Ann Arbor Roadway Rightsizing Overview and Methodology

Ann Arbor Transportation Commission

Tuesday, September 17

AGENDA

- Project Overview
- Background
- Reconfiguration Analysis Methodology
- Engagement

TOOLE DESIGN

Overall Project Purpose:

Evaluate ten (10) of the City's multi-lane roads to consider **road reconfigurations** that can:

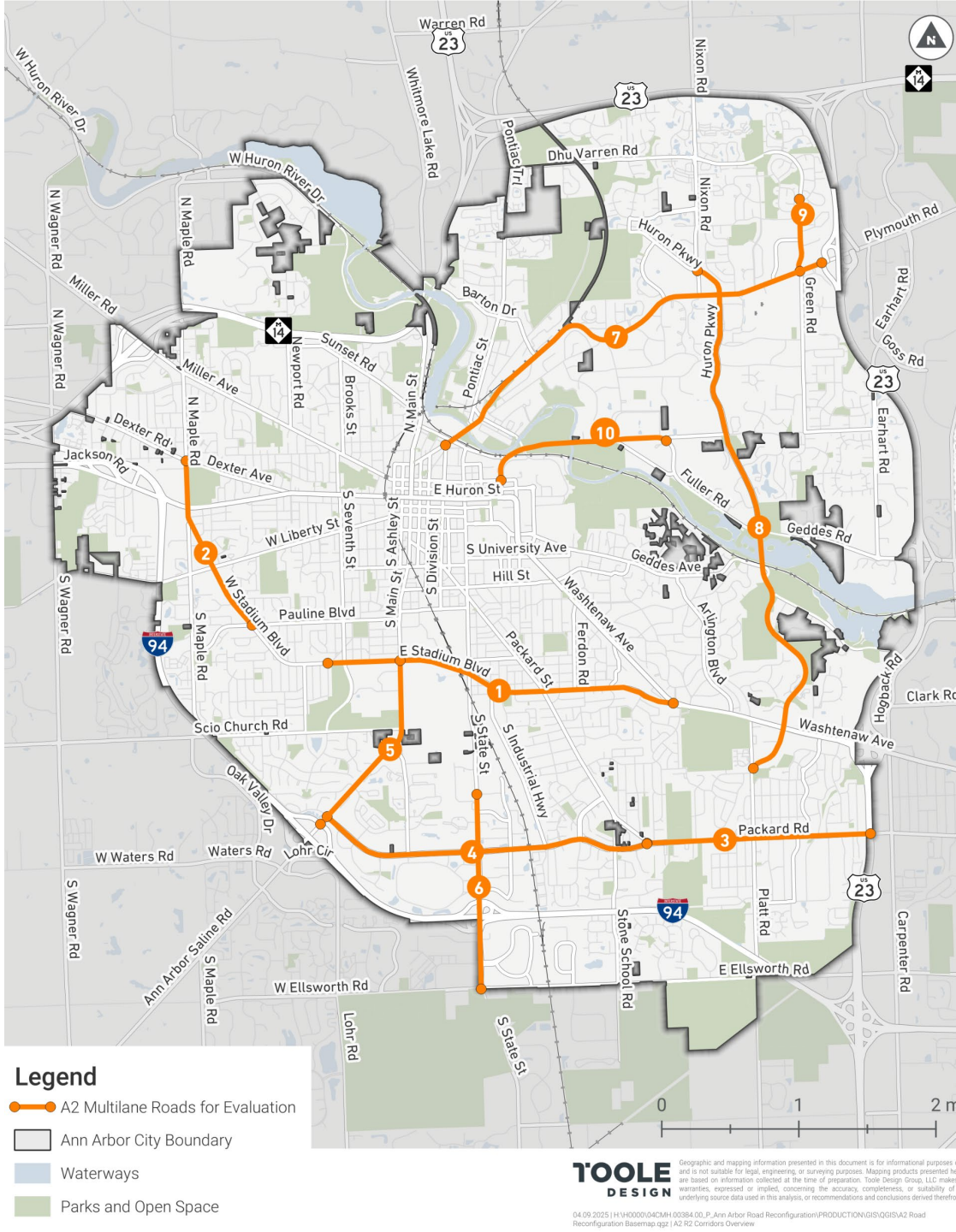
- Reduce speeds
- Better organize traffic
- Address systemic safety issues for all road users
- Incorporate future planned transit and bicycle infrastructure

TOOLE DESIGN

Study Corridors

1) Stadium Blvd
2) North Maple/West Stadium Blvd
3) Packard St
4) Eisenhower Pkwy
5) Main St/Ann Arbor Saline
6) State St
7) Broadway/Plymouth Rd
8) Huron Pkwy
9) Green Rd
10) Fuller Rd

