NATIONAL ACADEMIES Sciences Engineering Medicine

TRB TRANSPORTATION RESEARCH BOARD

TRB Webinar: The Value of Access Management—Tools for Difficult Conversations

September 28, 2023

11:00 AM – 12:30 PM

PDH Certification Information

1.5 Professional Development Hours (PDH) – see follow-up email

You must attend the entire webinar.

Questions? Contact Andie Pitchford at TRBwebinar@nas.edu

The Transportation Research Board has met the standards and requirements of the Registered Continuing Education Program. Credit earned on completion of this program will be reported to RCEP at RCEP.net. A certificate of completion will be issued to each participant. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the RCEP.

ENGINEERING
RCEP
REGISTERED CONTINUING EDUCATION PROGRAM

AICP Credit Information

1.5 American Institute of Certified Planners Certification Maintenance Credits

You must attend the entire webinar

Log into the American Planning Association website to claim your credits

Contact AICP, not TRB, with questions

Purpose Statement

This webinar will provide agencies and their consultants with research-based tools for demonstrating the many benefits of managing roadway access when conversations become difficult.

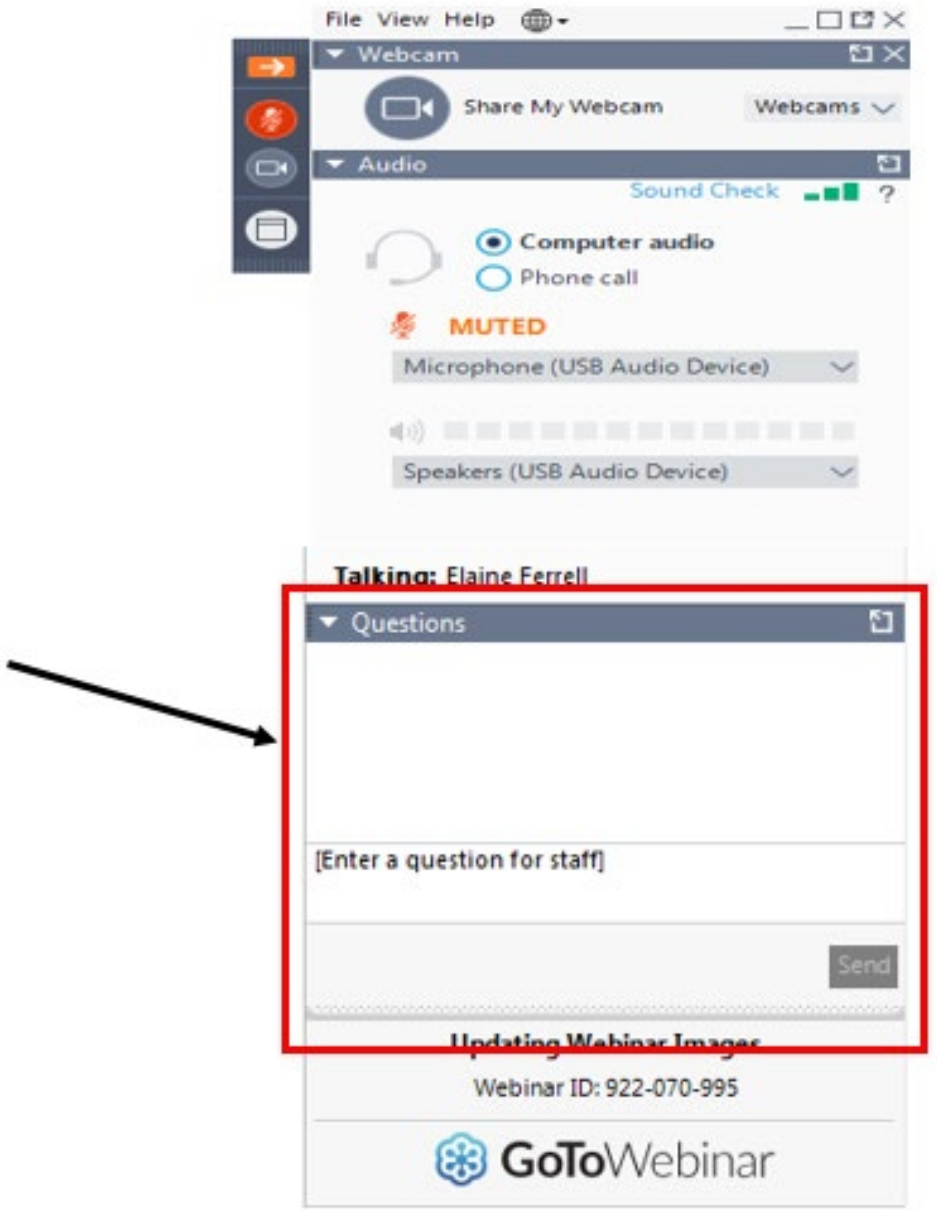
Learning Objectives

At the end of this webinar, you will be able to:

- Articulate the concept of access management through the lenses of safety, mobility, economy, and livability
- Identify and access the resources and tools in the Access Management Communications Toolkit
- Apply the Access Management Communications Toolkit to explain the benefits and cost of access management decisions

Questions and Answers

- Please type your questions into your webinar control panel
- We will read your questions out loud, and answer as many as time allows



Today's presenters

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The Value of Access Management—Tools for Difficult Conversations

Kristine Williams, Jerome Gluck, Karen Dixon, Brianne Glover

Transportation Research Board • September 28, 2023

KMW ASSOCIATES
Transportation + Land Use
Texas A&M Transportation Institute
AECOM

