Welcome!

AASHTO CEE Active Transportation Safety Peer Exchange

Type your name, agency, and if you are representing safety, active transportation, or both in GoTo!

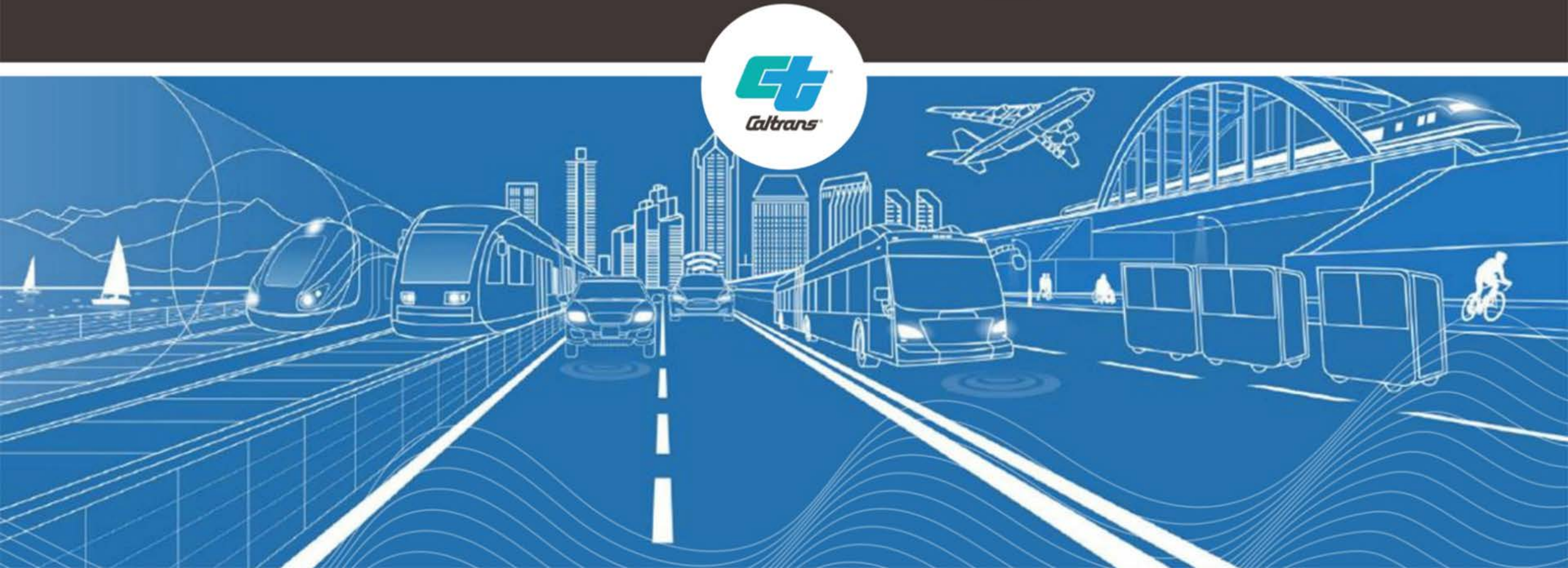
April 14, 21, and 28

Image Source: Dan Burden/PBIC

AASHTO'S CENTER FOR ENVIRONMENTAL EXCELLENCE
ACTIVE TRANSPORTATION SAFETY PEER EXCHANGE
AASHTO COUNCIL ON ATP

TOKS OMISHAKIN CALTRANS DIRECTOR

APRIL 14, 2021



SAFETY

VULNERABLE USERS

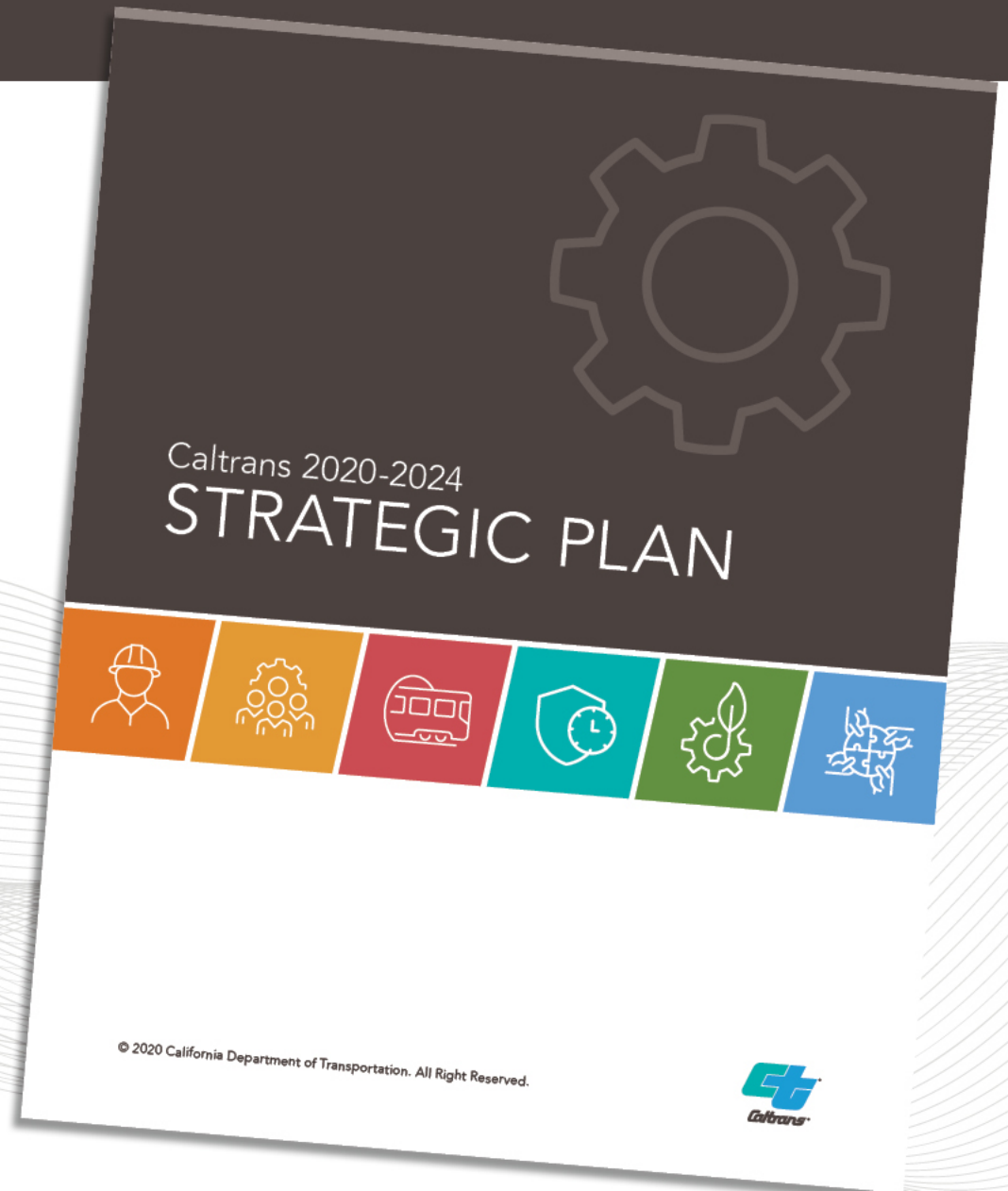
VEHICLES

ZERO DEATHS

STRATEGIC PLAN

CALTRANS 2020-2024 STRATEGIC PLAN

- SAFETY FIRST
- CULTIVATE EXCELLENCE
- ENHANCE AND CONNECT THE MULTIMODAL TRANSPORTATION NETWORK
- STRENGTHEN STEWARDSHIP AND DRIVE EFFICIENCY
- LEAD CLIMATE ACTION
- ADVANCE EQUITY AND LIVABILITY IN ALL COMMUNITIES



FOR MORE INFORMATION

TOKS OMISHAKIN

Caltrans Director

(916) 654-5267

toks.omishakin@dot.ca.gov

Twitter: @ToksOmishakin

Federal Highway Administration
Active Transportation Safety Peer Exchange

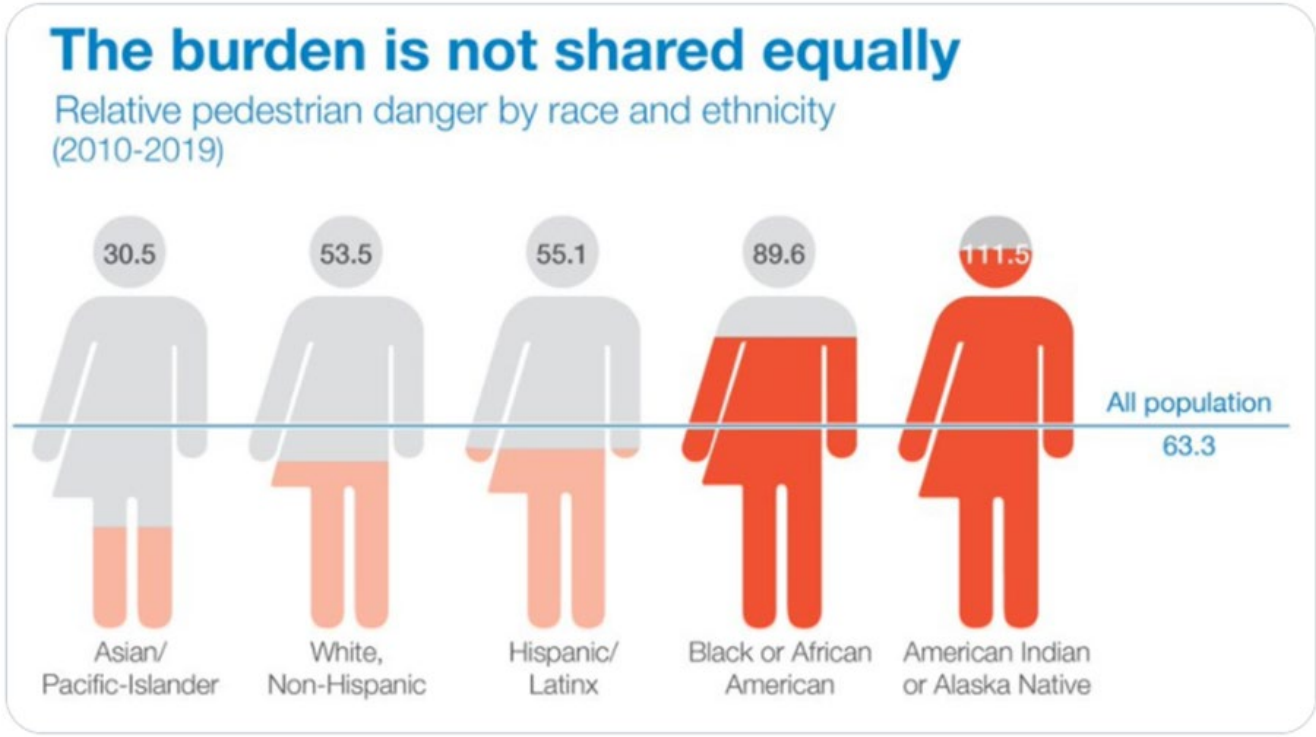
Shari Schaftlein, Director, Office of Human Environment

April 14, 2021

Safety Focus

Secretary Pete Buttigieg
@SecretaryPete

These disparities are awful, but we know how to fix them. It's time to reverse these patterns of exclusion and invest in safer, equitable streets.
smartgrowthamerica.org/dangerous-by-d...



1:32 PM · Mar 24, 2021 · Twitter Web App

Ensuring Transportation Equity

TransportationGov Retweeted

Secretary Pete Buttigieg
@SecretaryPete

Let me be clear: American highways were too often built through Black neighborhoods on purpose—dividing communities, adding pollution, and making pedestrians less safe.

2:22 PM · Apr 12, 2021 · Twitter Web App

Executive Order 13985: Advancing Racial Equity and Support for Underserved Communities Through the Federal Government

Addressing Climate Change

Executive Order 14008: [Tackling the Climate Crisis at Home and Abroad]

Innovative and Transformational Investment

TransportationGov Retweeted

Secretary Pete Buttigieg
@SecretaryPete

Not every generation gets to literally build anew and shape its own future, but the generations living today in America have that chance. This is a season for thinking big about infrastructure.

4:09 PM · Mar 22, 2021 · Twitter Web App

Job Creation to Build Economic Security

Secretary Pete Buttigieg
@SecretaryPete

I believe we have—at this moment—the best chance in any of our lifetimes to make a generational investment in infrastrastructure that will help us meet the country's most pressing challenges today and create a stronger future for decades to come. #BuildBackBetter

11:19 AM · Mar 25, 2021 · Twitter Web App

Executive Order 14002: Economic Relief Related to the COVID-19 Pandemic

Strategic Agenda Update

Figure 1: Goals

Image from: https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/strategic_agenda/

Ideas/Questions? Email Darren.Buck@dot.gov

Other Bike and Pedestrian Research Underway

- Toolkit of Innovative Funding Strategies to Accelerate Bicycle and Pedestrian Project Delivery
- Planning Multimodal Networks in a Connected and Automated Vehicle Future
- Strategic Agenda for Pedestrian and Bicycle Transportation
- Impacts of Electric Bicycles (ebikes) on the Transportation Network and Trail System
- Tribal Development of Trails and other Dedicated Pedestrian and Bicycle Infrastructure
- Trails and Resiliency

For more information: www.fhwa.dot.gov/hep/hep_research/offices/fs_he.cfm

Program Websites

Bicycle/Pedestrian: https://www.fhwa.dot.gov/environment/bicycle_pedestrian/

Livability: https://www.fhwa.dot.gov/livability/

CSS/D (Complete Streets): https://www.fhwa.dot.gov/planning/css/benefits/completestreet.cfm

Environmental Justice/Equity: https://www.fhwa.dot.gov/environment/environmental_justice/

Recreational Trails: https://www.fhwa.dot.gov/environment/recreational_trails/

Transportation Alternatives: https://www.fhwa.dot.gov/environment/transportation_alternatives/

Day 1 Breakout Group Assignments

Breakout Group 1	
Leads: Melissa Savage, Peter Haag, Darren Buck	
Gabrielle	Abbate
Anthony	Aglio
Kelly	Campbell
Mark	Cole
Keith	Fulton
Kandese	Holford
David	Leingang
Matt	Messina
Jon	Nelson
Lauren	Parrish
Gabe	Priebe
Stephen	Read
Shari	Schaftlein
Steve	Shaughnessy
Robert	Skehan
Brad	Steckler
Sam	Sturtz
Shawn	Troy
Jared	Wiley

Breakout Group 2	
Leads: Sarah Abel, Bonnie Polin, Derek Leuer	
Chad	Amick
Jack	Anninos
Dan	Brugman
Don	Butler
Barb	Chamberlain
Josh	DeBruyn
Jessica	Downing
Mike	Griffith
Samuel	Harris
Tim	Kerns
Barbara	McCann
Jill	Mrotek-Glenzinksi
Milly	Ortiz
Hiral	Patel
Laura	Riggs
Eric	Schroeter
Duncan	Smith
Carol	Strizich
Andy	Vandel
Brian	Wood

Breakout Group 3	
Leads: Phillip Burgoyne-Allen, Marty Baker, Michelle Morgan	
Julius	Adolfsson
Melissa	Anderson
Keri	Bohlmann
Mark	Carlino
Monica	Crider
Preston	Elliott
Kelly	Hardy
Ben	Huot
Adriane	McRae
Scott	Neidert
Mary	O'Brien
Joseph	Ouellette
Samuel	Pridgen
Adnan	Qazi
Jake	Rueter
Ray	Shank
Jason	Siwula
Jeremy	Thompson
Will	Watts

Breakout Group 4	
Leads: Doug Noble, Jeanie Ward-Waller, Jackie DeWolfe	
Katherine	Beckett Suter
Rob	Bedenbaugh
Brandon	Burgoa
DeWayne	Carver
Logan	Gran
Gavin	Gray
Caitlin	Harley
Tom	Honich
Perry	Keller
Donna	Lewandowski
Brian	Mayhew
John	Milton
Veda	Nguyen
Sonja	Piper
Chad	Rawls
Bonnie	Sherman
Emily	Thomas
Jim	Willis
Scott	Zehngraff

Scalable Risk Assessment Methods for Pedestrians and Bicyclists

U.S. Department of Transportation
Federal Highway Administration

Safe Roads for a Safer Future
Investment in roadway safety saves lives
http://safety.fhwa.dot.gov

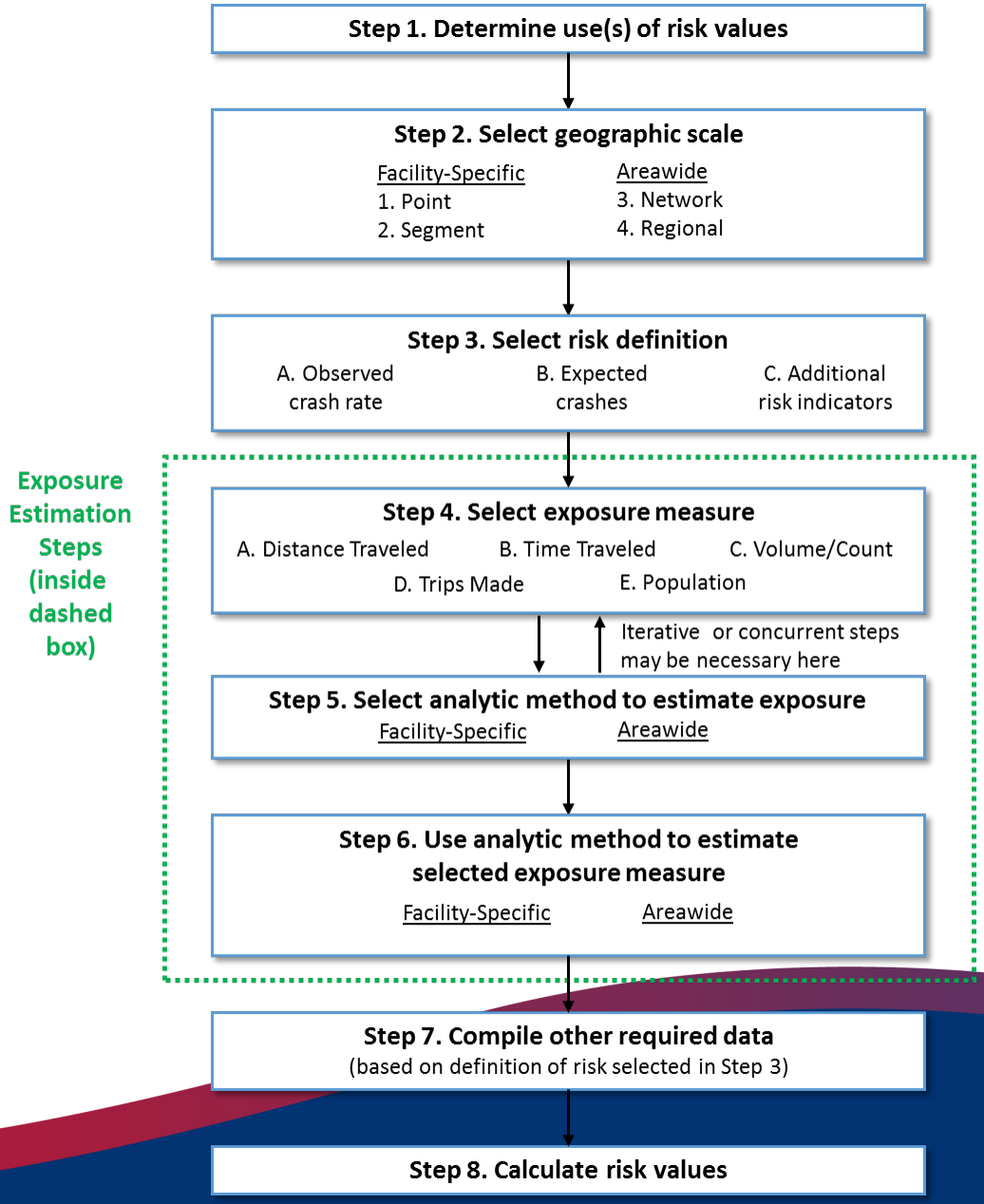
Introduction

- **Project Objective**
  - Develop approach to estimate pedestrian & bicyclist risk (includes exposure) at several geographic scales

- **Project Motivation**
  - Identify high-priority areas and facilities
  - Monitor safety performance measures
  - Evaluate countermeasures and sites before and after improvements
  - Need exposure in safety and risk analyses

8 Steps

- Framework with flexibility
- Scale matters (a lot)
- Exposure is key ingredient, focus in project

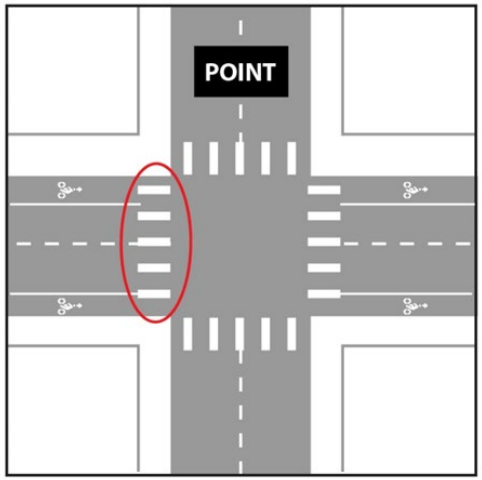


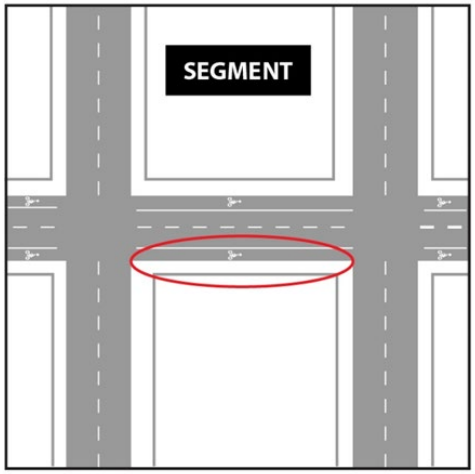
Step 1. Determine Use(s) of Risk Values

A. Safety performance measures
B. Network screening, area-based
C. Network screening, facility-based
D. Project prioritization
E. Countermeasure evaluation
F. Site evaluation

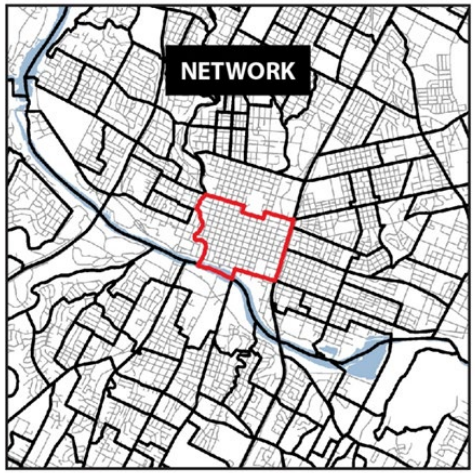
Step 2. Select Geographic Scale

Facility-Specific





Areawide



Step 3. Select Risk Definition

1. Observed crash rate

2. Expected crashes

3. Additional risk indicators

Step 3. Select Risk Definition

1. **Observed crash rate**
   - Traditional approach
   - Use with other crash analysis tools
   - Observed crashes on specific facilities may not accurately represent risk
   - Preferred for areawide scales

$$\text{Risk} = \frac{\text{Observed crashes}}{\text{Exposure}}$$

Step 3. Select Risk Definition

2. **Expected crashes**
   - Highway Safety Manual and other statistical models
     - Function of **pedestrian and bicyclist exposure**, other road and traffic variables
   - Overcomes issues with observed crashes on specific facilities
   - Preferred for specific facilities, but requires advanced statistical methods to estimate expected crashes

Step 3. Select Risk Definition

3. **Additional risk indicators**
   - Systemic safety: risk score based on combining pedestrian and bicyclist exposure with other road and traffic variables (i.e., risk factors)
   - Compatible with FHWA's Systemic Safety approach
   - Risk is numeric score or rating, does not estimate crashes
   - Preferred for specific facilities if expected crashes not feasible

Step 4. Select Exposure Measure

Exposure Measure	Point	Segment	Network	Region
Volume/count	●			
Distance traveled		●	●	●
Time traveled	○	○	●	●
Trips made			●	●
Population			●	●

Steps 5 & 6. Select and Use Analytic Methods to Estimate Exposure

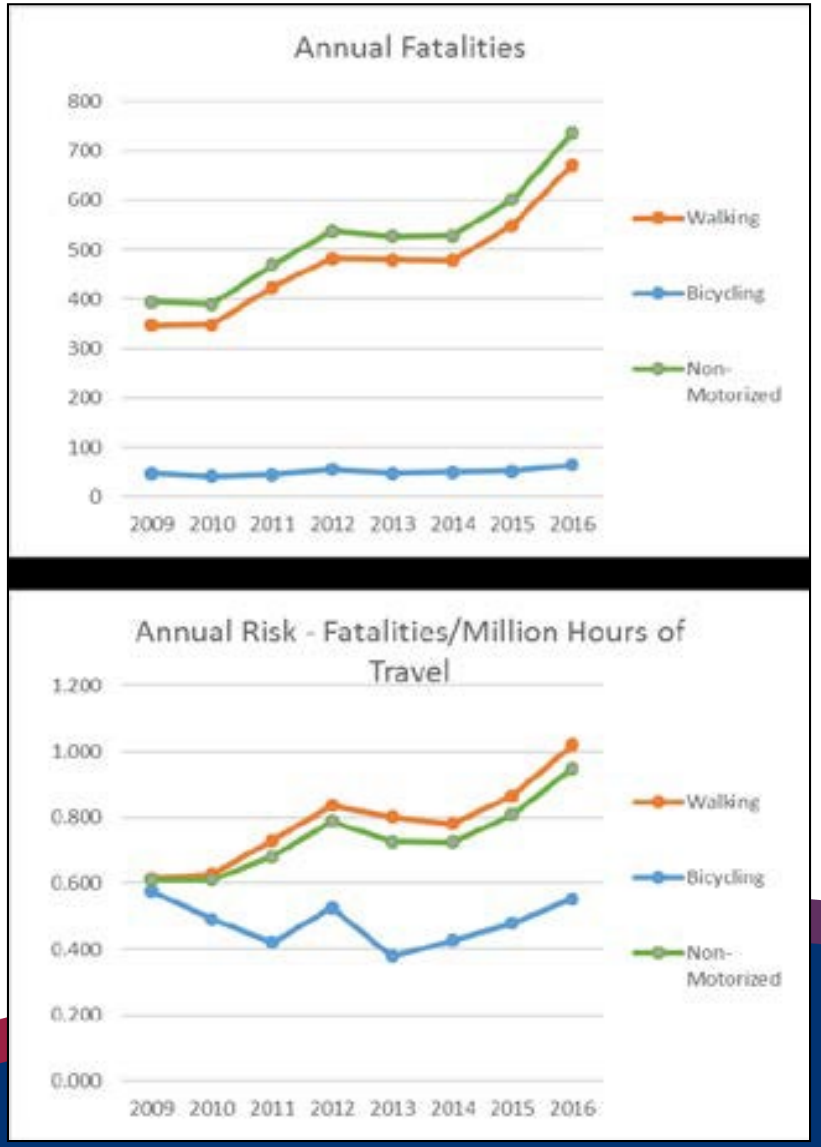
- Site counts
- Demand estimation models

} (FACILITY-SPECIFIC)

- Travel surveys (AREAWIDE)

Areawide Non-Motorized Exposure Tool

- Combines the best of NHTS and ACS travel surveys
- Statewide and MPO area estimates of TOTAL pedestrian and bicyclist exposure



Steps 7 & 8: Compile Other Data, Calculate Risk Values

- Step 7: Compile other required data (based on risk definition from Step 3)

- Step 8: Calculate Risk Values

Resources

- Synthesis of Methods (FHWA-SA-17-041)
  - https://safety.fhwa.dot.gov/ped_bike/tools_solve/fhwasa17041/index.cfm
- Scalable Non-Motorized Exposure Tool
  - https://ldwhite.shinyapps.io/Scalable_NonMotorized_Exposure/

Active Transportation Safety Peer Exchange

Derek Leuer, PE| State Traffic Safety Engineer

April 14, 2021

DEPARTMENT OF TRANSPORTATION

Intersection Risk Assessment

Topics

The Problem

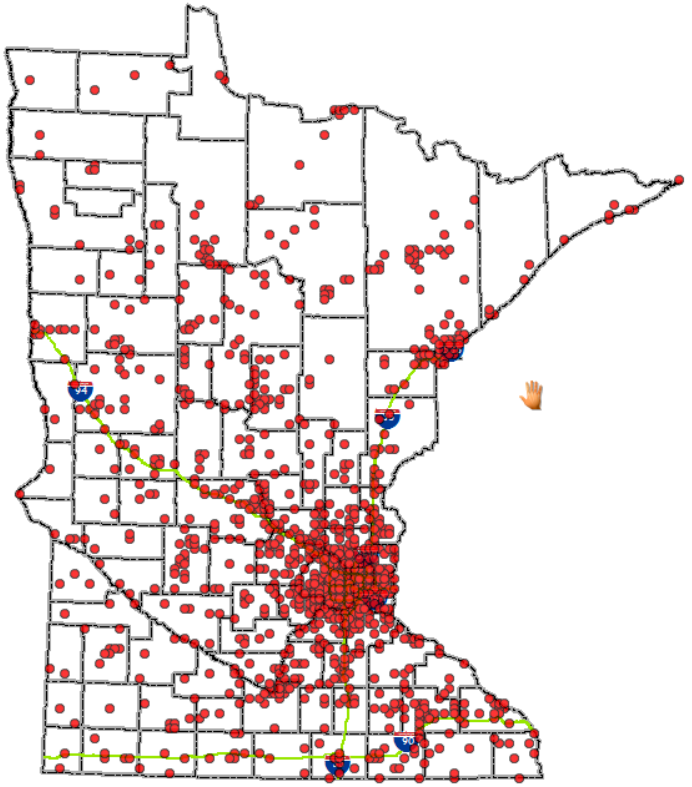
Intersection Risk Assessments

Statewide Risk Assessment

Questions and Discussion

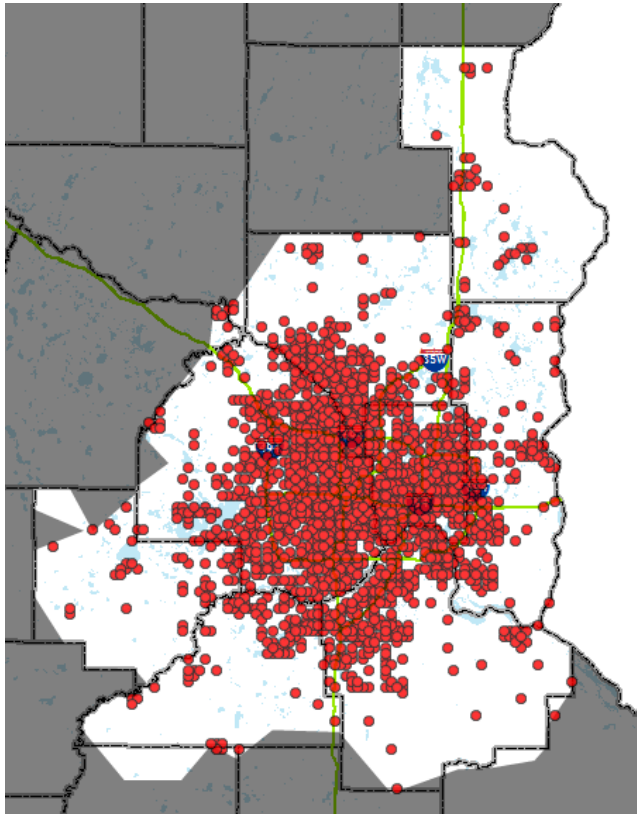
What is the Problem

- Every year 1,600 to 2,000 Pedestrians and Bicyclists are involved with Motor Vehicle Crashes
- 22 fatalities (2014) – 67 fatalities (2016)
- Average is around 50 fatalities/year
- Average about 150 serious injuries/year