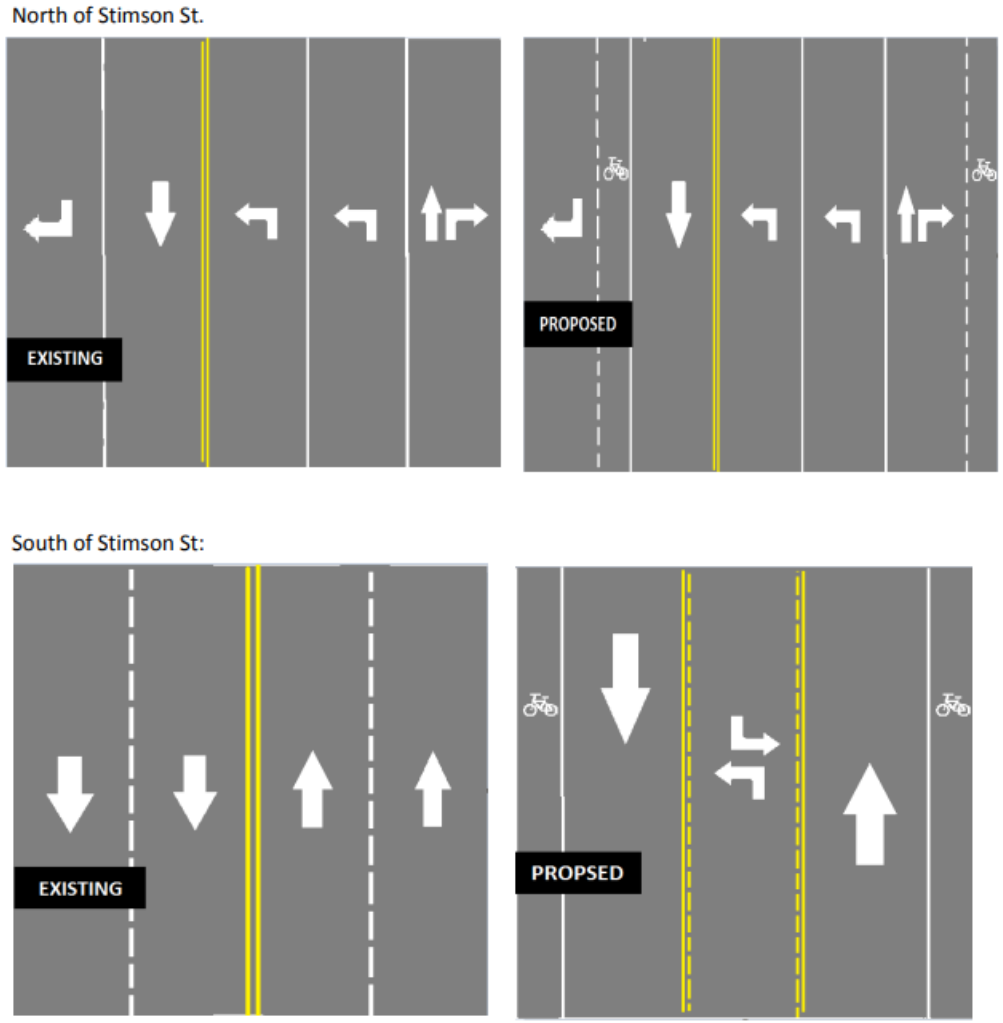
TOOLE DESIGN



PAST APPROACHES TO LANE CONVERSION

2005 Criteria Used

- Traffic Data
- Crash Data
- Driveway Density



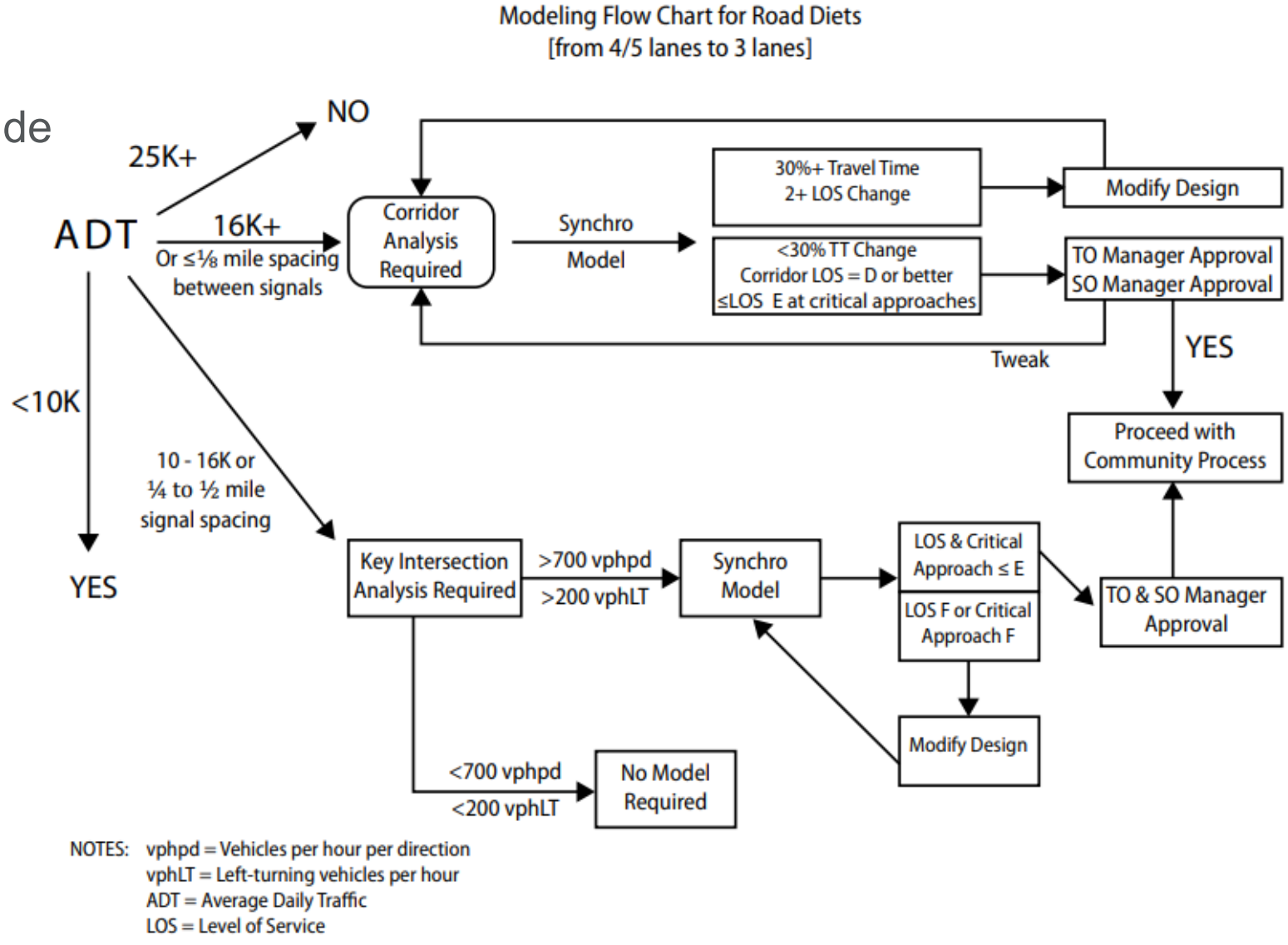
S Industrial Hwy (2021)

TOOLE DESIGN

PAST APPROACHES TO LANE CONVERSION

2019 Considerations

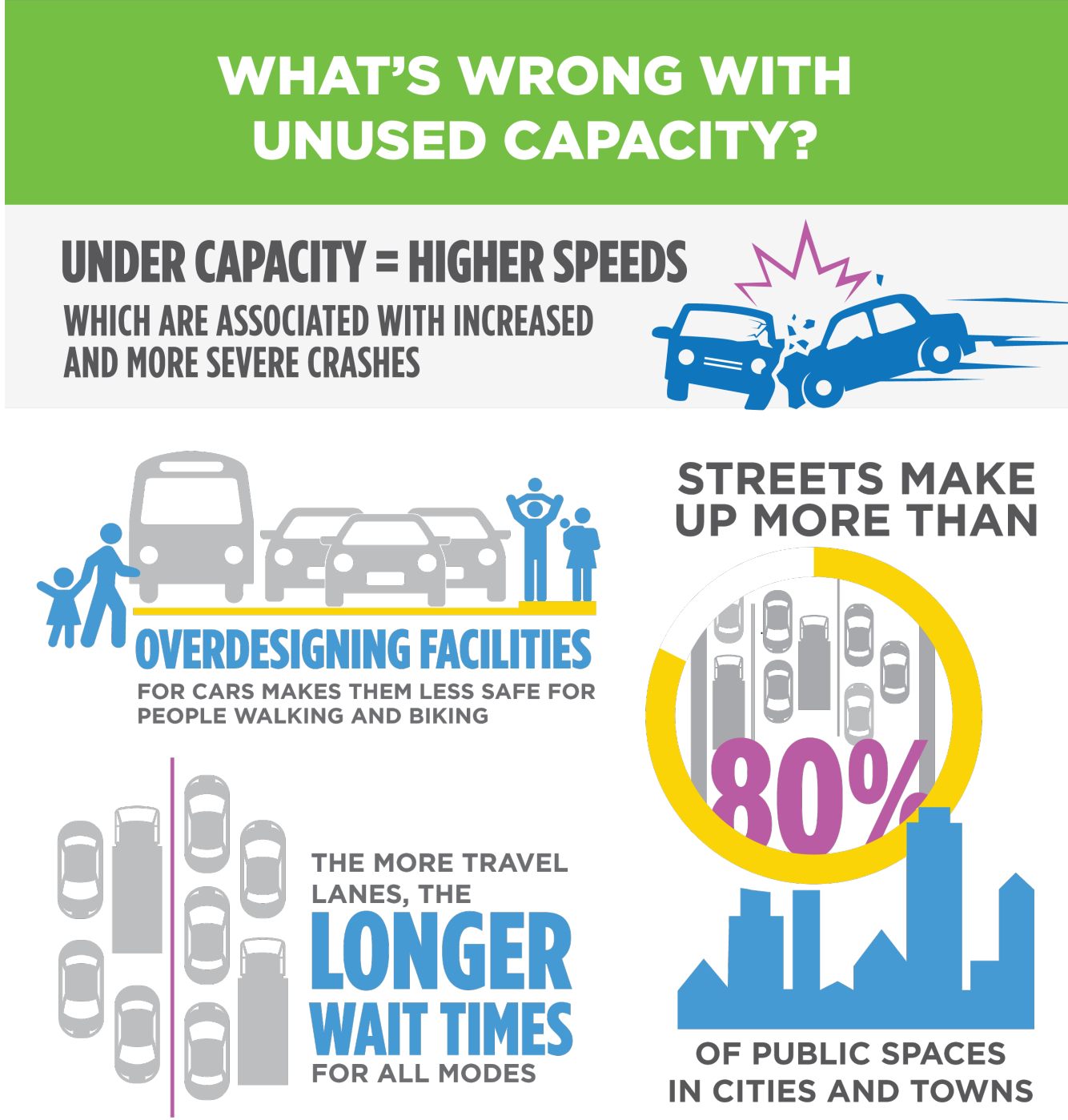
- FHWA Road Diet Information Guide
- MDOT Road Diet Checklist



TOOLE DESIGN

INSPIRED BY NCHRP 1036

- 16 Hour Framework rather than focus only on peak vehicle traffic hours
- Considers the negative consequences of too much roadway capacity in balance with other considerations



TOOLE DESIGN

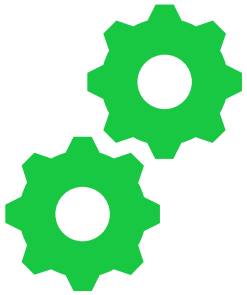
Inspired by NCHRP 1036: Roadway Cross-Section Reallocation Guide

Historic Approach:		NCHRP 1036 Approach:
Motor vehicle traffic operations above all else	→	Focus on **safety** and **community goals** and considers the negative consequences of excess capacity
Evaluate peak hour or peak 15 minutes	→	24- and 16-Hour Evaluation Framework
Establish space for motor vehicles first, use all “leftover” space for sidewalks, bike lanes, streetscaping	→	Define ideal space needed for every mode based on the community’s vision