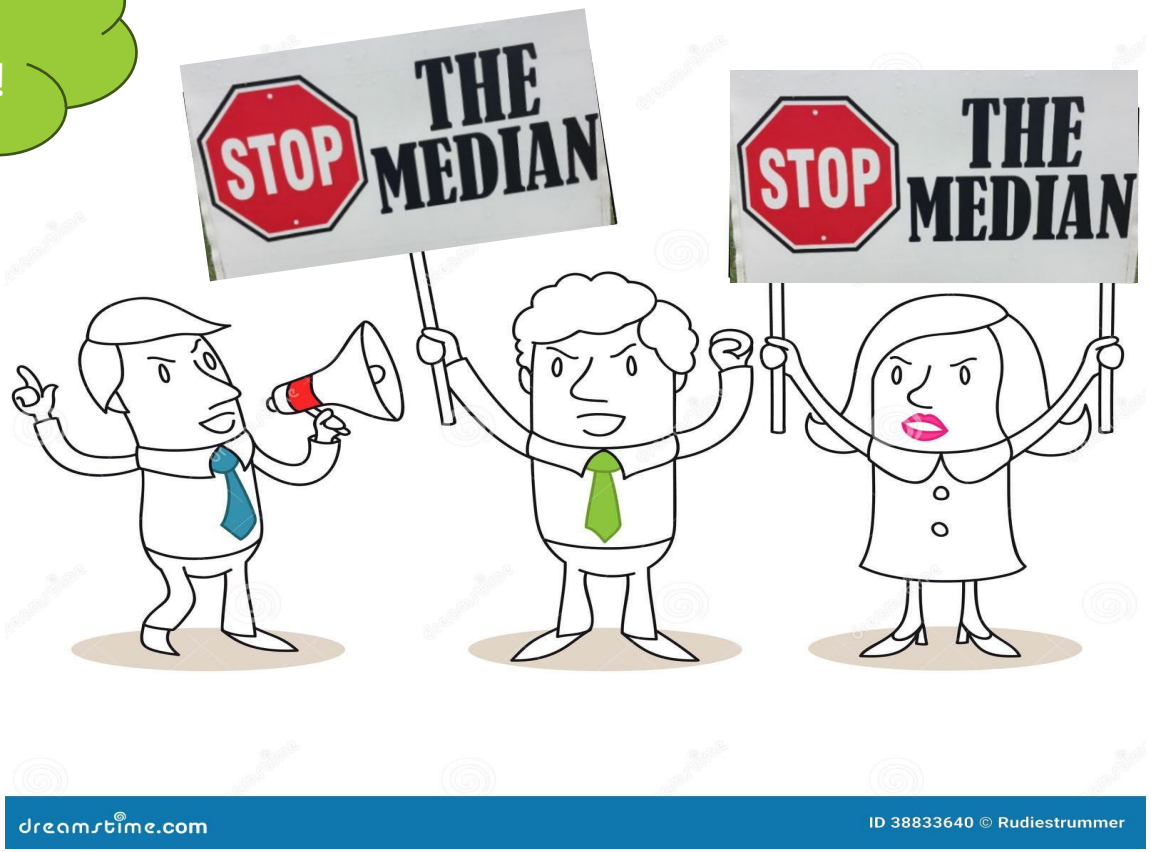
Before

Access management can increase safety, reduce delay, improve modal quality of service, and enhance livability.

After

Photo by J. Malone

I need that extra driveway!



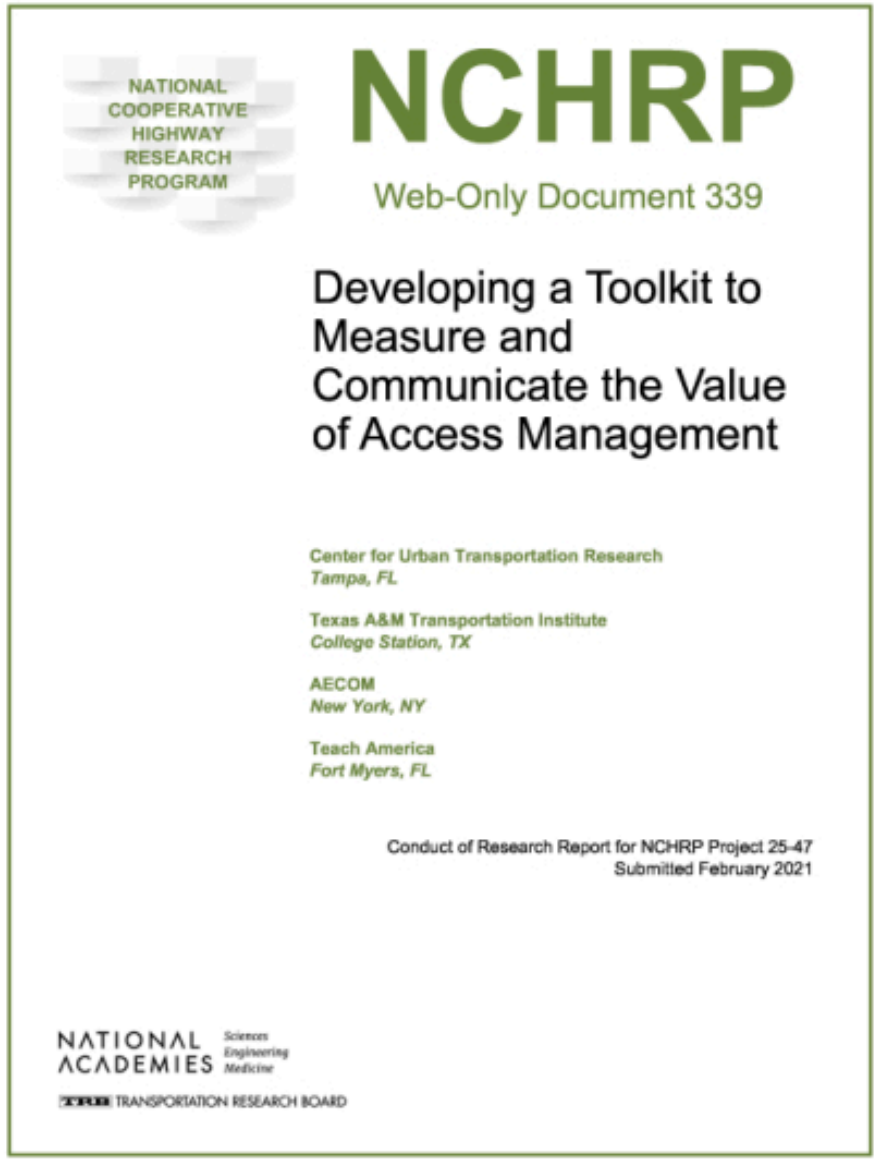
Where is the signal I asked for?

