



A NOVEL APPROACH TO SAFETY PLANNING AND IDENTIFYING SAFETY COUNTERMEASURES

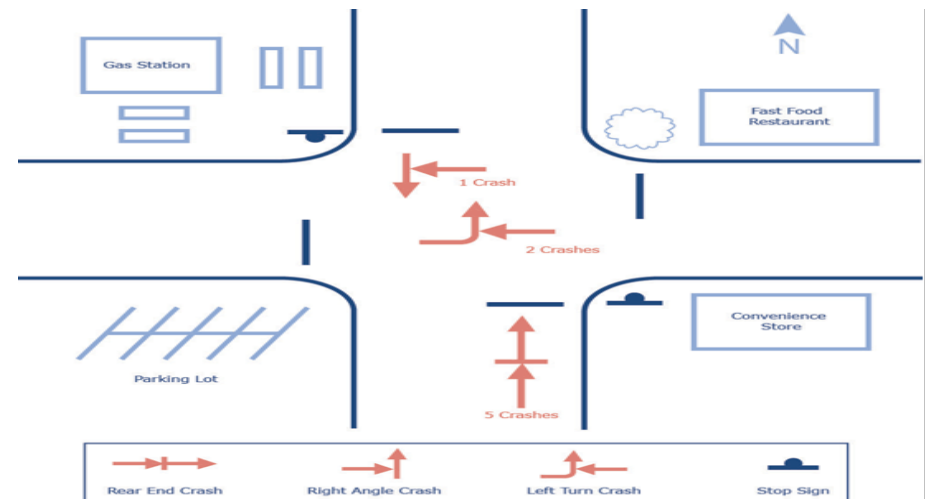
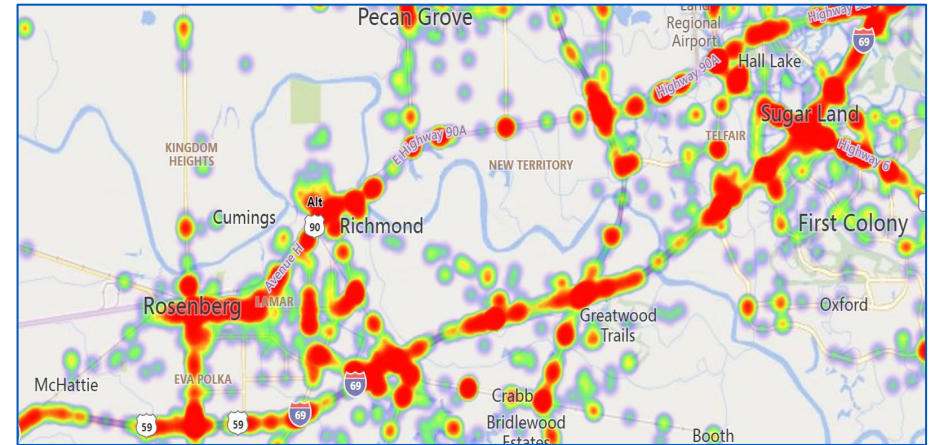
2026 TexITE District Meeting

TOPICS FOR TODAY

- Ideas for Revised Approaches
- A Novel Safety Engineering Viewer
- Application to Road Safety Audits
- Application to Safety Action Plans
- Other Applications
- Ideas for Safety Enforcement and Emergency Response Viewers
- Emerging Trends – Using Big Mobility Data

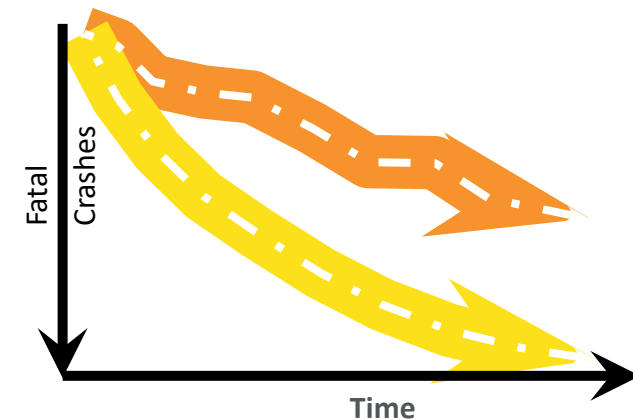
IDEAS FOR REVISED APPROACHES

- Why revised approaches?
- The lament of a County Engineer (crash data is very random and hard to organize)
- The spark of an idea from a Vision Zero lead (automate a crash diagram)
- Years of experience in Design Exceptions, Safety Benefits for Grant Proposals, Vision Zero, Safe Routes to School, and SS4A (and being a pretty good designer)
- Fort Worth Downtown Wrong-Way Study
- Somebody asked me what I think we should do



IDEAS FOR REVISED APPROACHES

- Conventional approach
 - Spend effort cleaning the data
 - Prioritize segments and intersections by severe and fatal crashes
 - Extensively custom study each of the “high priority” segments and intersections
 - Use the crash data and other methods (?) to develop safety solutions on the High Injury Network only
 - Group and prioritize the projects
- Humbly suggested novel approach
 - Use the crash data, automated cluster diagrams, engineering filters, and Streetview to develop safety solutions across a whole region
 - Group and prioritize the projects
- And all the rest... (engagement, strategies, long range planning)



