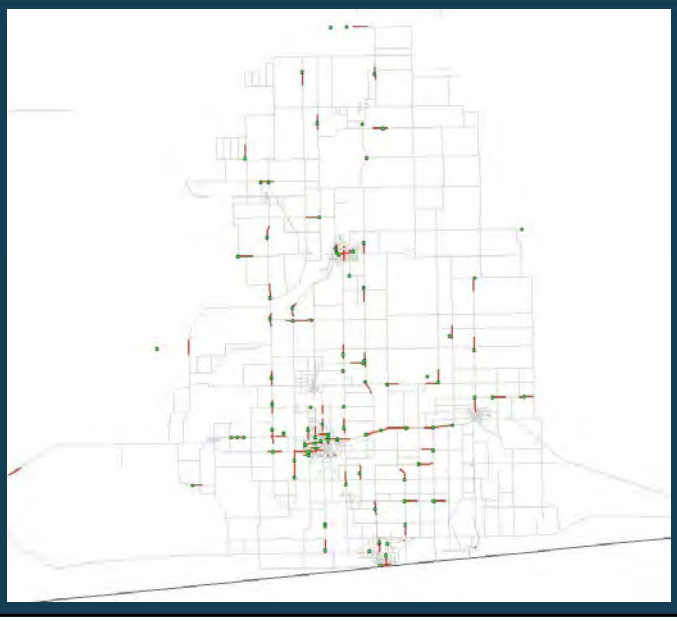
GIS tool : Edit & Delete



## 4. Assign Collision to Street network

GIS tool : Near

FSI HIN



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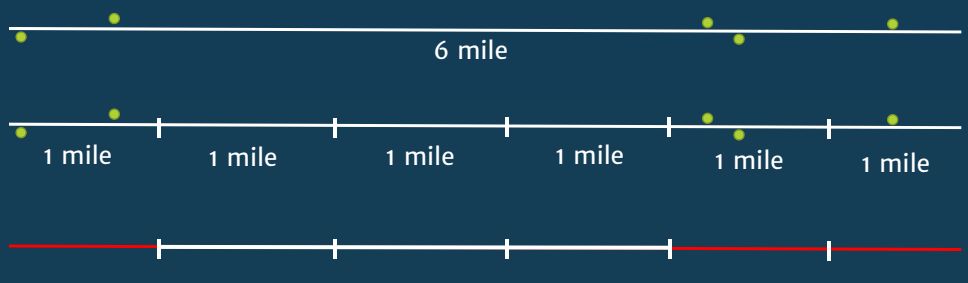
GIS tool : Near




Collision
Street
HIN

## Results

| *Maximum number of Collisions per mile* | | | | |
|---|---|---|---|---|
| | ***FSI*** | ***Auto*** | ***Ped*** | ***Bike*** |
| ***Imperial*** | 3 | 2 | 1 | 1 |
| ***LA*** | 14 | 7 | 9 | 5 |
| ***Orange*** | 13 | 4 | 4 | 4 |
| ***SB*** | 8 | 4 | 3 | 2 |
| ***Riverside*** | 10 | 6 | 4 | 2 |
| ***Ventura*** | 7 | 5 | 5 | 3 |