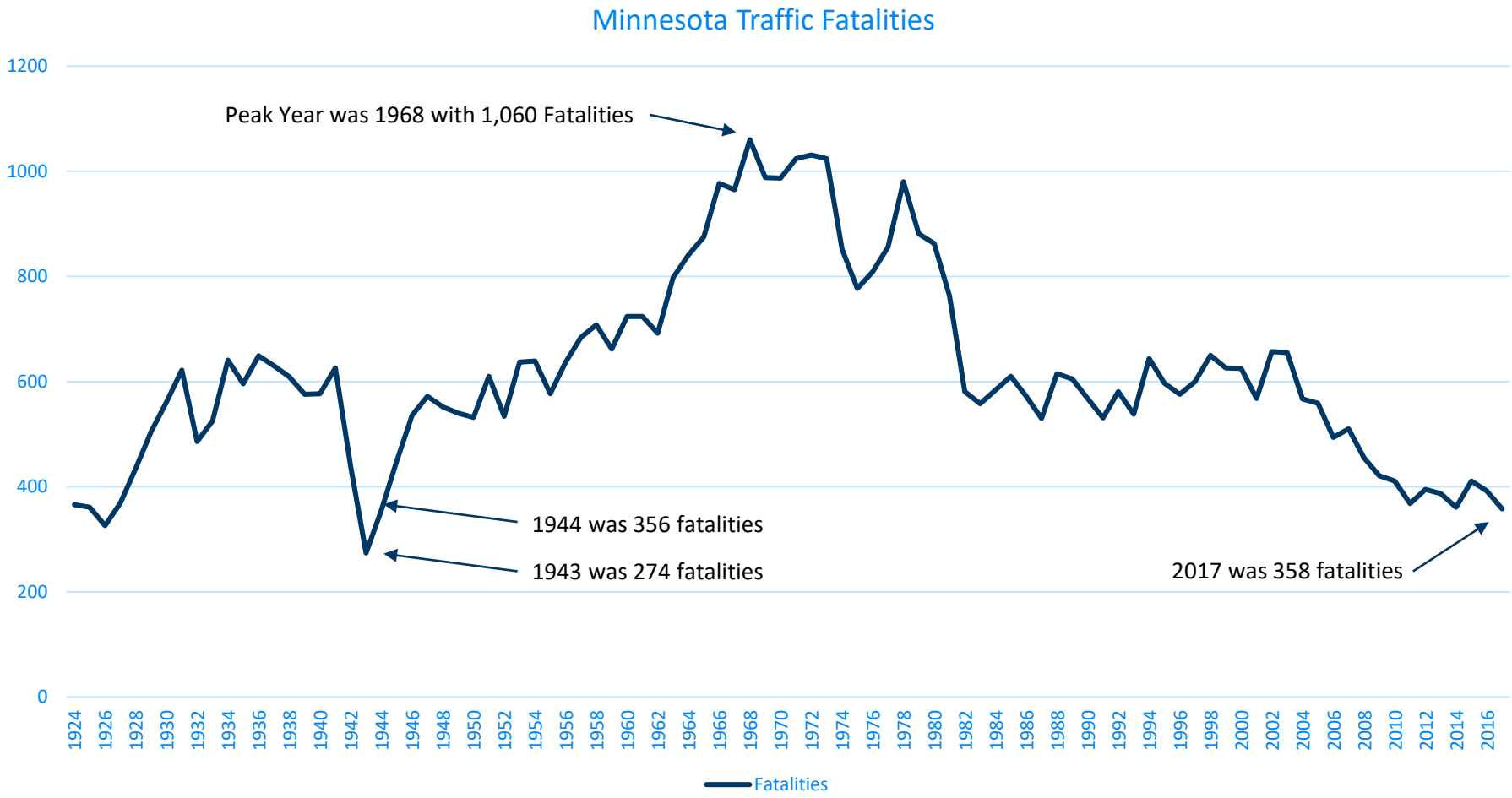


What is the Problem

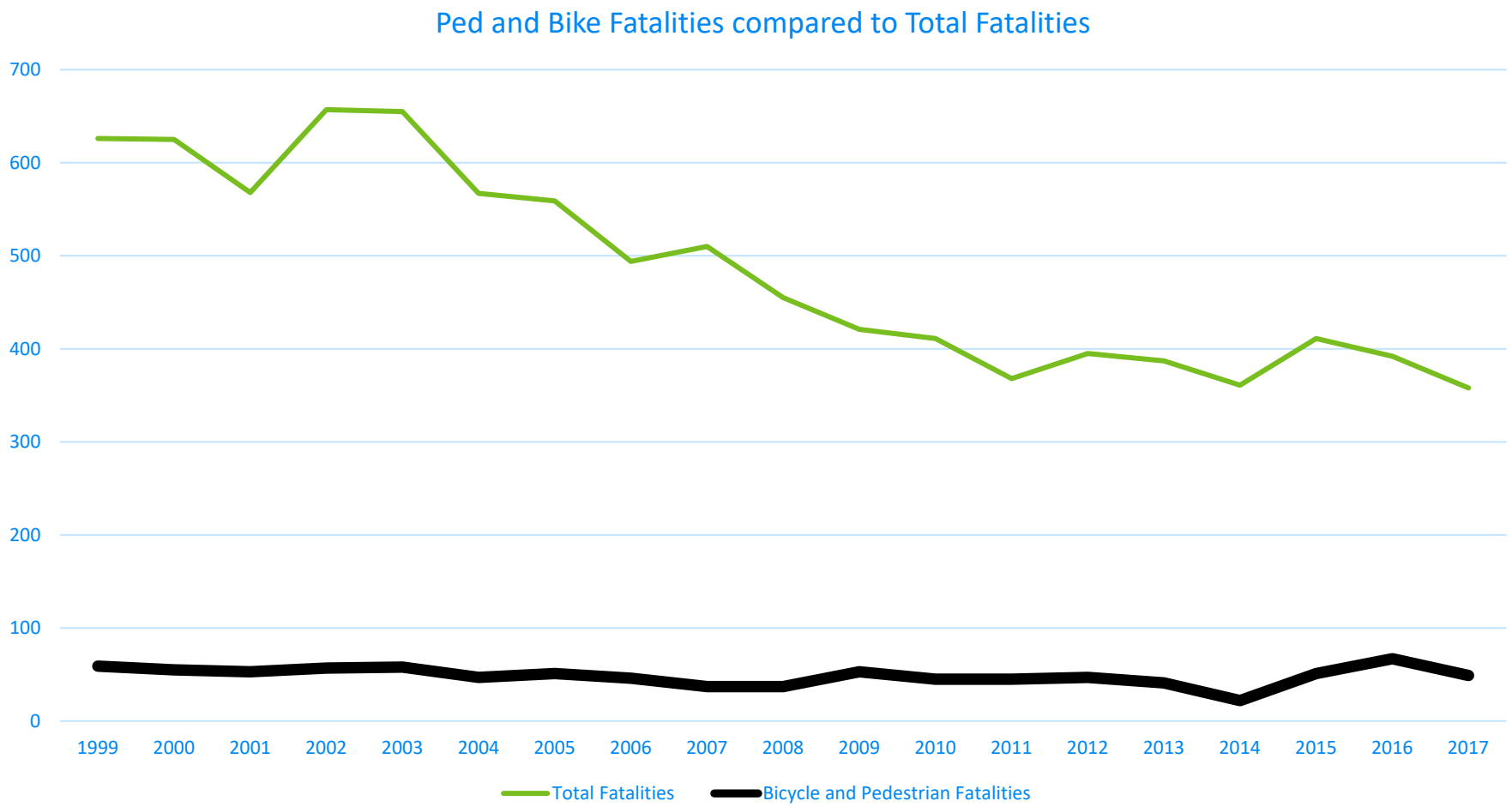
- Every year ~ 1,200 Pedestrians and Bicyclists are involved with Motor Vehicle Crashes
- 16 fatalities (2008) – 28 fatalities (2015)
- Average is around 22 fatalities/year
- Average about 100 serious injuries/year

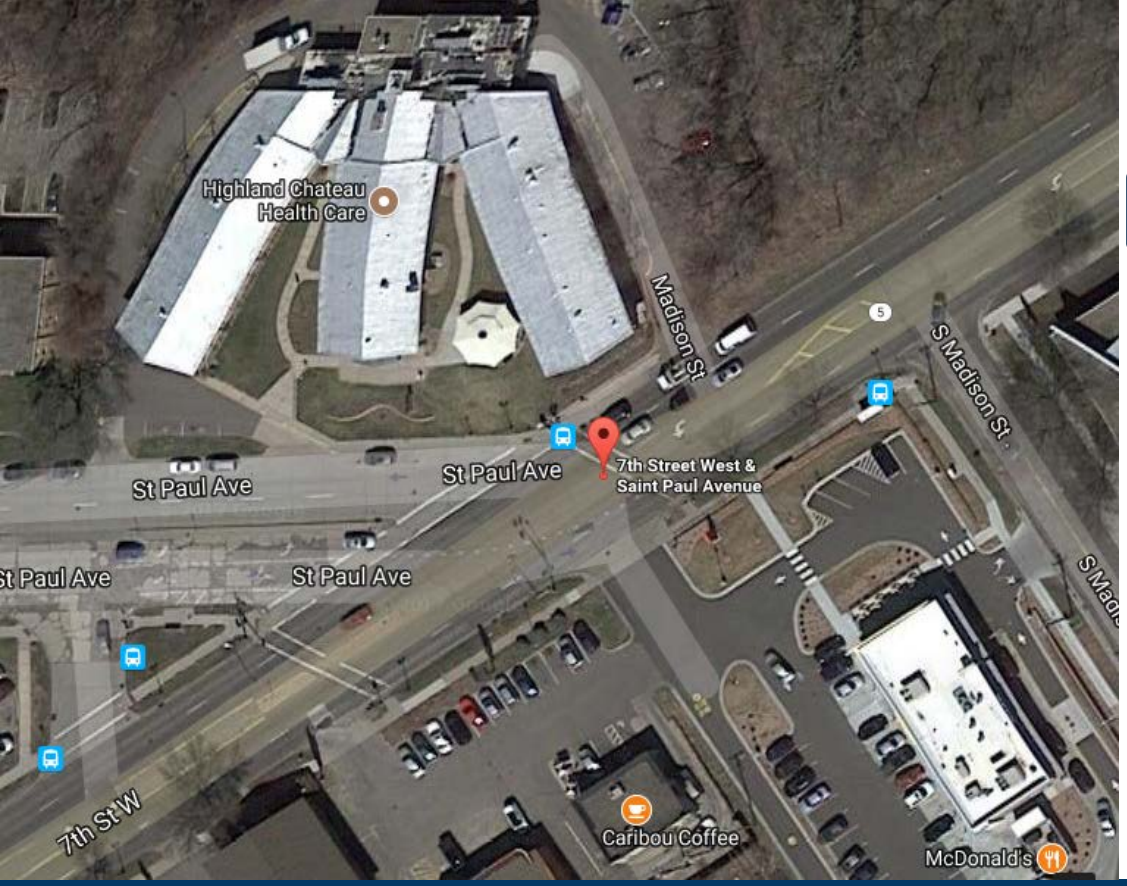


What is the Problem



What is the Problem





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Intersection Risk Assessment

Derek Leuer

Intersection Risk Assessments

- This is a ***data driven*** analysis
- Goal: To identify at - risk intersections and suggest countermeasures to reduce pedestrian and bicycle related fatal and serous injury crashes
- Fund safety directly (vs system continuity)
- Lots of requests (unknown if risk was real)
- Be Proactive, Not Reactive
- Expand; Preserve and Enhance
- Maximize Investment
- Mix Stand-Alone Projects and Project Enhancements
    - Pavement Program

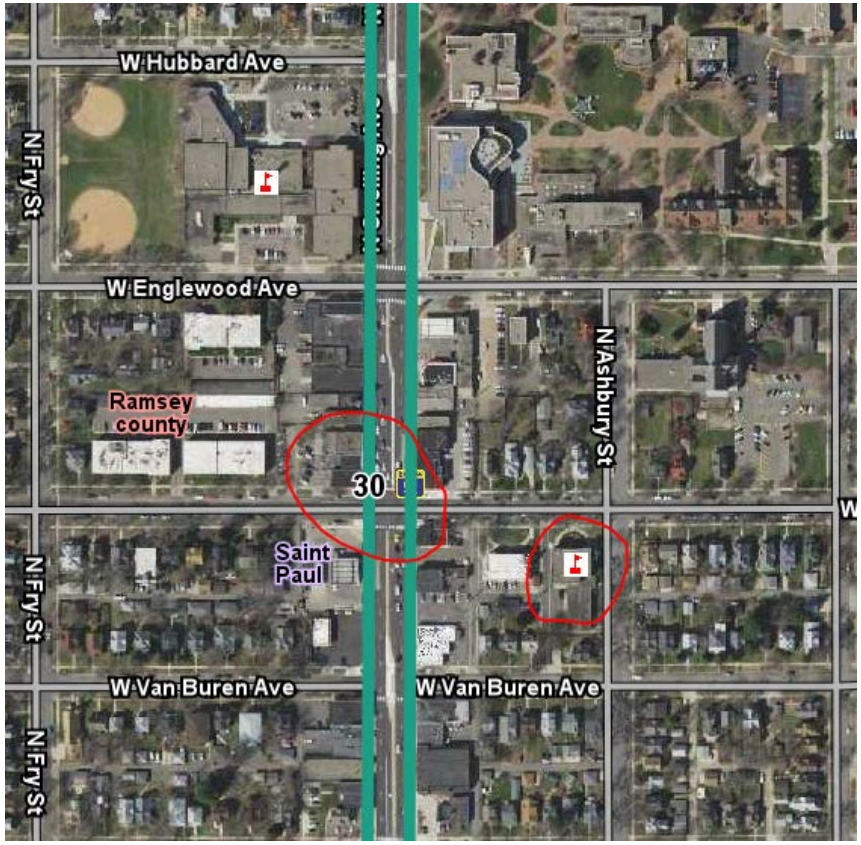
Data Collection

- Used Arc GIS, Google Maps, and Georilla to identify intersection characteristics
- Intersection Characteristics
  - Location information
  - Intersection type
  - Configuration
  - Traffic Control Device
  - Major and Minor Speed Limit
  - Major and Minor Turn Approach Lanes
  - Major Left Turn Lane
  - Major and Minor Left Signal
  - Lane Configuration
  - Traffic Volumes
  - On Street Parking
  - Ped Generator
  - Near School
  - Bus Stop
  - Marked Cross Walk
  - Major and Minor Median

Data Collection

Google Maps

Georilla / GIS

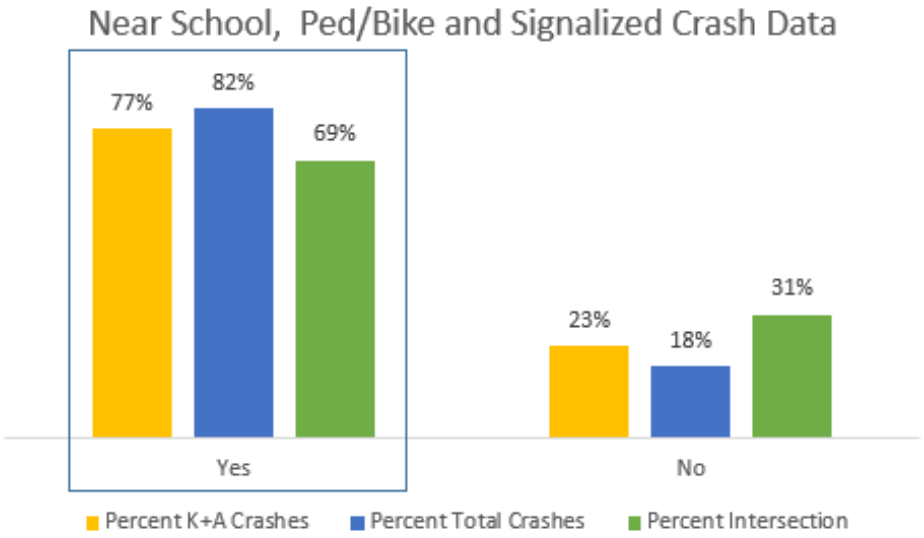


Data Analysis

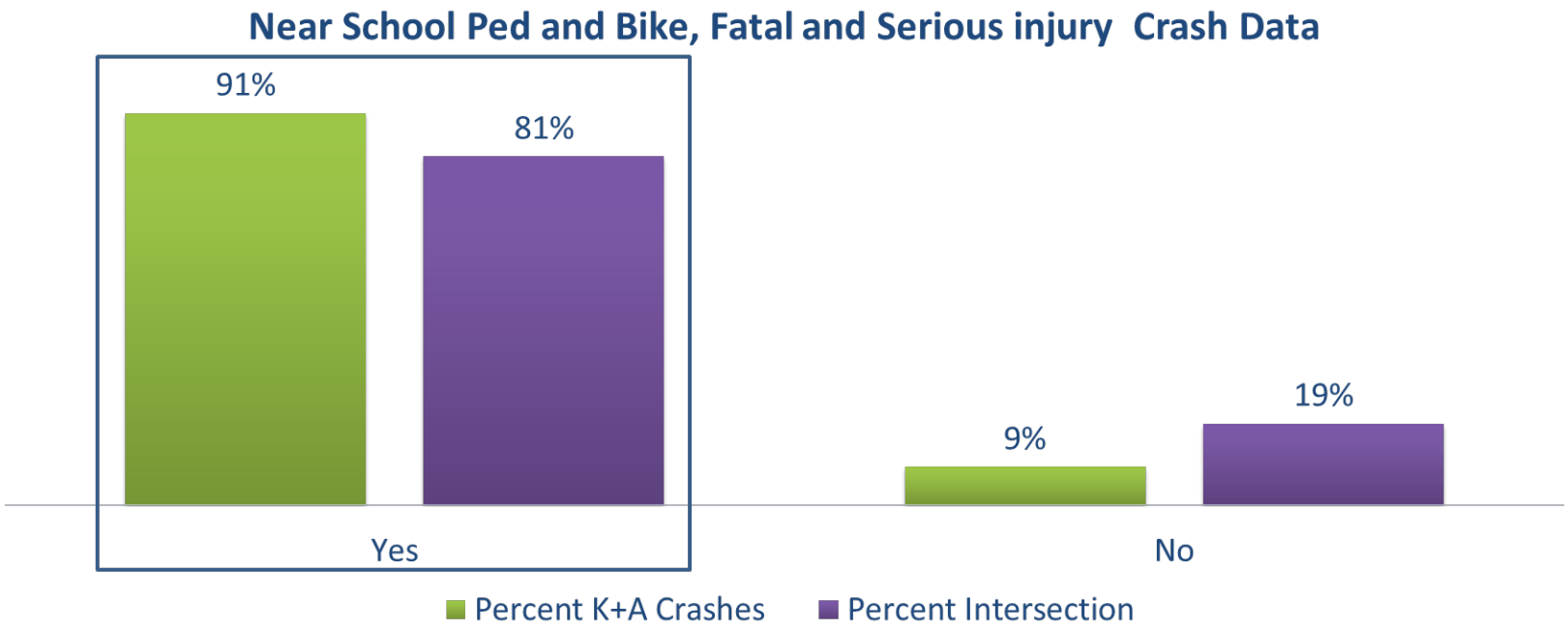
- Once all the characteristics for the intersections were collected - used Excel to analyze them
- Comparing the percentage of total crashes and K+A crashes to the percentage of intersections
- Characteristics with a percentage that was 10% higher crashes then the percentage of intersection was listed as a risk factor
- This may or may not be statistically significant

Data Analysis

Bus Stop	K+A Crashes	Total Crashes	# of Intersections	Percent K+A Crashes	Percent Total Crashes	Percent Intersection	Difference K+A	Difference Total
Yes	71	709	167	77%	82%	69%	8%	13%
No	21	153	74	23%	18%	31%	-8%	-13%
Total	92	862	241					



Data Analysis



* K+A Crashes = Fatal and Serious Injury

Risk Factors

- Now the risk factors were applied back to the intersections
- The goal is to create a rating system for the intersections and a list of higher risk intersections
- Set different risk factor limits to get the most severe crashes in the least amount of intersections

Risk Factors Metro Trunk Highways

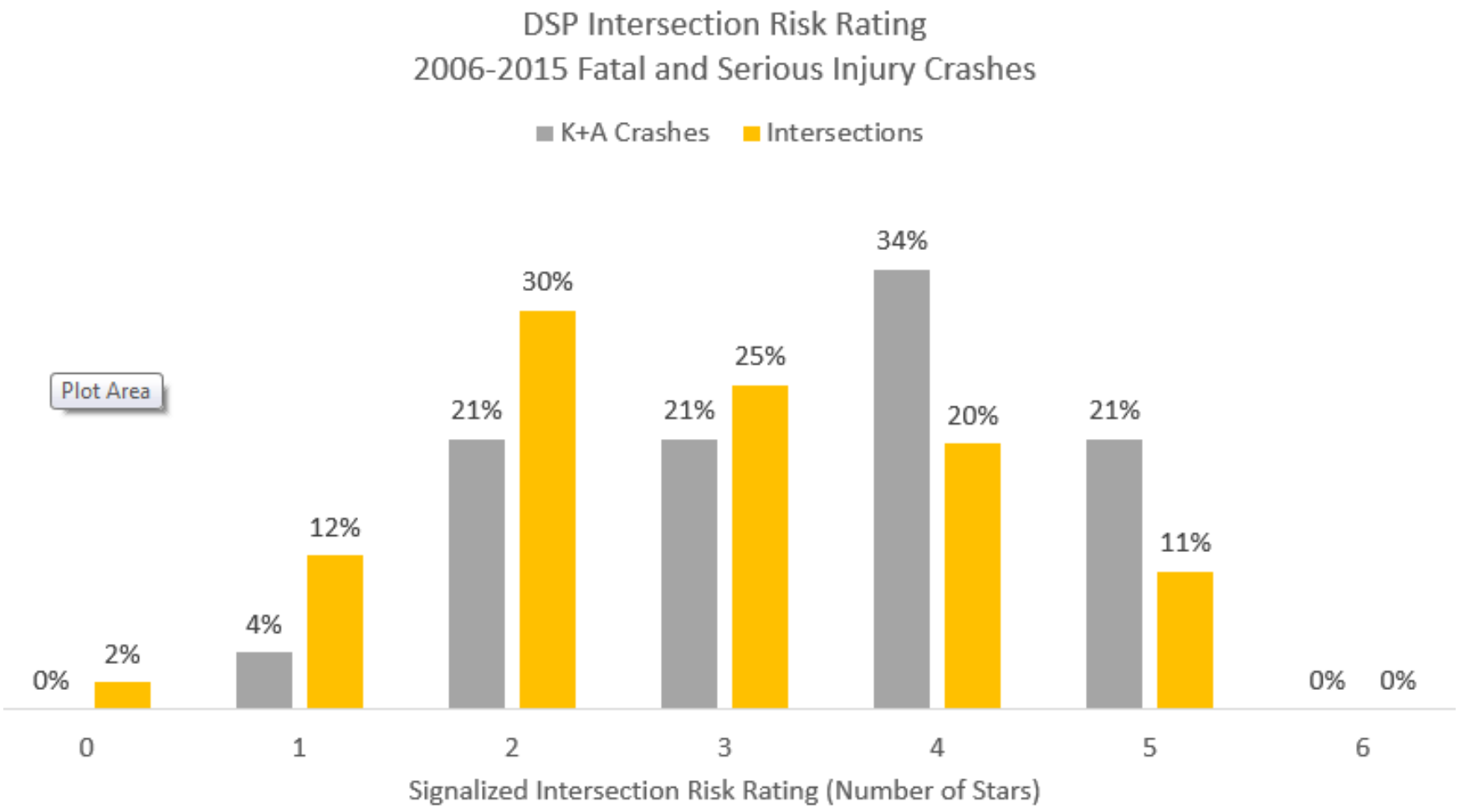
Signalized Risk Factors

- Bus Stop
- Major Median
- Major Speed Limit (35-50 mph)
- Near School
- Major Left Turn Signal (Protected)
- Approach Volume (25,001-35,000)
- Location Type (Suburban)
- Approach Volume (35,001-45,000)
- No on Street Parking

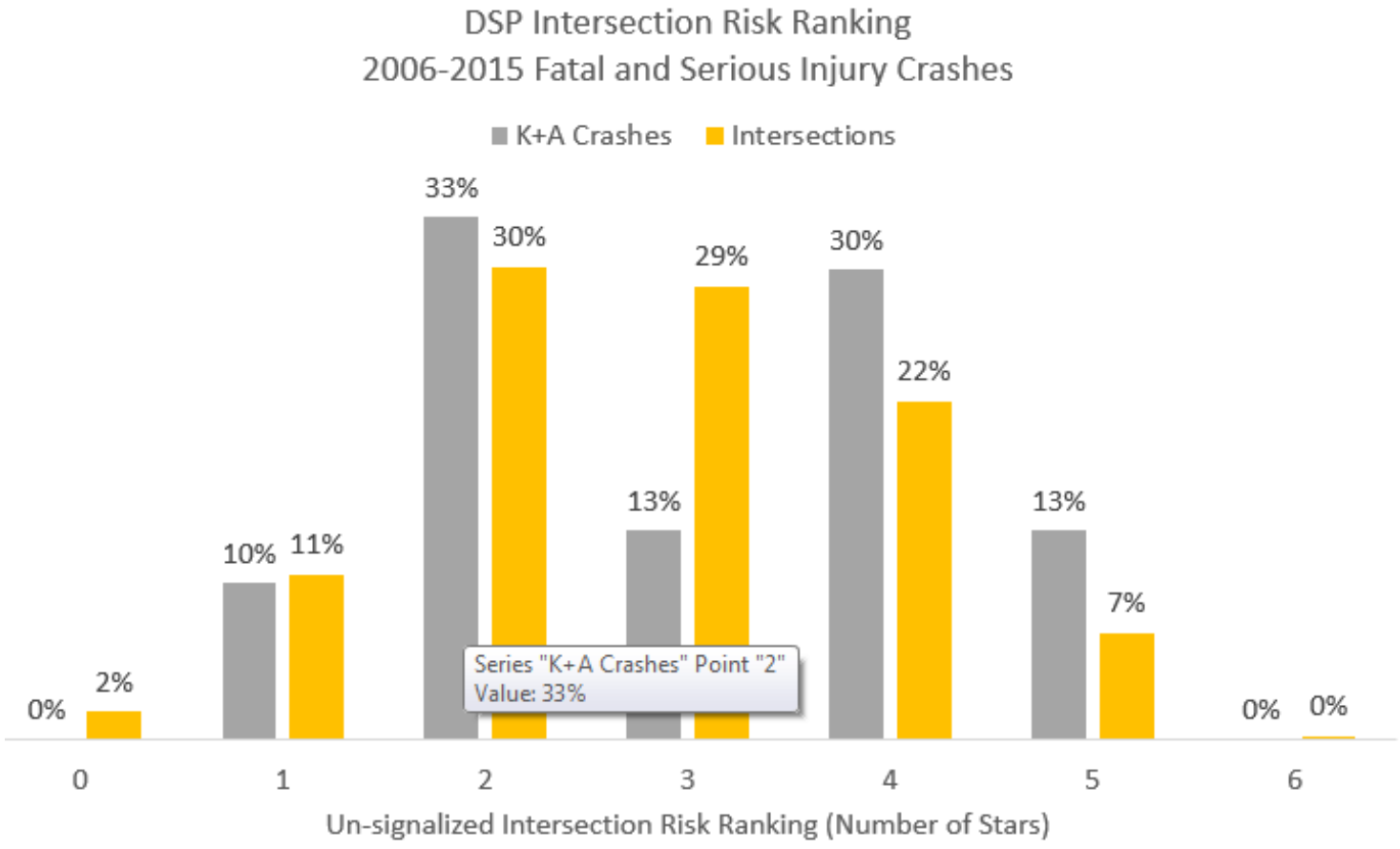
Un-Signalized Risk Factors

- No on Street Parking
- Location Type (Suburban)
- Speed Limit (30 or Less mph)
- Major Through Lanes (4)
- Major Median
- Near School
- Bus Stop
- Approach Volume (35,001-45,000)
- Location Type (Urban)
- Major Speed Limit (35-50 mph)
- Street Lighting (NONE)
- Number Legs (4)