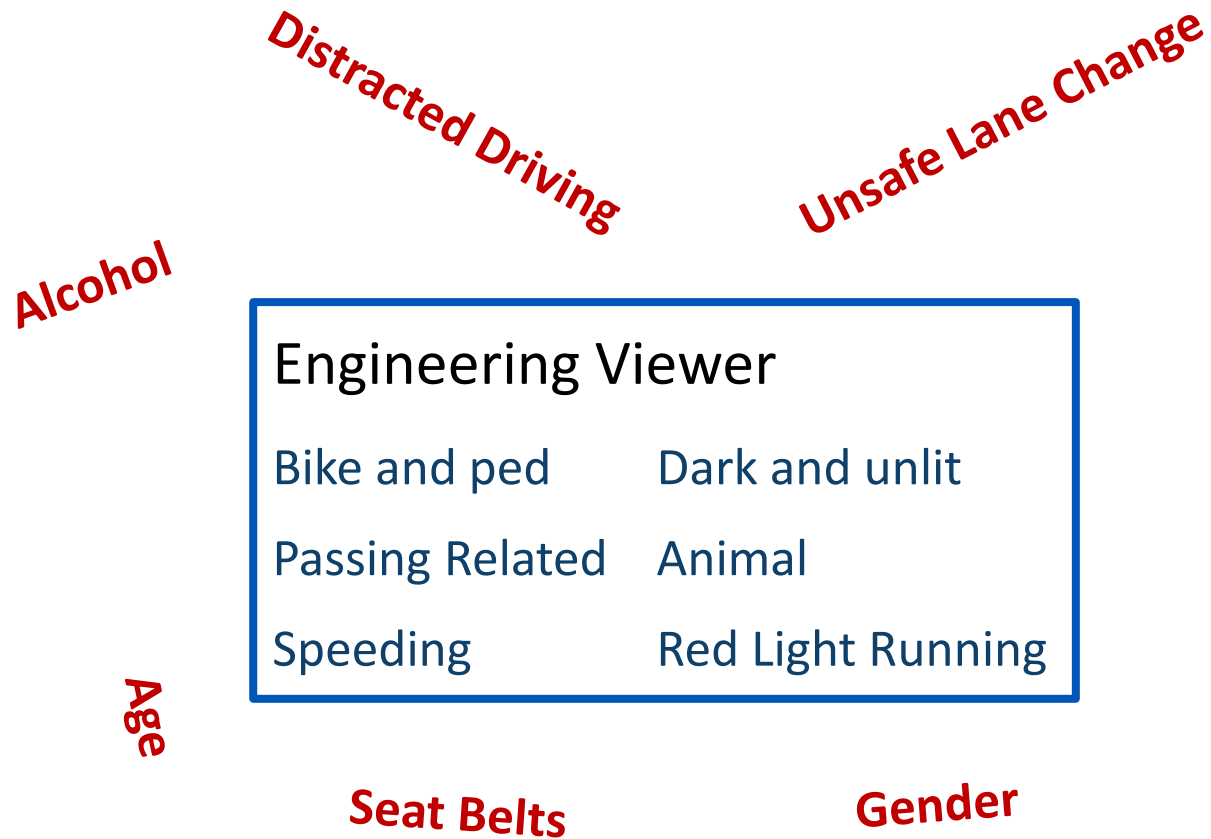
A NOVEL SAFETY ENGINEERING VIEWER

- Automate the crash diagram (summary of total crashes for each direction and orientation combination)

| Manner of Collision | Vehicle Travel Directions | Number of Crashes |
|---|---------------------------|-------------------|
| OPPOSITE DIRECTION - ONE STRAIGHT-ONE LEFT TURN | E - EAST, W - WEST | 26 |
| SAME DIRECTION - BOTH GOING STRAIGHT-REAR END | E - EAST, E - EAST | 5 |
| SAME DIRECTION - ONE STRAIGHT-ONE STOPPED | E - EAST, E - EAST | 5 |
| ANGLE - BOTH GOING STRAIGHT | E - EAST, S - SOUTH | 3 |
| SAME DIRECTION - BOTH GOING STRAIGHT-REAR END | W - WEST, W - WEST | 3 |
| ANGLE - BOTH GOING STRAIGHT | S - SOUTH, W - WEST | 2 |
| ANGLE - ONE STRAIGHT-ONE LEFT TURN | N - NORTH, W - WEST | 2 |
| ANGLE - ONE STRAIGHT-ONE LEFT TURN | S - SOUTH, W - WEST | 2 |
| SAME DIRECTION - BOTH GOING STRAIGHT-SIDESWIPE | E - EAST, E - EAST | 2 |
| SAME DIRECTION - BOTH GOING STRAIGHT-SIDESWIPE | W - WEST, W - WEST | 2 |
| ANGLE - BOTH GOING STRAIGHT | N - NORTH, E - EAST | 1 |
| | TOTAL | 53 |