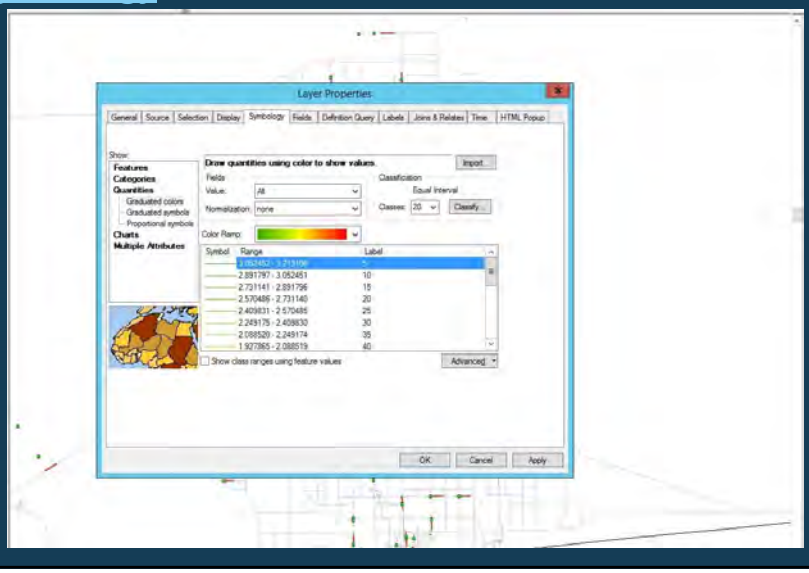
## Threshold

- Identify a subset of streets where at least >50% collisions occur.