Signalized Risk Factors



Unsignalized Risk Factors



Example of 5 Star Intersection

TH 5 (7th St. W) and St. Paul Ave

Signalized Risk Factors

- ★ • Bus Stop
- • Major Median
- ★ • Major Speed Limit (35-50 mph)
- • Near School
- ★ • Major Left Turn Signal (Protected)
- ★ • Approach Volume (25,001-35,000)
- • Location Type (Suburban)
- • Approach Volume (35,001-45,000)
- ★ • No on Street Parking

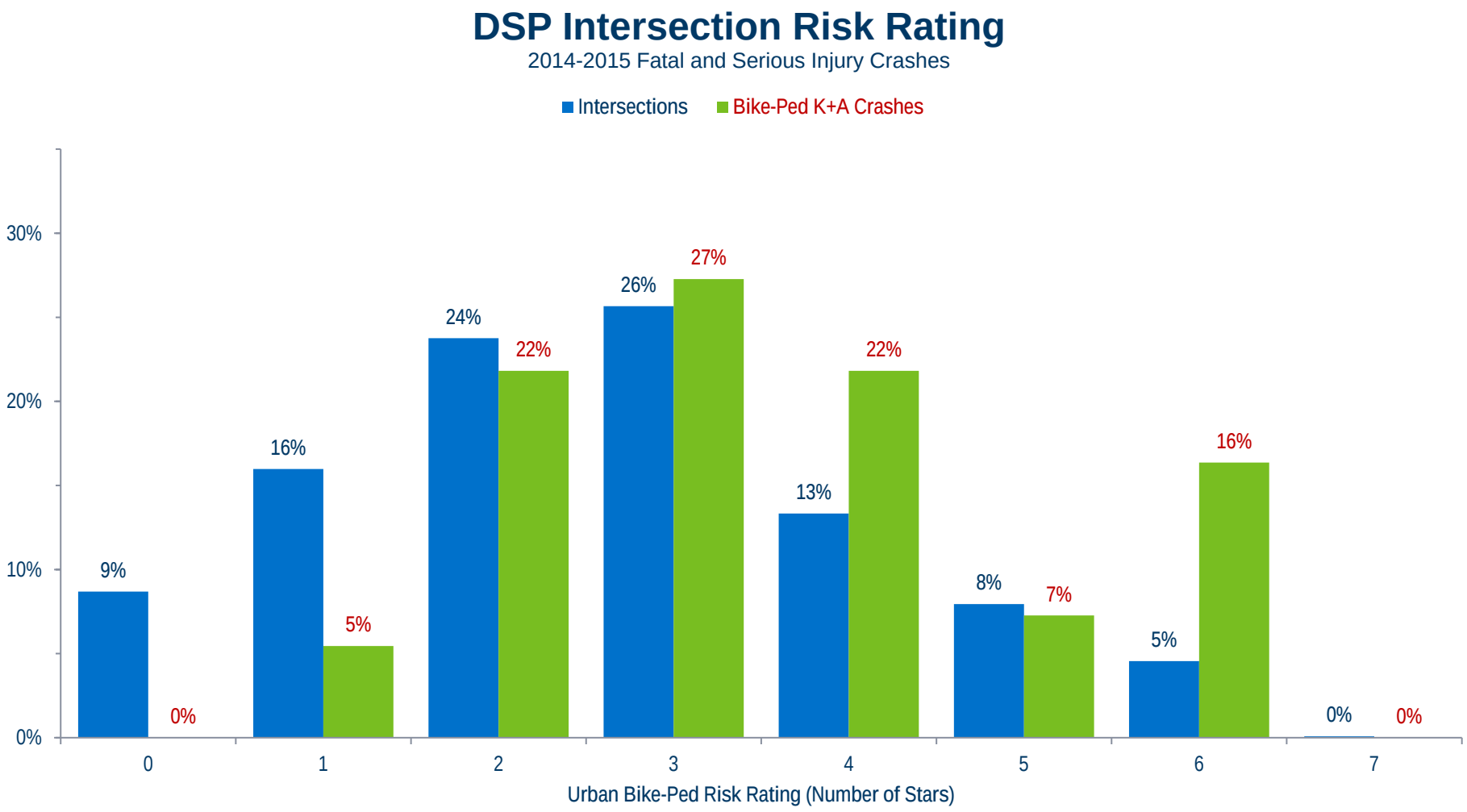
2016 District Safety Plans Update

	Minimum	Maximum
Urban Segments		
ADT	9000	Unlimited
Road Geometry	Multi-Lane (4+)	
Access Density	36	Unlimited
Speed Limit	35	45
Primary Land Use	Urban or Suburban Retail	
Severe HO + RE + SSP + SSO Crash History	0.019	
Urban Intersections - Right Angle		
Cross Product	3000000	Unlimited
Traffic Control	Signal	
Major Corridor Speed	40	Unlimited
Skew	5	Unlimited
Adjacent Curve	Present	
Primary Land Use	Urban or Suburban Retail	
Severe Right Angle Crash History	0.006	
Urban Intersections - Ped/Bike		
Cross Product	3000000	Unlimited
Traffic Control	Signal	
Major Corridor Speed	35	Unlimited
Skew	5	Unlimited
Adjacent Curve	Present	
Primary Land Use	Urban or Suburban Retail	
Severe Ped/Bike Crash History	0.001	

Metro Signalized Intersection Risk Factors

- Bus Stop
- Major Median
- Major Speed Limit (35-50 mph)
- Near School
- Major Left Turn Signal (Protected)
- Approach Volume (25,001-35,000)
- Location Type (Suburban)
- Approach Volume (35,001-45,000)
- No on Street Parking

2016 District Safety Plans Update



26% of the intersections had 45% of the crashes!

DEPARTMENT OF TRANSPORTATION

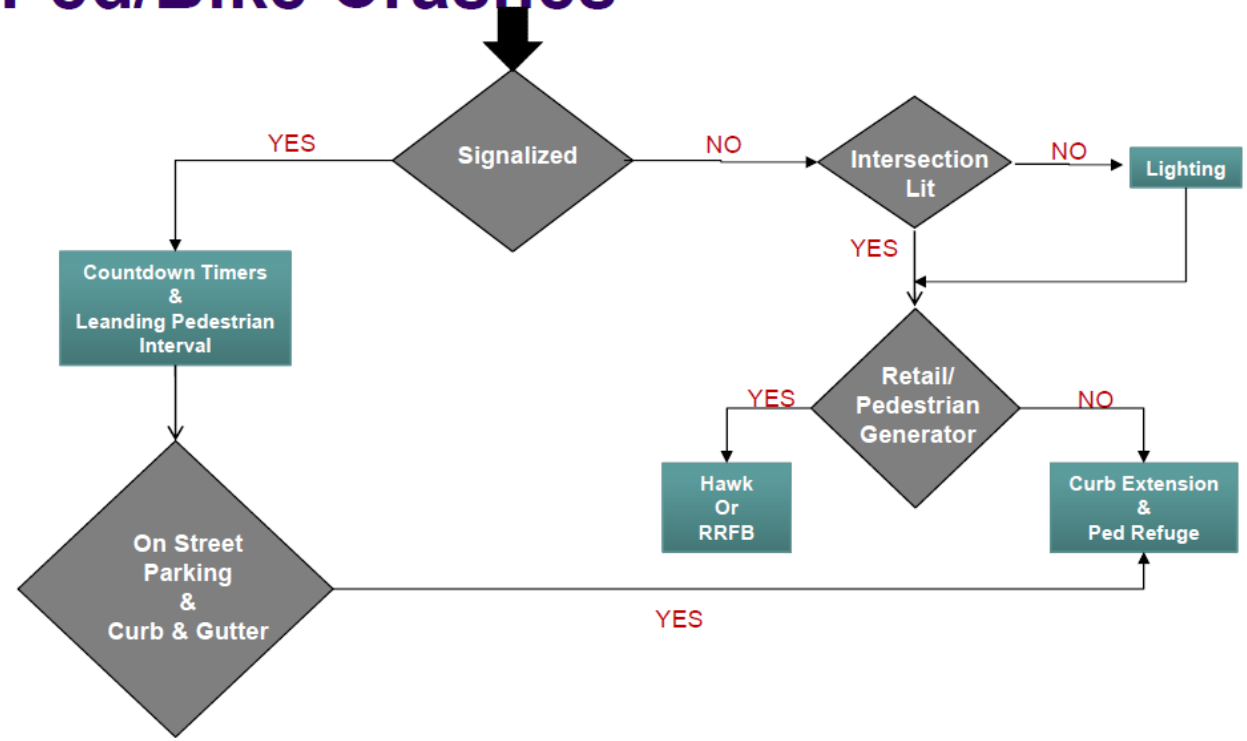
The End!

Questions? Discussions?

Derek Leuer

2016 District Safety Plans Update

Urban Intersections at Risk Ped/Bike Crashes



RRFB = Rectangular Rapid Flash Beacon

*Over 300 intersections had some type of project selected and assigned!

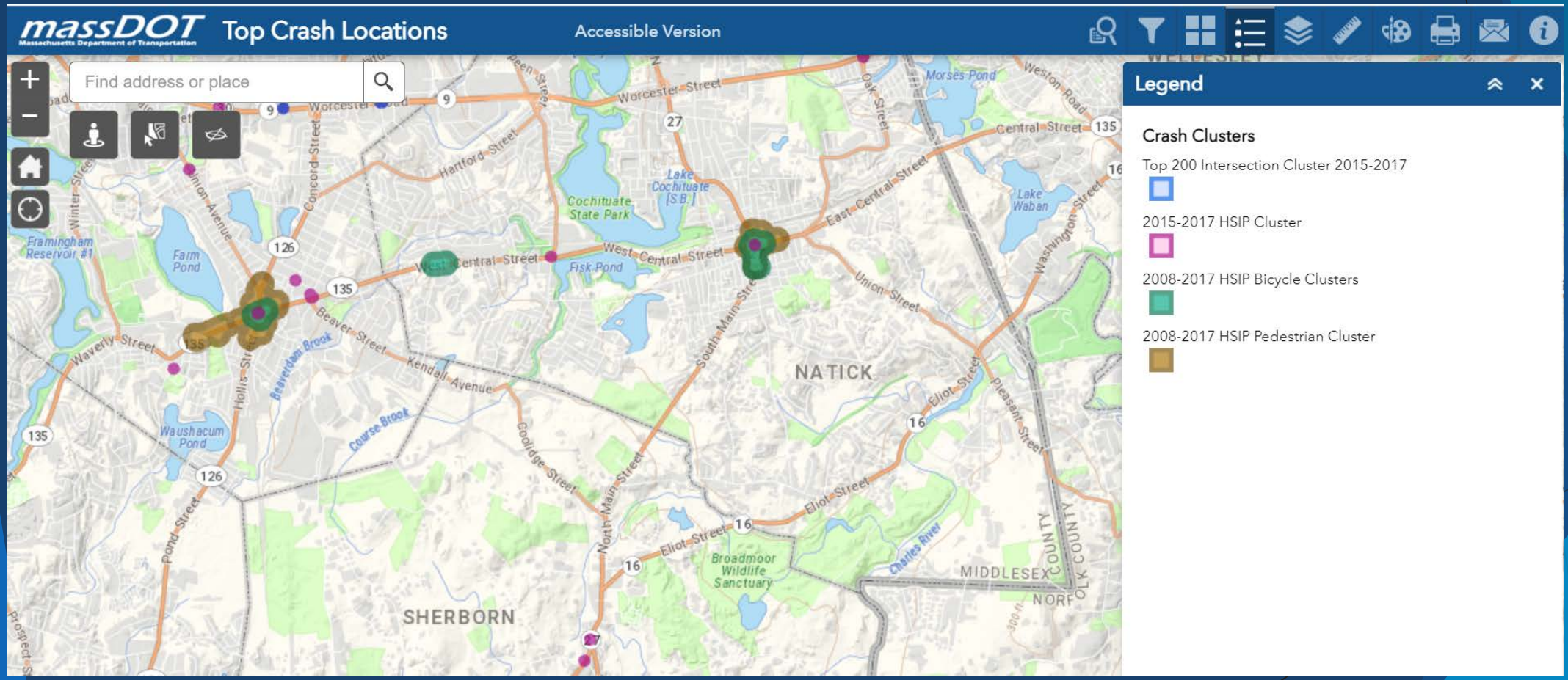
Crash and Risk Based Approaches to Safety in MA

Bonnie Polin

MassDOT – Traffic and Safety Engineering

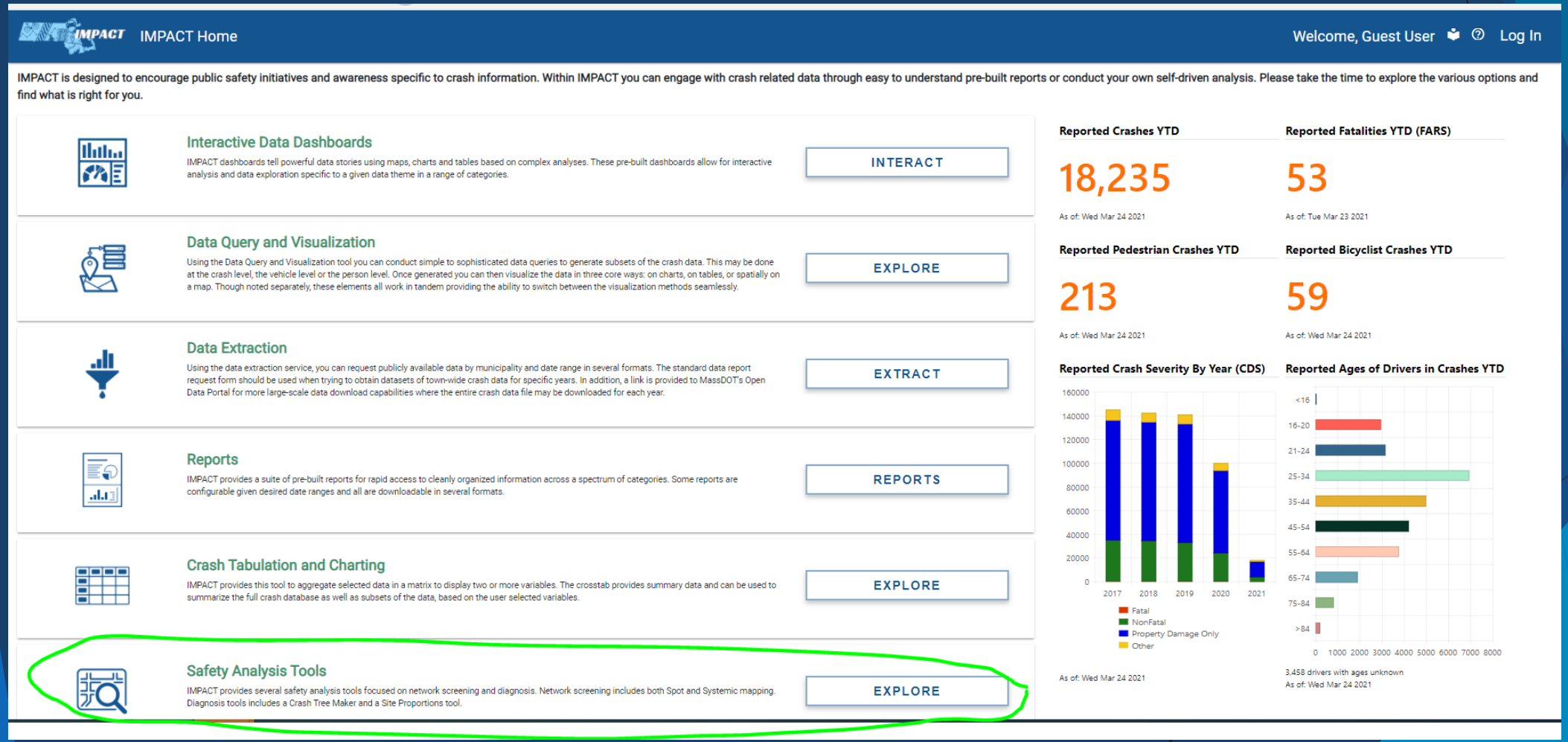
Existing Hot Spot / Crash Based Approach

https://gis.massdot.state.ma.us/topcrashlocations/

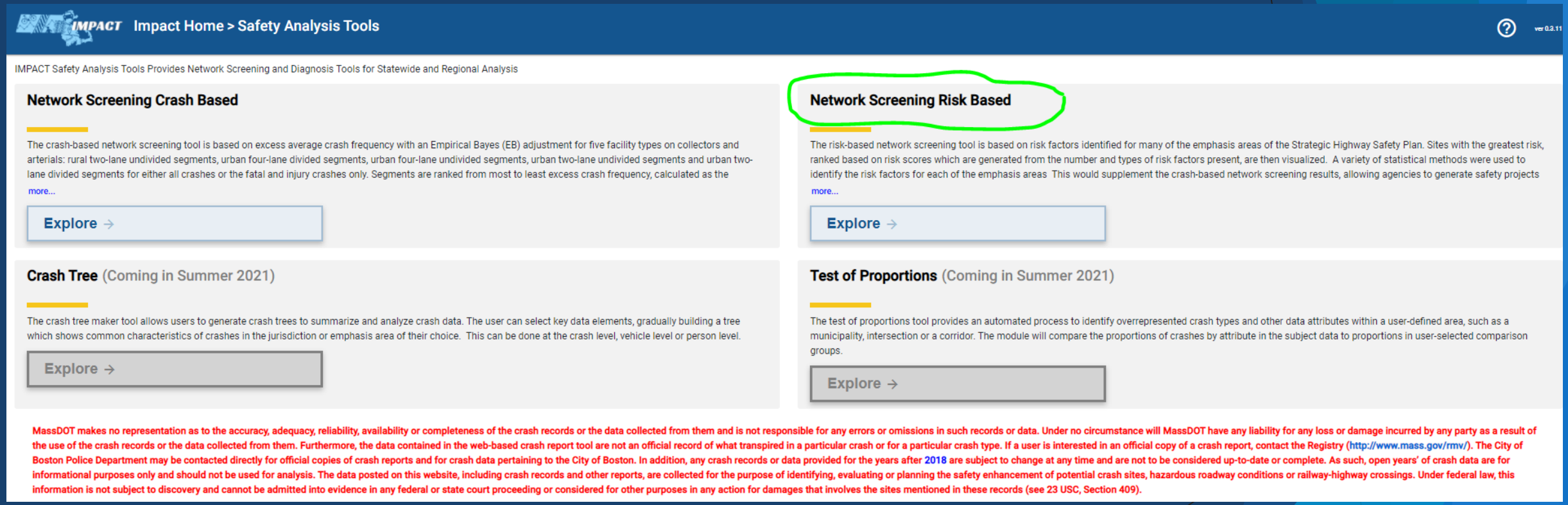


New Modules in IMPACT – Safety Analysis Tools

- IMPACT https://apps.impact.dot.state.ma.us/cdp/home



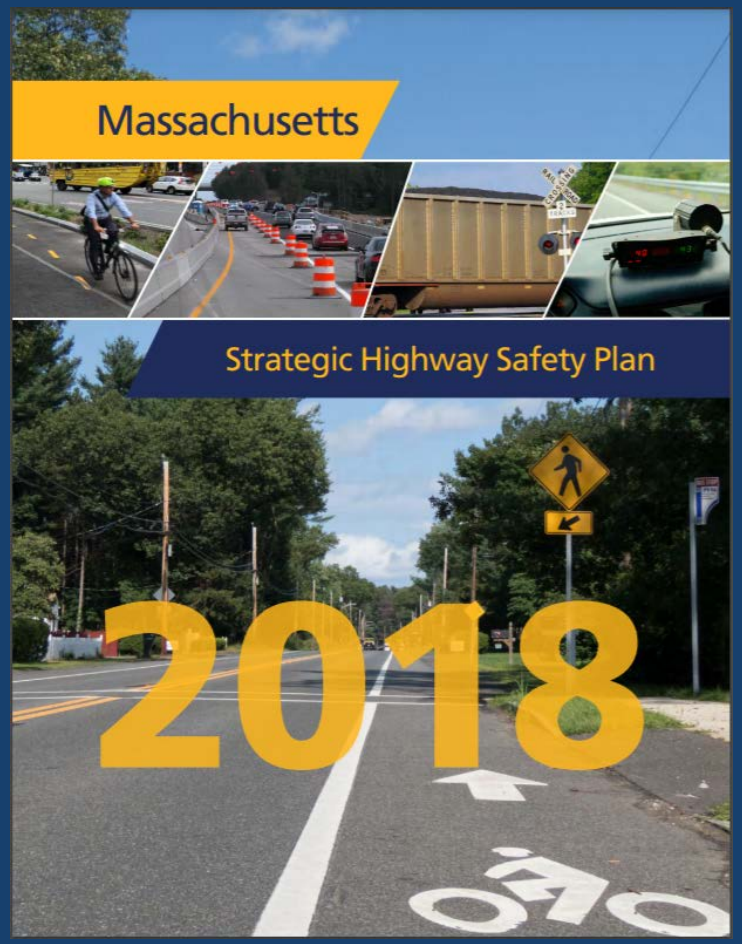
New Modules in IMPACT – Safety Analysis Tools



Network Screening Level – Risk Based Approach for SHSP Emphasis Areas

- A systemic approach to safety involves widely implemented improvements based on high-risk roadway features correlated with specific severe crash types. The approach helps agencies broaden their traffic safety efforts at little extra cost. [Source: FHWA - https://safety.fhwa.dot.gov/systemic/index.cfm]
  - The systemic approach does not replace the site analysis approach. There is a clear need to continue a level of focus on individual locations with large numbers of severe crashes.
  - The systemic approach is a complementary technique that supplements the site analysis approach and provides an expanded comprehensive and proactive approach to road safety efforts.
  - By using the systemic approach agencies can better meet the requirements for the Highway Safety Improvement Program, identifying highway safety improvement projects on the basis of both crash experience and crash potential to reduce fatal and serious injury crashes on all public roads.
  - The key to the systemic approach is evaluating an entire system using a defined set of criteria, which results in an inferred prioritization that indicates some elements of the system are better candidates for safety investment than others.
  - The system-based approach acknowledges that crashes alone are not always sufficient to establish an implementation prioritization of countermeasures across a system.

Network Screening Level –
Risk Based Approach for SHSP Emphasis Areas



Emphasis Areas

based upon average fatalities (2012-2016)

- Lane Departure Crashes [198]
- Impaired Driving [124]
- Occupant Protection [102]
- Speeding and Aggressive Driving [97]
- Intersection Crashes [96]
- Pedestrians [80]
- Older Drivers [74]
- Motorcycle Crashes [49]
- Younger Drivers [41]
- Large Truck-Involved Crashes [34]
- Driver Distraction [30]
- Bicyclists [10]
- Safety of Persons Working on Roadways [2]
- At-Grade Rail Crossings [1]

Defining the SHSP Emphasis Areas

In response to the ELC analysis, 14 EAs were created for the 2018 SHSP. Narrowing in on these categories provided a foundation for targeting improvements and moving toward the long-term goals. However, to be successful, the approach must be coordinated and multidisciplinary.

For each EA team, a leader was identified to organize and coordinate activities.

The SHSP is a comprehensive effort across the transportation safety spectrum, including Federal, state, regional, local, nonprofit, and private sector stakeholders, and employs a data-driven, multidisciplinary approach to address the critical elements of safety —engineering, education, enforcement, emergency response, legislation, and policy as well as data integration and quality. As a result, a multidisciplinary team of stakeholders was created for each of the 14 EAs, and a series of in-depth data analyses were completed. The EA teams met (from 1 to 4 times) to examine the issues, combine resources, document ongoing and future programming, and create a five-year action plan made up of strategies and actions with the goal of improving safety within their EA. Yet there is a notable overlap between the EAs. Consider as an example a scenario in which a younger driver that was speeding on a motorcycle departed the lane. Understanding the interconnected nature of crashes, the EA teams worked together to address the overlap of issues from one EA to the next. Collaboration is key to SHSP success, and the 2018 SHSP included active participation within the 14 EA teams by more than 250 stakeholders representing over 50 agency partners.

Network Screening Level – Risk Based Approach for SHSP Emphasis Areas

Risk model factors for various emphasis areas and road types

Table 1: Binary Logit Model for Pedestrian KA Crashes on Principal Arterials.

Variable	Odds Ratio	Standard error	z-value	P>|z|	95% Confidence Interval	
3 or more travel lanes, both directions	1.72	0.12	7.63	<0.01	1.49	1.97
Presence of median	0.37	0.03	-11.00	<0.01	0.31	0.44
AADT over 15,000	1.53	0.10	6.55	<0.01	1.35	1.74
Segment length (miles)	4.28	0.51	12.08	<0.01	3.38	5.41
Transit stop presence (rail and/or bus) on road segment	1.88	0.14	8.58	<0.01	1.62	2.17
Two or more MassGIS EJ flags	1.24	0.11	2.47	0.01	1.04	1.46
Median household income	0.49	0.06	-5.88	<0.01	0.38	0.62
Transit stop density	1.90	0.23	5.18	<0.01	1.49	2.42
Proportion of employment in the accommodation, food services, or retail trades	1.45	0.16	3.30	<0.01	1.16	1.80
Employment density	2.65	0.39	6.66	<0.01	1.99	3.53
Population density	2.13	0.34	4.68	<0.01	1.55	2.92
Constant	0.004	0.0005	-43.80	<0.01	0.003	0.005

Table 1. Binary logit model for bike KAB crashes on principal arterials.

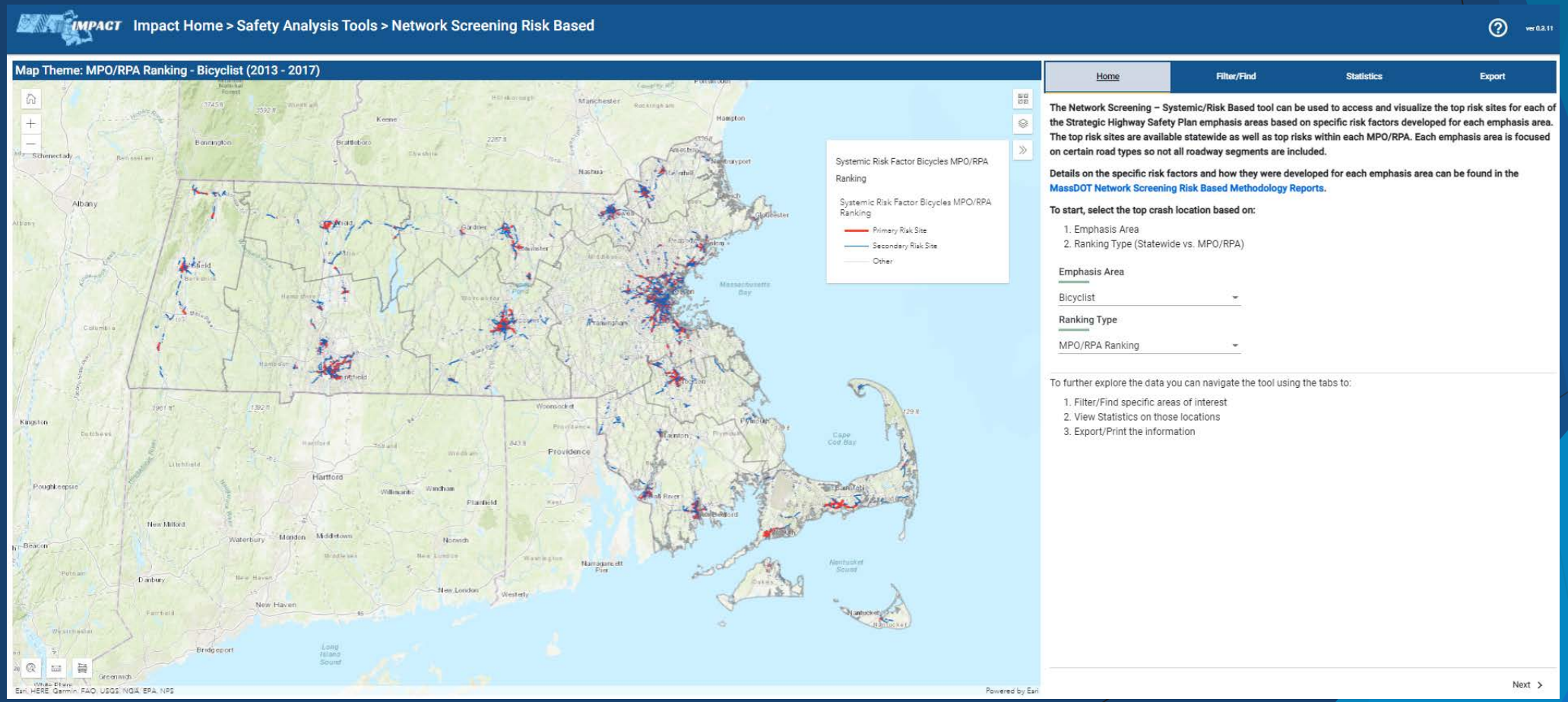
Variable	Odds Ratio	Standard error	z-value	P>|z|	95% Confidence Interval	
3 or more travel lanes, both directions	0.92	0.07	-1.11	0.27	0.79	1.07
Presence of median	0.52	0.05	-6.82	<0.01	0.43	0.63
AADT over 15,000	1.30	0.08	4.12	<0.01	1.15	1.48
Segment length (miles)	4.45	0.64	10.41	<0.01	3.36	5.90
Transit stop presence (rail and/or bus) on road segment	1.83	0.13	8.73	<0.01	1.60	2.09
Median household income	1.87	0.23	5.14	<0.01	1.47	2.38
Proportion of commuters that walk, bicycle, or take transit	2.60	0.39	6.40	<0.01	1.94	3.49
Proportion of households without a motor vehicle	2.07	0.30	5.00	<0.01	1.56	2.75
Proportion of employment in the accommodation, food services, or retail trades	1.67	0.18	4.63	<0.01	1.34	2.07
Employment density	3.39	0.52	7.91	<0.01	2.50	4.58
Population density	5.57	0.96	9.98	<0.01	3.98	7.81
No shoulder wider than 4 feet on either side of the road segment	1.49	0.13	4.71	<0.01	1.26	1.75
Constant	0.0005	0.0001	-50.2	<0.01	0.0004	0.0007