TOOLE DESIGN

OUR APPROACH TO LANE CONVERSION

Screening



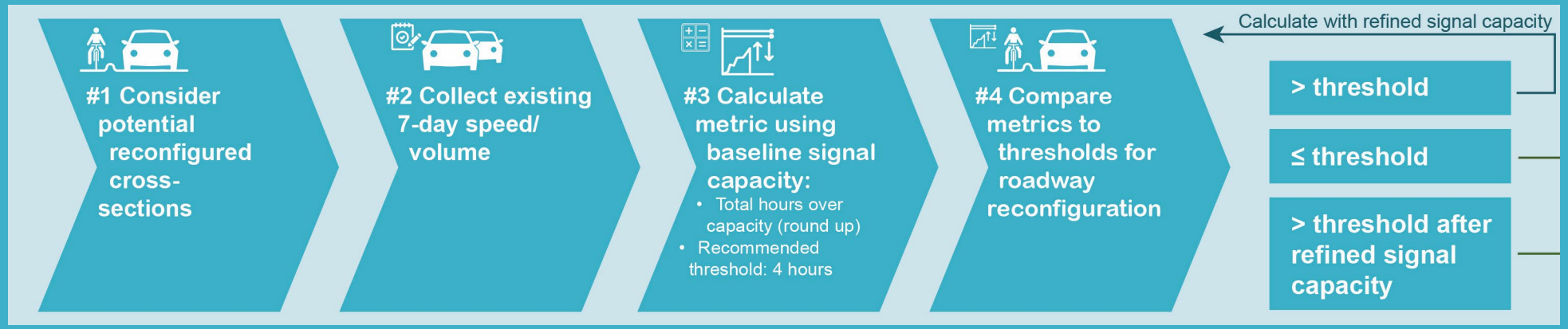
Mitigation

Concept Design

TOOLE DESIGN

Screening

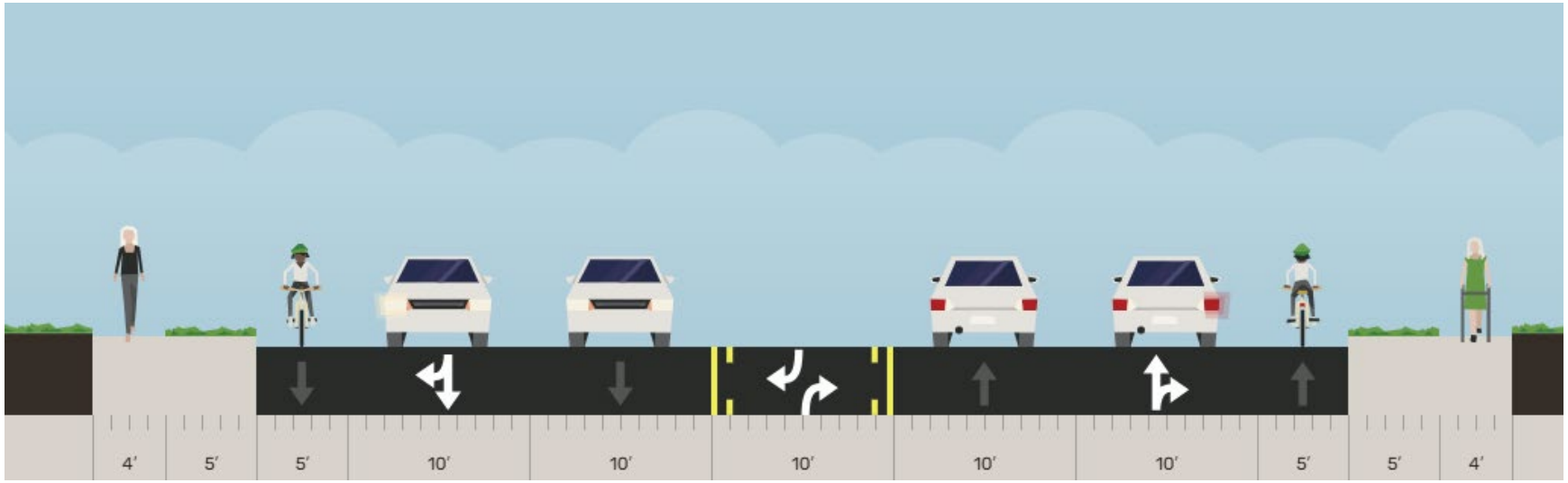
NCHRP 1036 Roadway Cross Section Reallocation Methodology



TOOLE DESIGN

EXAMPLE – PACKARD STREET, EISENHOWER PKWY TO I-94

- 2 travel lanes per direction with two-way center left-turn lane
- Conventional bike lanes and narrow sidewalks
- 35 mph speed limit

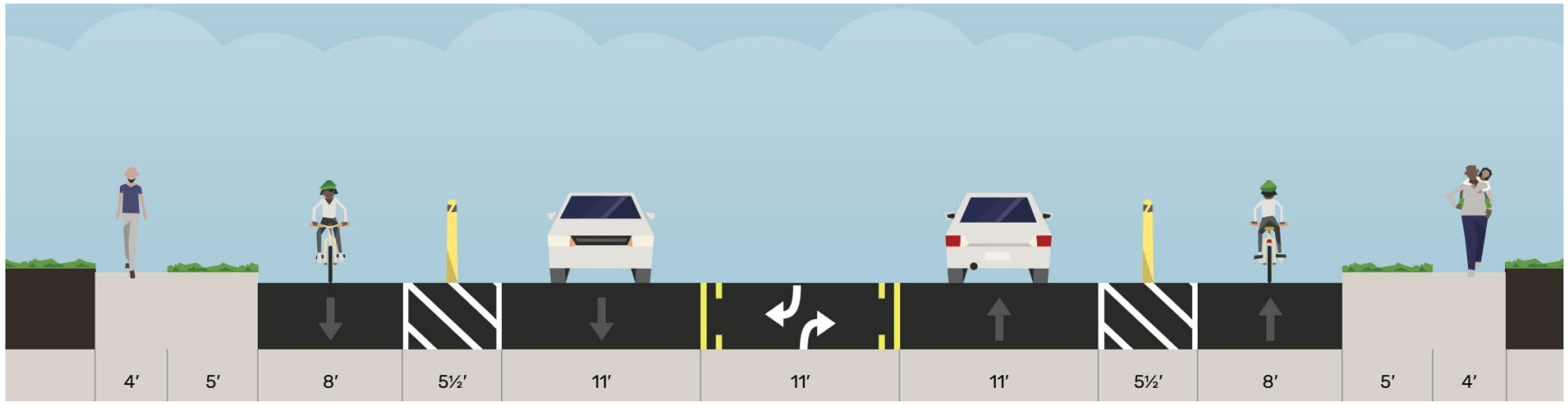


Existing Conditions

TOOLE DESIGN

USE CITY PLANS TO INFORM POSSIBLE FUTURE CROSS SECTIONS

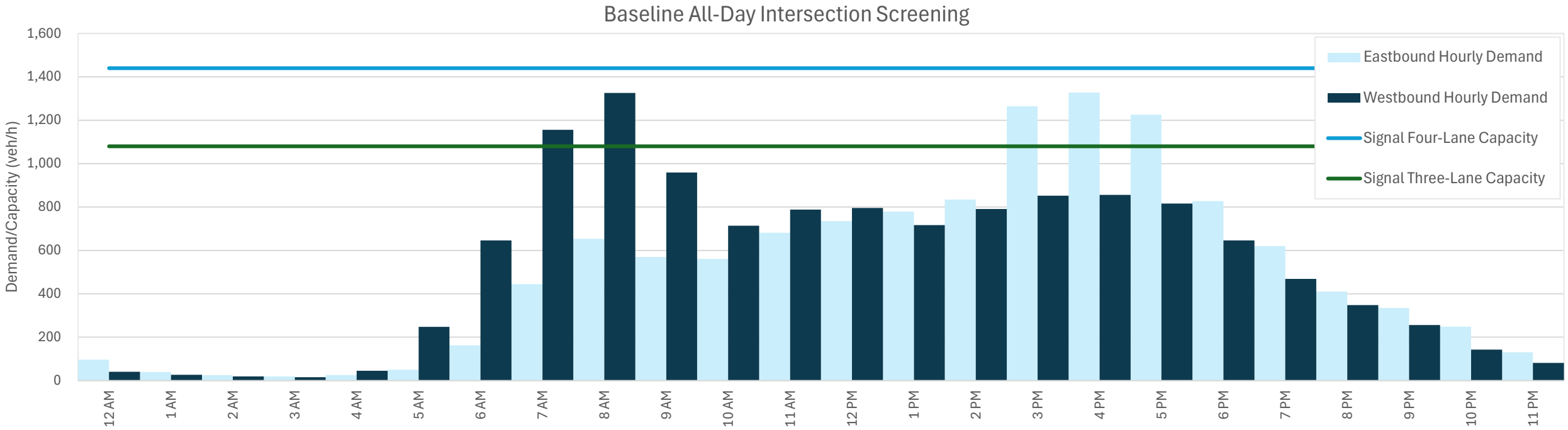
- Tier 2 High Injury Network
- Proposed All Ages and Abilities Major Bike Route
- Priority Service Transit Corridor