- San Francisco 70%
- Los Angeles 65%
- Oregon Metro 60%
- Portland City Top 30

## 4. Assign Collision to Street network

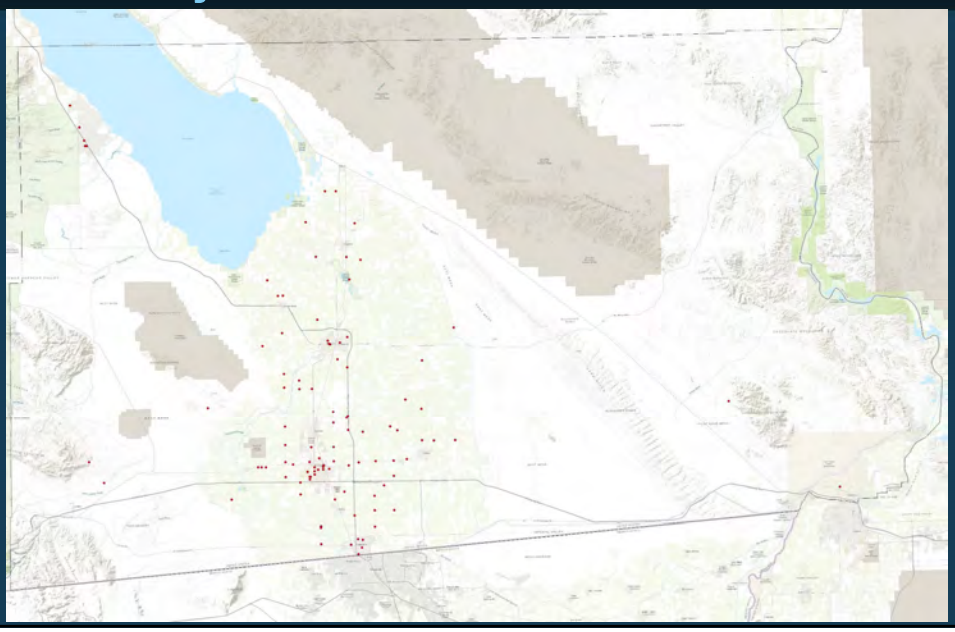
### GIS tool : Symbology



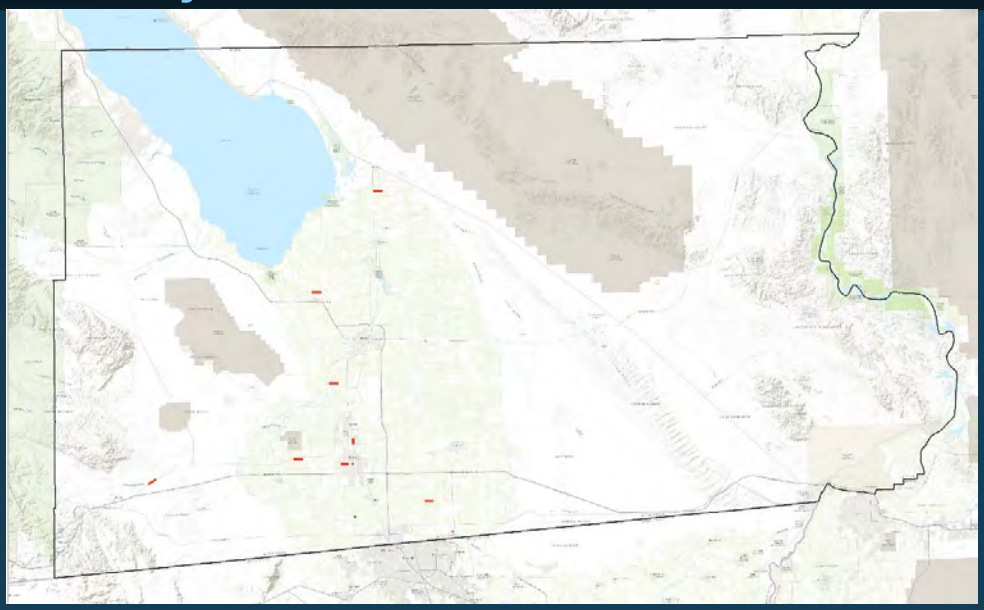

## Threshold

| Calculation for % street miles | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Total Roadway Miles* | *HIN roadway miles 60%* | *60%* | *HIN roadway miles 65%* | *65%* | *HIN roadway miles 70%* | *70%* | *HIN roadway miles 75%* | *75%* | *HIN roadway miles 80%* | *80%* |
| ***Imperial*** | 1693.5 miles | 7.9 miles | **0.47%** | 7.9 miles | **0.47%** | 95.5 miles | **5.64%** | 95.5 miles | **5.64%** | 95.5 miles | **5.64%** |
| ***LA*** | 16845.9 miles | 180.4 miles | **1.07%** | 314.0 miles | **1.86%** | 314.0 miles | **1.86%** | 563.4 miles | **3.34%** | 1029.6 miles | **6.11%** |
| ***Orange*** | 3885.8 miles | 14.1 miles | **0.36%** | 32.3 miles | **0.83%** | 85.6 miles | **2.20%** | 85.6 miles | **2.20%** | 227.6 miles | **5.86%** |
| ***SB*** | 9103.7 miles | 36.7 miles | **0.40%** | 85.0 miles | **0.93%** | 85.0 miles | **0.93%** | 266.9 miles | **2.93%** | 266.9 miles | **2.93%** |
| ***Riverside*** | 6225.6 miles | 17.8 miles | **0.29%** | 45.0 miles | **0.72%** | 120.5 miles | **1.94%** | 120.5 miles | **1.94%** | 120.5 miles | **1.94%** |
| ***Ventura*** | 1653.2 miles | 46.5 miles | **2.82%** | 46.5 miles | **2.82%** | 46.5 miles | **2.82%** | 152.2 miles | **9.21%** | 152.2 miles | **9.21%** |