NCHRP 25-47 Research Objectives

Guidance for transportation agencies

Measure benefits and costs

Communicate value of access management


NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM
NCHRP
Web-Only Document 339
Developing a Toolkit to Measure and Communicate the Value of Access Management
Center for Urban Transportation Research
Tampa, FL
Texas A&M Transportation Institute
College Station, TX
AECOM
New York, NY
Teach America
Fort Myers, FL
Conduct of Research Report for NCHRP Project 25-47
Submitted February 2021
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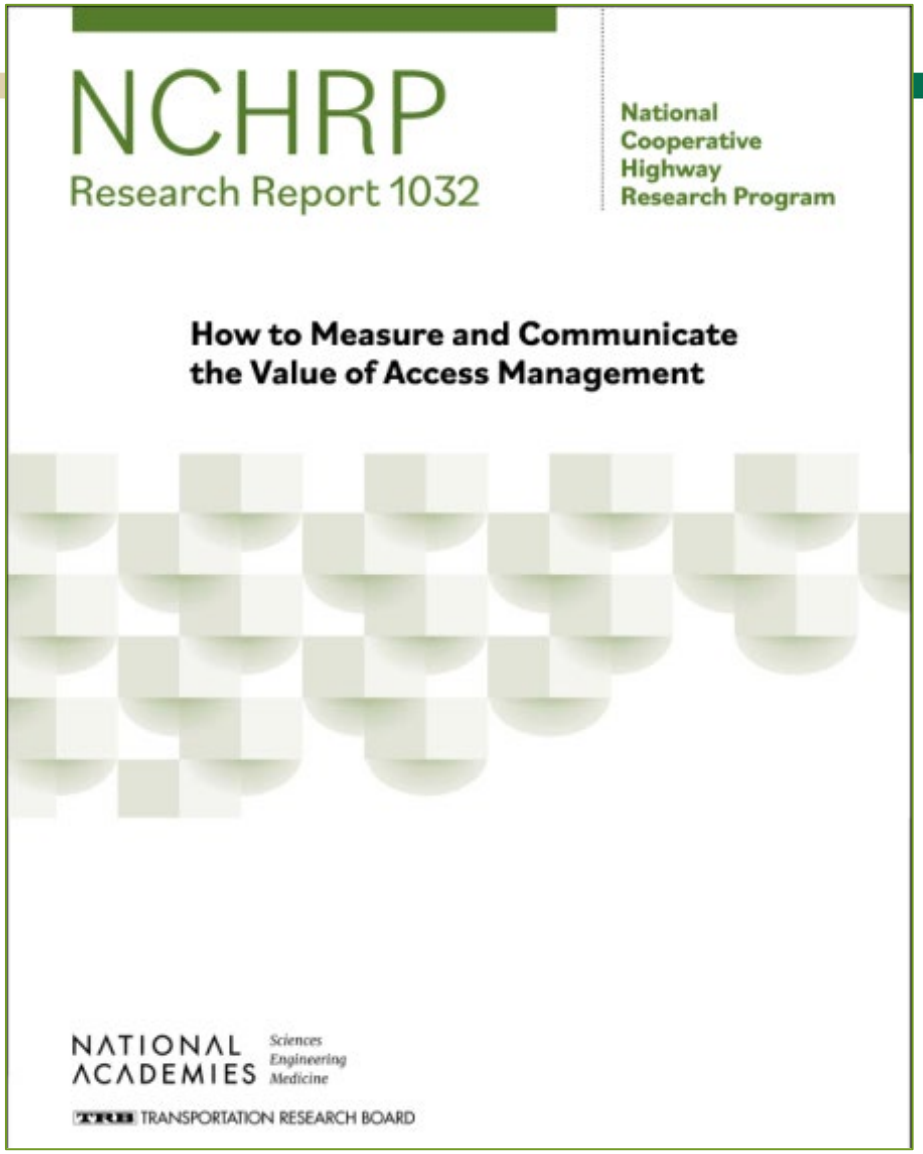

NCHRP
Research Report 1032
National Cooperative Highway Research Program
How to Measure and Communicate the Value of Access Management
NATIONAL ACADEMIES Sciences Engineering Medicine
TRB TRANSPORTATION RESEARCH BOARD

Access Management Communication TOOLKIT

- A visual document that organizes ideas, images, and resources on the value of access management.

HOW TO USE THE TOOLKIT

Safety | Mobility | Economy | Livability

This area above indicates the value being communicated.

Photo by J. Malone

The photo or graphic shown in this area can be used to communicate about your project.

The technique is highlighted here with an icon so you know where you are in the Toolkit.

MESSAGING

This area shows messages you can share with stakeholders and includes example infographics.

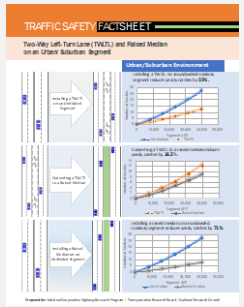
Access management preserves the safety, economy, mobility and livability of our community.

Simple spreadsheet tools provide help in calculating the safety, mobility, and economic value of selected techniques.

TECHNICAL SUPPORT

This area provides technical support in the form of information, tools, and links to other resources.

A Fact Sheet is available for every spreadsheet

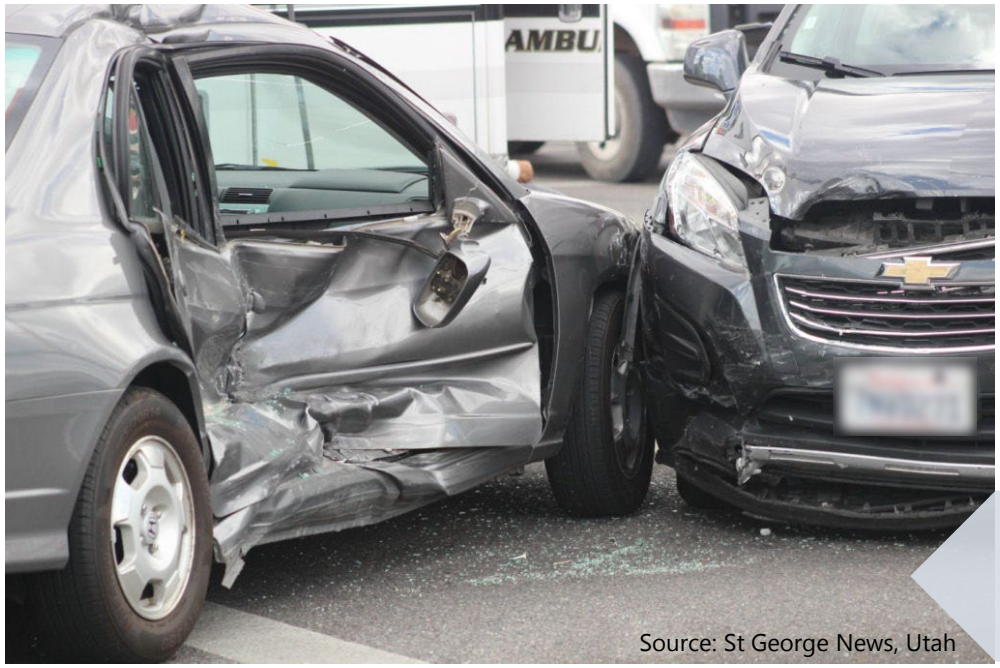


Use the spreadsheets to generate project-specific data for your communication tools

Spreadsheets

See the final report for more information on how to use the tools.

Safety (*Example page*)



Source: St George News, Utah

Median Type and Driveway Density

Reducing Left-Turn Conflicts

- Medians reduce left-turn conflicts between motor vehicles and with other roadway users. More than two-thirds of all access-related collisions involve left-turning vehicles. Left turns represent the highest injury and fatality crashes on at-grade arterials.