Table 3. Binary Logit Regression Model for "Exceed Speed Limit" Non-Intersection Crashes on Principal Arterial - Others

Variable	Odds Ratio	Standard Error	z-value	P>|z|	95% Confidence Interval	
Natural log of segment length (miles)	2.81	0.30	9.55	<0.001	2.28	3.48
AADT between 30,000 and 60,000 vehicles per day	2.63	0.53	4.78	<0.001	1.77	3.91
AADT exceeding 60,000 vehicles per day	4.06	1.92	2.97	0.003	1.61	10.25
Weighted average degree of curvature 5 or more degrees per 100 feet[4]	1.98	0.33	4.16	<0.001	1.44	2.73
Posted speed limit of 30 mph	1.28	0.23	1.38	0.167	0.90	1.81
Sidewalk present on at least one side of the segment[5]	1.75	0.39	2.53	0.011	1.13	2.70
Segment is in PVPC	1.43	0.33	1.59	0.113	0.92	2.24
Maximum absolute difference in posted speed limit of 15 mph	3.03	2.20	1.52	0.128	0.73	12.59
Maximum absolute difference in posted speed limit of 25 mph	20.61	21.54	2.90	0.004	2.66	159.8
Constant	0.05	0.02	-8.39	<0.001	0.02	0.09

Network Screening Level –
Risk Based Approach for SHSP Emphasis Areas

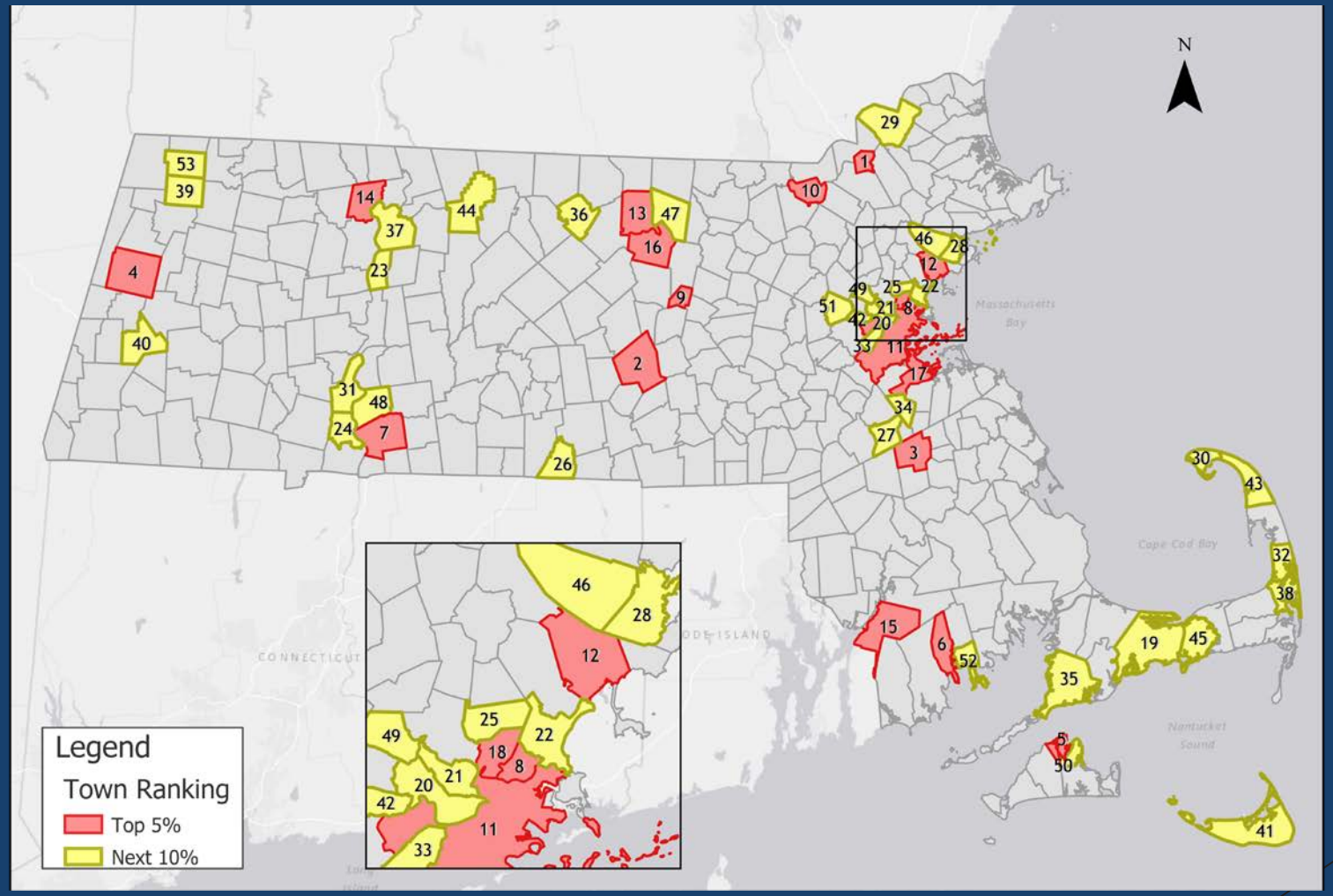
https://apps.impact.dot.state.ma.us/sat/NetworkEmphasisArea



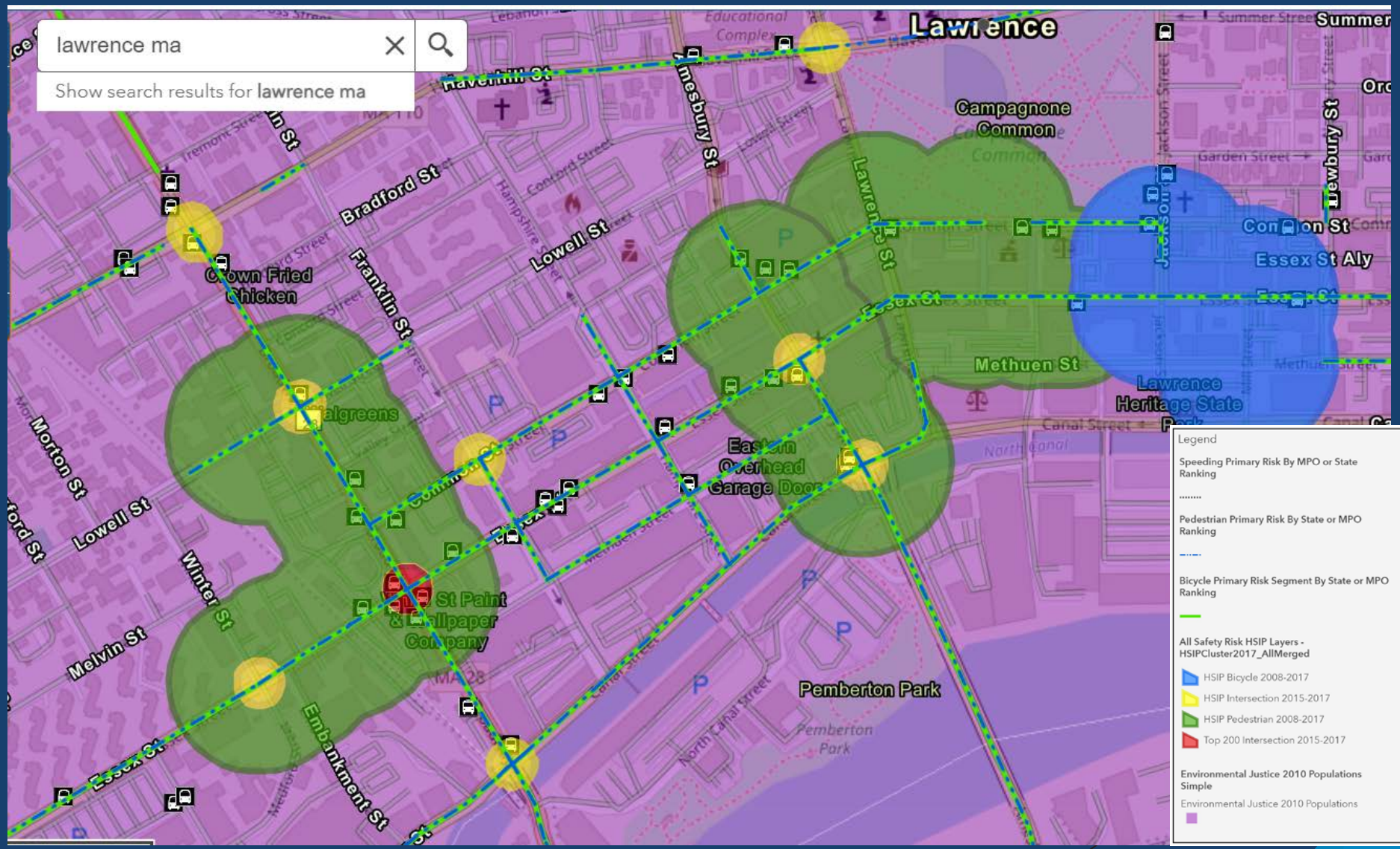
Network Screening Level – Combination

Bike and Pedestrian Related Risk and Hot Spots

Web map for combination risks / crashes (Internal only for now)



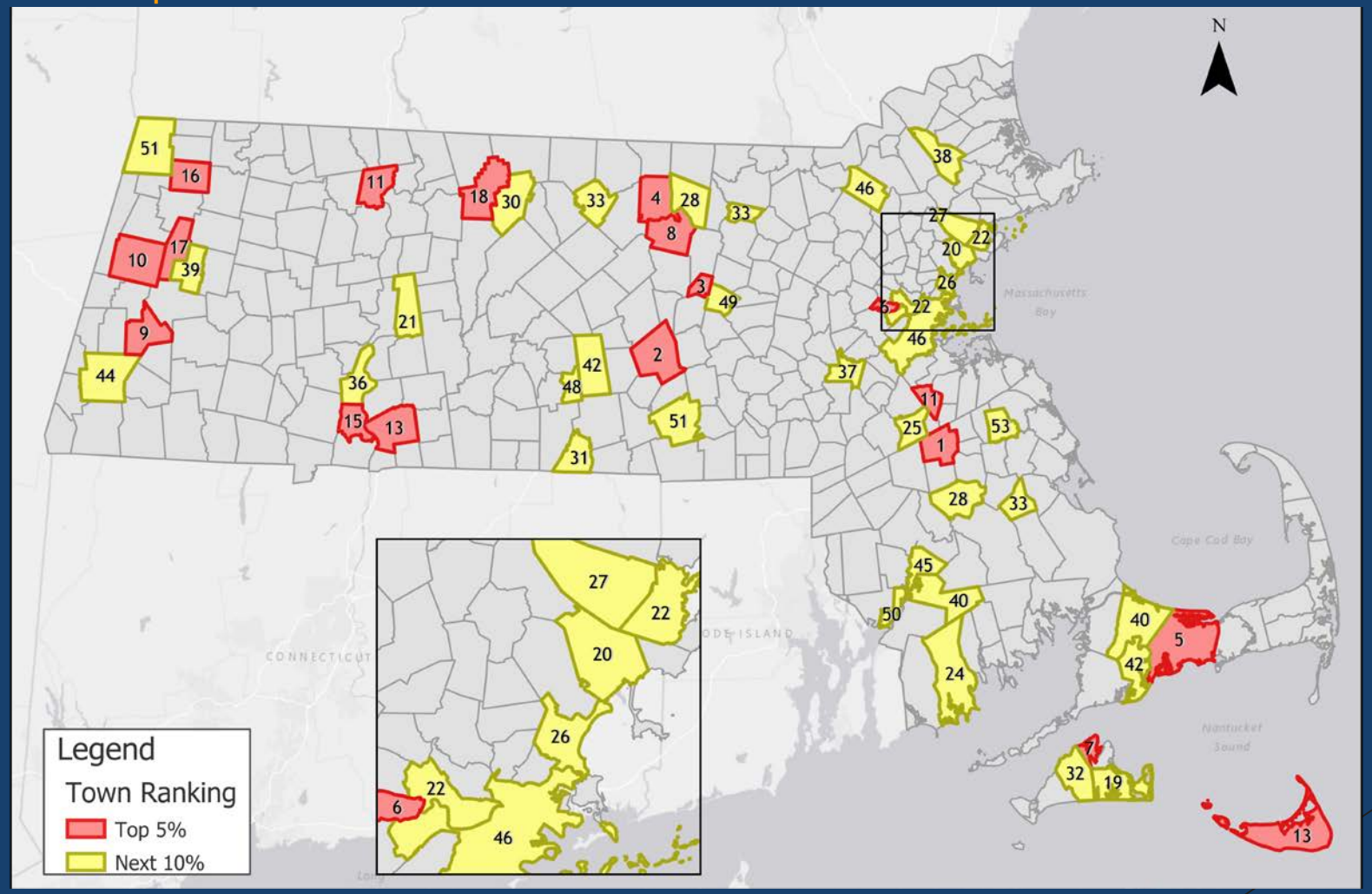
Network Screening Level - Combination



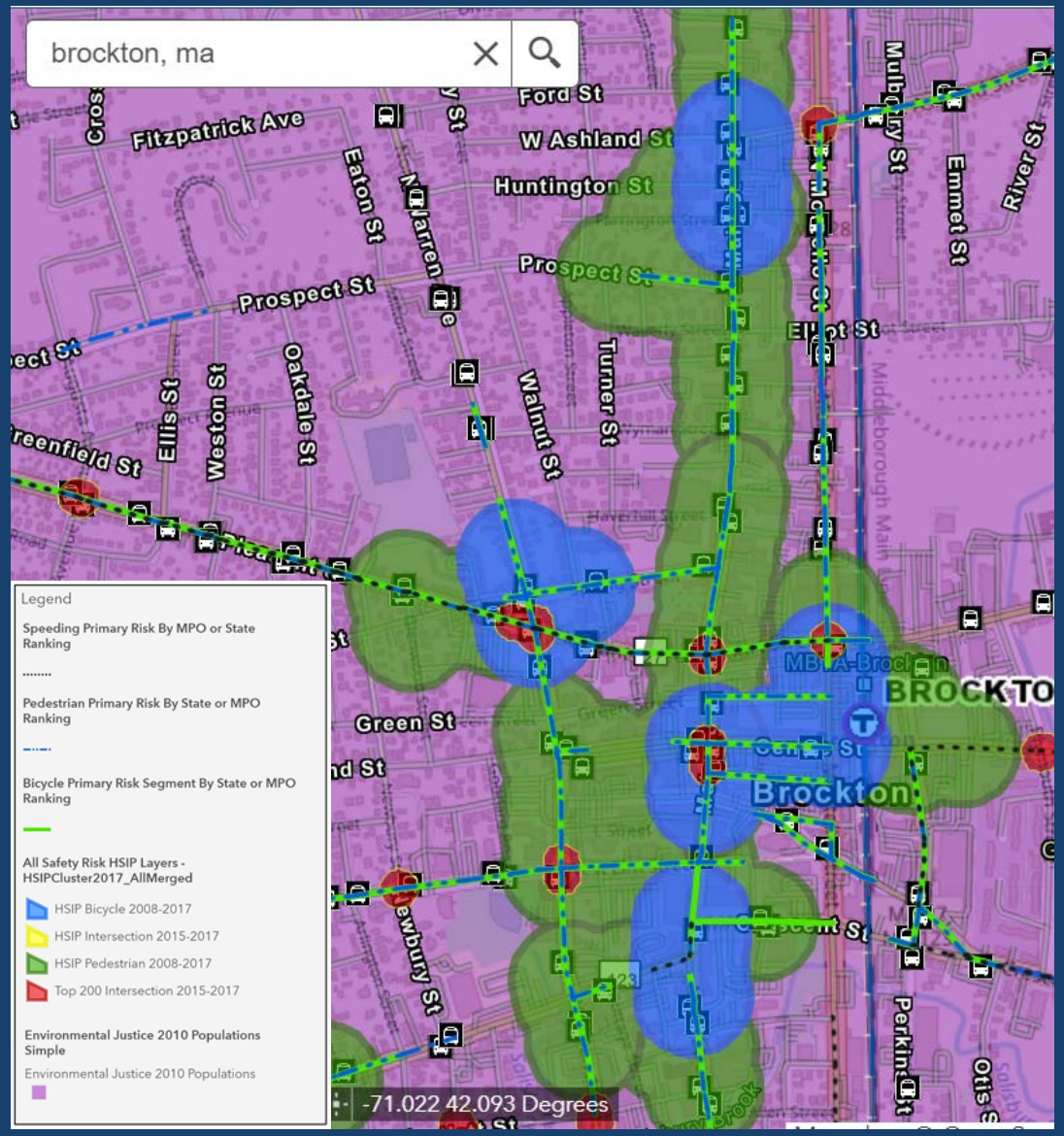
Network Screening Level – Combination

Bike, Pedestrian, and Speed Related Risk

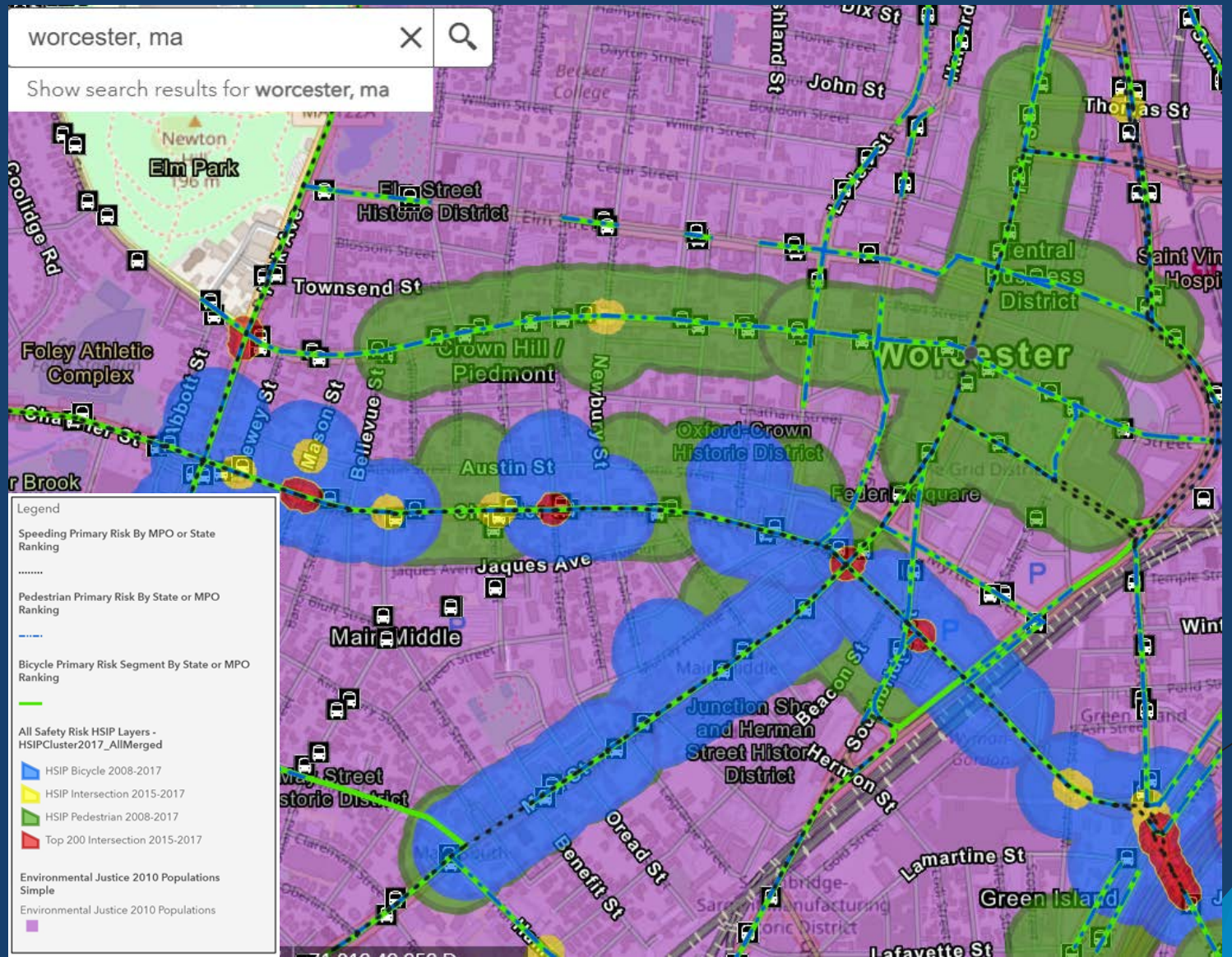
Web map for combination risks / crashes (Internal only for now)



Network Screening Level – Combination



Network Screening Level – Combination



Crash and Risk Based Approaches to Safety in MA

Thank you,
Bonnie Polin

Overview and findings from NCHRP Synthesis 558

Availability and Use of Pedestrian Infrastructure Data to Support Active Transportation Planning



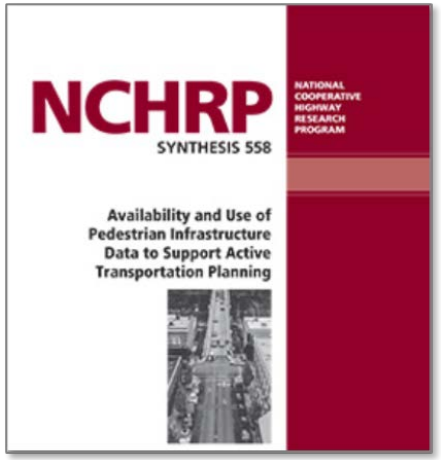
Michelle Morgan
Washington State Department of Transportation
Information Technology Division

Background

Objective

Document how state DOTs are collecting, managing, sharing, and analyzing pedestrian infrastructure data, including

- Mechanisms
- Types, variables, attributes and formats of data being collected
- How data consistency is ensured
- How state DOTs use and analyze data for decision making



Contributors

Kim Voros, *Planning Associate/GIS Group Manager with Alta Planning + Design*

Hugh Louch, *Formerly a Principal with Alta Planning + Design and currently Deputy Director for Planning at San Francisco County Transportation Authority*

Erin David, *Planning Associate with Alta Planning + Design*

Background

Methodology to Assess State of the Practice

- Literature review involving roadway, bicycling, and pedestrian infrastructure
- Online survey of state DOTs distributed to state bicycle and pedestrian coordinators
- Follow-up phone interviews with representatives from 5 state DOTs representing diverse collection frameworks, different geographies, and various development contexts

Literature Review

Colorado Department of Transportation (CDOT): ADA Transition Plan, 2017. Colorado's ADA transition plan.

Florida Department of Transportation (FDOT): Transportation Data and Analytics Office Handbooks, 2017. Data collection methods used in Florida.

New Jersey Department of Transportation (NJDOT): New Jersey County Road Sidewalk Inventory, 2007. Methods used for sidewalk inventory.

New York State Department of Transportation (NYSDOT): Sidewalks and Curb Ramps on the New York State-Owned Highway System, 2013. Methods used for sidewalk and curb ramp inventory.

North Carolina Department of Transportation (NCDOT): Pedestrian and Bicycle Information Network (PBIN) Project, 2019. Ongoing pedestrian infrastructure data collection project.

Washington Department of Transportation (WSDOT): Sidewalk Data in King County's Urban Growth Boundary, 2013. Methods and data collected for King County by WSDOT and partners.

Delaware Valley Regional Planning Commission (DVRPC): Pedestrian Facilities Inventory, 2019. Ongoing pedestrian inventory effort.

Case Studies

- Kentucky
- Louisiana
- New Hampshire
- Utah
- Washington

Items addressed in more depth include

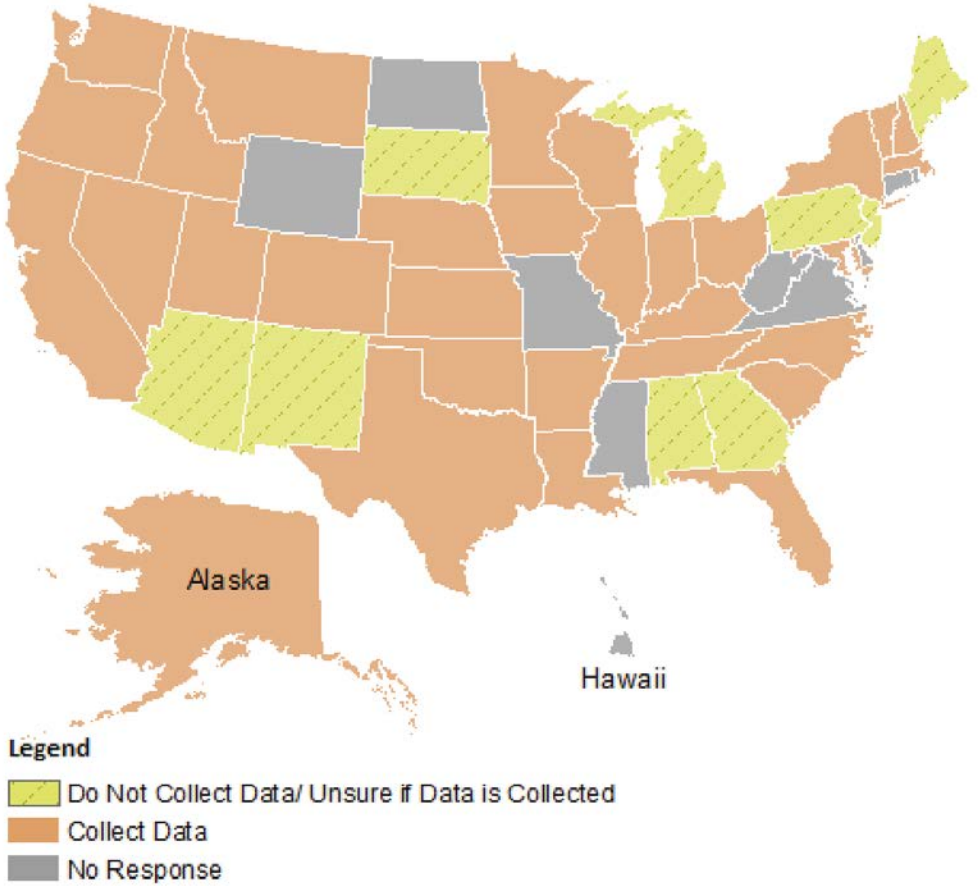
- Assessment of data collection
- Facility and pedestrian network definition
- Data collection methods, management, sharing, and responsible parties
- Data consistency
- Data maintenance and update strategy
- Program Funding

Key Findings

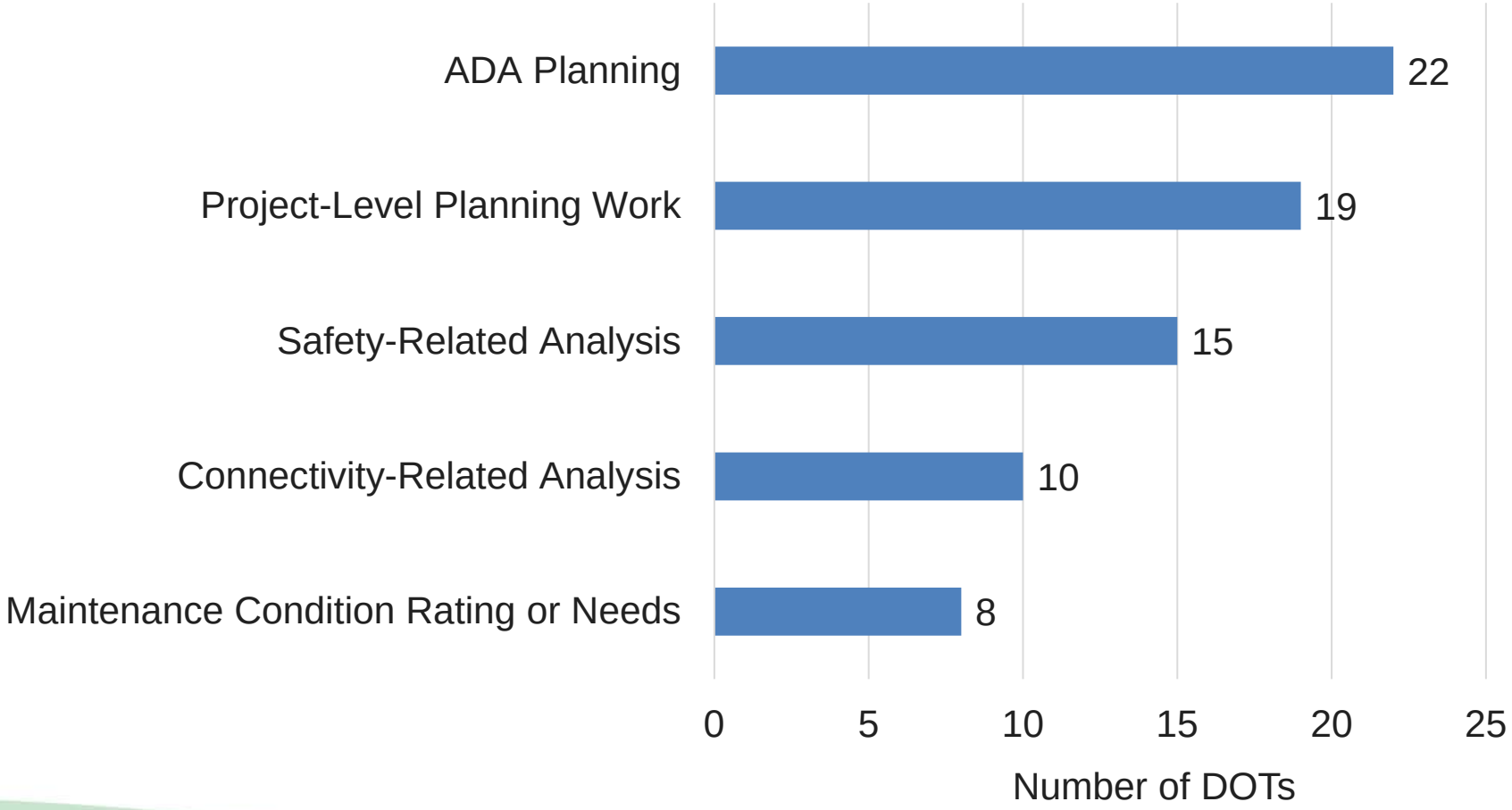
31 of the 40 (78%) responding DOTs report that they collect pedestrian infrastructure data