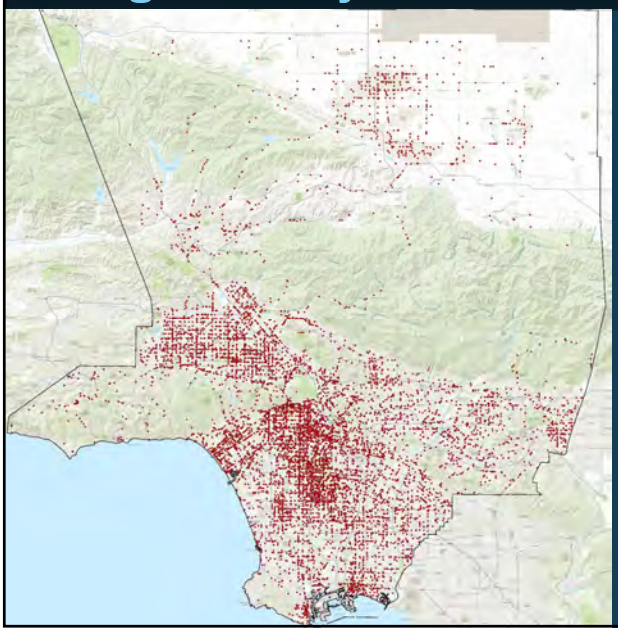
## Imperial County – All FSI Collisions



## Imperial County - HIN



## Los Angeles County-All FSI



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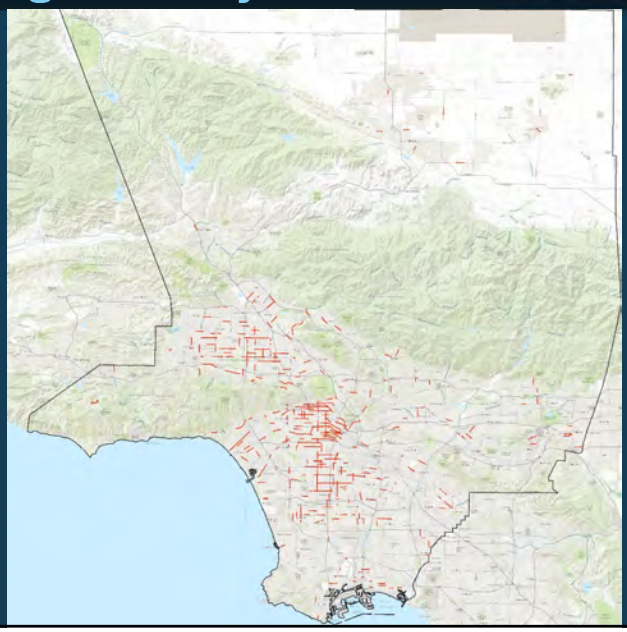
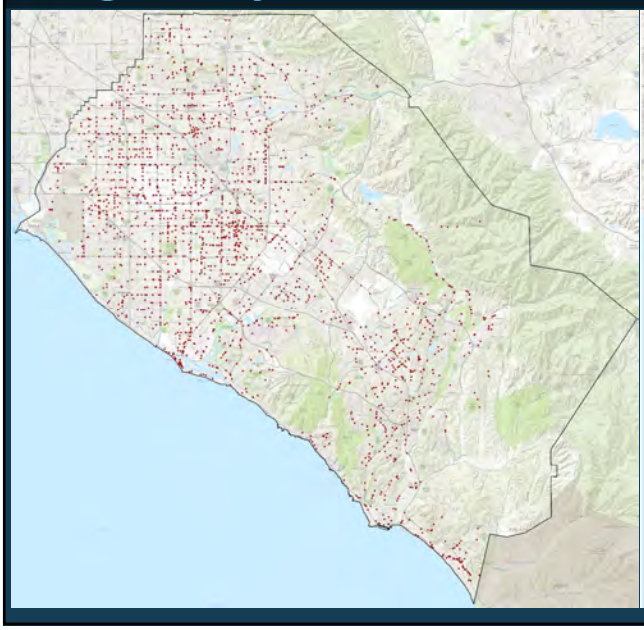


