Regional High Injury Network (HIN) Toolbox Training

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Review Crash Trend
**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

- 6 mile

- 1 mile

- Collision

- Street

- HIN
Results

<table>
<thead>
<tr>
<th></th>
<th>FSI</th>
<th>Auto</th>
<th>Ped</th>
<th>Bike</th>
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<tbody>
<tr>
<td>Imperial</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>LA</td>
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<td>7</td>
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<td>5</td>
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<tr>
<td>Orange</td>
<td>13</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>SB</td>
<td>8</td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Riverside</td>
<td>10</td>
<td>6</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Ventura</td>
<td>7</td>
<td>5</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>

Maximum number of Collisions per mile

- 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**

![GIS tool](image)

### Threshold

Calculation for % street miles

<table>
<thead>
<tr>
<th>County</th>
<th>Total Roadway Miles</th>
<th>HIN roadway miles 60%</th>
<th>60%</th>
<th>HIN roadway miles 65%</th>
<th>65%</th>
<th>HIN roadway miles 70%</th>
<th>70%</th>
<th>HIN roadway miles 75%</th>
<th>75%</th>
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<tbody>
<tr>
<td>Imperial</td>
<td>1693.5 miles</td>
<td>7.9 miles</td>
<td>0.47%</td>
<td>7.9 miles</td>
<td>0.47%</td>
<td>95.5 miles</td>
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<td>95.5 miles</td>
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<td>95.5 miles</td>
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<tr>
<td>LA</td>
<td>16845.9 miles</td>
<td>180.4 miles</td>
<td>1.07%</td>
<td>314.0 miles</td>
<td>1.86%</td>
<td>314.0 miles</td>
<td>1.86%</td>
<td>563.4 miles</td>
<td>3.34%</td>
<td>1029.6 miles</td>
<td>6.11%</td>
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<tr>
<td>Orange</td>
<td>3885.8 miles</td>
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<td>32.3 miles</td>
<td>0.83%</td>
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<td>85.6 miles</td>
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<td>SB</td>
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<td>0.93%</td>
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<td>0.93%</td>
<td>266.9 miles</td>
<td>2.93%</td>
<td>266.9 miles</td>
<td>2.93%</td>
</tr>
<tr>
<td>Riverside</td>
<td>6225.6 miles</td>
<td>17.8 miles</td>
<td>0.29%</td>
<td>45.0 miles</td>
<td>0.72%</td>
<td>120.5 miles</td>
<td>1.94%</td>
<td>120.5 miles</td>
<td>1.94%</td>
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<tr>
<td>Ventura</td>
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<td>46.5 miles</td>
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<td>46.5 miles</td>
<td>2.82%</td>
<td>46.5 miles</td>
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<td>152.2 miles</td>
<td>9.21%</td>
<td>152.2 miles</td>
<td>9.21%</td>
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</table>
High Quality Transit Area (HQTA) Overlay

FSI occurring on 1.86% of LA County streets

Comparing LA City vs LA County HIN

65% of all deaths and severe injuries involving people walking occur on just 6% of our streets.
Questions?

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