A NOVEL SAFETY ENGINEERING VIEWER

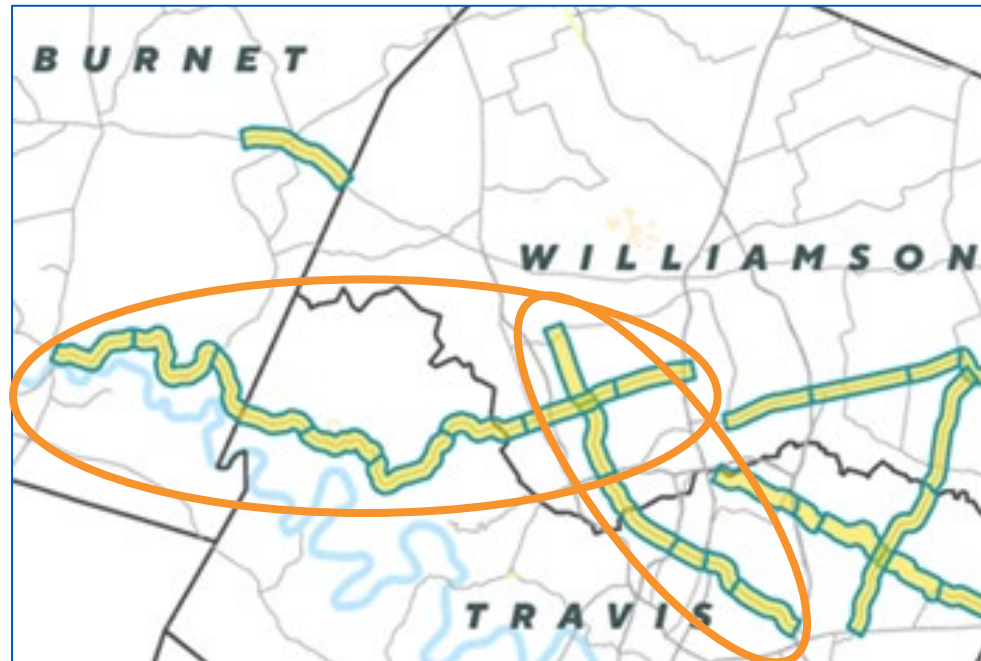
- Do not include filters that are irrelevant to engineering mitigation



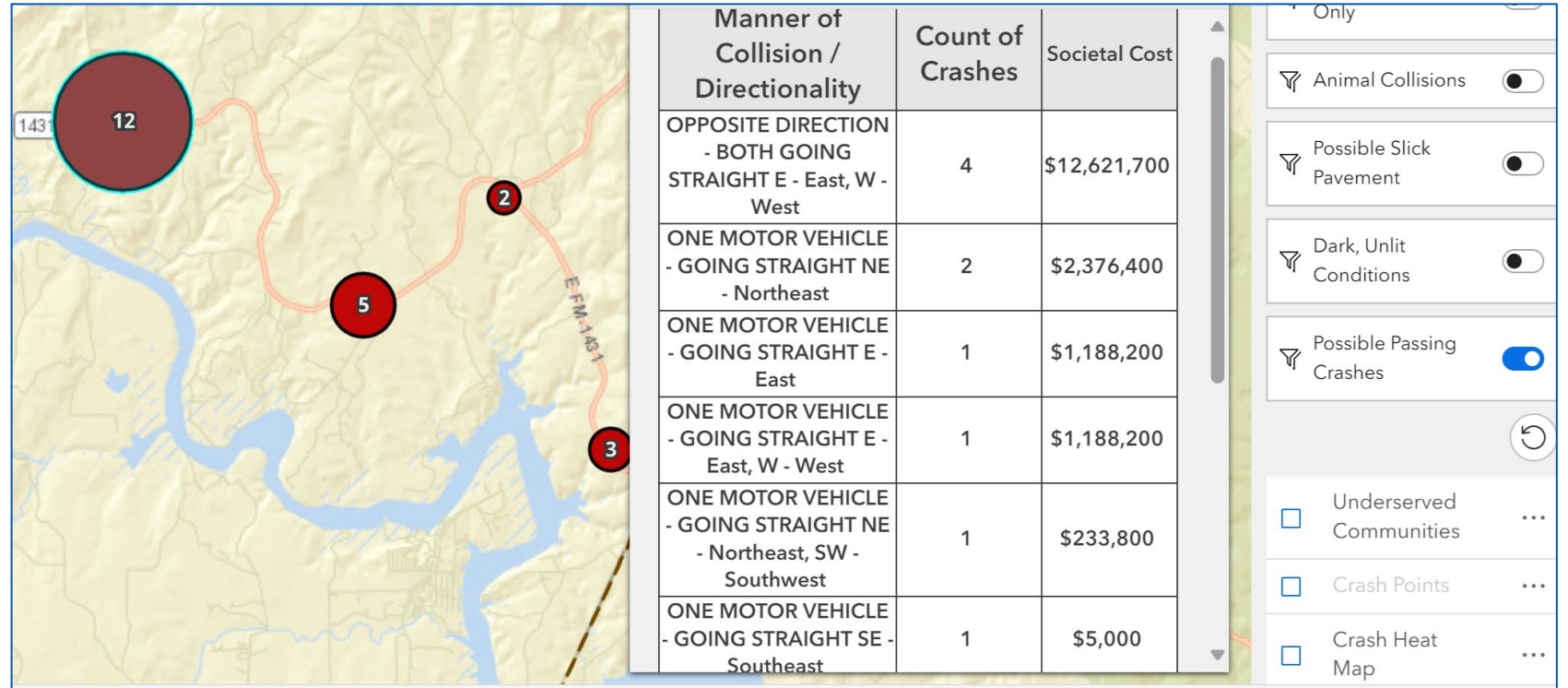
APPLICATION TO ROAD SAFETY AUDITS

- RM 1431
 - 40 miles
 - Rural 2-lane highway, hilly context to the west
 - Suburban 6-lane arterial, signalized context to the east
 - It had it all