Increasing Pedestrian and Bicycle Safety

- Medians increase pedestrian and bicycle safety by reducing left-turn conflicts and by incorporating safe crossing refuges into the median design.

Medians improve safety by reducing left-turn crashes and conflicts.

Converting a TWLTL to a raised median reduces yearly pedestrian crashes by **46%**

Converting a TWLTL to a raised median reduces yearly crashes by **27%**

Use spreadsheet to calculate your own values

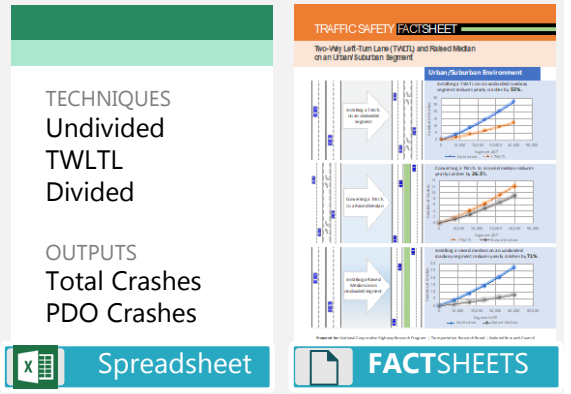
Spreadsheet

MedianTypeDwyDensity.xlsx

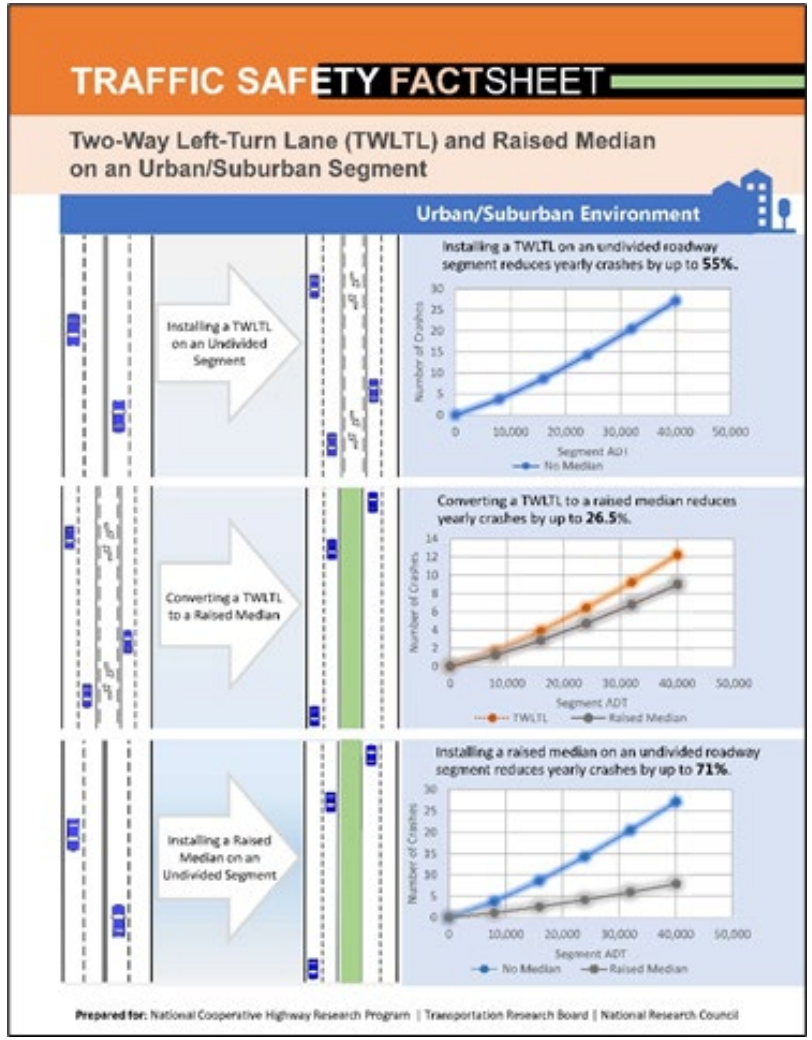
Calculates reduction in crashes by installing a raised median on an undivided roadway or roadway with a two-way left-turn lane (TWLTL).

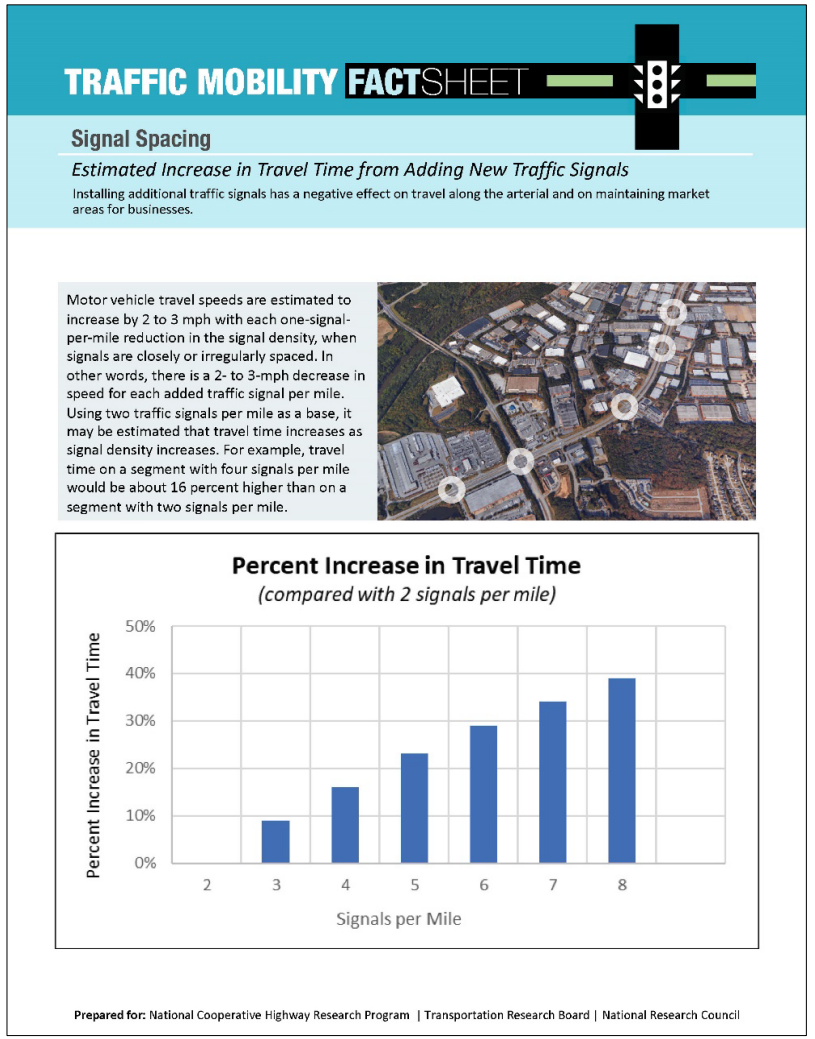
Impact of Median Installation:	
Total Crashes (All Severities)	2.76
PDO Crashes	7.22
Base Condition: Absence of raised median.	