Proposed Conditions - *Example*

TOOLE DESIGN

PILOT – BROADWAY STREET BRIDGE



Intersection Control	Signal – Five Lane	Signal – Three Lane
Hours Exceeding Capacity	0	5

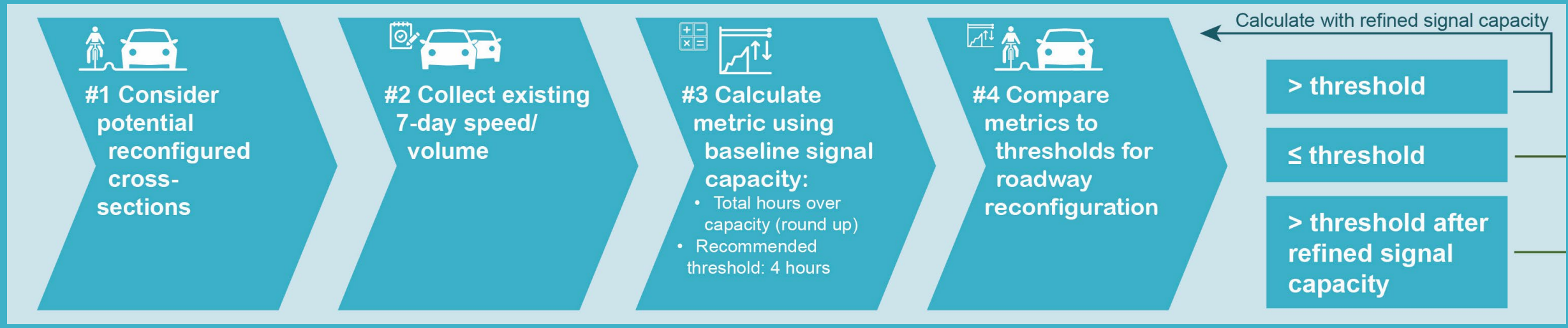
Conclusion

- Reconfiguration to three lanes exceeds threshold of 4 hours overcapacity
- Calculate with refined signal capacity

TOOLE DESIGN

Screening

NCHRP 1036 Roadway Cross Section Reallocation Methodology



TOOLE DESIGN

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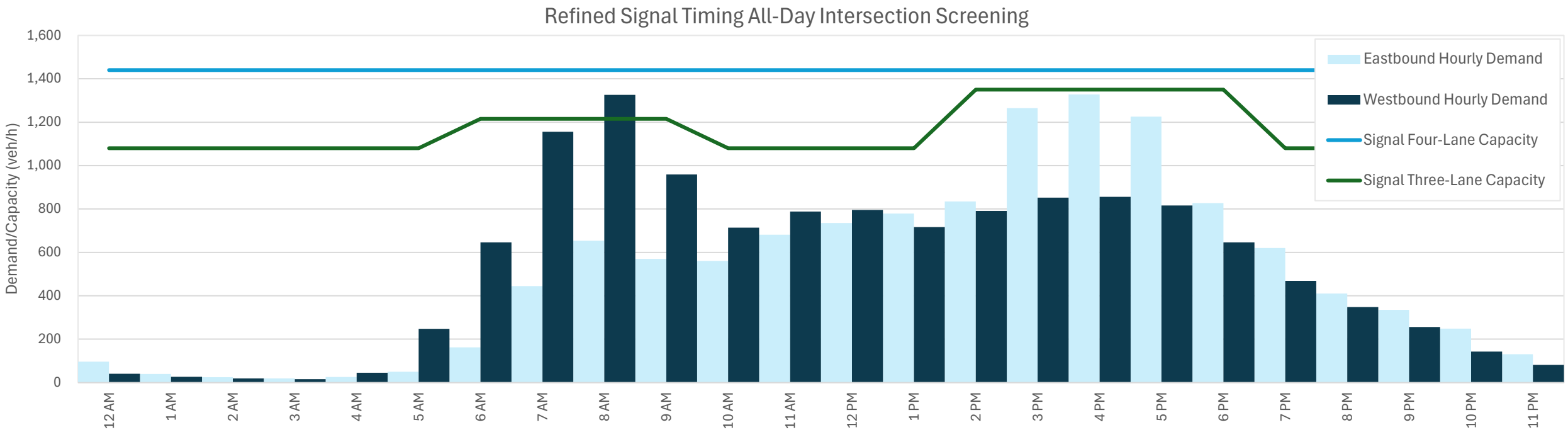


Intersection Control	Signal – Five Lane	Signal – Three Lane
Hours Exceeding Capacity	0	1

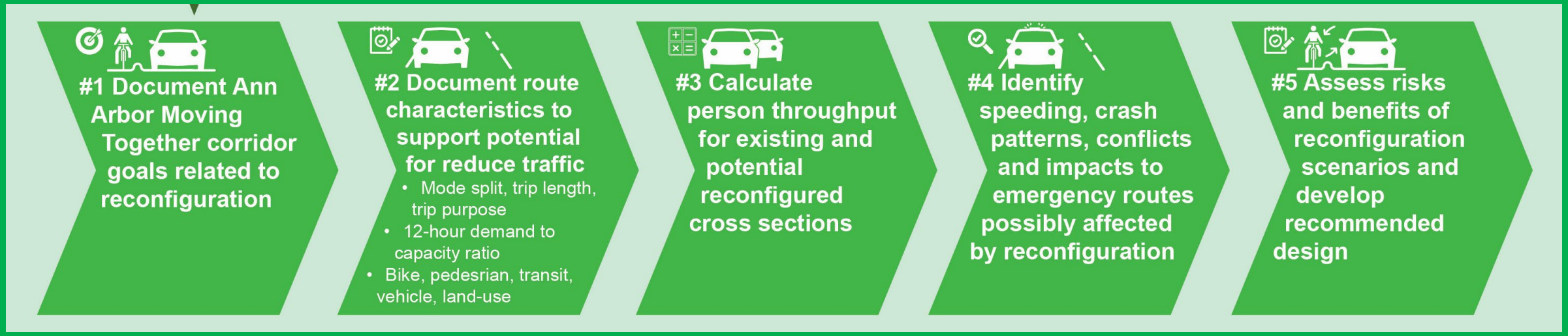
Conclusion

- Refined analysis shows 1 hour overcapacity
- Advance to Concept Design

TOOLE DESIGN

Mitigation

Analysis of Tradeoffs and Benefits



TOOLE DESIGN

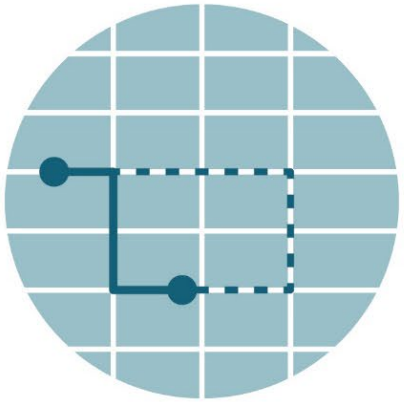
The most important thing is not to change people's minds, but to be honest about the choices on the table and describe them fairly.