- FM 734
 - 10 miles
 - Suburban divided highway context
 - Very consistent section and context

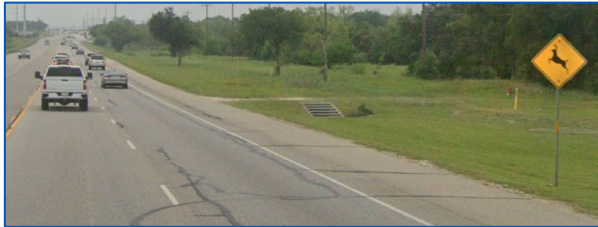


APPLICATION TO ROAD SAFETY AUDITS

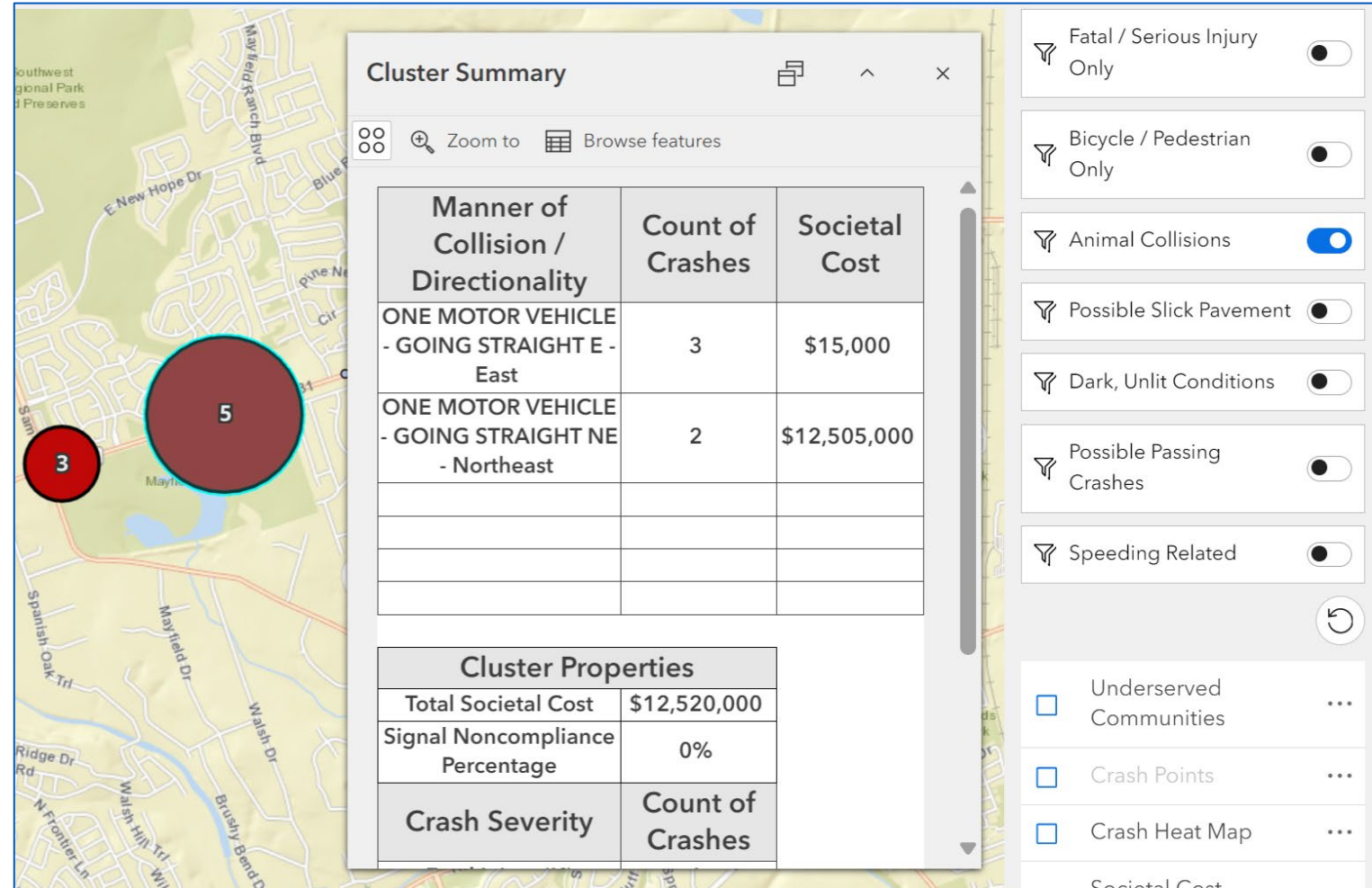
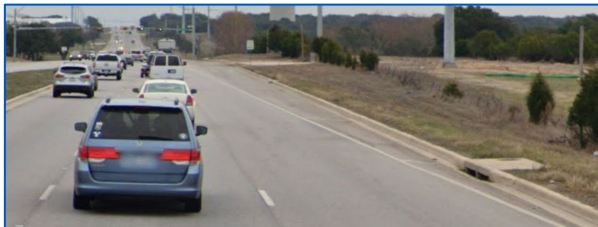