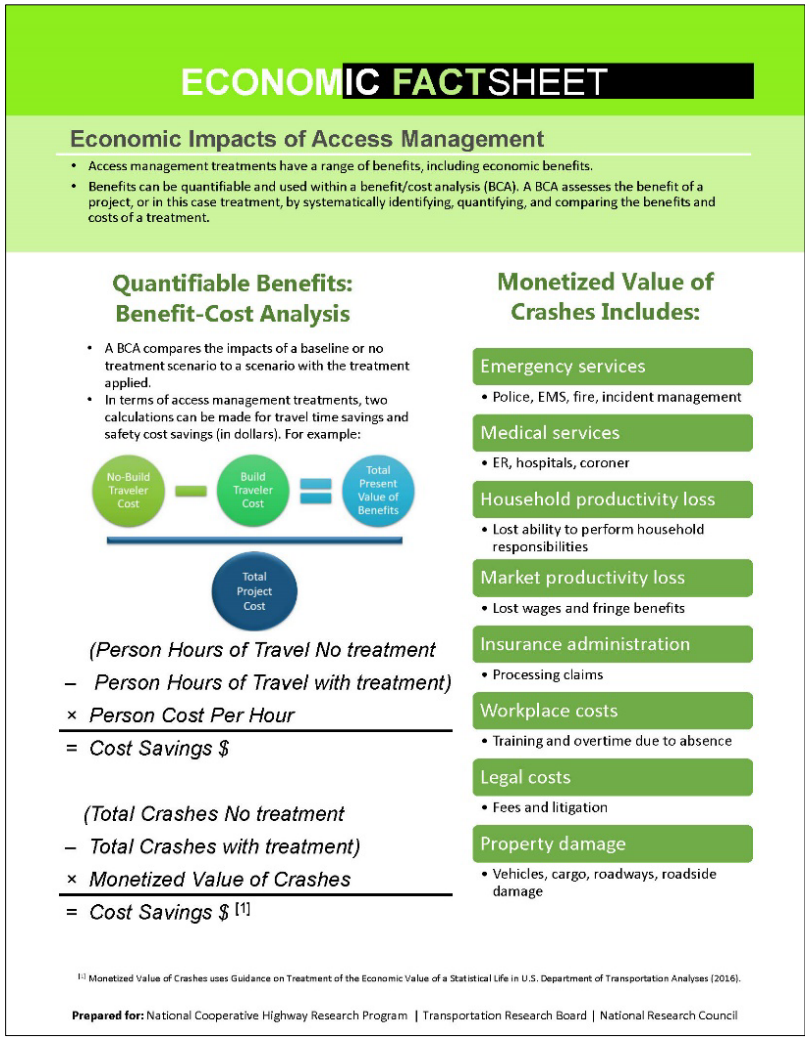
Median and TWLTL Fact Sheet.pdf



Fact Sheets Demonstrate Outputs or Methods

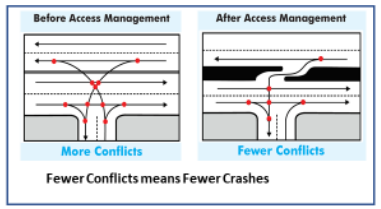






Infographics and Slide Decks

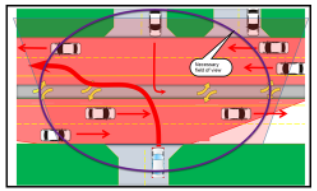
The Main Reason for Access Management
Because Traffic Conflicts can be Deadly



Safety, by reducing conflicts, is **THE** reason for access management

Our Most Important Safety Concern
Manage left-turns out at unsignalized locations

Why are left-turns out so dangerous?

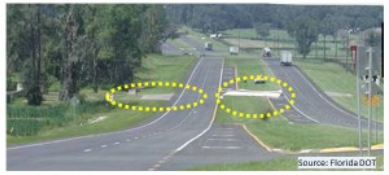


Driver has a large area to observe for a safe gap to enter traffic

As the line of traffic grows, drivers get frustrated and begin taking more risks

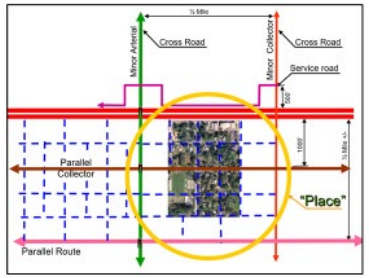
When crashes happen, they are more likely to be side-impact crashes that pose the highest chance of severe injury or death.

How to Manage Left Turns Out of Unsignalized Driveways



Restrictive medians designed to support U-turns

Closing and channelizing median openings

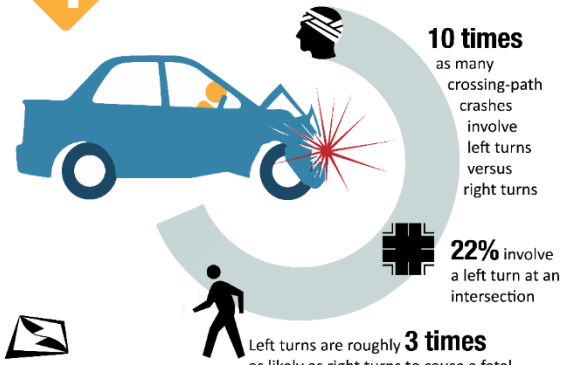


Connecting streets and parking areas so left turns can be made at signals or other safe locations