NCHRP 1036

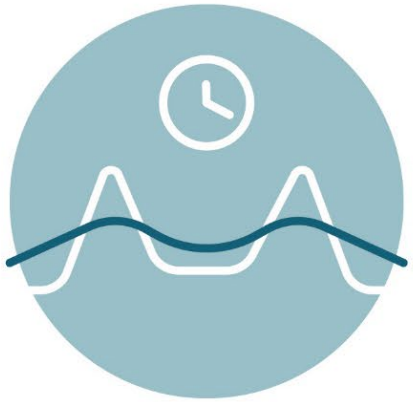
Mitigation Process

- Consider potential for reduced peak hour vehicle traffic due to mode shift, diversion, adapting travel patterns due to changes land use and urban form
- Consider safety benefits from reconfiguration such as multiple threat crossings and lower speeds
- Consider person-throughput of proposed future cross sections

ASSESS POTENTIAL ADAPTATION TO REDUCED ROADWAY CAPACITY



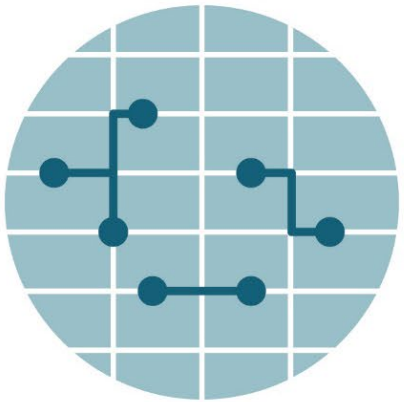
Route Change



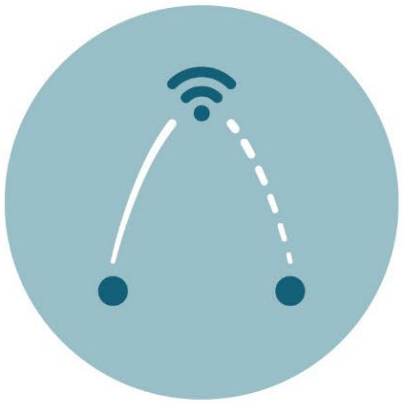
Time Shift

Proximity Shift

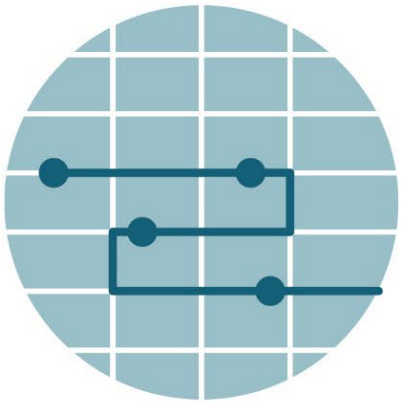
Mode Change



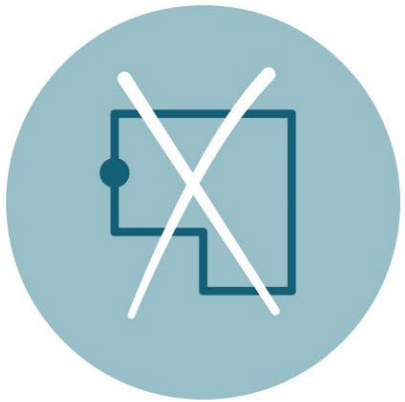
Trip Length Change



Trip Substitution



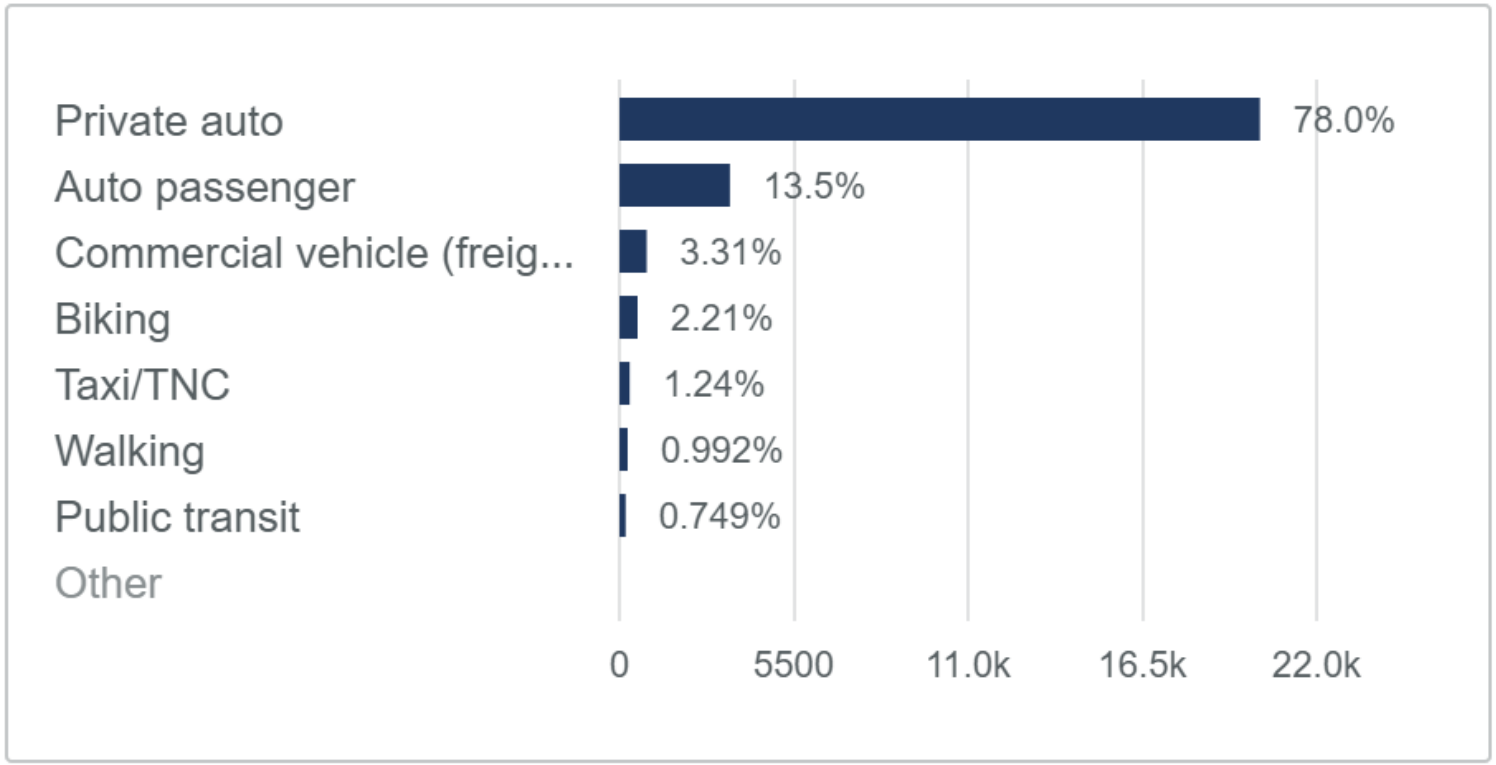
Trip Chaining



Trip Elimination

REPLICA PACKARD STREET PERSON-TRIP CHARACTERISTICS

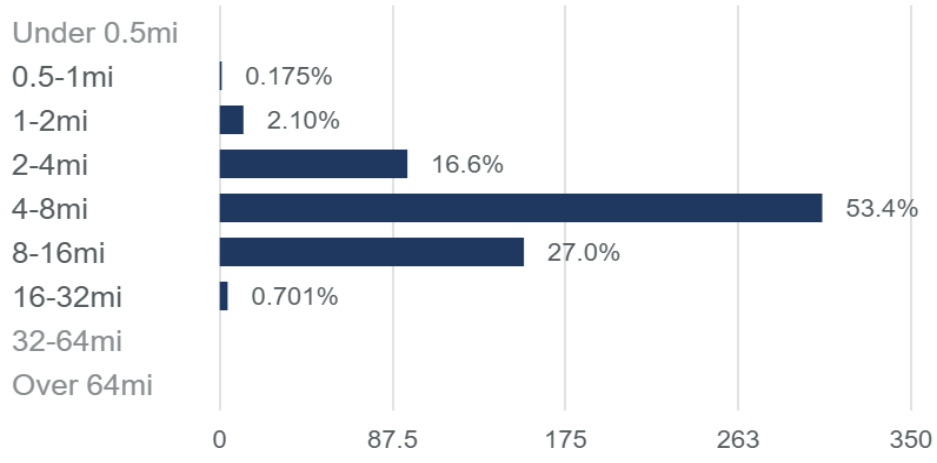