APPLICATION TO ROAD SAFETY AUDITS

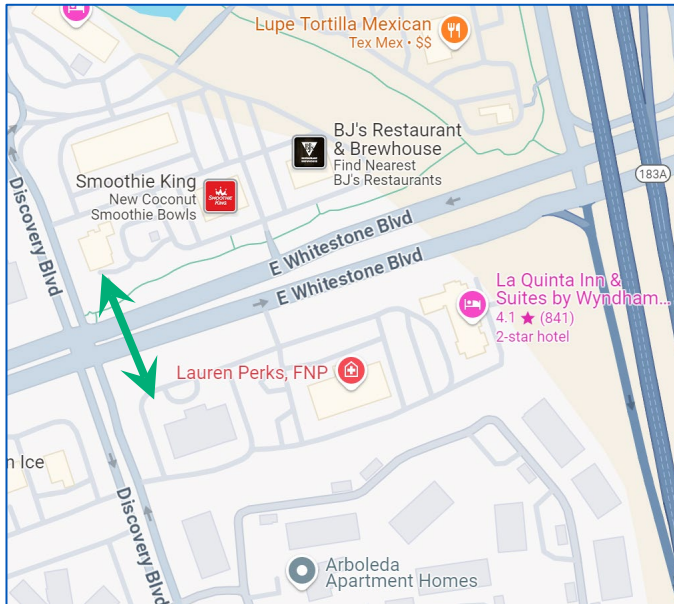
Westbound



Eastbound



APPLICATION TO ROAD SAFETY AUDITS



The map shows a cluster of 3 crashes highlighted in a red circle at the intersection of E Whitestone Blvd and TX-183A TOLL N. A 'Cluster Summary' window is overlaid on the map, displaying the following data:

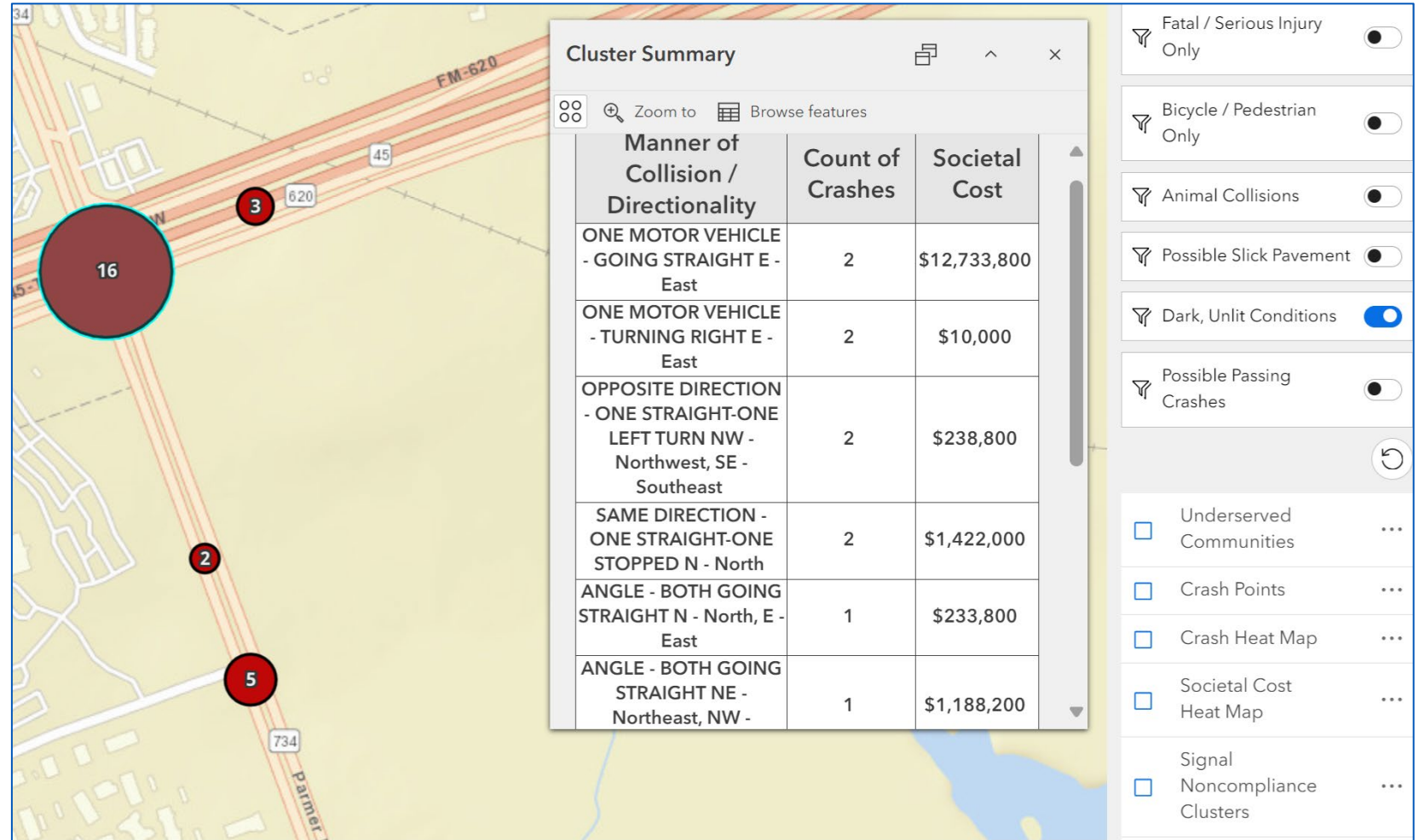
| Manner of Collision / Directionality | Count of Crashes | Societal Cost |
|---|------------------|---------------|
| ONE MOTOR VEHICLE - GOING STRAIGHT E - East | 1 | \$1,188,200 |
| ONE MOTOR VEHICLE - GOING STRAIGHT SE - Southeast | 1 | \$111,700 |
| ONE MOTOR VEHICLE - TURNING LEFT SE - Southeast | 1 | \$111,700 |
| | | |
| | | |
| | | |