## Orange County-All FSI Collisions



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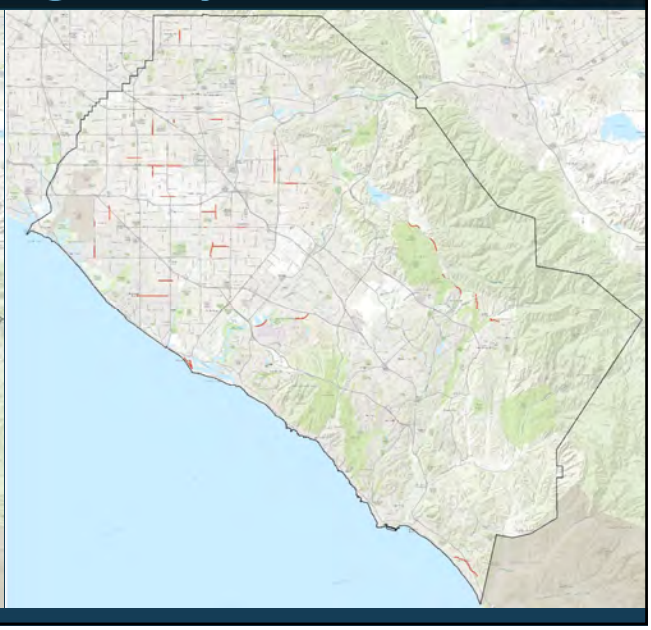
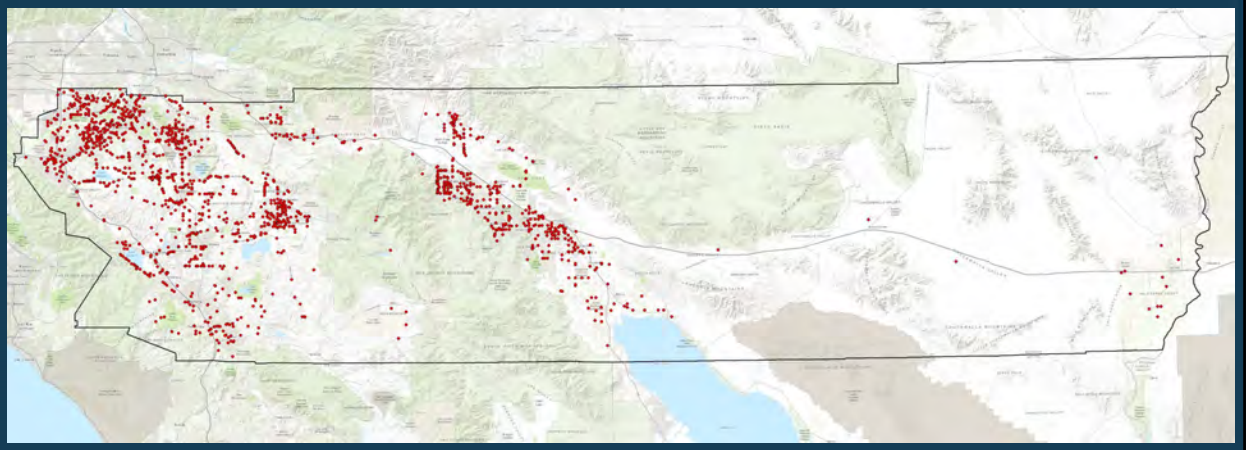