Primary Mode



TOOLE DESIGN

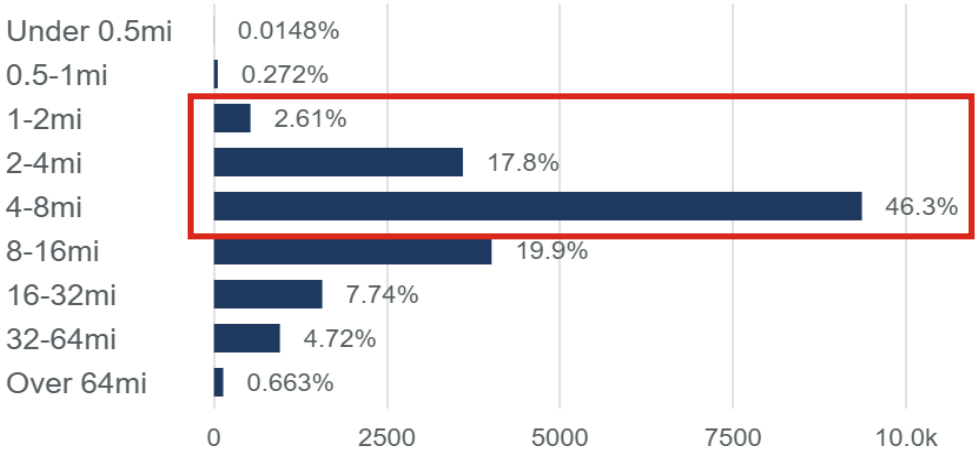
REPLICA PACKARD STREET ROUTE CHARACTERISTICS

Trip Distance (Miles) **Biking**



Average Miles **6.7** | Median Miles **6.4**

Trip Distance (Miles) **Private Auto**



Average Miles **10.0** | Median Miles **6.3**

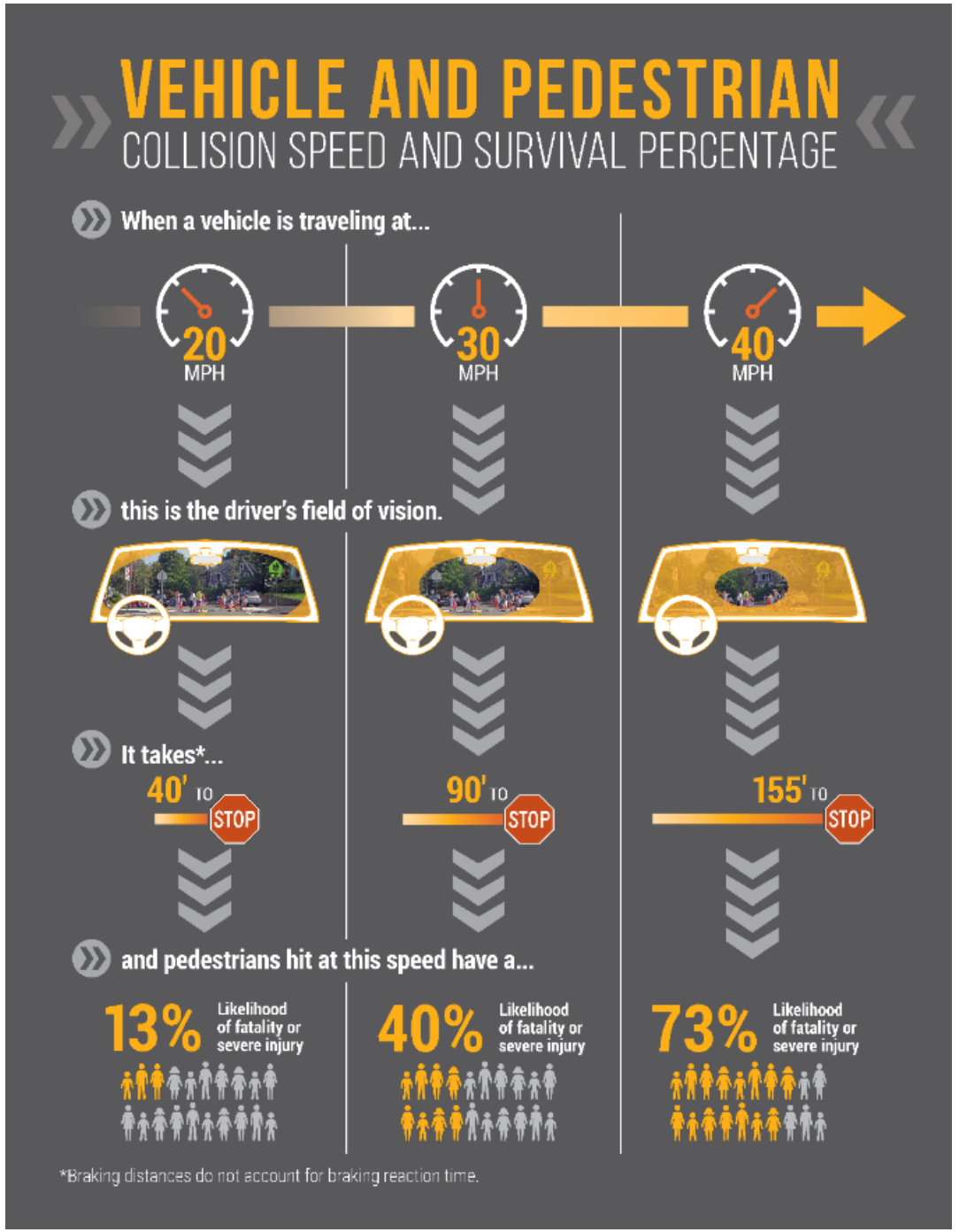
Potential for bike trips

TOOLE DESIGN

SAFE SPEEDS

Packard Street East of Easy Street Speeds

	Eastbound
Posted Speed Limit	35 mph
85th Percentile	47 mph
Average Speed	41 mph
Percent traveling up to 20 mph	0%
Percent traveling between 21 and 30 mph	1%
Percent traveling between 31 and 40 mph	32%
Percent traveling over 40 mph	66%



TOOLE DESIGN

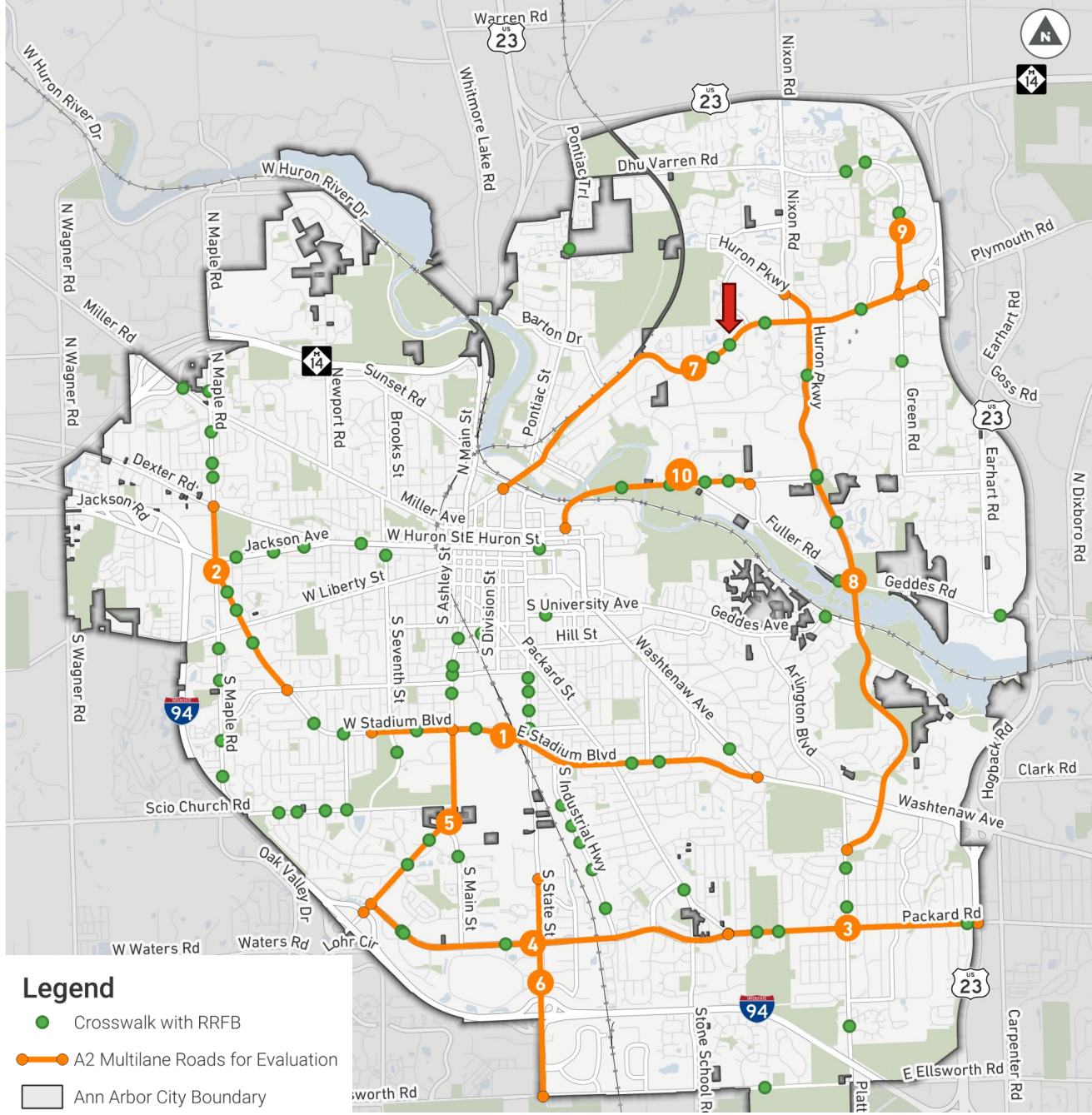
Tefft, B.C. "Impact Speed and a Pedestrian's Risk of Severe Injury or Death." Accident Analysis and Prevention, Vol. 50, 2013, pp. 71-878