No consistent definition of what pedestrian infrastructure includes or how the data should be collected and stored

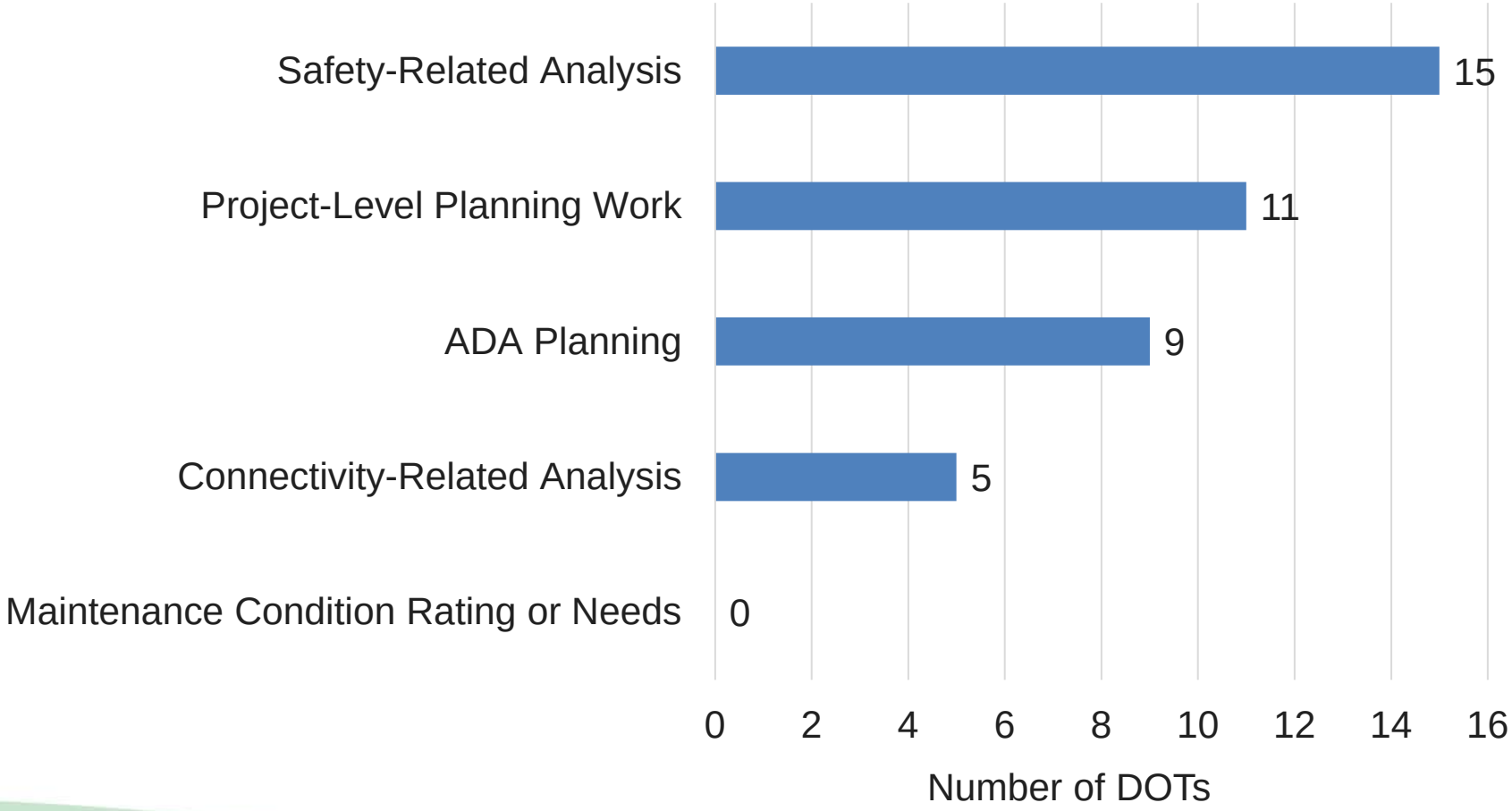
Data are frequently collected for a single purpose – less frequently collected comprehensively across an entire transportation network



Summary of current pedestrian infrastructure data use



Summary of top-ranked future use of pedestrian infrastructure data

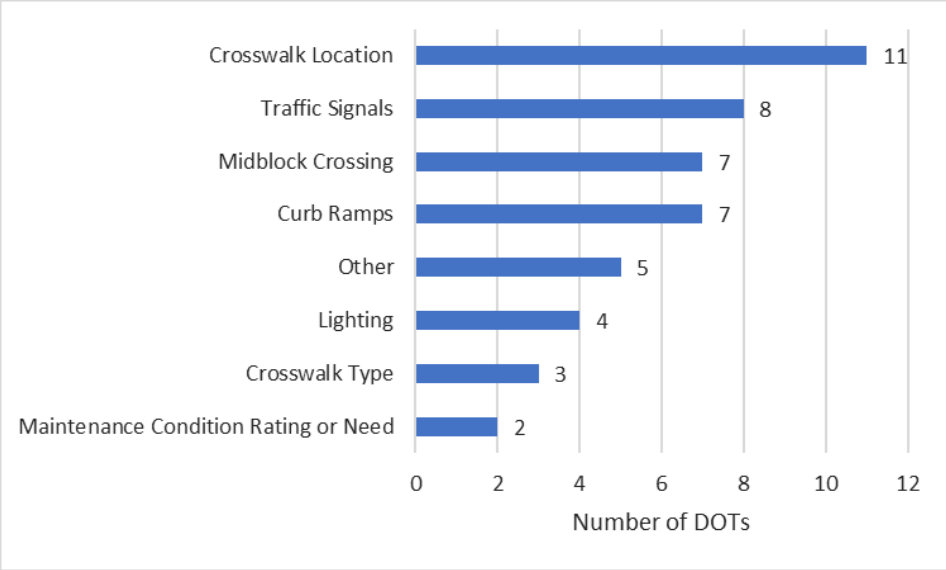


Entities and Attributes

- Data about shoulders and sidewalks for projects on all state roadways are collected most frequently
  - Shoulders
    - Facility width
    - Facility material/surface type
    - Presence of rumble strip
    - Maintenance condition rating
  - Sidewalks
    - Facility width
    - Surface type
    - Detectible warnings
    - Maintenance condition rating
    - Indicator Utilities
    - Buffer presence
    - Effective Width

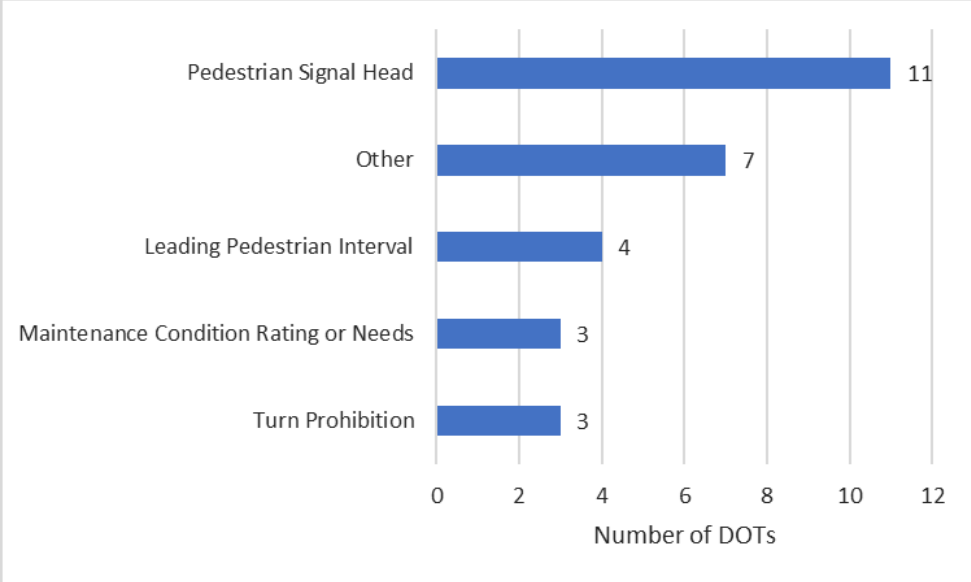
Entities and Attributes

- Trail data are not collected comprehensively
  - No state collected trail data on all projects
  - Most common attributes collected include surface type, width, and maintenance condition rating
- Crossing and signal data are collected with the lowest frequency and extent:



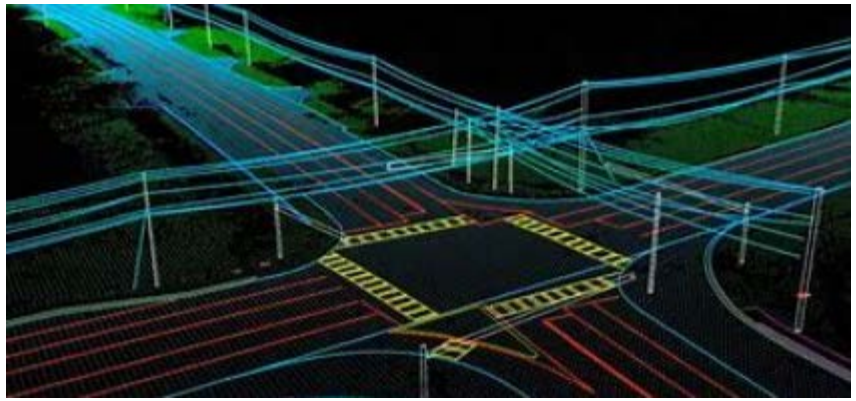
Summary of Crossing Attributes Collected

Summary of Signal Attributes Collected



Data Sources/Collection

- Existing GIS data
- Aerial imagery
- Van-mounted data collection
- LiDAR
- Third party vendors
- Most DOTs play a primary role in data collection; MPOs and RTPOs play a minor role; local governments less so
- Multiple sources can result in data consistency issues
- Intentional database design is critical to the support of future analysis



Data Storage, Sharing, and Maintenance

- Most agencies have multiple methods of storing pedestrian infrastructure data, which can lead to data inconsistency and funding inefficiencies
  - Spatial GIS system
  - Relational database system
  - PDFs, drawings, paper maps
  - In tabular format with route an milepost
  - In CAD-based system
  - In KMZ file
- Data are available for download in 12 of 31 states that reported collection of pedestrian infrastructure data
- Most states have no data sharing concerns
- Some potential concerns with data sharing include:
  - Liability
  - Privacy
  - Contractual
- 39% of the states have a data maintenance plan, often funding-dependent

Funding

- **Funding and resources dictate the amount of data that can be collected**
- Data collection and maintenance are funded through multiple sources
  - Federal funding most common, usually associated with HPMS and HSIP
  - State DOT maintenance program budget
  - Project specific funding
  - Other program budgets

Ideas for Future Research

- Research on the development of a standardized data collection scheme and related guidance, perhaps leveraging established data schemes like MIRE
- Additional research into current and emerging best practices for collecting and managing infrastructure asset data
- Research ways to improve understanding about common uses of pedestrian infrastructure data across various DOT departments

- Targeted research on
  - Using pedestrian infrastructure data to help prioritize maintenance activities
  - The validity and application of cell phone and Bluetooth-sourced data as they relate to demand
  - Understanding pedestrian demand patterns that capture a more comprehensive set of user types
  - Incorporating count information into a larger pedestrian planning process

Thank you for your time!

For more information, please see NCHRP Synthesis 558

Topic 50-10 Panel

Tom Bowman, *Iowa DOT, Ames, IA*

Wei Fan, *University of North Carolina—Charlotte, Charlotte, NC*

Dustin J. Foster, *Sacramento Area Council of Governments, Sacramento, CA*

Roy E. Gothie, *Pennsylvania DOT, Harrisburg, PA*

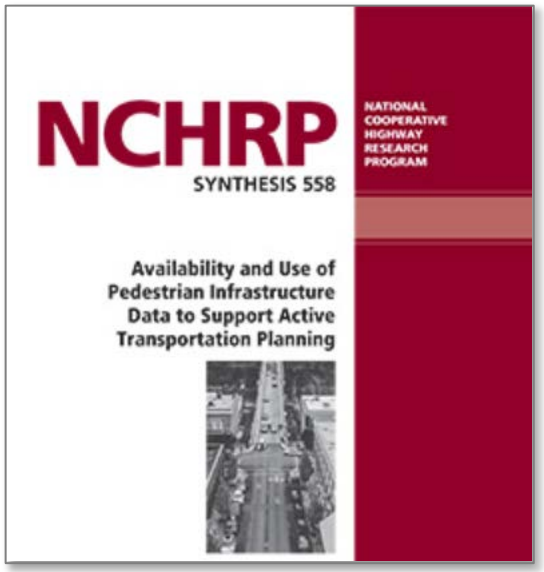
Kimberly Korejko, *Delaware Valley Regional Planning Commission, Philadelphia, PA*

In-Kyu Lim, *Virginia DOT, Richmond, VA*

Michelle Morgan, *Washington State DOT, Tumwater, WA*

Ann Do, *FHWA Liaison*

Bernardo Kleiner, *TRB Liaison*



ADA Transition Plans and Asset Management

Melissa Anderson, PE

FHWA Office of Civil Rights

U.S. Department of Transportation
Federal Highway Administration

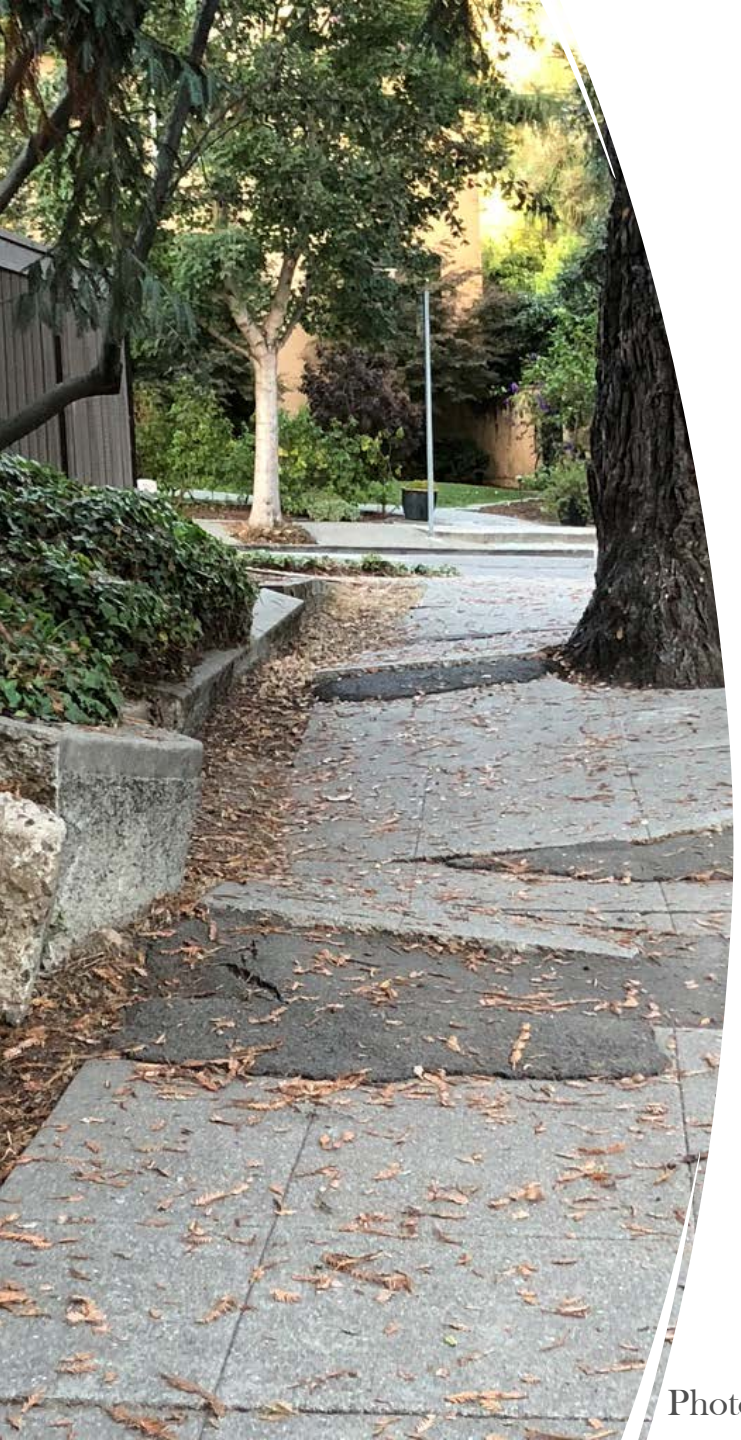
Federal Civil Rights Laws

- 1973 Rehabilitation Act, Section 504
  - Applies to programs and activities receiving Federal funds
  - Prohibits discrimination in programs and activities receiving Federal funds
  - Enforced by DOT/FHWA – Complaints
- 1990 Americans with disabilities Act
  - Title II applies to state and Local governments
  - Prohibits discrimination in the provision of facilities, services and programs
  - Transportation accessibility enforced by DOJ/DOT – complaints and Project Civic Access

Obligations for Access

- **New Construction** - accessible (to the extent not structurally impracticable (28 CFR 151(a)
- **Alterations** – accessible to the extent feasible within the scope of the project (28 CFR 35.151(b)
- **Existing Facilities** – cannot deny program access to persons with disabilities (28 CFR 35.150)

Photo: Access Board



Existing Facilities

- **Cannot deny access** (28 CFR 150)
- **Title II Self-evaluation** (28 CFR 35.105) – Applies to all public entities
- **Transition Plan** (28 CFR 35 150(d)) – Applies to public entities with 50 or more employees

Photo: MAnderson

Self-evaluation

- 28 CFR 35.105
- Evaluation of programs, policies, and procedures
- Identify noncompliant facilities-
  - Sidewalks
  - Curb ramps
  - Pedestrian signals
  - On-street parking

Public outreach is required as part of self-evaluation (28 CFR 35.105(b)); should involve activists, organizations that support the rights of the disabled, general citizens, elected officials, as well as other agencies (local and State).

"Nothing about us without us"

ADA Transition Plan

- Title II - required if 50 or more employees (28 CFR 35.150(d)(1))
- Covers existing facilities
- Transition Plan requirements (28 CFR 150(d)(3))
  - Identify the physical barriers
  - Methods to remove barriers
  - Schedule
  - Identify responsible person

Publication

- Available to the public (28 CFR 35.150(d)(1))
- “Living document”
- Used for project planning, budgeting, tracking improvements in accessibility
- Record of accomplishments

Asset Management

- Who is responsible for managing the data?
- What type of system are you going to use?
- Who will have access to the system?
- What performance measures will ensure progress?
- To whom and how will there be reporting?

FHWA CIVIL RIGHTS PROGRAM

Contact:
Melissa.Anderson@dot.gov

Federal Highway Administration

Office of Civil Rights

U.S. Department of Transportation
Federal Highway Administration

Florida Department of Transportation (FDOT)

Asset Management's Role in Active Transportation Safety

1. How FDOT keeps track of active transportation assets
2. FDOT Context Classification Guide
3. How pedestrian and bicycle safety improvements are prioritized

How FDOT Keeps Track of Active Transportation Assets

- **Roadway Characteristics Inventory (RCI) database**
  - https://www.fdot.gov/statistics/rci/default.shtm
- **eTraffic website**
  - https://www.fdot.gov/traffic/default.shtm

How FDOT Keeps Track of Active Transportation Assets

- **Roadway Characteristics Inventory (RCI) database**
  - https://www.fdot.gov/statistics/rci/default.shtm

200 SERIES FEATURES - PHYSICAL FEATURES (GEOMETRIC)		6,656 KB	Back to Top
216	Bike Lanes/Pedestrian Facilities	798 KB	Transportation Data & Analytics
	BIKELNCD - Bicycle Lane		
Nov 2019	BIKESLTCD - Bicycle Keyhole Lanes		
	SDWLKBCD - Sidewalk Barrier Code		
	SHARDPTH - Shared Path Width & Separation		
	SIDWLKWD - Sidewalk Width & Separation		
217	Sidewalks	204 KB	Maintenance
	SIDEWALK - Sidewalk Width		

How FDOT Keeps Track of Active Transportation Assets

- **Roadway Characteristics Inventory (RCI) database**
  - https://www.fdot.gov/statistics/rci/default.shtm

200 SERIES FEATURES - PHYSICAL FEATURES (GEOMETRIC)		6,656 KB	Back to Top
214	Outside Shoulders	332 KB	Transportation Data & Analytics

MLTRFSEP - Managed Lane Separator

SHLDTYPE - Highway Shoulder Type

SHLDTYPx - Highway Shoulder Type (x=2,3)

SLDWIDTH - Highway Shoulder Width

SHLDWTHx - Highway Shoulder Width (x=2,3)

How FDOT Keeps Track of Active Transportation Assets

- **Roadway Characteristics Inventory (RCI) database**
  - https://www.fdot.gov/statistics/rci/default.shtm

300 SERIES FEATURES - OPERATIONAL		579 KB	Back to Top
323	School Zones SCHLNAME - School Name SCHLPED - School Speed Zone	76 KB	Traffic Engineering & Operations

How FDOT Keeps Track of Active Transportation Assets

- **Roadway Characteristics Inventory (RCI) database**
  - https://www.fdot.gov/statistics/rci/default.shtm

400 SERIES FEATURES - MAINTENANCE		2,347 KB	Back to Top
453	Cross Walks	151 KB	Maintenance

Crosswalks Summary

CRWALK24 - Number of 24 Foot Crosswalks

CRWALK36 - Number of 36 Foot Crosswalks

CRWALK48 - Number of 48 Foot Crosswalks

CRWALK60 - Number of 60 Foot Crosswalks

CRWALK72 - Number of 72 Foot Crosswalks

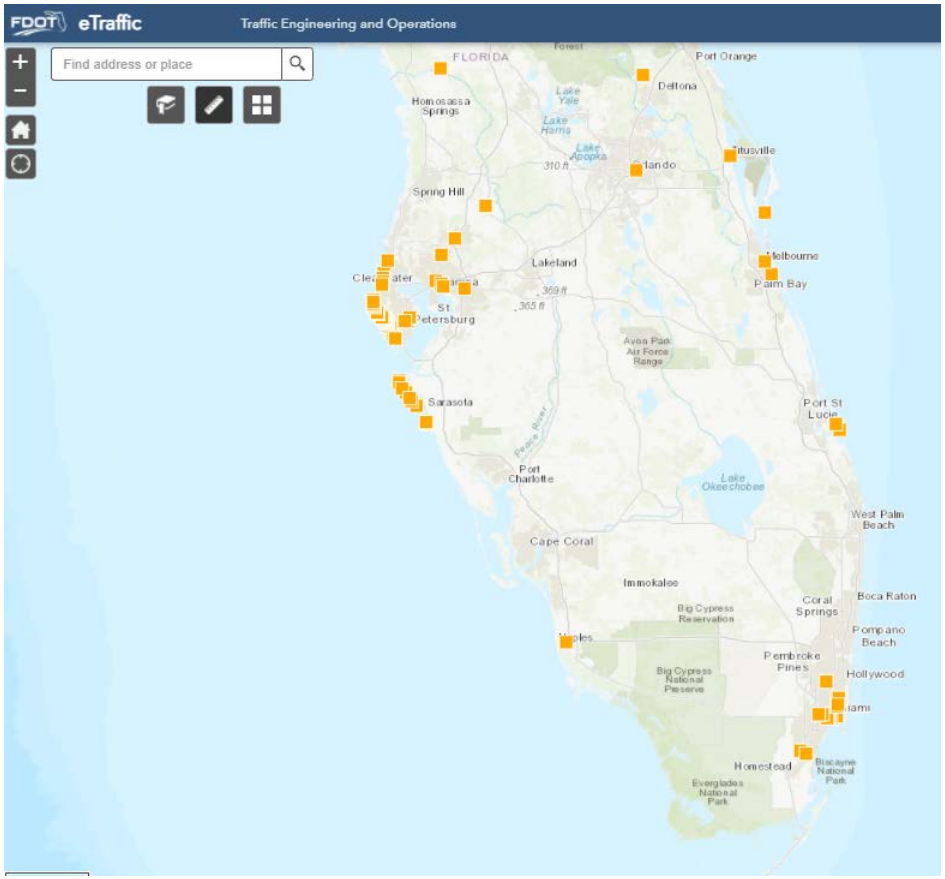
How FDOT Keeps Track of Active Transportation Assets

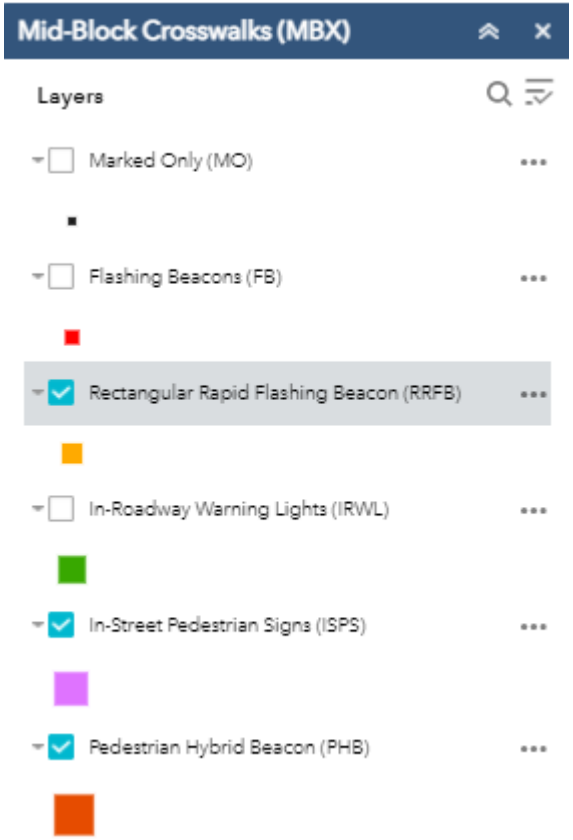
- **Roadway Characteristics Inventory (RCI) database**
  - https://www.fdot.gov/statistics/rci/default.shtm

800 SERIES FEATURES - NON-MOTORIZED WAY			180 KB	Back to Top
801	SUN Trails		573 KB	Systems Planning
	Nov 2019	SUNTRTYP - SUN Trails Type		
	Nov 2019	SUNTRCOR - SUN Trails Corridor Name		

How FDOT Keeps Track of Active Transportation Assets

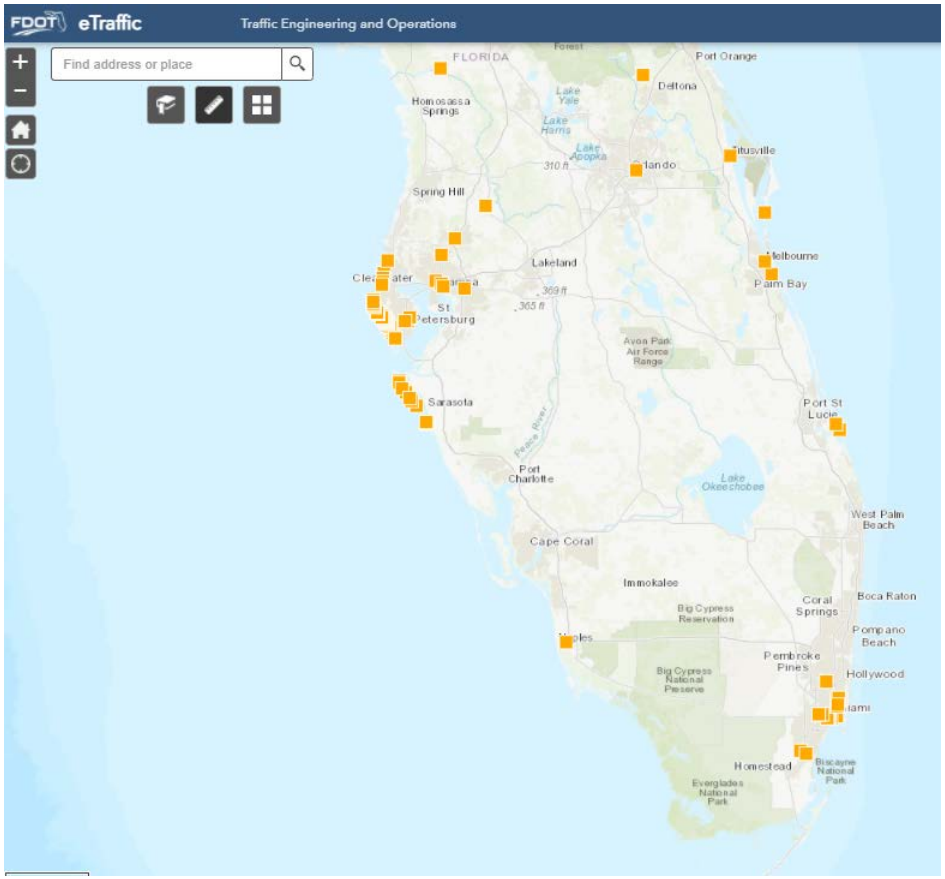
- eTraffic website

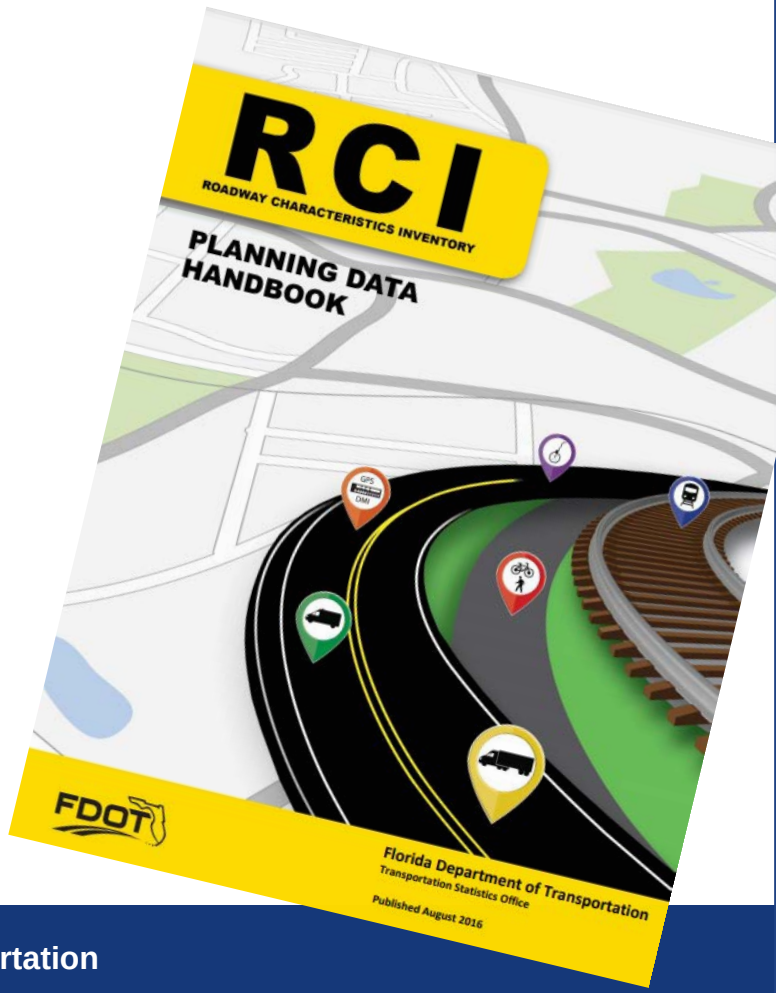




How FDOT Keeps Track of Active Transportation Assets

- How do we get information gathered into the eTraffic website and RCI?