| Cluster Properties | |
|---------------------------------|-------------|
| Total Societal Cost | \$1,411,600 |
| Signal Noncompliance Percentage | 0% |
| | Count of |

On the right side of the interface, there are several filter and feature options:

- Fatal / Serious Injury Only
- Bicycle / Pedestrian Only
- Animal Collisions
- Possible Slick Pavement
- Dark, Unlit Conditions
- Possible Passing Crashes
- Underserved Communities
- Crash Points
- Crash Heat Map
- Societal Cost Heat Map
- Signal Noncompliance Clusters

APPLICATION TO ROAD SAFETY AUDITS



APPLICATION TO ROAD SAFETY AUDITS

Southbound



Northbound



Cluster Summary

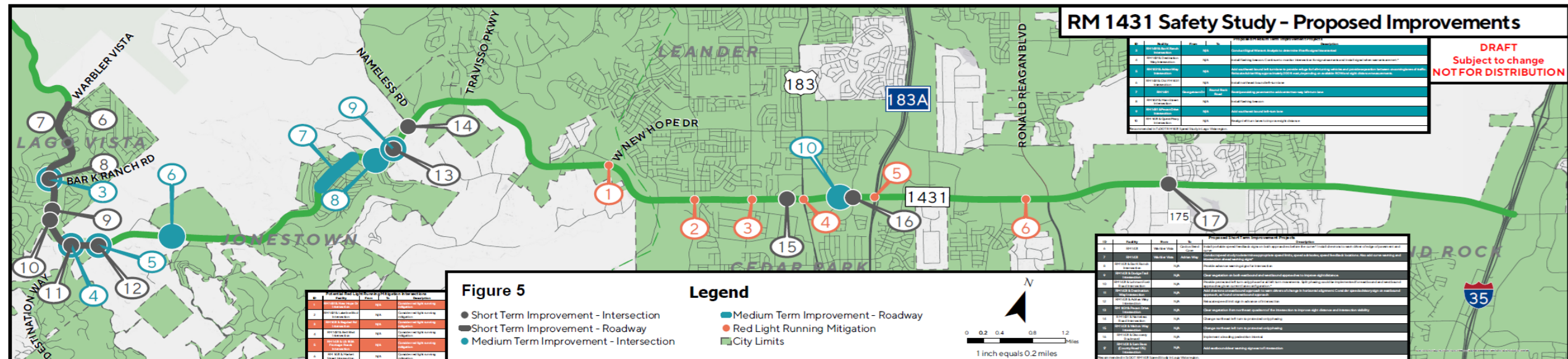
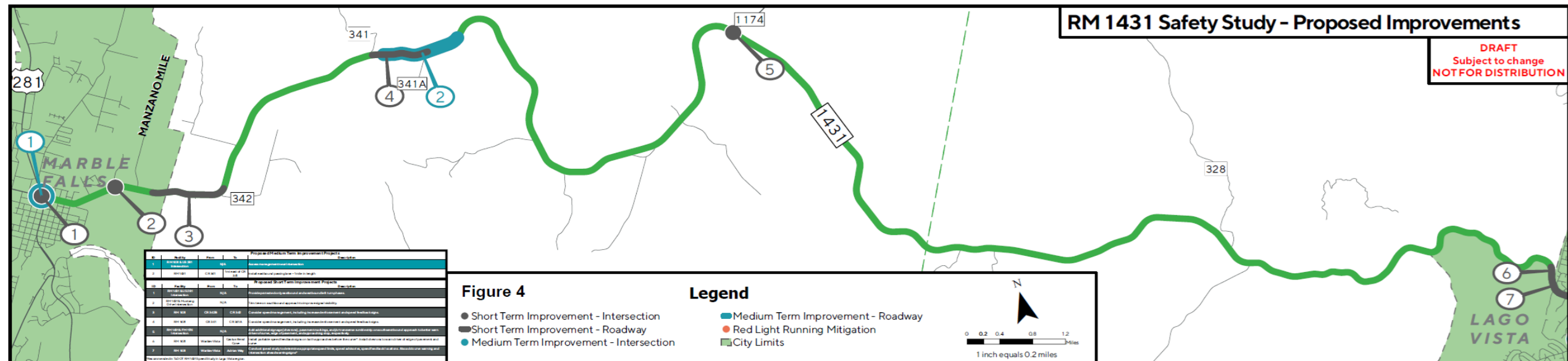
Zoom to Browse features