## Riverside County - All FSI Collisions



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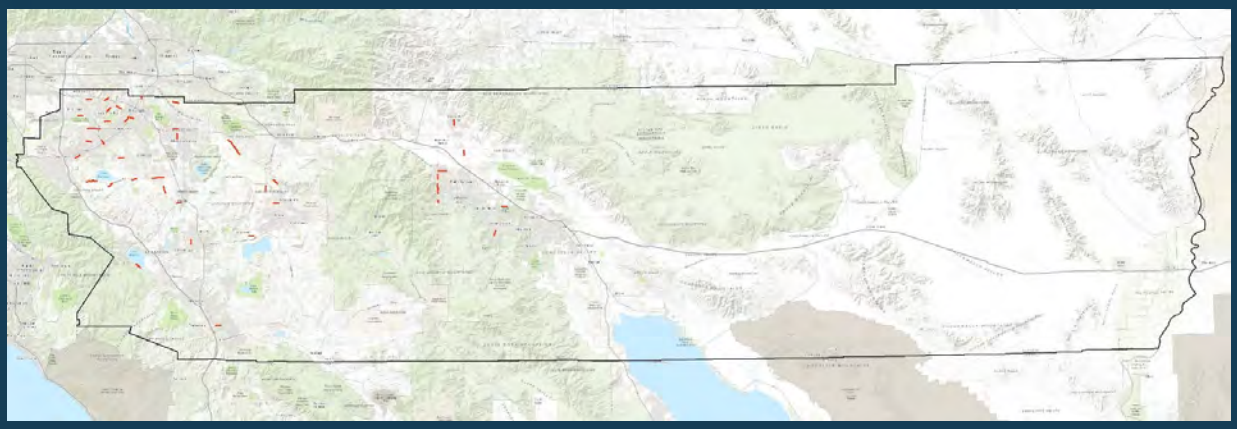
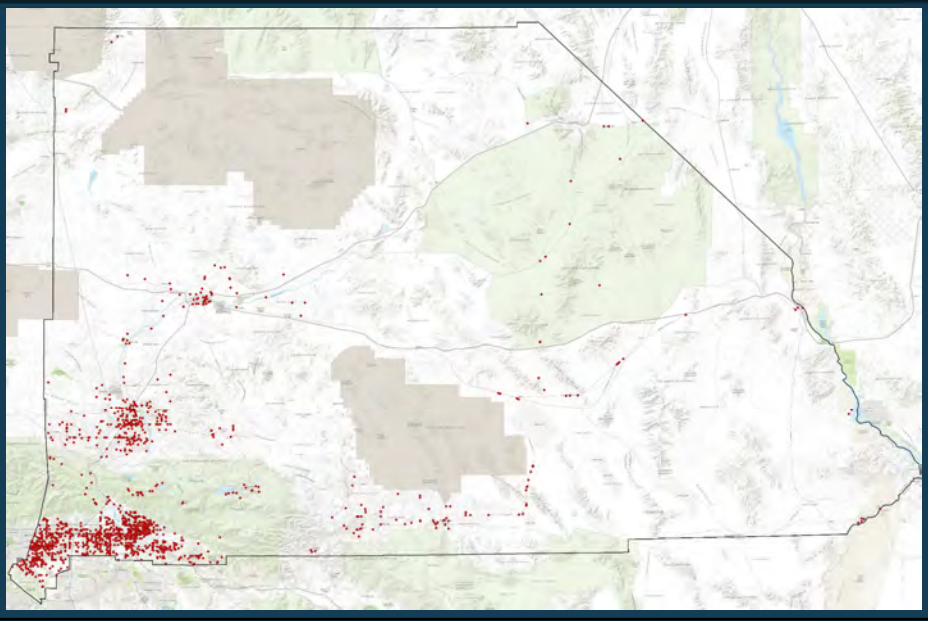