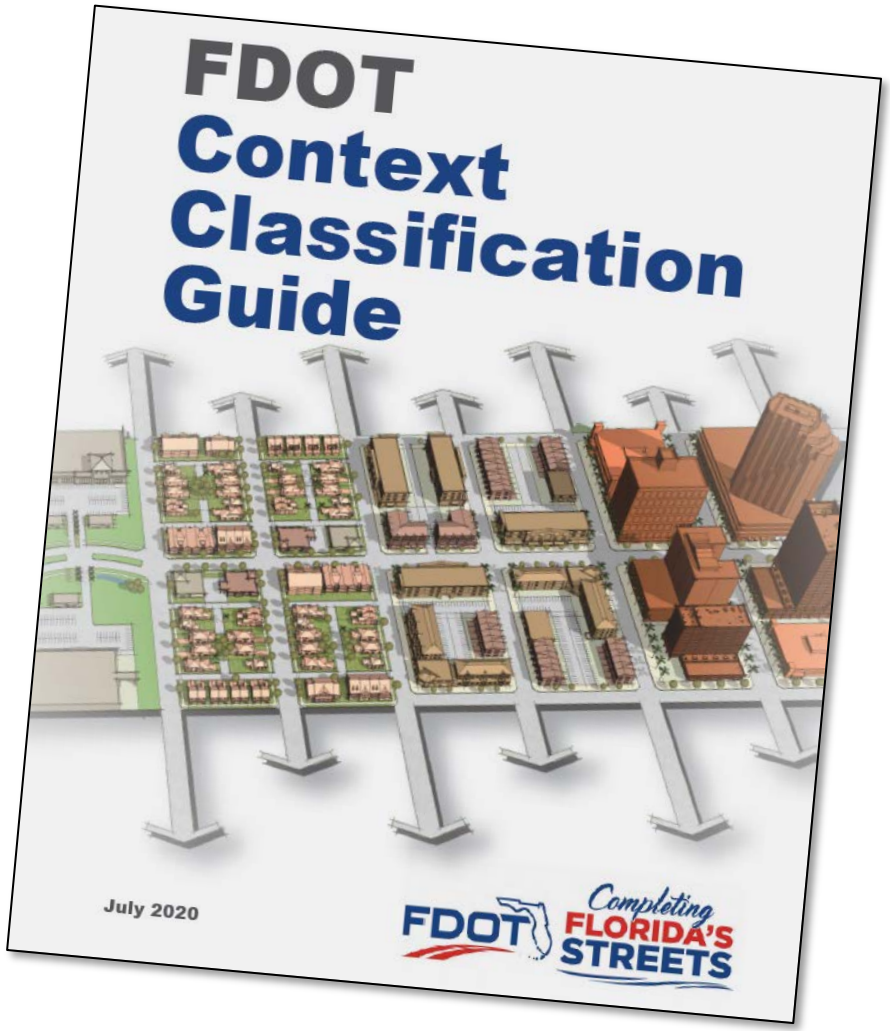




FDOT Context Classification Guide

FDOT Context Classification Guide

- How we determine the Context Classification



www.FLcompletestreets.com

FDOT Context Classification Guide

- **How we keep track of the Context Classification**
  - Initial statewide assessment
  - Reassessed with each project

FDOT Context Classification Guide

- **How we keep track of the Context Classification**

ROUGHIND - Pavement Roughness Index

126	Preliminary Context Classification	299 KB	Transportation Data & Analytics
	Nov 2019 CCTXTCLS - Preliminary Current Context Classification		
	Nov 2019 FCTXTCLS - Future Context Classification		
	Nov 2019 CCTXTDTE - Preliminary Current Context Classification Date		
	Nov 2019 FCTXTCLS - Future Context Classification Date		

FDOT Context Classification Guide

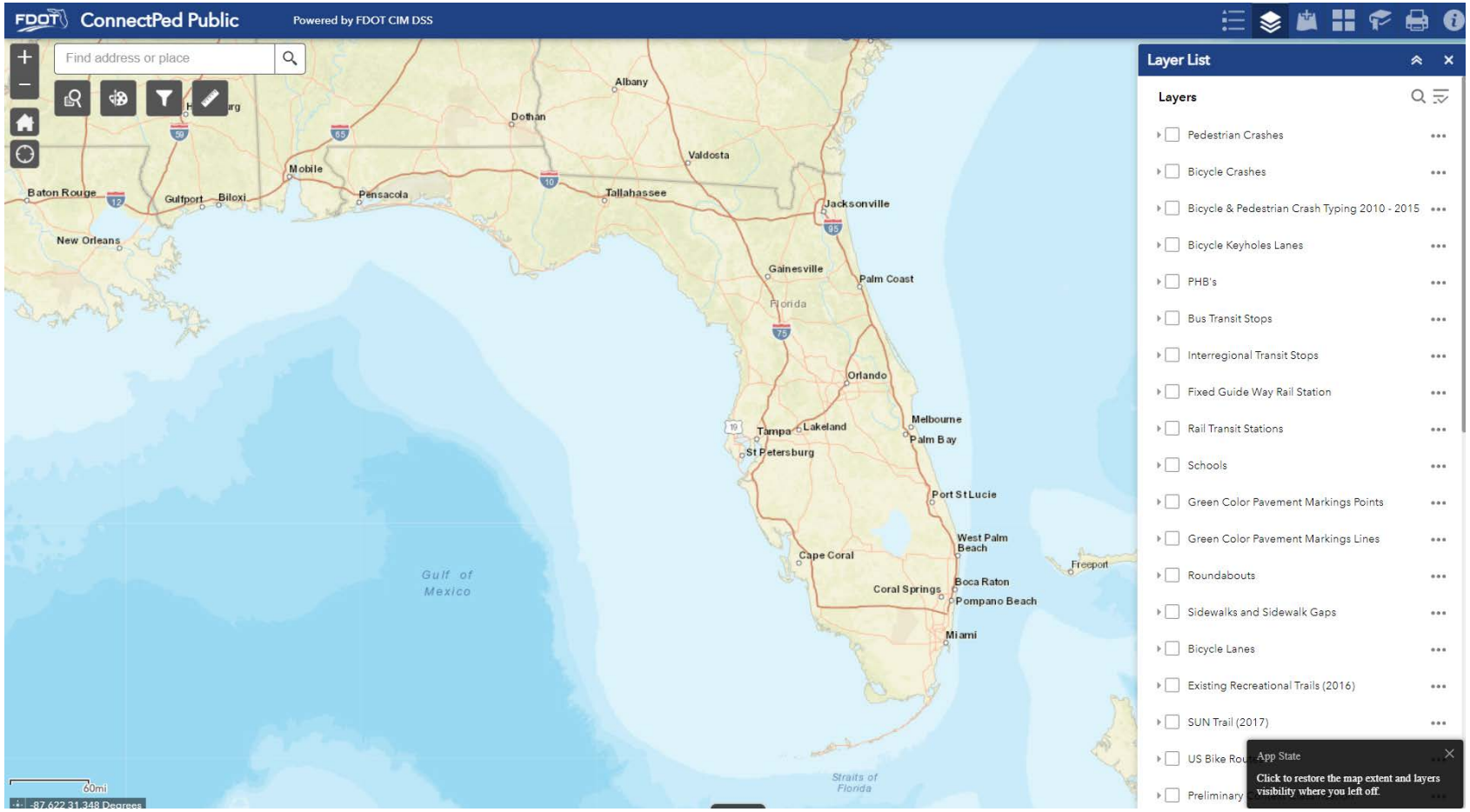
- **How the Context Classification helps us make design decisions**
  - **Informs planners and engineers about that roadway segment's:**
    - Type of users (pedestrians, people biking, etc.) and
    - Volume of those users

How pedestrian and bicycle safety improvements are prioritized

- District Bicycle Pedestrian Facility Plans

How pedestrian and bicycle safety improvements are prioritized

- ConnectPed www.fdot.gov/connectped



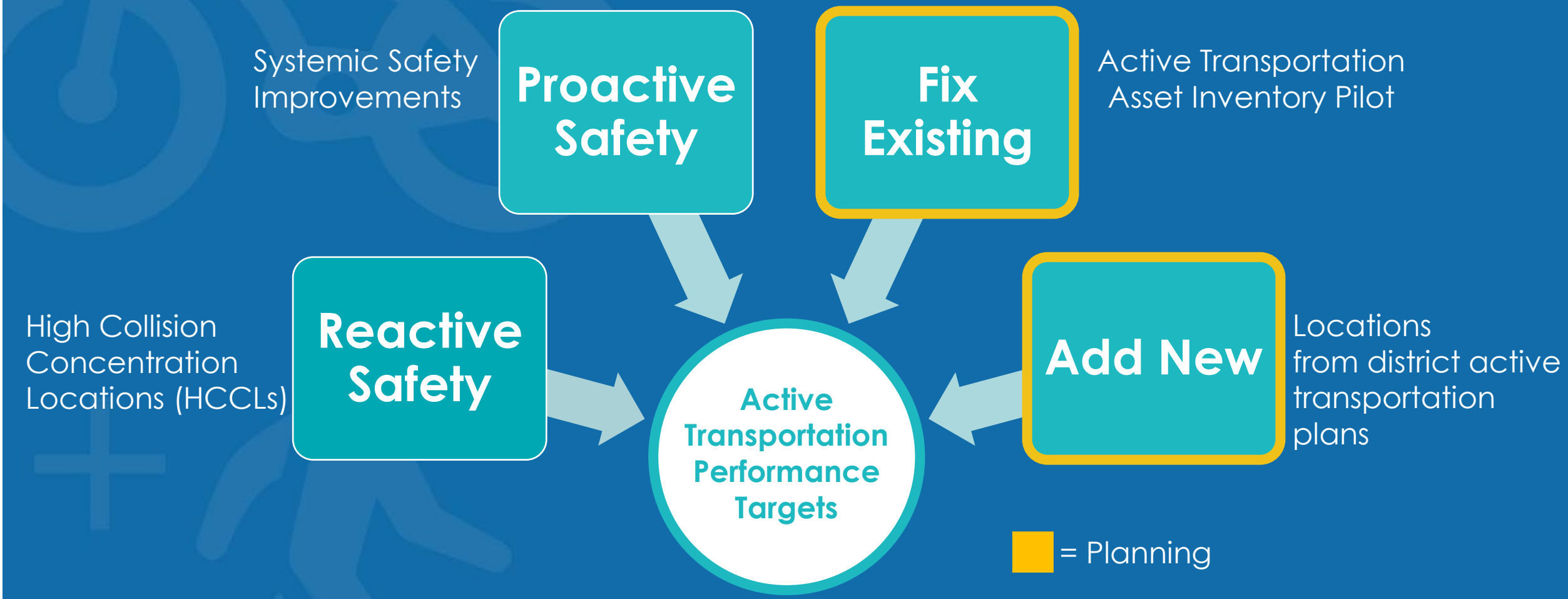
The Role of Asset Management in Active Transportation Safety

April 21, 2021

Jessica (Jessi) Downing, Pedestrian and Bicyclist Safety Specialist

Caltrans, Division of Safety Programs

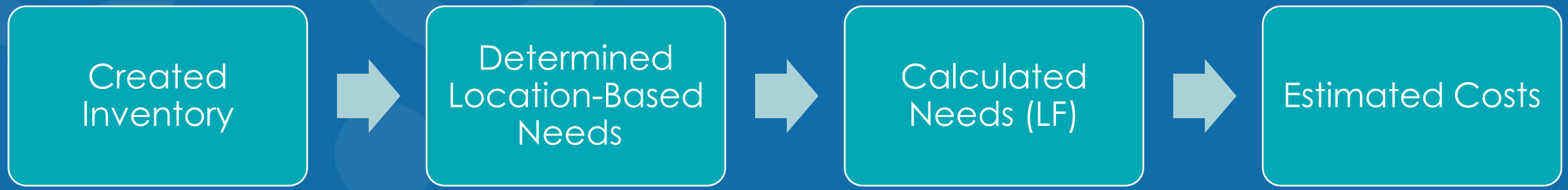
Active Transportation Performance Targets



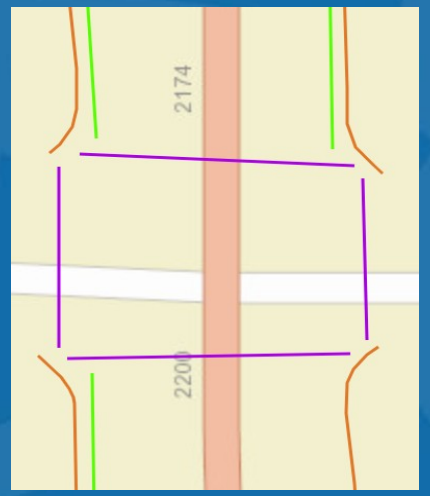
Asset Management Models

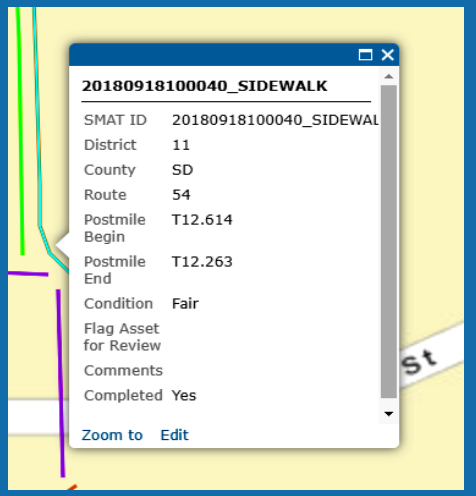
Physical Fix Existing	**Reservation** Reactive Safety	**Deficiency** Add New & Proactive Safety
• Inventory • Deterioration • Condition ratings	• Financial reservation • Locations triggered by safety investigations • 60% overall safety goal investment	• Improve/correct issues • District Plan Gaps • Systemic Safety improvements • 40% overall safety goal investment

Overall Process - Planning



Physical Asset Model – Fix Existing





1. Features are created for each asset and mapped at Caltrans HQ using ArcGIS Pro, Google Maps, and Caltrans imagery.

2. Districts enter data into Arc GIS Portal, assessing the conditions of assets using Postmile Services, Google Maps, and Pathweb imagery.

3. Data can be used by many functional units to make more informed decisions at the project level.

Active Transportation Asset Inventory Pilot (ATAIP)

- Baseline existing pedestrian and bicycle asset information on the State Highway System
- Simplified – bikeways, crosswalks, and sidewalks
- 26,000 + assets statewide
- Condition Ratings based on pavement and striping condition

Deficiency Asset Model
Add New Facilities

Extrapolation Criteria for districts without an active transportation plan:

- Not Prohibited to bicyclists
- No existing facility
- Within a Census Designated Place
- Level of Traffic Stress 3 or 4

Linear Feet

Compare % of need types in similar district with a completed gap analysis (bikeways, crosswalks sidewalks)

Estimate Costs

Deficiency Asset Model
Proactive Safety

Pedestrian Systemic Safety Program

- Initiated in 2019
- Uses Statistical Methodologies to identify locations that have a high risk of pedestrian injuries and fatalities
- First year generated over 500 locations for investigation and improvements
- Currently in its second round

Deficiency Asset Model
Proactive Safety

Pedestrian Systemic Safety Program

- Gather data from crashes
- Perform data analysis and modeling
- Identify locations ("hot spots") at high risk for future crashes
- Based on roadway features, context, and characteristics

Example Results

Lanes (maj+min)	0-7,000 AADT	7,000-15,000 AADT	15,000-25,000 AADT	25,000+ AADT
All-way stops	0.03	0.28	0.38	0.43
2+2	0.02	0.20	*0.13*	*0.50*
3+2			*2.00*	
4+2	*0.13*	*0.83*	*0.50*	*0.40*
4+4		*0.50*		
6+2				*0.50*
Signal	0.35	0.53	0.87	1.11
2+1			*0.60*	
2+2	0.33	0.22	0.62	0.23
3+2	0.36	0.89	1.87	*0.20*
3+3	*0.67*	*3.33*	*3.43*	*4.00*
4+1			*0.22*	0.08
4+2	0.29	0.55	0.78	0.83
4+3	*0.50*	1.07	0.70	0.73
4+4		1.11	1.09	1.16
5+2		*0.33*	0.26	0.73
5+3			*1.00*	*0.25*
5+4			0.82	0.88
6+2		*1.20*	*1.40*	1.28
6+3				2.40
6+4			1.08	1.48
6+5				*1.20*

Treatments

Pedestrian Systemic Safety Program

- Implement pedestrian safety countermeasures
- Examples may include:
  - Upgrading Curb Ramps
  - Pedestrian Refuge Island
  - High-Visibility Crosswalk

Lessons Learned

Process

- Start early
- Consensus on a methodology
- Document process and historical knowledge
- Extensive coordination with stakeholders
- Progress, not perfection

Data Needs

- Existence and availability of data
- Automated data collection – photogrammetry, LiDAR, machine learning
- Separate striping and pavement condition ratings to accurately estimate costs
- Keep it simple – interim targets and pilots

What's Next?

- Finish district active transportation plans by 2023
- Transportation System Network Replacement (TSNR)
- Roadway asset inventory data collection
- Bicyclist Systemic Safety Program
- District Traffic Safety Plans

Thank you!

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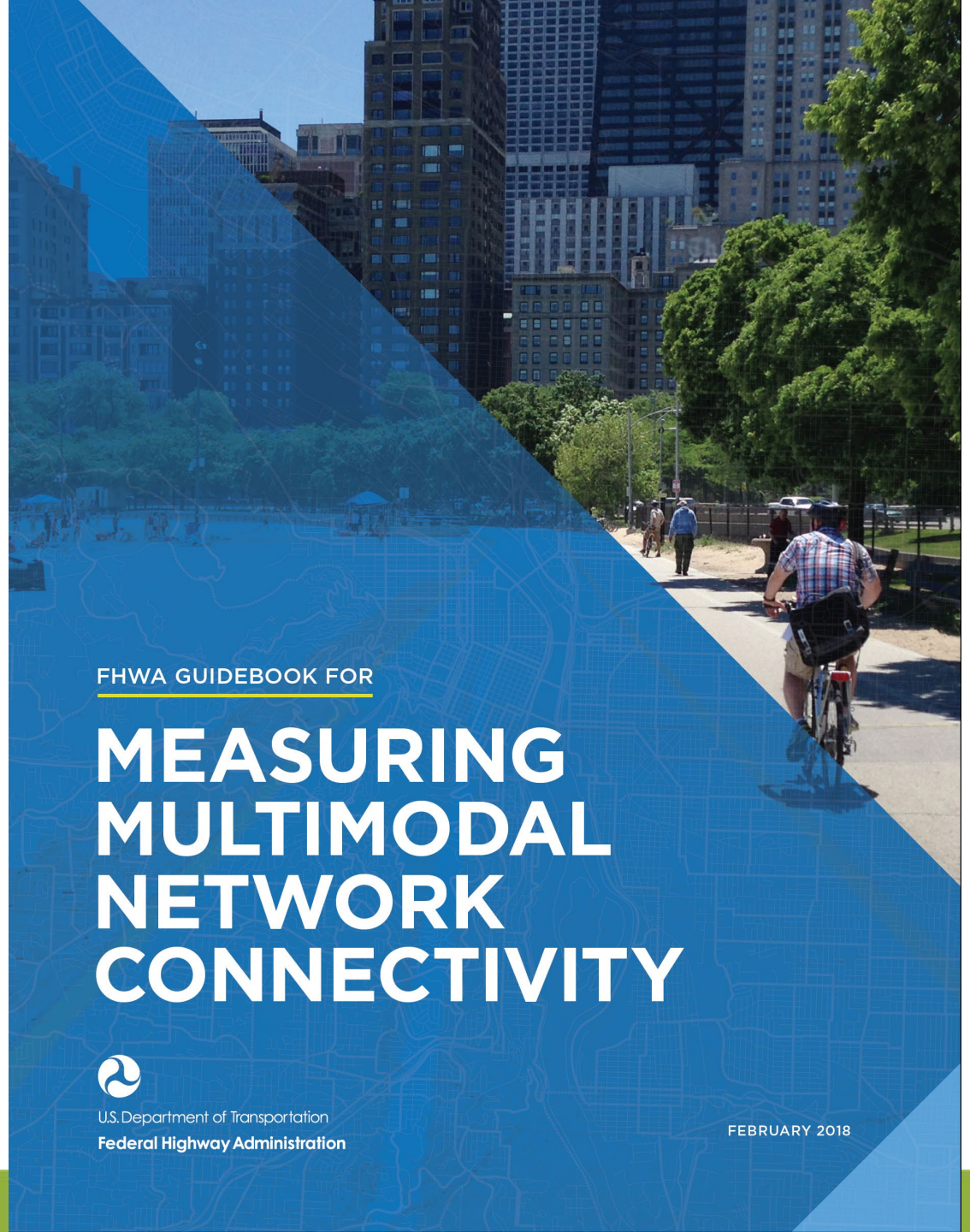
Federal Highway Administration
AASHTO CEE Active Transpo Workshop

Darren Buck, Ped & Bike Program Coordinator

Office of Human Environment

April 28, 2021

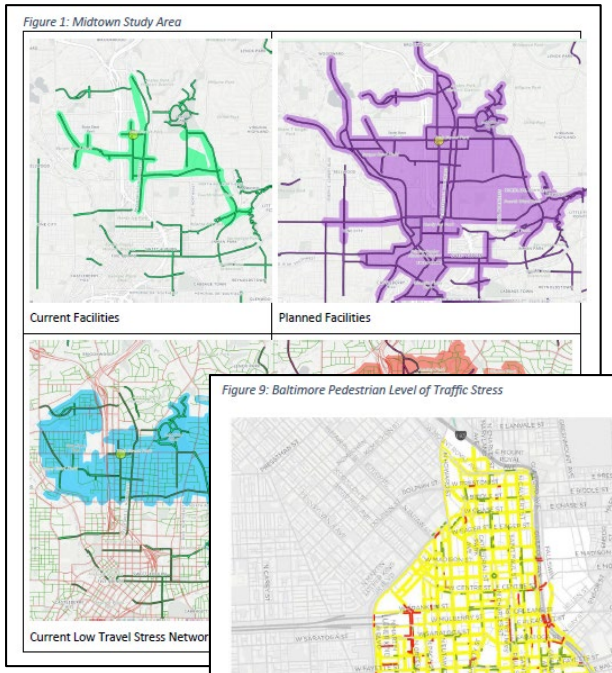


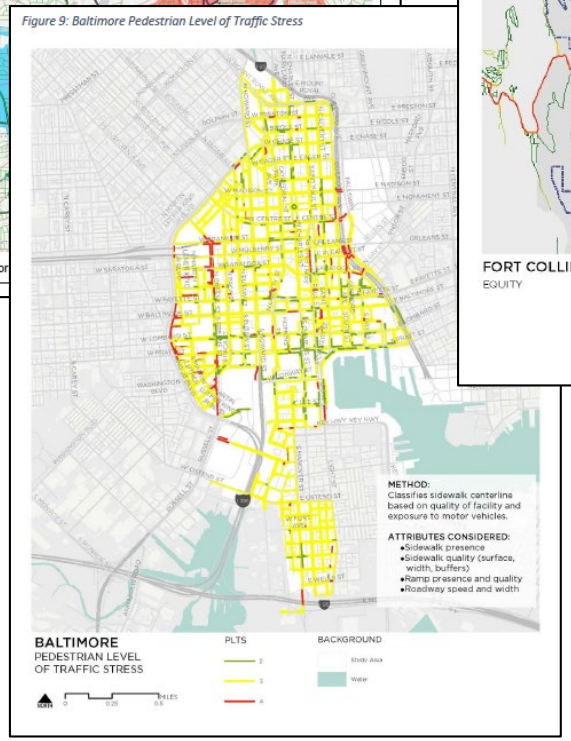
https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/multimodal_connectivity/

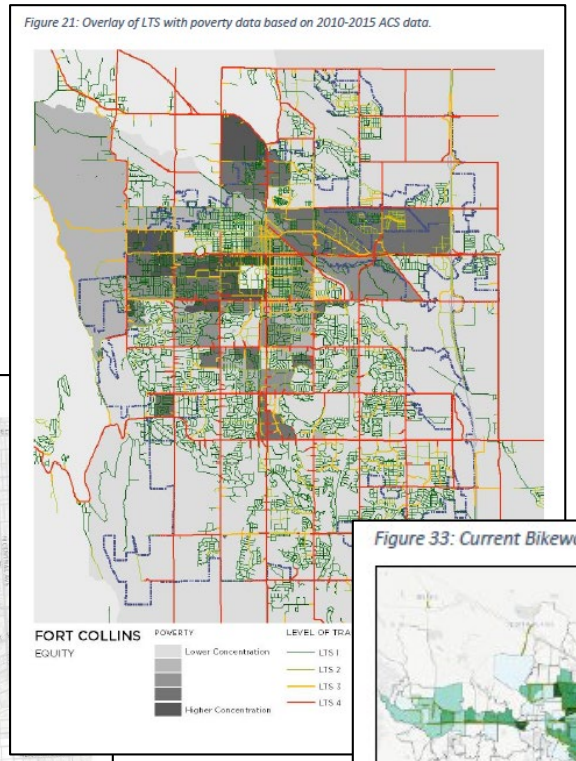
MEASURING MULTIMODAL NETWORK CONNECTIVITY POSITIONS A TRANSPORTATION AGENCY TO:

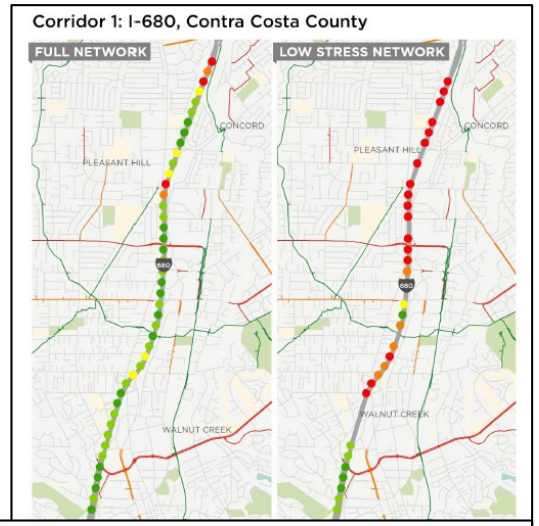
- Enhance access to jobs, training, schools, and economic centers
- Accelerate project delivery by capturing efficiencies in economies of scale, project sequencing, construction phasing, financing, and community involvement
- Increase accountability of efforts to increase mobility options and system efficiency
- Prioritize infrastructure investments that fill gaps and address barriers in the transportation network, and that increase safety for all users
- Partner with the private sector to provide innovative multimodal transportation services and capture opportunities relating to shared-use mobility and automated and connected technology