MULTIPLE THREAT CROSSINGS

Example: Plymouth Road and Bishop Street

Multiple-Threat Crash occurred in 2016:
https://www.mlive.com/news/ann-arbor/2016/07/driver_cited_for_car-pedestria.html

TOOLE DESIGN



Legend

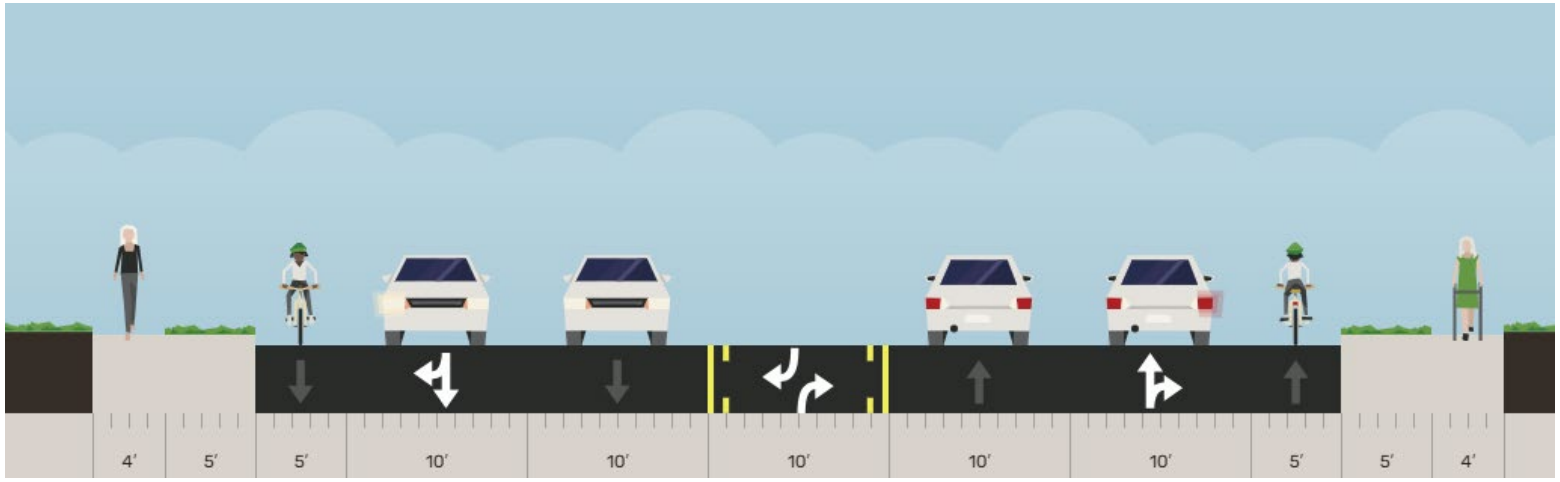
- Crosswalk with RRFB
- A2 Multilane Roads for Evaluation
- Ann Arbor City Boundary
- Waterways
- Parks and Open Space

PERSON CAPACITY

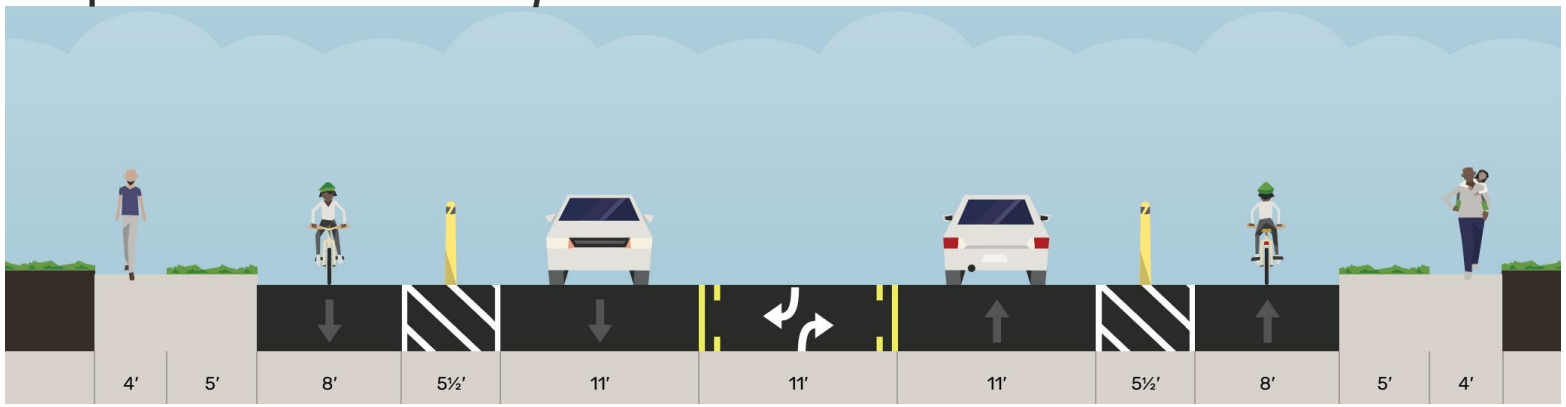
Packard Street East of Easy Street

Person Capacity Per Hour	Existing Conditions	Proposed Three-Lane
Sidewalk	1,260	1,260
Bicycle	740	1,970
Transit	240	240
Vehicle	4,220	2,530
Total	**6,460**	**6,000**