## San Bernardino County – All FSI Collisions



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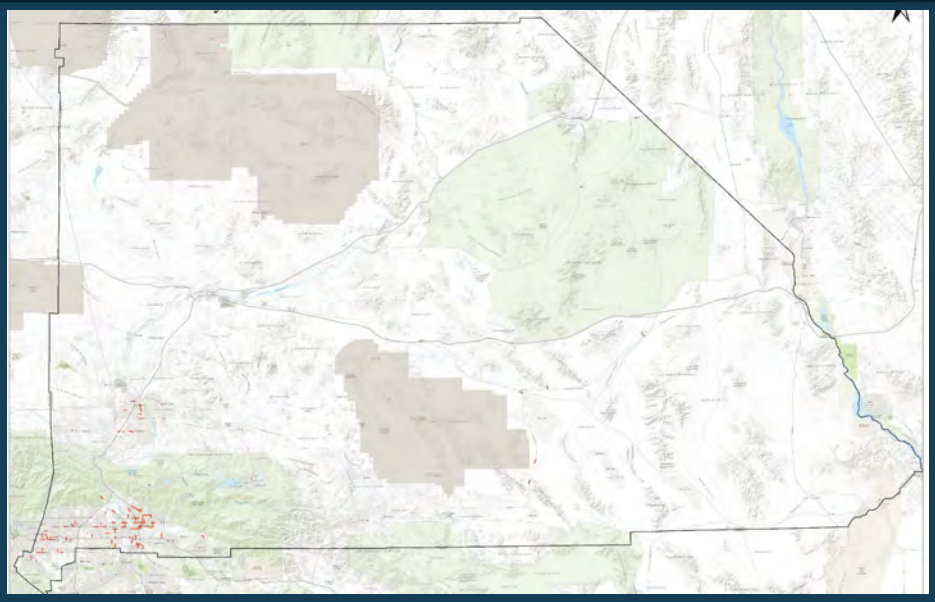
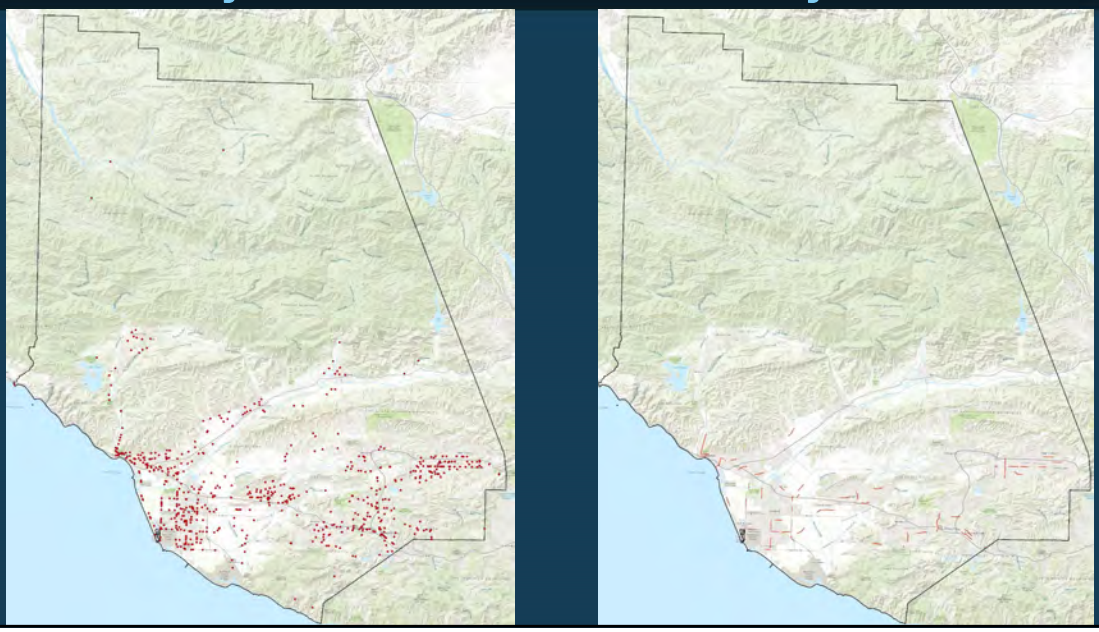
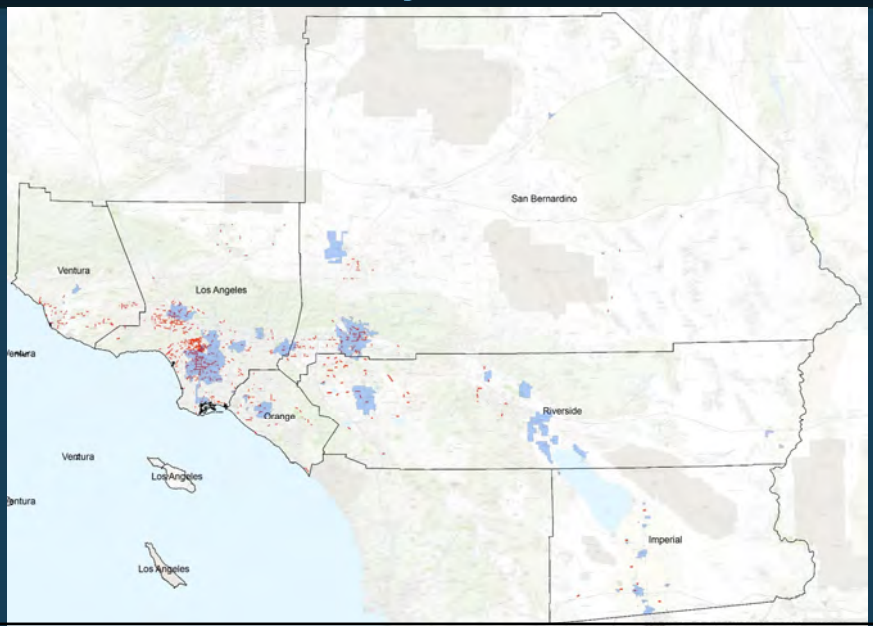