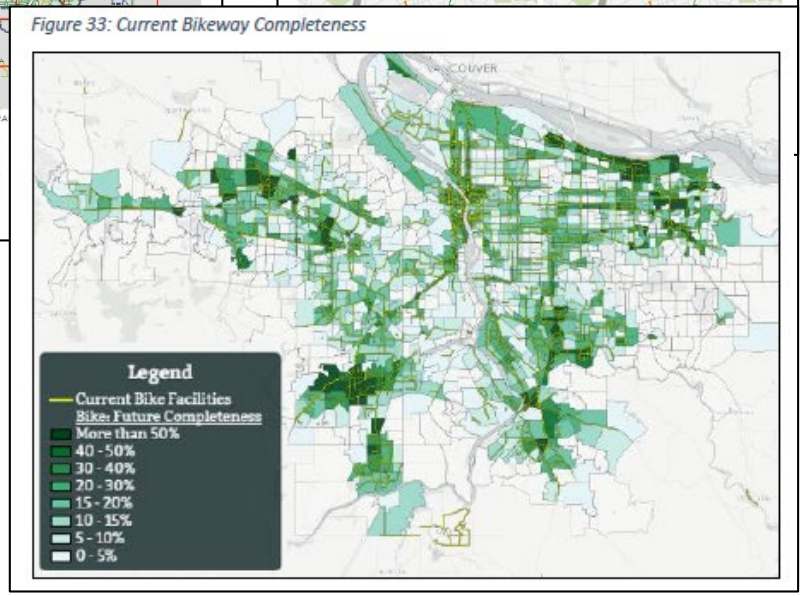
Case Studies





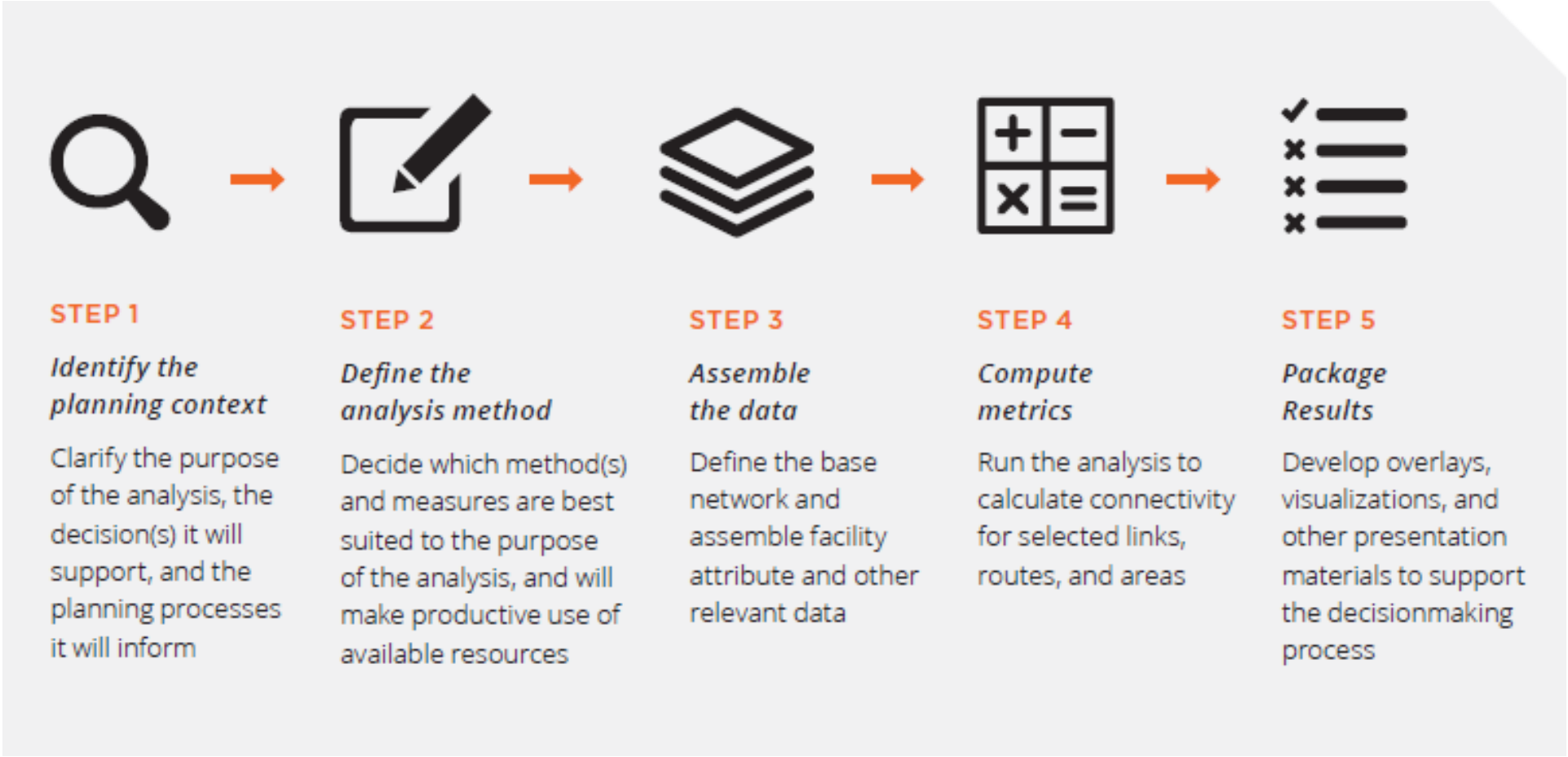






- Atlanta Regional Commission
- City of Baltimore
- California Department of Transportation District Four Office
- City of Fort Collins
- Portland Metro

Connectivity Analysis Process



STEP 1

Identify the planning context

Clarify the purpose of the analysis, the decision(s) it will support, and the planning processes it will inform

STEP 2

Define the analysis method

Decide which method(s) and measures are best suited to the purpose of the analysis, and will make productive use of available resources

STEP 3

Assemble the data

Define the base network and assemble facility attribute and other relevant data

STEP 4

Compute metrics

Run the analysis to calculate connectivity for selected links, routes, and areas

STEP 5

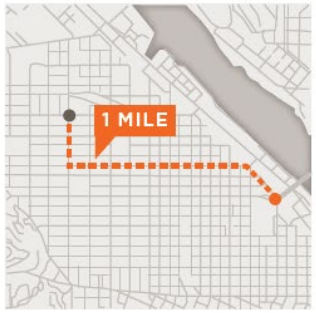
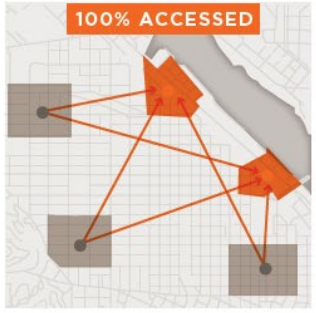
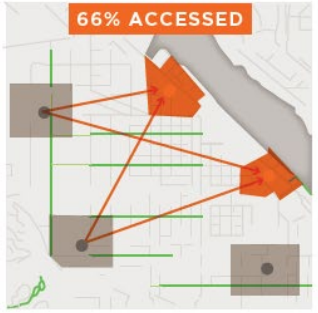
Package Results

Develop overlays, visualizations, and other presentation materials to support the decisionmaking process

Analysis Methods

- Network Completeness
- Network Density
- Route Directness
- Access to Destinations
- Network Quality

ANALYSIS METHOD	KEY QUESTION	EXAMPLE MEASURES	SCALE	PLANNING TASK
Network Completeness	How complete is the planned bicycle and pedestrian network?	• Percent of planned nonmotorized facility-miles that are complete • Miles of planned nonmotorized facilities that have been built	• Small area • Large area	Monitoring and Benchmarking
	What portion of streets contain nonmotorized facilities?	• Percent of street-miles with nonmotorized facilities • Percent of street-miles that meet level of service or low-stress thresholds	• Small area • Large area	Needs Assessment, Scenario Analysis
Network Density	Does the street network allow for travel between destinations via a number of routes?	• Intersection density • Connected node ratio • Block length • Network density (street-miles per square mile)	• Route • Small area • Large area	Needs Assessment; Scenario Analysis
	Do designated bicycle and pedestrian facilities allow people to travel between destinations via a number of routes?	• Network density of nonmotorized facilities (lane miles per square mile) • Intersection density of nonmotorized facilities	• Small area • Large area	Scenario Analysis, Project Prioritization
Route Directness	Do nonmotorized facilities allow users to travel throughout a community via direct routes?	• Out of direction travel as a percentage of shortest path route • Network permeability	• Corridor • Small area • Large area	Scenario Analysis, Gap Identification, Project Prioritization, Benchmarking
Access to Destinations	How well do bicycle facilities connect to key destinations?	• Nonmotorized travelshed size • Number of homes/jobs accessible by bike/foot • Accessibility indices (e.g. Walk Opportunity Index) • Number of homes/jobs accessible by bike/foot using a certain level of network quality	• Corridor • Small area • Large area	Needs Assessment, Gap Identification, Project Prioritization
Network Quality	What is the objective quality of connectivity provided by an existing or planned network?	• Percent or area of network with high ratings for nonmotorized Level of Service, Bicycle Route Quality, or Pedestrian Index of Environment • Percent or area of network with low ratings for Level of Traffic Stress	• Link • Route • Small area • Large area	Needs Assessment, Gap Identification, Scenario Analysis

	ANY NETWORK	BIKE/PED SPECIFIC	HIGH QUALITY
*How **complete** is the network?*			
*How **dense** is the network?*			
*How **direct** is the network?*			
*What destinations can you **access** with the network?*			

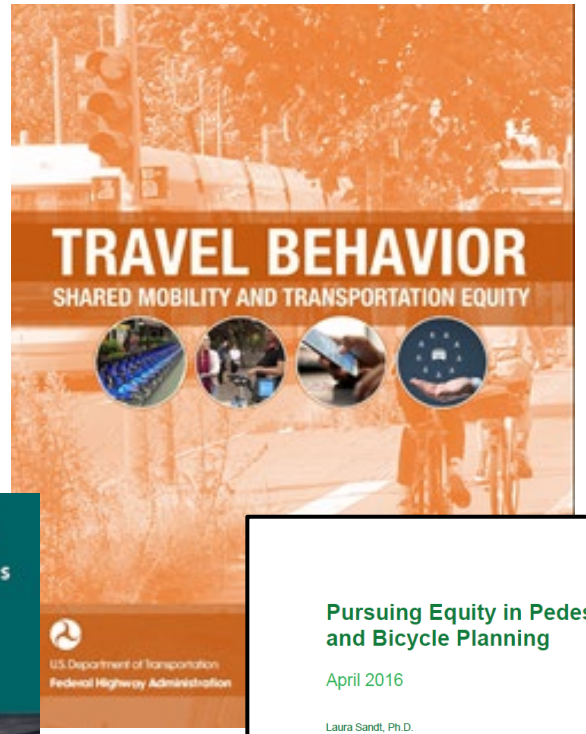
Multimodal Network Planning Pilot Projects

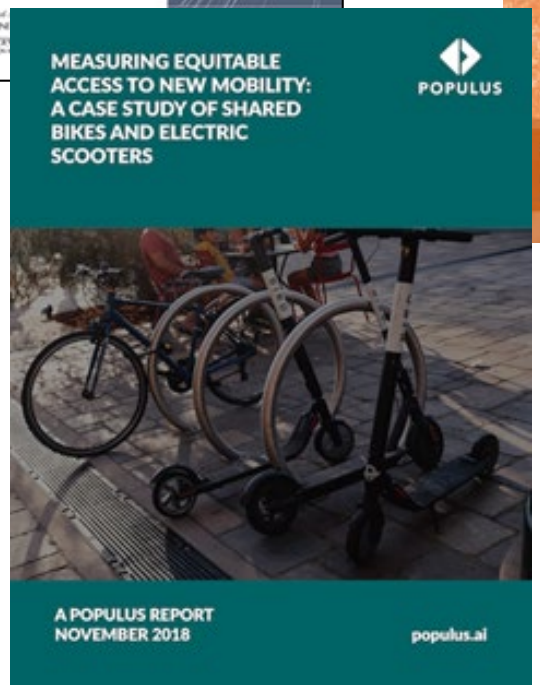
- Using variety of network measurement tools (including Level of Traffic Stress)
- New data sources (including Streetlight, Sidewalk Labs)
- Variety of contexts (arterial corridors all the way to statewide)
- Answering different questions (safety, planning, project prioritization, equity)

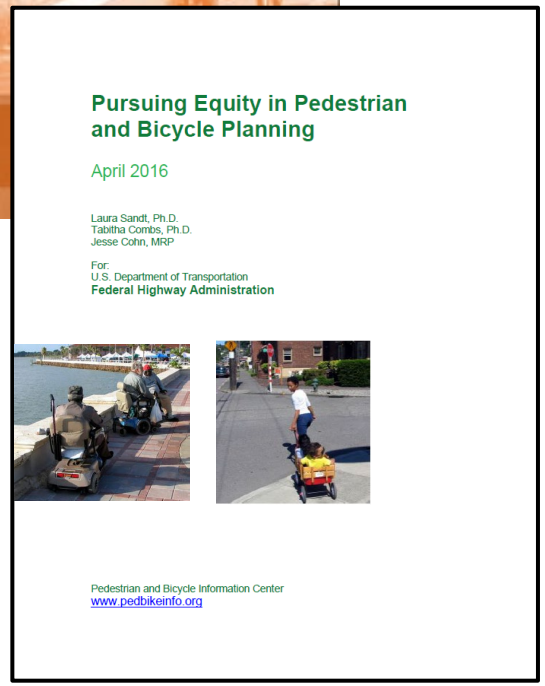
Multimodal Network Planning Pilot Locations

- MetroPlan, Orlando, FL
- Mid-America Regional Council, MO-KS
- New Hampshire MPOs
- Eastgate Regional Council of Governments, OH
- Corvallis and Albany MPOs, OR
- Houston-Galveston Area Council, TX
- Utah DOT/Wasatch Front Regional Council/Mountainland Association of Governments
- Washington State DOT

Equity Considerations







http://www.pedbikeinfo.org/

Shifting Streets

- Pedbikeinfo.org tracking list of local actions to support walking and bicycling

Local Actions to Support Walking, Bicycling During Social Distancing

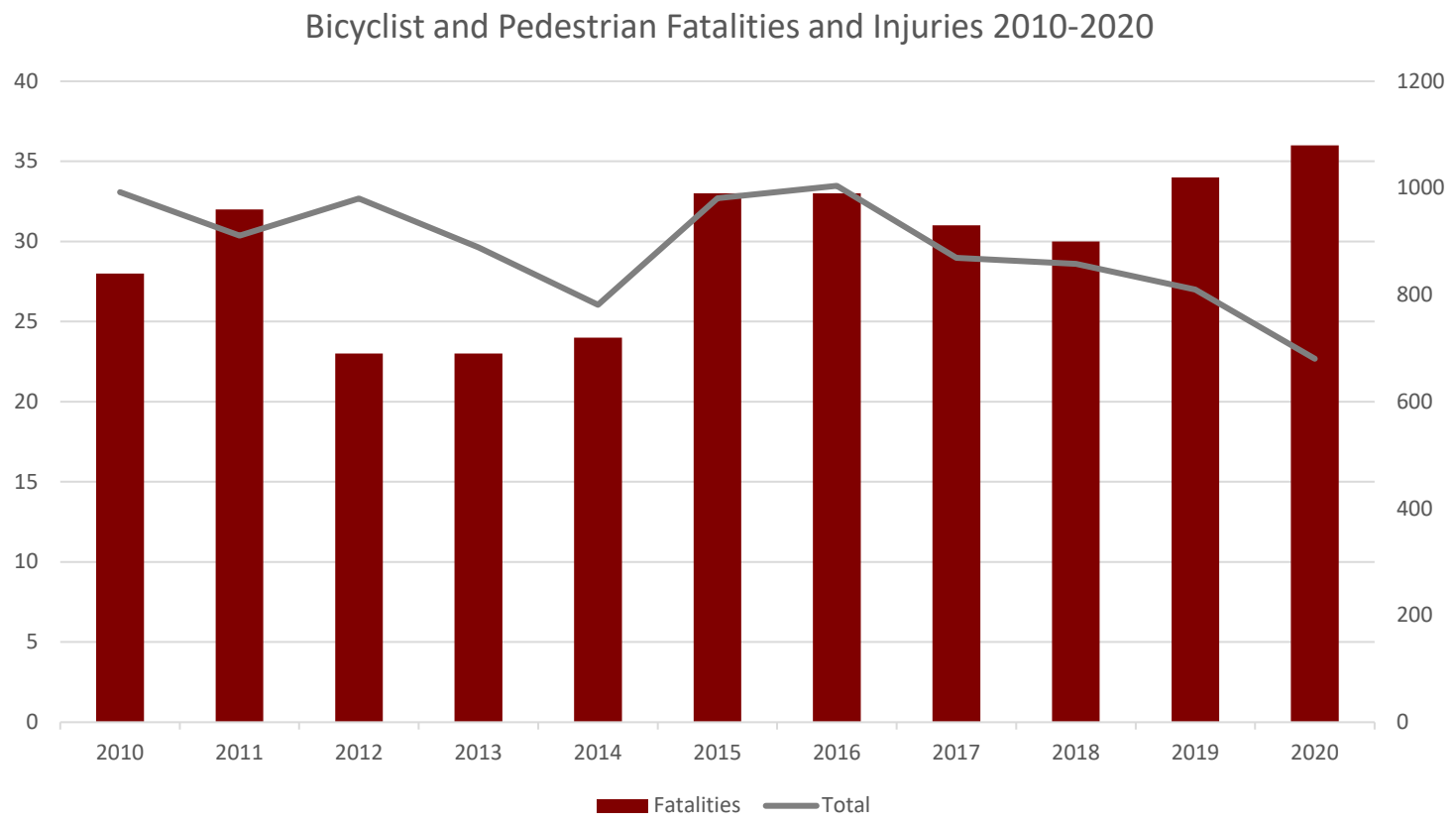
Dataset tracks immediate community actions that show adaptation to changing demands on public space

Source: PBIC

IOWA DOT
GETTING YOU THERE

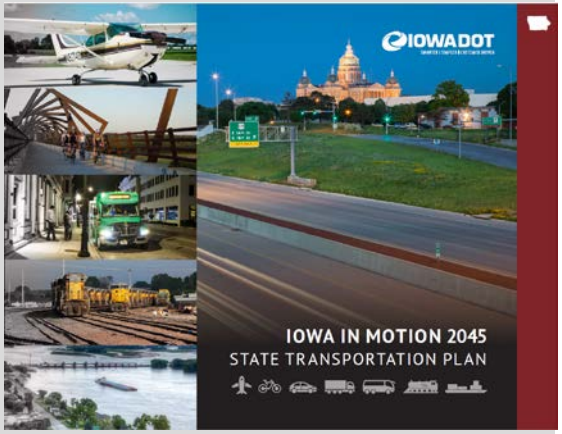
Bicyclists and Pedestrian **Systemic Safety Analysis**

Bicyclists and Pedestrian Systemic Safety Analysis



Bicyclists and Pedestrian Systemic Safety Analysis

Iowa in Motion 2045



"Evaluate Key safety challenges pertaining to bicycling and walking and develop crash reduction strategies"

Iowa Bicycle and Pedestrian Long Range Plan

"Identify the primary urban and rural crash types occurring in Iowa and develop strategies for reducing crashes"

"Develop methodology for bicycle and pedestrian safety audits of high crash corridors and intersections to identify adequate counter measures"

Iowa SHSP

"Conduct enforcement campaigns related to bicycle and pedestrian awareness at targeted intersections"

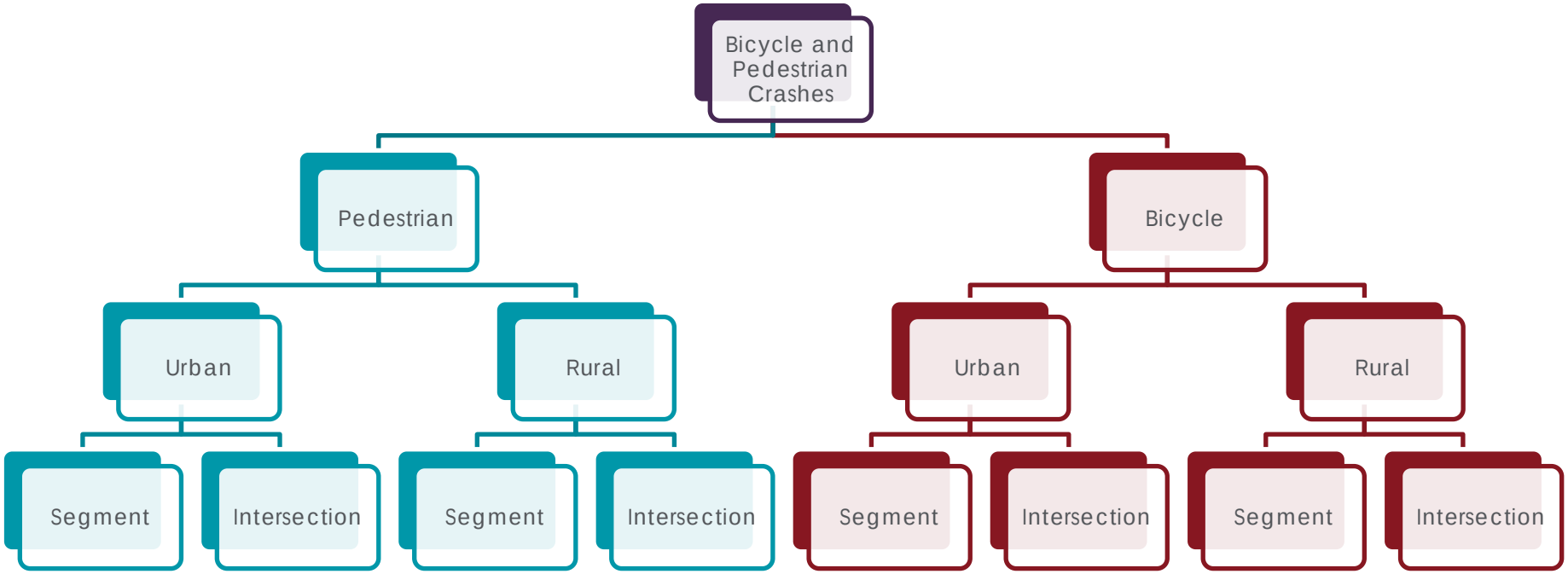
Systemic
Safety Analysis

"The systemic approach to safety involves widely implemented Improvements based on high-risk roadway features correlated with specific severe crash types. The approach provides a more comprehensive method for safety planning and implementation that supplements and complements traditional site analysis." *

*FHWA. 2013. Systemic Safety Project Selection Tool. Safety.fhwa.dot.gov/systemic/fhwasa13019/. U.S. Department of Transportation, Federal Highway Administration. July.

- Data Sources
  - Crash Data 2009-2018
  - Intersection Database
  - Roadway Data (RAMS)
- Software
  - ArcGIS
  - SQL Developer

Bicyclist and Pedestrian Systemic Safety Analysis



Intersections

- Attributes included
  - AADT
  - Intersection Angle
  - Intersection type
  - Number of Lanes
  - Number of Legs
  - Speed Limit
  - Traffic Control

Segments

- Attributes included
  - AADT
  - Median Type
  - Number of Lanes
  - Parking Type
  - Shoulder Rumble
  - Shoulder Type
  - Shoulder Width
  - Speed Limit

Normalization, Weighting, and Composite score

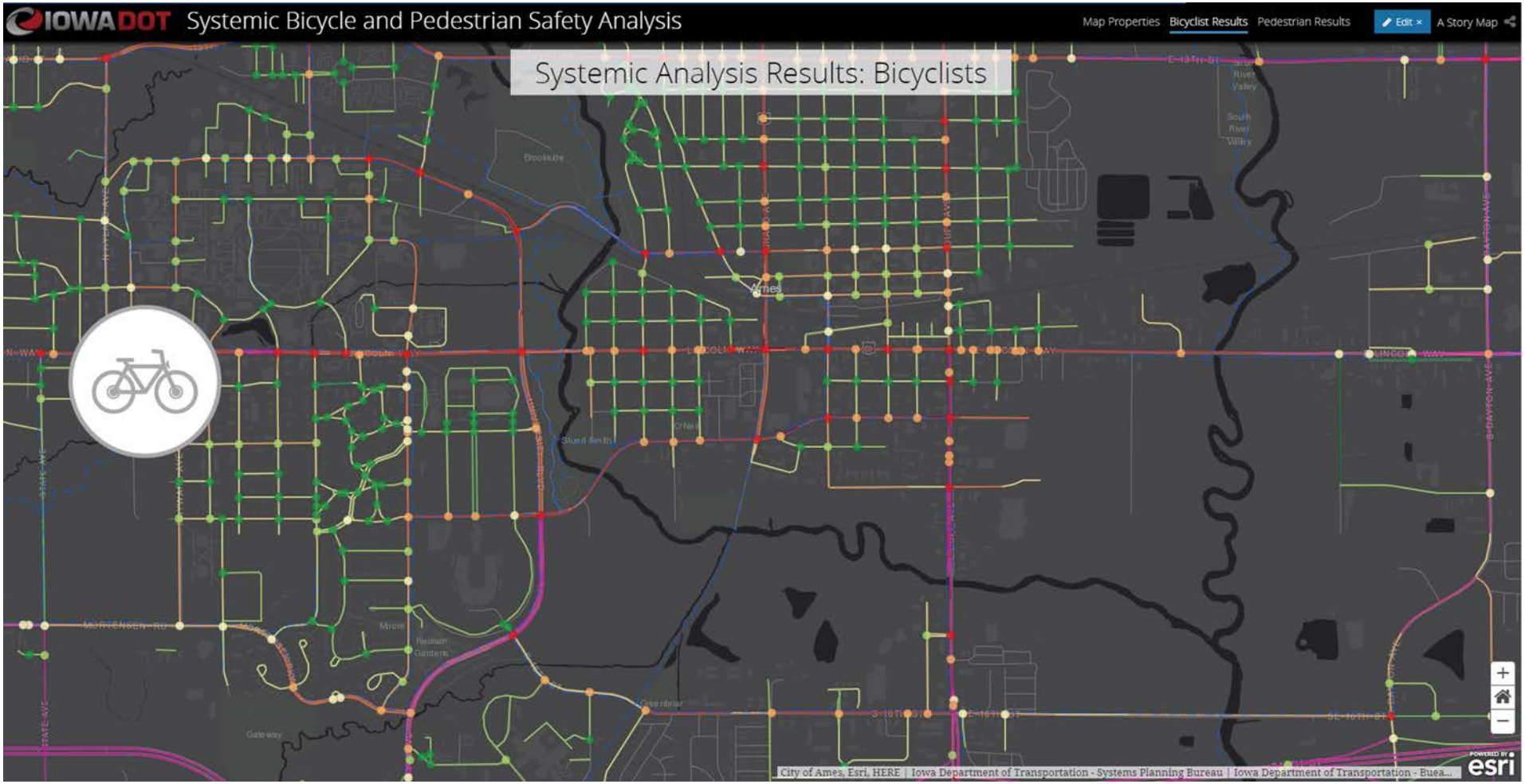
- Normalization
  - For each element a rate is developed based on the number of crashes and associated mileage related to that attribute.
  - A normalized Score of 1-10 is developed based on the range of possible values for each element attribute.
- Weighting
  - Once all the elements have been normalized to a common scale a weighting multiplier is applied.
  - This is essentially done for two reasons
    - To eventually have a composite score from 0-100
    - In the future the ability to emphasize elements over each other.
- Composite Scores
  - After weighting, all the weighted element scores are added together for each segment or intersection which makes up a composite score.

Composite Scoring

- Elements
  - AADT → 14.28
  - Speed Limit → 12.85
  - Number of Lanes → 14.28
  - Shoulder Width → 1.42
  - Shoulder Type → 12.85
  - Median Type → 1.42
  - Shoulder Rumble → 14.28

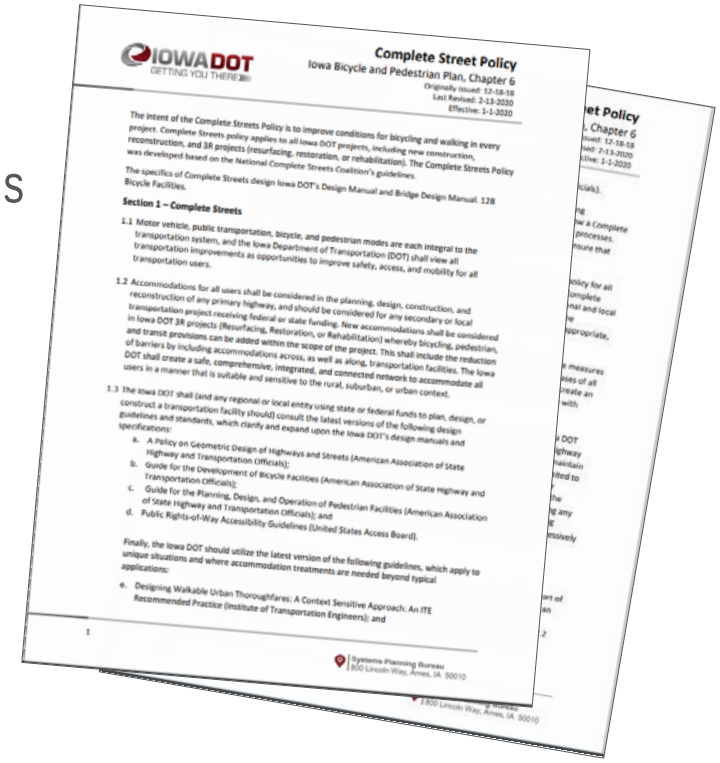
= **71.38**

Bicyclist and Pedestrian Systemic Safety Analysis



Integrating into Decision Making

- Local Decision Making
  - Please use in support of plans, analysis, and prioritization of local projects!
- State Decision Making
  - Iowa DOT has 6 District offices
  - Complete Streets Policy
    - Needs Test Assessment



IOWA DOT
GETTING YOU THERE

Complete Street Policy
Iowa Bicycle and Pedestrian Plan, Chapter 6
Originally Issued: 12-18-18
Last Revised: 2-13-2020
Effective: 1-1-2020

The intent of the Complete Streets Policy is to improve conditions for bicycling and walking in every project. Complete Streets policy applies to all Iowa DOT projects, including new construction, reconstruction, and 3R projects (resurfacing, restoration, or rehabilitation). The Complete Streets Policy was developed based on the National Complete Streets Coalition's guidelines.

The specifics of Complete Streets design Iowa DOT's Design Manual and Bridge Design Manual. 12B Bicycle Facilities.

Section 1 – Complete Streets

1.1 Motor vehicle, public transportation, bicycle, and pedestrian modes are each integral to the transportation system, and the Iowa Department of Transportation (DOT) shall view all transportation improvements as opportunities to improve safety, access, and mobility for all transportation users.

1.2 Accommodations for all users shall be considered in the planning, design, construction, and reconstruction of any primary highway, and should be considered for any secondary or local transportation project receiving federal or state funding. New accommodations shall be considered in Iowa DOT 3R projects (Resurfacing, Restoration, or Rehabilitation) whereby bicycling, pedestrian, and transit provisions can be added within the scope of the project. This shall include the reduction of barriers by including accommodations across, as well as along, transportation facilities. The Iowa DOT shall create a safe, comprehensive, integrated, and connected network to accommodate all users in a manner that is suitable and sensitive to the rural, suburban, or urban context.

1.3 The Iowa DOT shall (and any regional or local entity using state or federal funds to plan, design, or construct a transportation facility should) consult the latest versions of the following design guidelines and standards, which clarify and expand upon the Iowa DOT's design manuals and specifications:

a. A Policy on Geometric Design of Highways and Streets (American Association of State Highway and Transportation Officials);
b. Guide for the Development of Bicycle Facilities (American Association of State Highway and Transportation Officials);
c. Guide for the Planning, Design, and Operation of Pedestrian Facilities (American Association of State Highway and Transportation Officials); and
d. Public Rights-of-Way Accessibility Guidelines (United States Access Board).