| Manner of Collision / Directionality | Count of Crashes | Societal Cost |
|--|------------------|---------------|
| SAME DIRECTION - ONE STRAIGHT-ONE STOPPED N - North | 7 | \$248,400 |
| OPPOSITE DIRECTION - ONE STRAIGHT-ONE LEFT TURN N - North, S - South | 5 | \$360,500 |
| SAME DIRECTION - ONE STRAIGHT-ONE STOPPED E - East | 4 | \$248,800 |
| ONE MOTOR VEHICLE - GOING STRAIGHT SE - Southeast | 3 | \$15,000 |
| SAME DIRECTION - BOTH GOING STRAIGHT-REAR END N - North | 3 | \$15,000 |
| SAME DIRECTION - BOTH GOING STRAIGHT-SIDESWIPE N - North | 3 | \$121,700 |

Filters:

- Fatal / Serious Injury Only
- Bicycle / Pedestrian Only
- Animal Collisions
- Possible Slick Pavement
- Dark, Unlit Conditions
- Possible Passing Crashes
- Underserved Communities
- Crash Points
- Crash Heat Map
- Societal Cost Heat Map
- Signal

APPLICATION TO ROAD SAFETY AUDITS



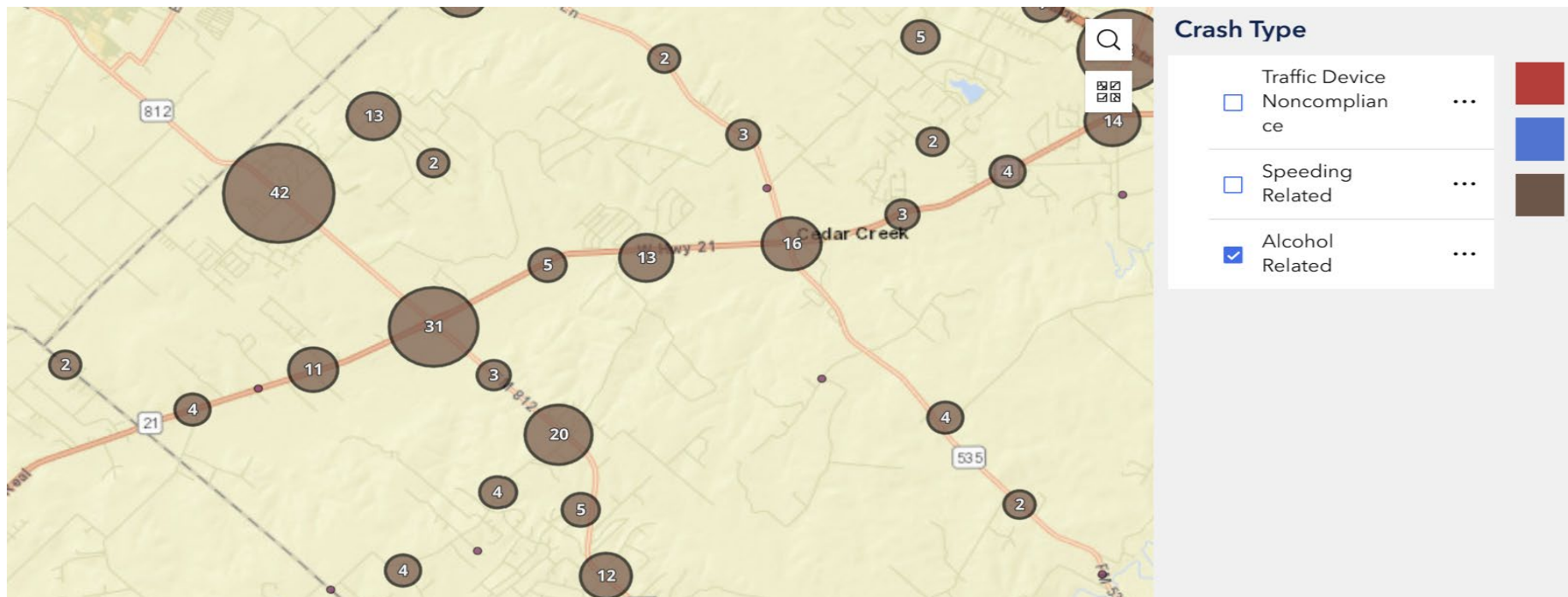
APPLICATIONS TO SAFETY ACTION PLANS

- See Bastrop County Safety Action Plan
 - <https://www.campotexas.org/wp-content/uploads/2025/11/Bastrop-County-SAP-2025-08-14.pdf>
- Strong participation by state, county, and municipal governments
- Included strategies, emphasis area, high-risk multimodal analyses, and long-term programming recommendations
- In addition to the High Injury Network required by SS4A, we knocked out the whole county
- Included 28 corridor and 69 intersection and spot location improvements
- County immediately implemented work orders for low-cost, short-term improvements