Existing Conditions



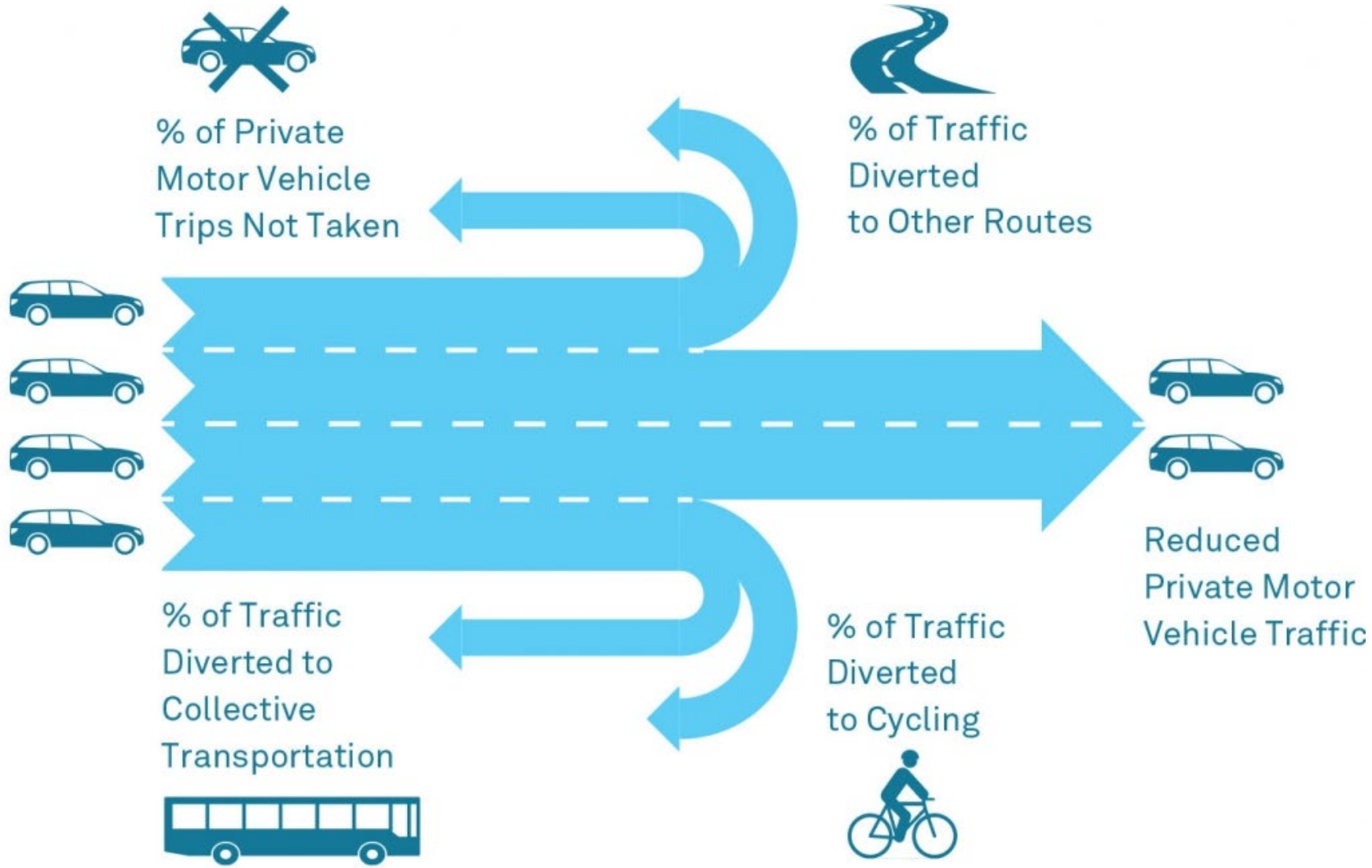
Proposed Conditions - *Example*



Note: Proposed conditions shown are theoretical and do not represent actual proposed cross section for this location

TOOLE DESIGN

ASSESS MITIGATION SCENARIOS



TOOLE DESIGN

Concept Design

Identify Critical Locations and Develop Concept Plans

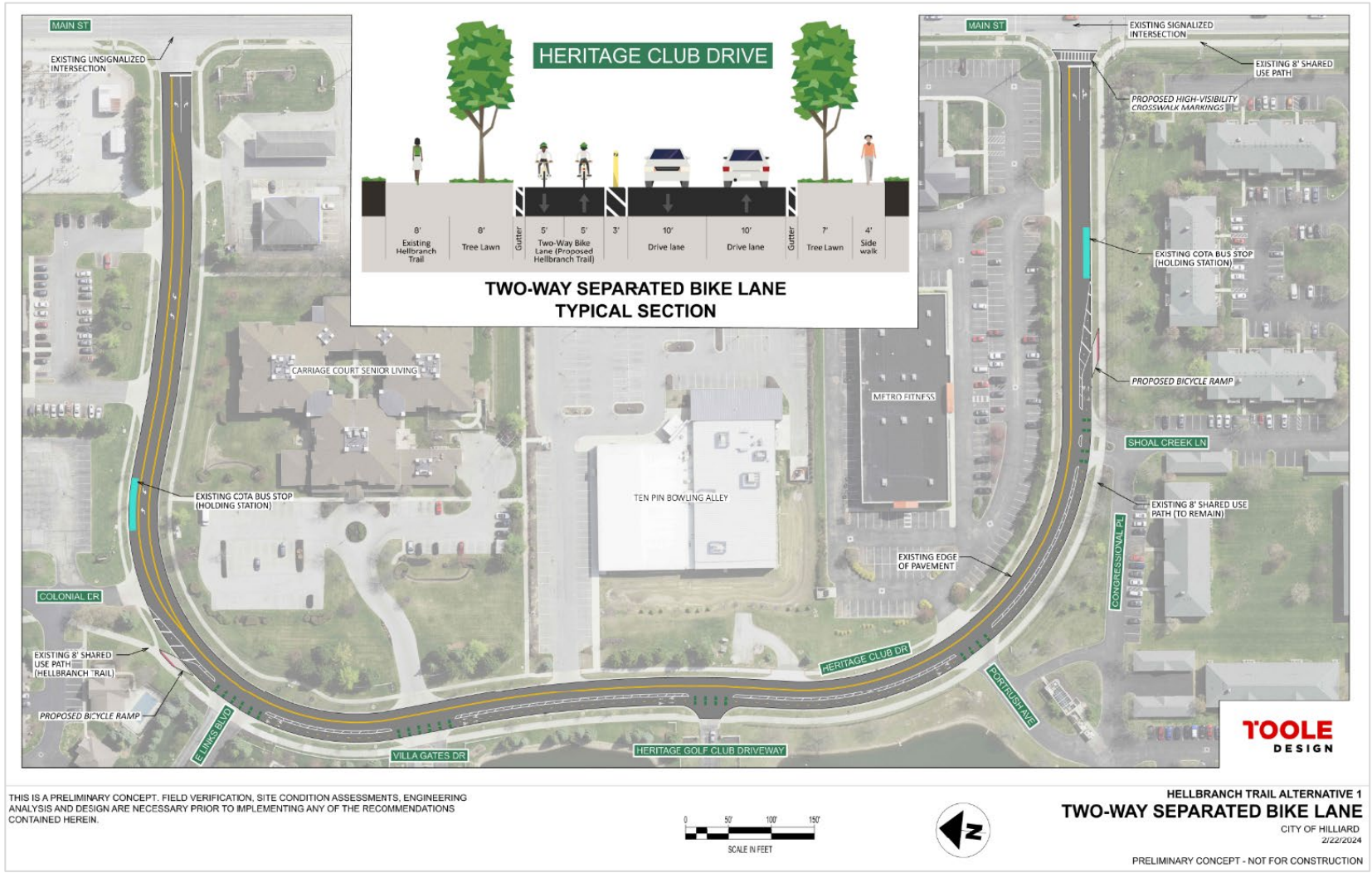
#1 Collect intersection turning movement counts

#2 Conduct Synchro analysis to determine operations at critical intersections

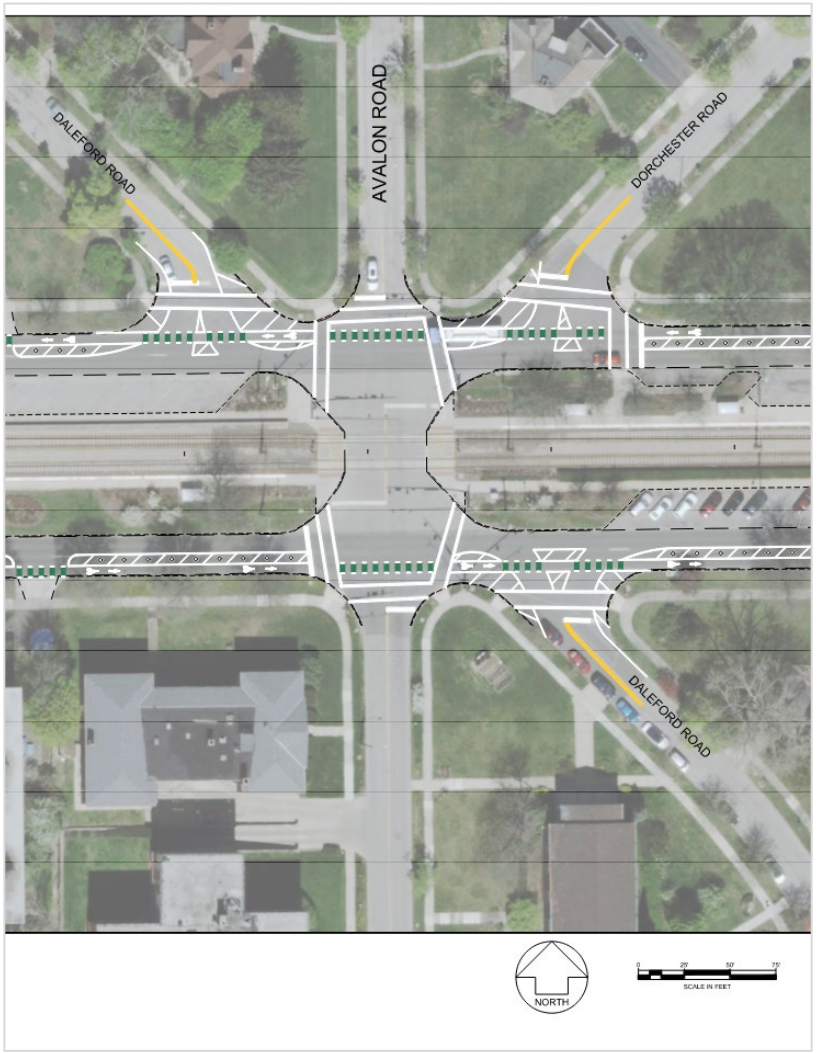
#3 Determine traffic calming treatments

#4 Develop concept designs for reconfigured corridors

Concept Design Example(s)



Hilliard, Ohio



Shaker Heights, Ohio

TOOLE DESIGN

Thank You!

Discussion

TOOLE DESIGN