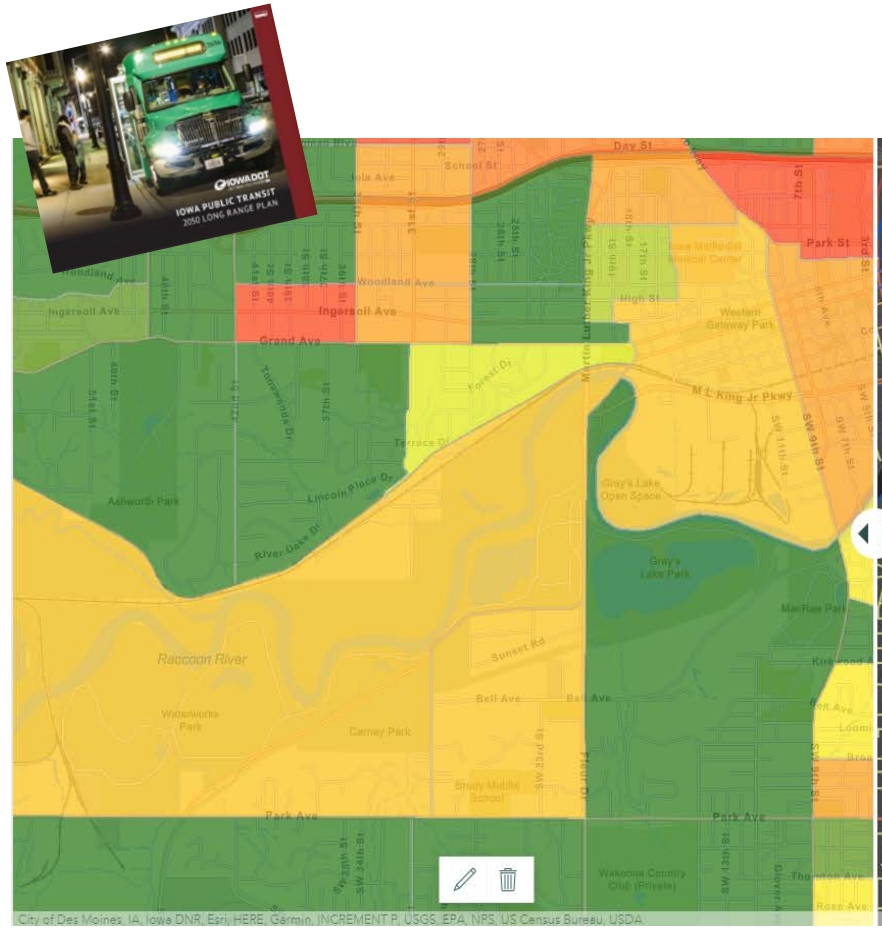
Finally, the Iowa DOT should utilize the latest version of the following guidelines, which apply to unique situations and where accommodation treatments are needed beyond typical applications:

e. Designing Walkable Urban Thoroughfares: A Context Sensitive Approach: An ITE Recommended Practice (Institute of Transportation Engineers); and

1

Systems Planning Bureau
800 Lincoln Way, Ames, IA 50010

Equity and Safety integration



THANK YOU FOR YOUR TIME AND ATTENTION

Samuel Sturtz
Transportation Planner
Systems Planning Bureau
515-239-1788
Samuel.sturtz@iowadot.us

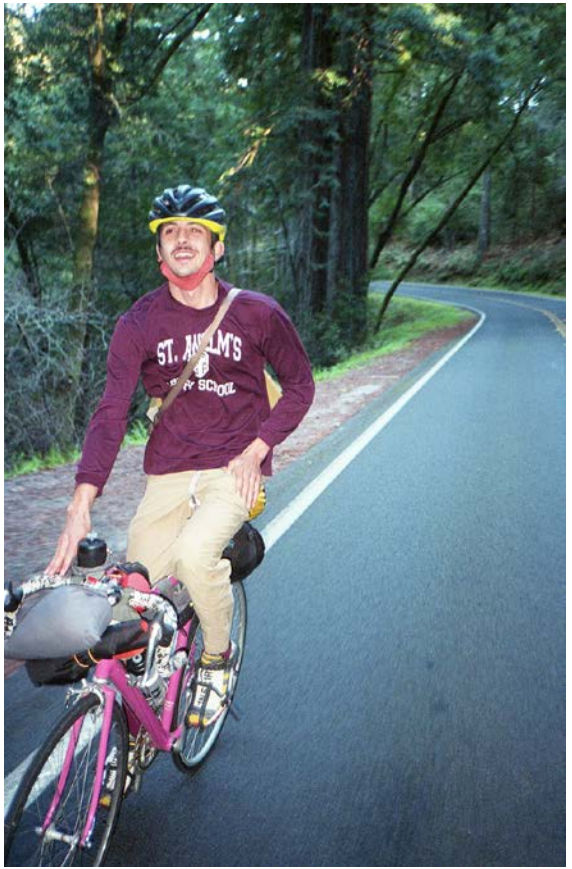
Georgia Department of Transportation

Safety & Equity in Active Transportation

AASHTO Peer Exchange

Jack Anninos

GDOT State Bicycle & Pedestrian Engineer



Georgia

- Georgia has 159 counties - the second most in any state behind Texas with 254

State of Safety

GDOT Safety Programs

- Bicycle & Pedestrian Safety
- Safety Project Identification
- Data Driven Decisions
- Education & Outreach
- Policy & Funding

Project Identification

A Look At The Data

01. Identify Location

02. Conduct Research

03. Analyze Data

04. Propose Solutions

The 2018 Georgia Pedestrian Safety Action Plan identifies pedestrian focus areas at a county, city, and corridor level across the state.

Project Identification

A Look At The Data

Research corridor data, including:

- Average daily traffic volumes
- Previous or planned projects in the area
- Historical speed data
- GIS right-of-way data

Project Identification

A Look At The Data

Analyze crash data to explore effective countermeasures and calculate benefit-cost values.

Project Identification

A Look At The Data

Provide recommendations for safety projects on the corridor. Partner with the GDOT District Office to develop delivery mechanisms.

Community Partnerships

Understanding the value of collaboration

- Perceptions of safety and education
- Local insight fills data gaps
- Community appreciation programs

GOHS State Safety Task Teams

We all see a different roads

- Occupant Protection
- Aggressive Driving
- Impaired Driving
- Pedestrian
- Bicycle
- Alternative Intersections
- Older / Younger Drivers
- Motorcycles
- Traffic Incident Mgmt Enhancement

Statewide Education

Familiarize yourself with the tools at your disposal

- SHSP Action Plan
  - Pedestrian Safety Action Plan
  - Bicycle Safety Action Plan
- GDOT Pedestrian Streetscape Guide
- Communications Plans
- Safety Partnerships

Georgia Department of Transportation

Thank you

Any questions?

Active Transportation Safety + Equity + and Mobility at WSDOT

Barb Chamberlain
Director, Active Transportation Division
@BarbChamberlain

AASHTO Peer Exchange
April 28, 2021

WSDOT

ATP goals

- **Connectivity:** Complete comfortable and efficient walking and rolling networks so people can reach their destinations and other forms of transportation and have everyday access to physical activity.
- **Safety:** Eliminate deaths and serious injuries of people walking and rolling.
- **Opportunity:** Eliminate disparities in access to safe active transportation connections for people and communities most dependent on walking, bicycling and transit.
- **Participation:** Increase the percentage of everyday short trips made by walking or bicycling.
- **Partnership:** Collaborate with local, regional, state, tribal and federal partners to complete and improve the network across boundaries.

“Safe, Safer, Safety”

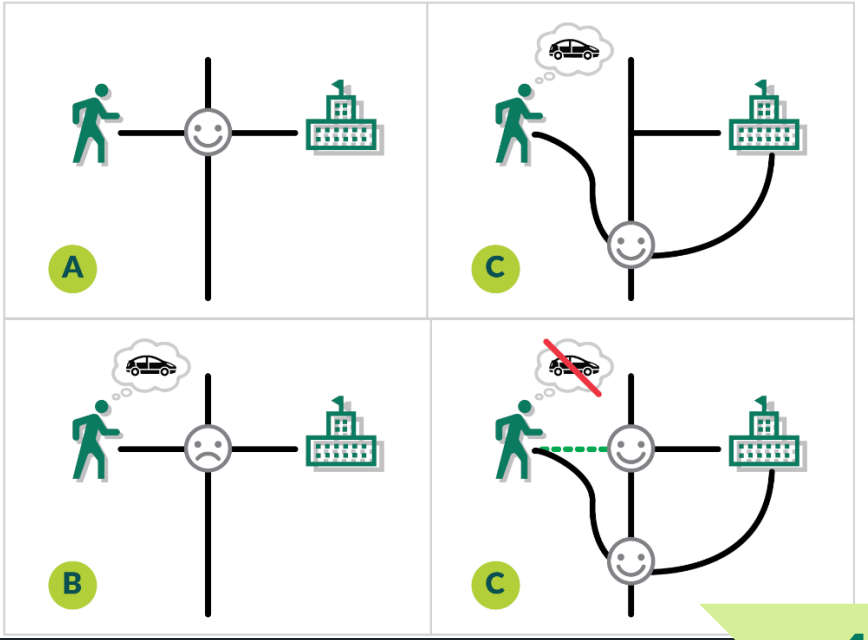
How does your agency define safety? How do you advance it?

- Exposure to potential for serious/deadly crashes
- Is there any space for me at all? (Safety = Connectivity = Mobility = Safety)
- Health+: Reduced exposure to things that affect health
- Health+: Access to places I can take care of my physical, mental, and emotional well-being through movement and being outdoors
  - Make the healthy choice the easy choice
  - COVID behavioral health issues: Walk/bike/outdoors “prescription”
- Environment+: Can I use transportation that doesn’t contribute pollutants/emissions to my neighborhood?
- Equity+: If I use this space, am I subject to harassment? Danger? Deadly encounters?
  - Dr. Charles T. Brown, #ArrestedMobility
  - AASHTO Passes Resolution Addressing Race, Equity, Diversity, And Inclusion
  - 10 Principles of Mobility Justice

Focus on facilities

- **Safe Systems Approach** underpinning analysis
- Level of traffic stress gives us an **objective, quantitative set of design and operations factors** that define gaps to improve over time.
- **Focus on population centers** lets us address critical safety needs and tap into latent demand where potential is highest.
- **Latent demand** is only unleashed when you can get all the way to your destination; importance of **route directness and crossing availability** in the context of **travel need**.

- It takes **partnership** to find the best way through for **network connectivity across jurisdiction boundaries**. Best solution for a gap on state right of way may be on the local system. More data + Plan alignment = Shared priority maps

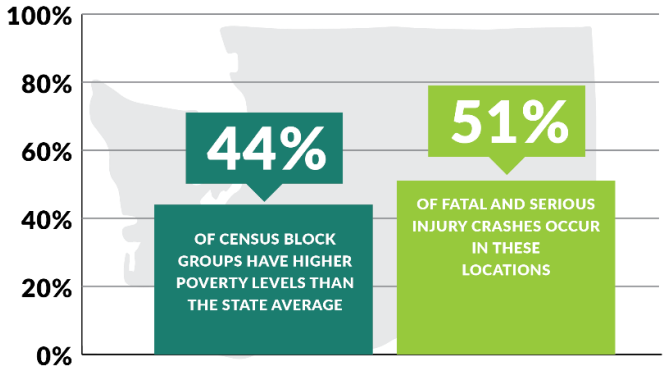


Core concepts for equity + safety

- Use of demographic information helps us address **disproportionate serious injuries and deaths** by applying **equity factors + safety + demand** in evaluation and future prioritization
- How many people in your state don't hold a driver's license? (Hint: Kids count too.)
- **"User count" is not synonymous with "need" or "demand".** Build it and they will walk and roll.
  - **(Induced demand worked for driving…)**
- Justification for ADA facilities is not tied to existing use; it is grounded in the right to have access to appropriate facilities. Active transportation facilities serve disabled users and are needed to develop a complete and accessible network for all.

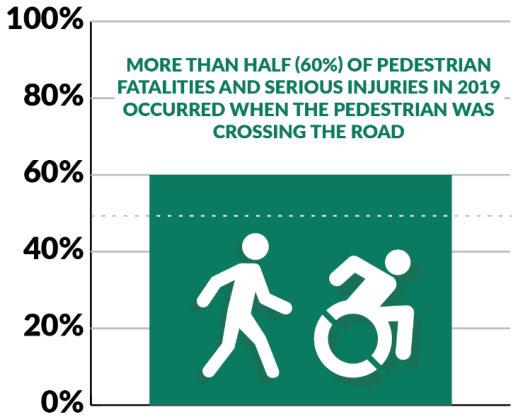
Equity: The data

- **History:** Effects of transportation and land use decisions
  - Very clear patterns in data
  - Redlining, reservations, and roads: Disparities in walk/bike infrastructure, road design, highway locations, exposure to pollution
- **Demographics**
  - ~25% of Washingtonians don't drive
  - More fatal/serious crashes in census tracts w/higher levels of poverty and Black, Indigenous, people of color



Safety: The data

- Pedestrian crossings
- Driver speed
- Population centers
- Target Zero: Safe Systems Approach



86%
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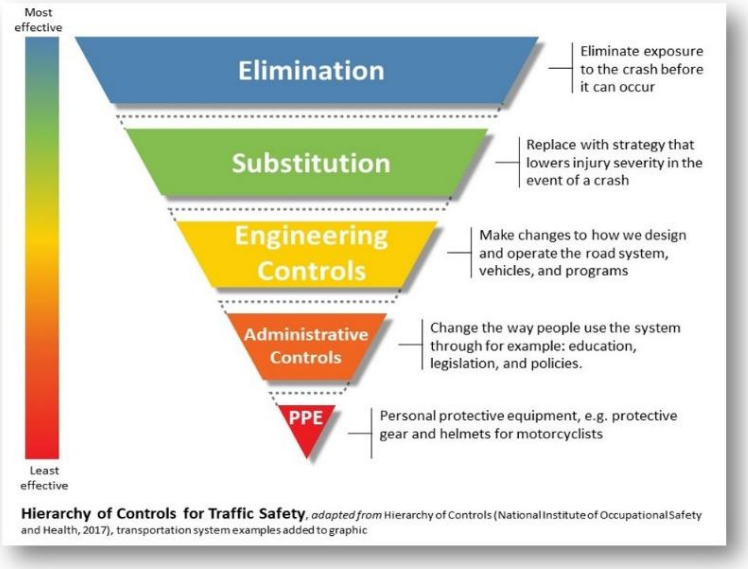
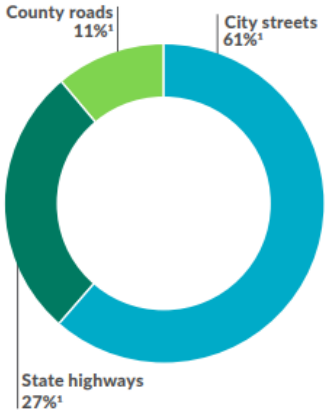


Hierarchy of Controls for Traffic Safety, *adapted from* Hierarchy of Controls (National Institute of Occupational Safety and Health, 2017), transportation system examples added to graphic

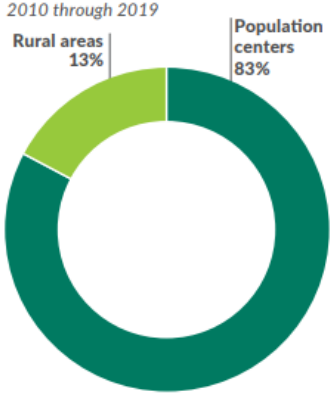
Majority of bicyclist and pedestrian fatalities and serious injuries in last decade were on city streets

Bicyclist and pedestrian fatalities and serious injuries; 2010 through 2019



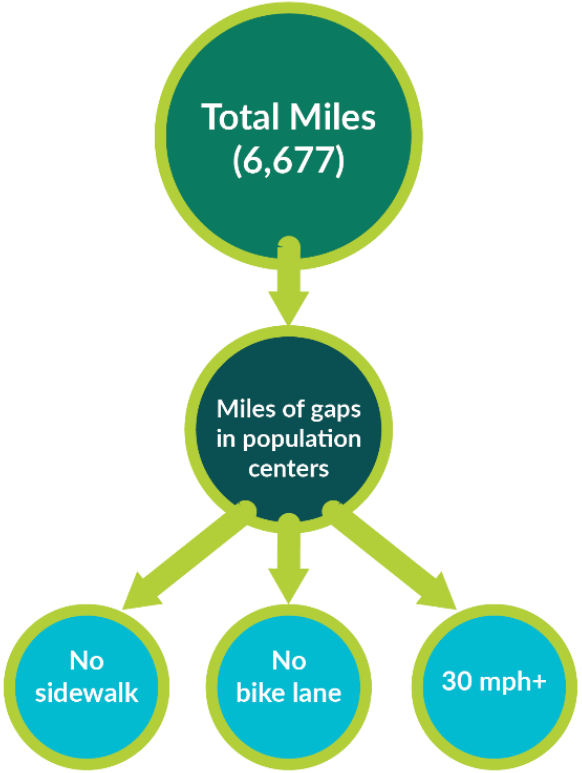
Majority of bicyclist and pedestrian fatalities and serious injuries on state highways are in population centers

Bicyclist and pedestrian fatalities and serious injuries on state highways; 2010 through 2019



Safety: Identifying gaps

- First-ever analysis of Washington state routes in all population centers based on roadway characteristics, traffic speed and volume, with evaluation criteria for safety, equity, and potential demand



Evaluation criteria

Safety

- History of serious/fatal driver crashes with bicyclists/pedestrians
- Systemic safety: Roadway characteristics that contribute to crash potential
  - LTS used first to identify gaps, then as index/proxy for systemic safety ranking in those gaps
- Connections to and between destinations (including intermodal links and trails)

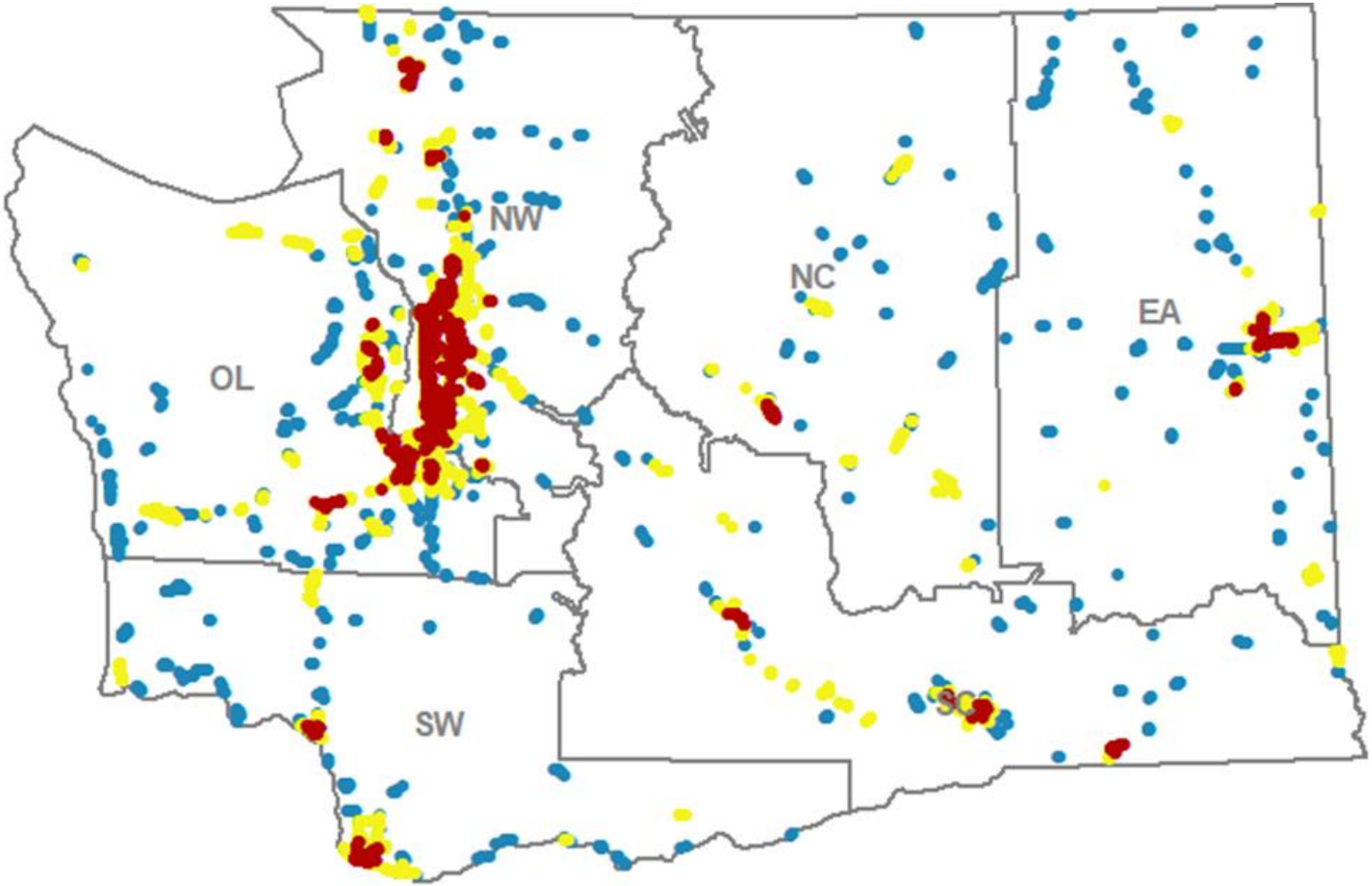
Equity

- Places with relatively high numbers of people living in poverty
- Places with relatively high numbers of Black, Indigenous, people of color
- Places with relatively high numbers of people with a disability

Potential Demand

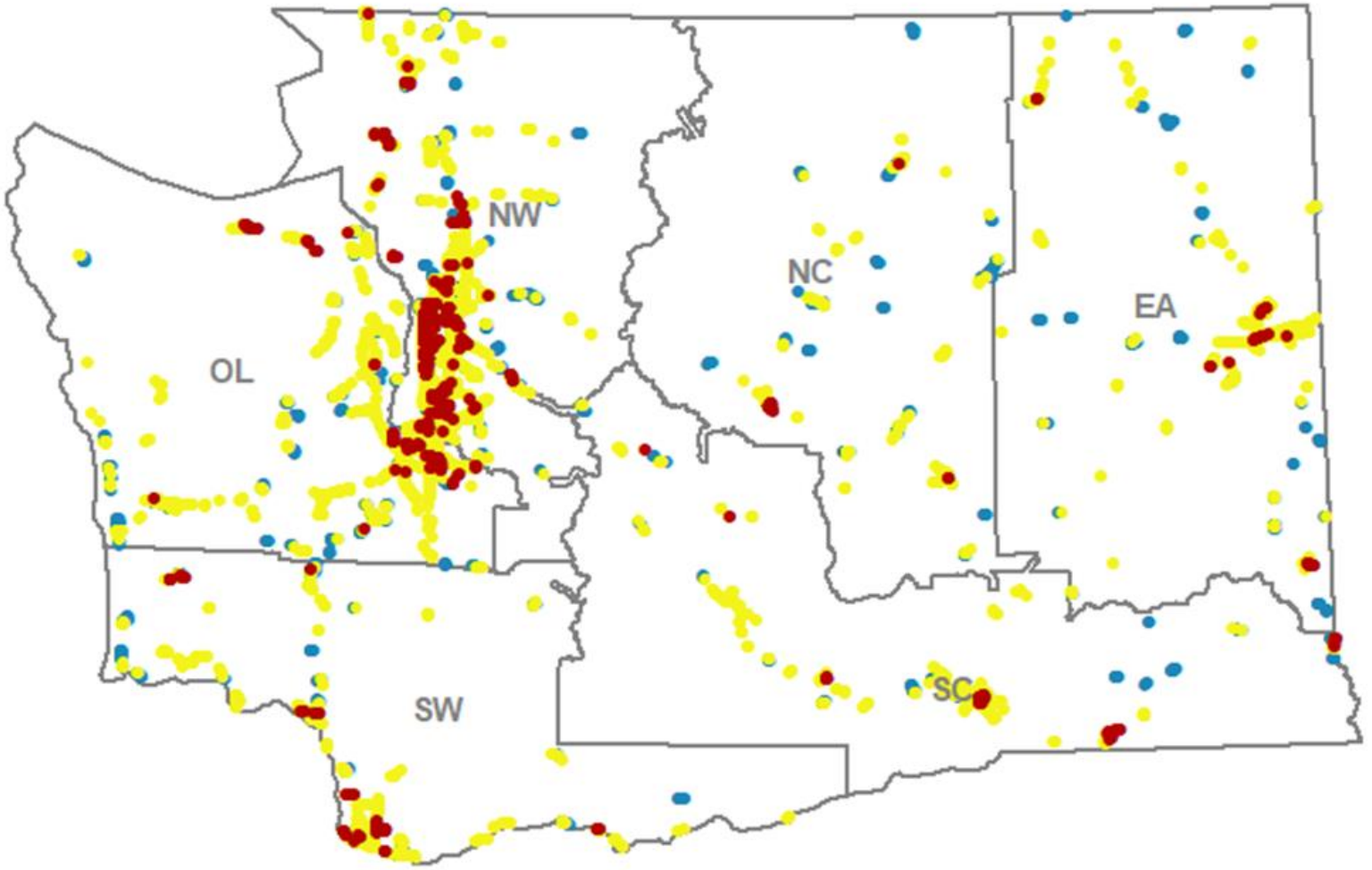
- Potential demand based on population density, density of jobs, proximity to schools, bus stops/intermodal connections, and other destinations

Evaluation criteria: Demand



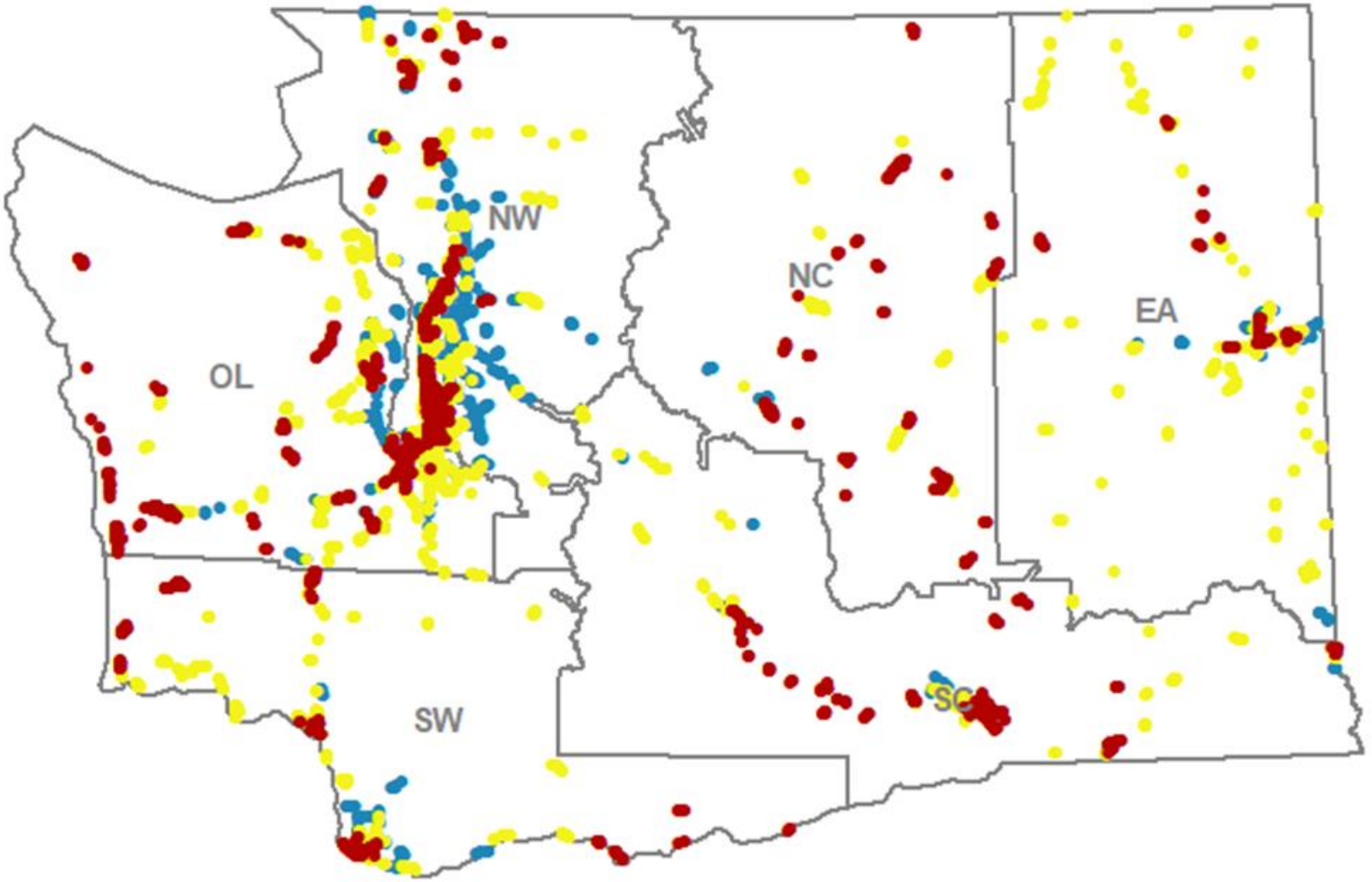
Intersection/crossing gaps with **Demand** criteria prioritized. Red: Greatest need/opportunity. Yellow: Moderate. Blue: Lower.

Evaluation criteria: Safety



Intersection/crossing gaps with Safety criteria prioritized. Red: Greatest need/opportunity. Yellow: Moderate. Blue: Lower.

Evaluation criteria: Equity



Intersection/crossing gaps with **Equity** criteria prioritized. Red: Greatest need/opportunity. Yellow: Moderate. Blue: Lower.

Contact information

- ATP will be published May 4, 2021 and will be linked at http://bit.ly/WSDOT-2019-ATP
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