Preventing this

2 OUT OF 3 crashes involve left turns

1 out of 3 severe injury crashes involve left turns



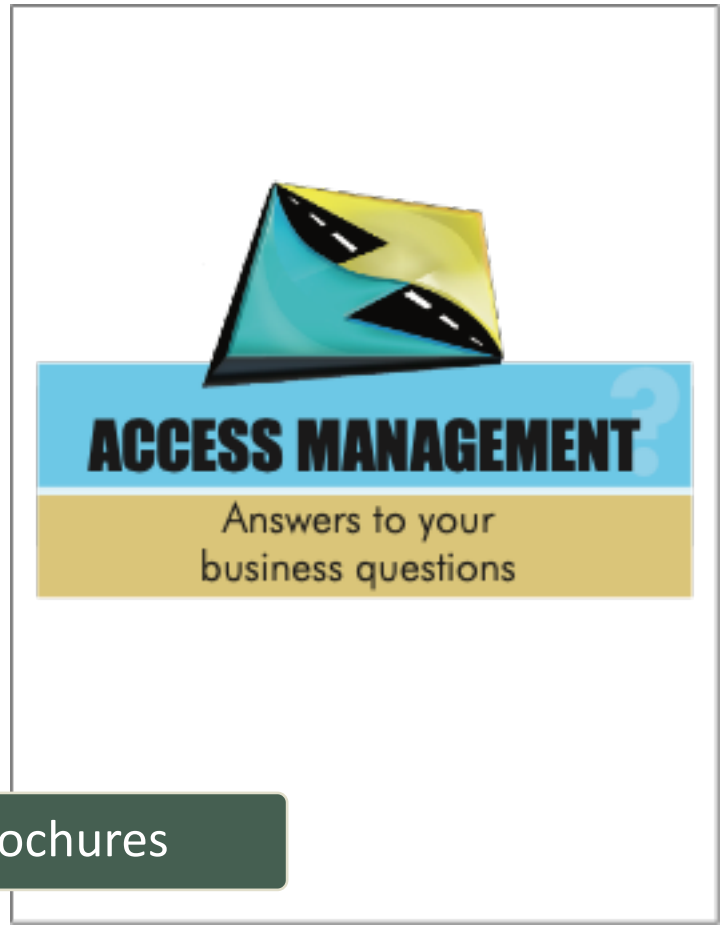
for more information, visit
www.accessmanagement.info/toolkit

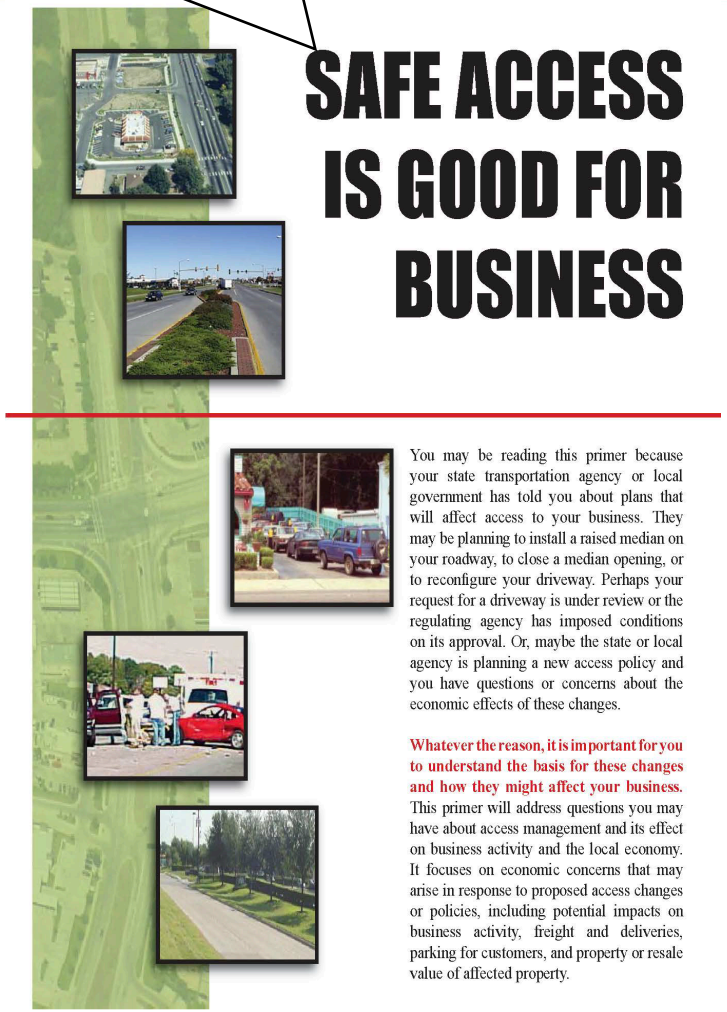
Can be edited for your project

Converting a TWLTL to a raised median reduces yearly pedestrian crashes by **46%**

Brochures

New version coming soon!





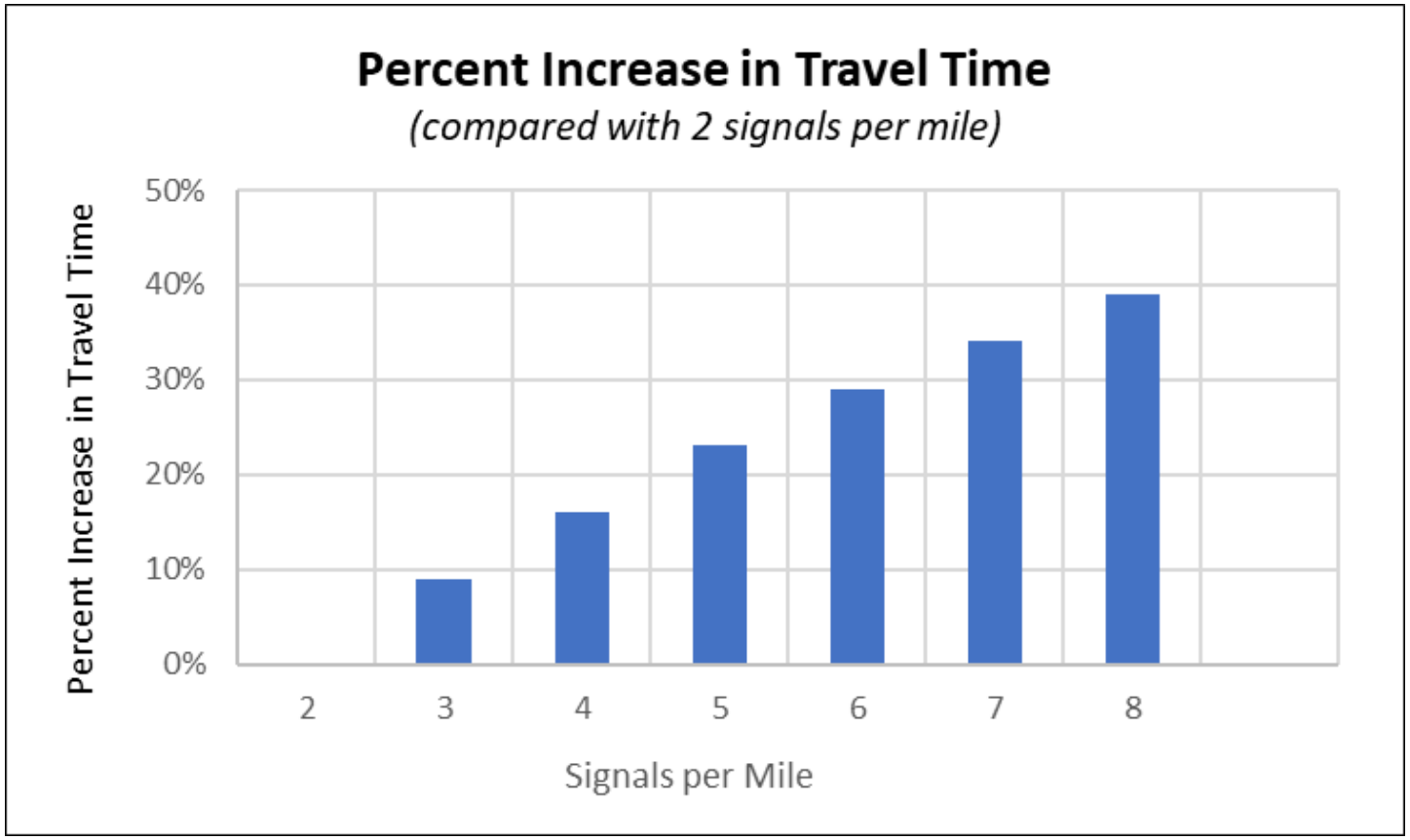
Links to adaptable and published brochures