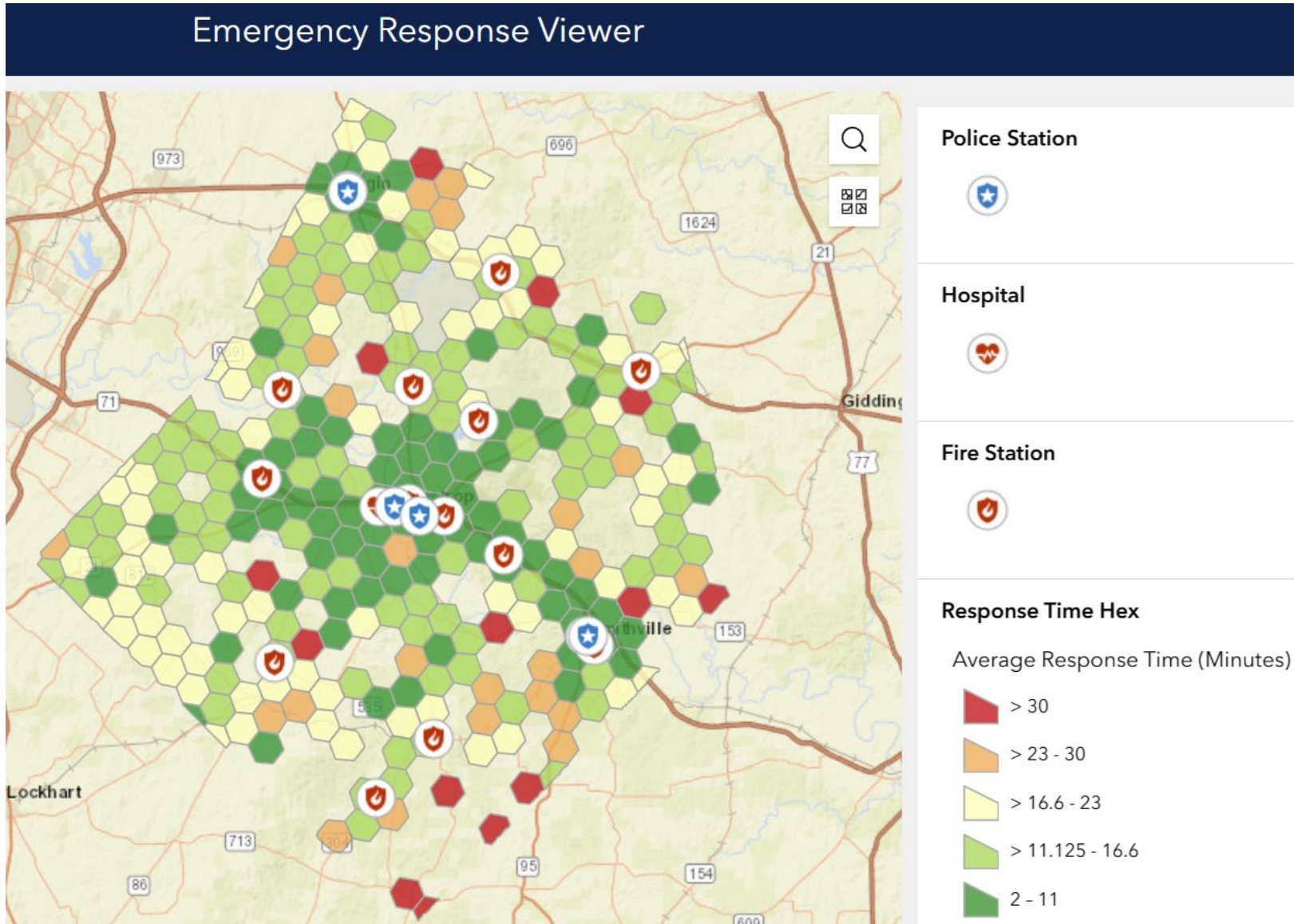
OTHER APPLICATIONS

- Rapid and quality response to citizen calls and requests
- Automated before and after improvement studies
- Automated presentations of safety needs to support proposed projects
- Partner with agencies to develop safety solutions

IDEAS FOR SAFETY ENFORCEMENT VIEWER



IDEAS FOR SAFETY EMERGENCY RESPONSE VIEWER



EMERGING TRENDS – USING BIG MOBILITY DATA

- Develop relationships with vendors
- It's rapid deceleration data, not near miss or hard braking (could have been a crash!)
- Automated before and after improvement studies
- The only true way to be proactive, find rapid spikes in near misses!
- Regression to the mean goes from 3-5 years down to potentially 1 year (maybe less?)

THANKS FOR LISTENING!

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