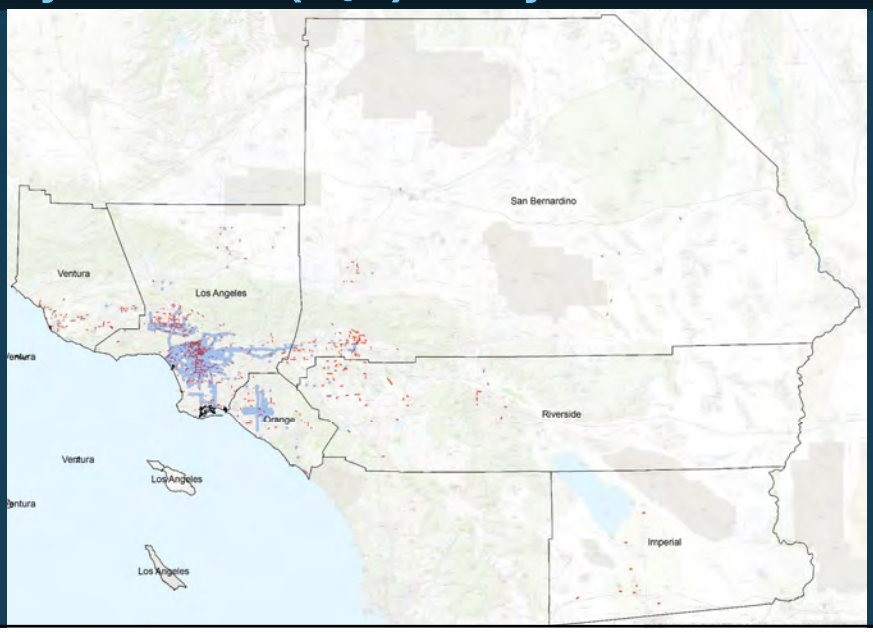
## Ventura County-All FSI Collisions Ventura County – HIN



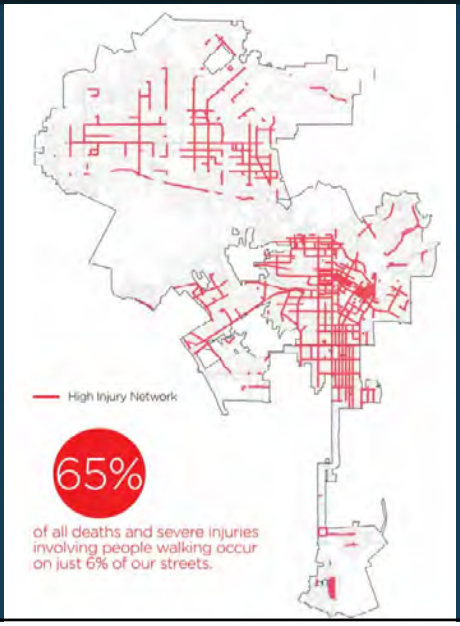
## Communities of Concern Overlay

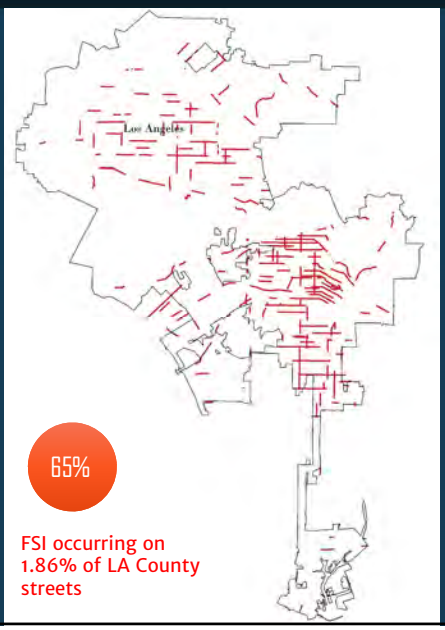


## High Quality Transit Area (HQTA) Overlay




## Comparing LA City vs LA County HIN



## Questions?

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