Photo by J. Malone

Mobility Assessment Tools

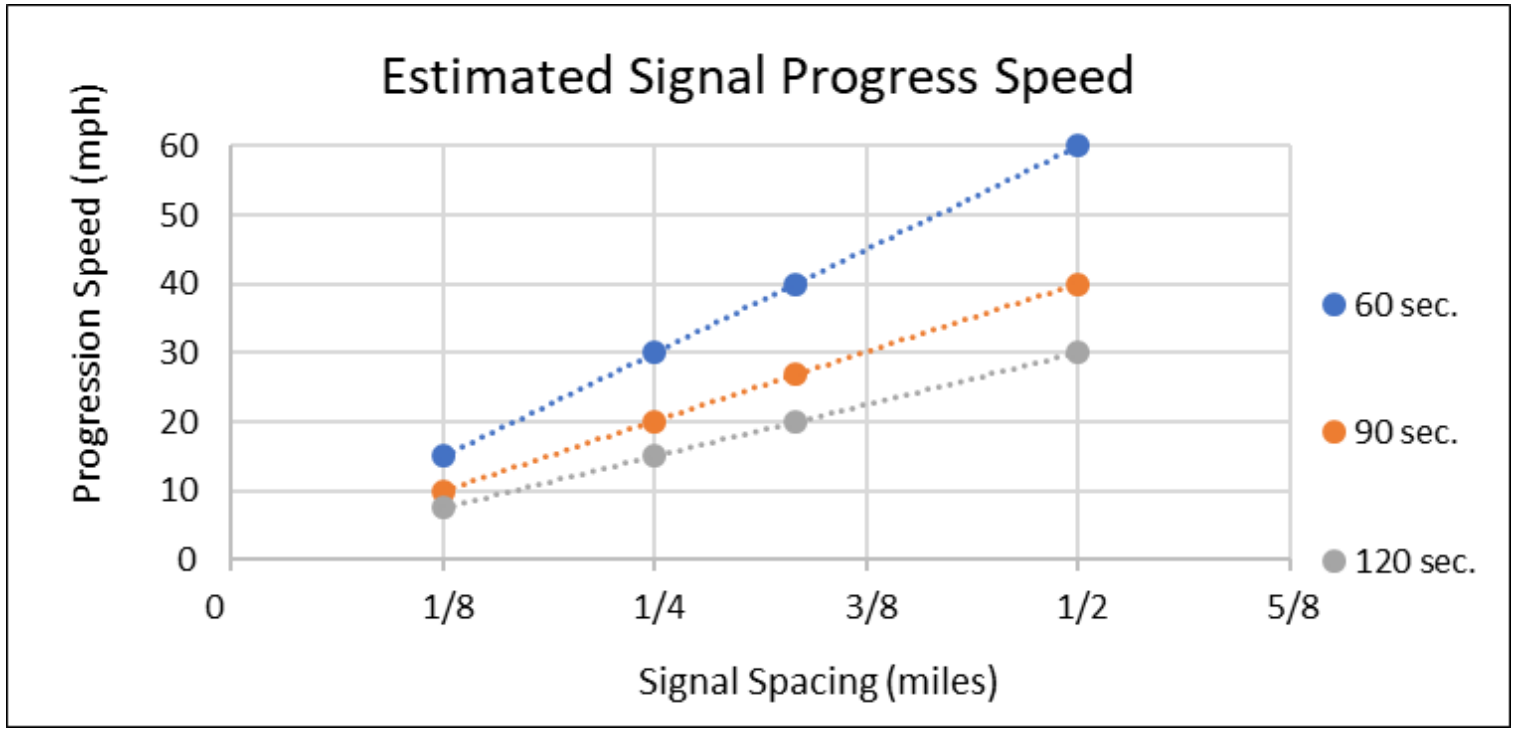
- Signal Spacing
- Signal Progression
- Right-turn Lanes and Left-turn Lanes
- Unsignalized Access Spacing
- Corner Clearance

Signal Spacing



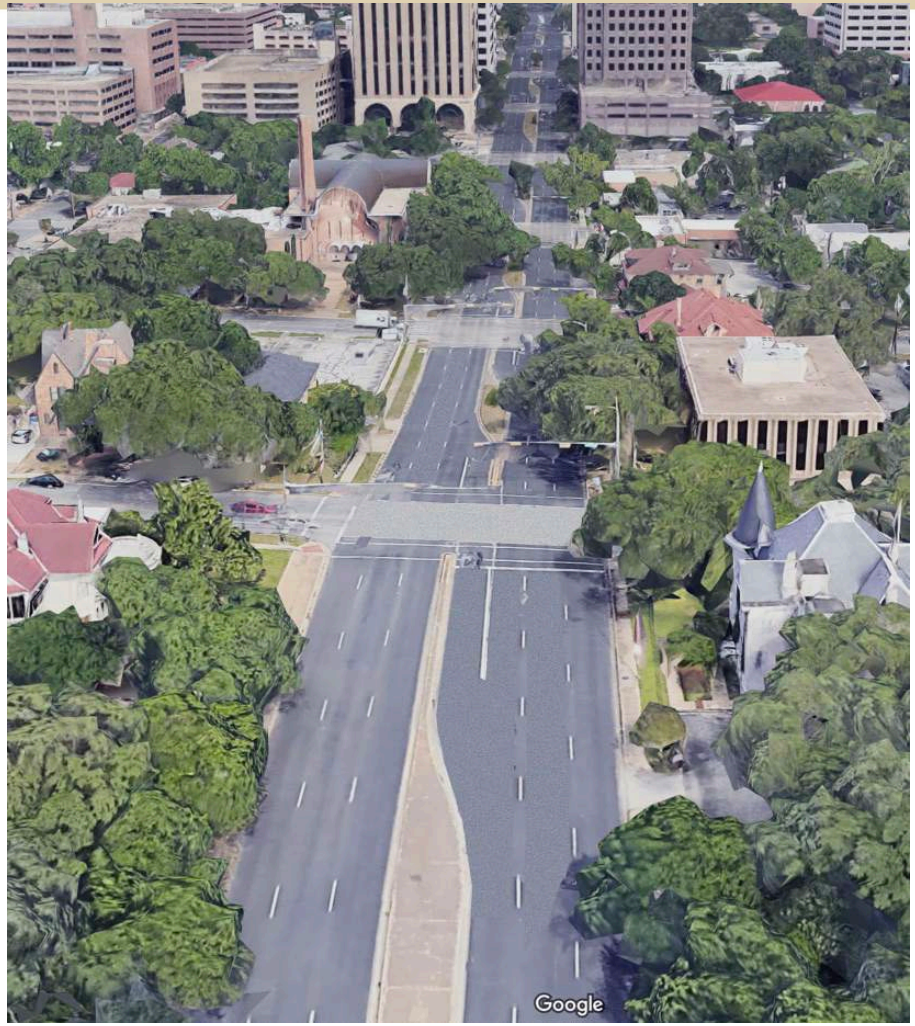
Estimated increase in travel time based on adding new signals

Signal Progression



Estimated progression speed based on signal spacing and cycle length

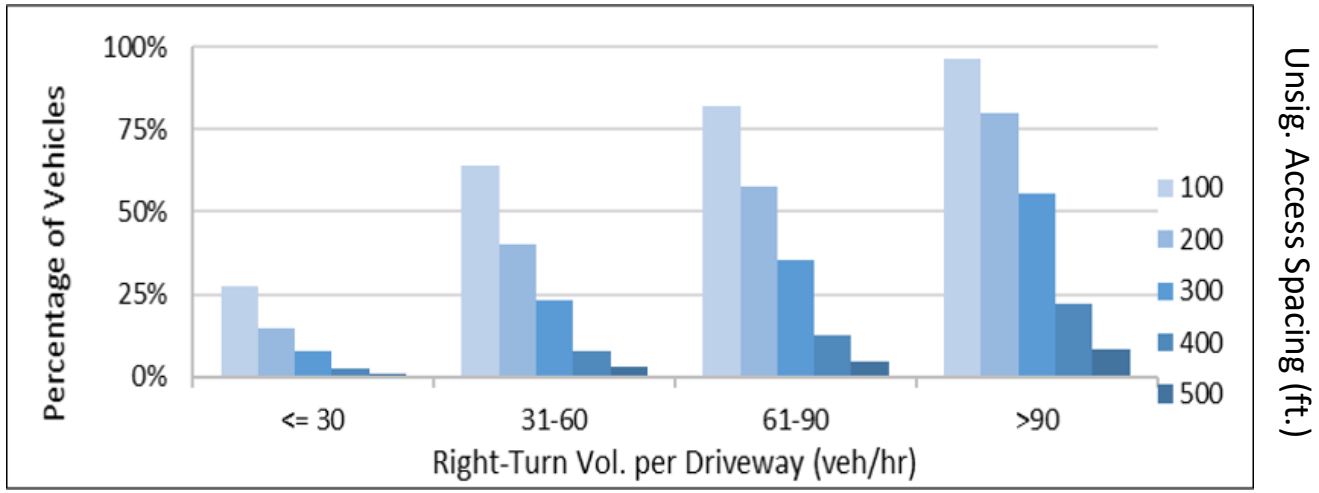
Right-turn Lanes and Left-turn lanes (two tools)



Estimated delay reduction from providing right-turn deceleration lane or left-turn deceleration lane at unsignalized intersection

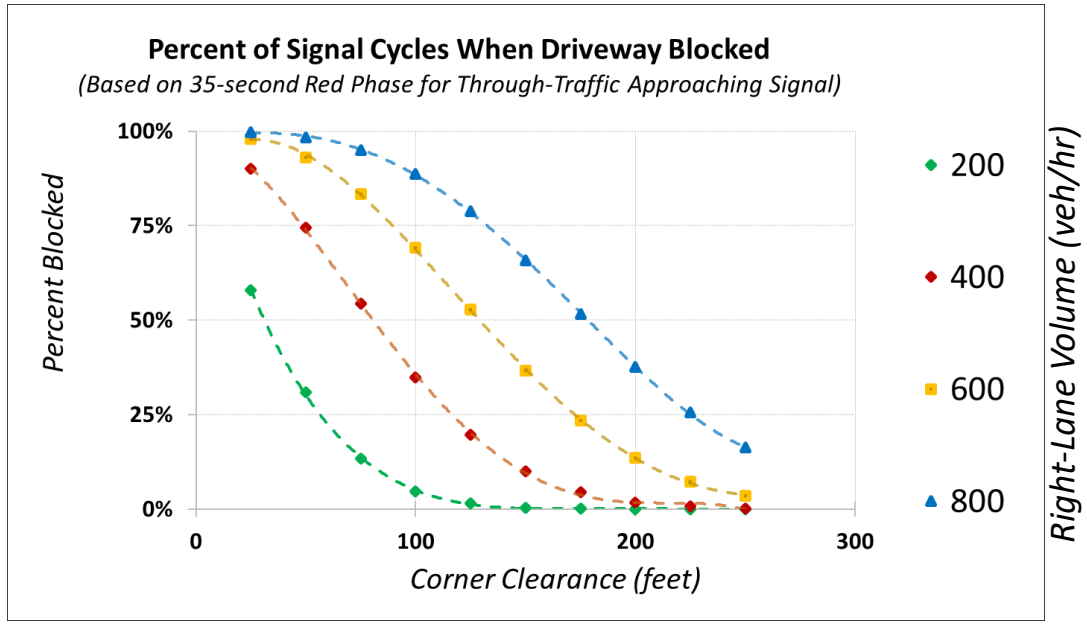
Unsignalized Access Spacing

Percentage of vehicles impacted by another driveway



Estimated impact of driveway spacing on right-lane, through-vehicle mobility

Corner Clearance



Estimated % of cycles during which a driveway near a signalized intersection will be blocked

Signal Spacing Module

Estimated increase in travel time based on adding new traffic signals	Signal Spacing

Inputs:

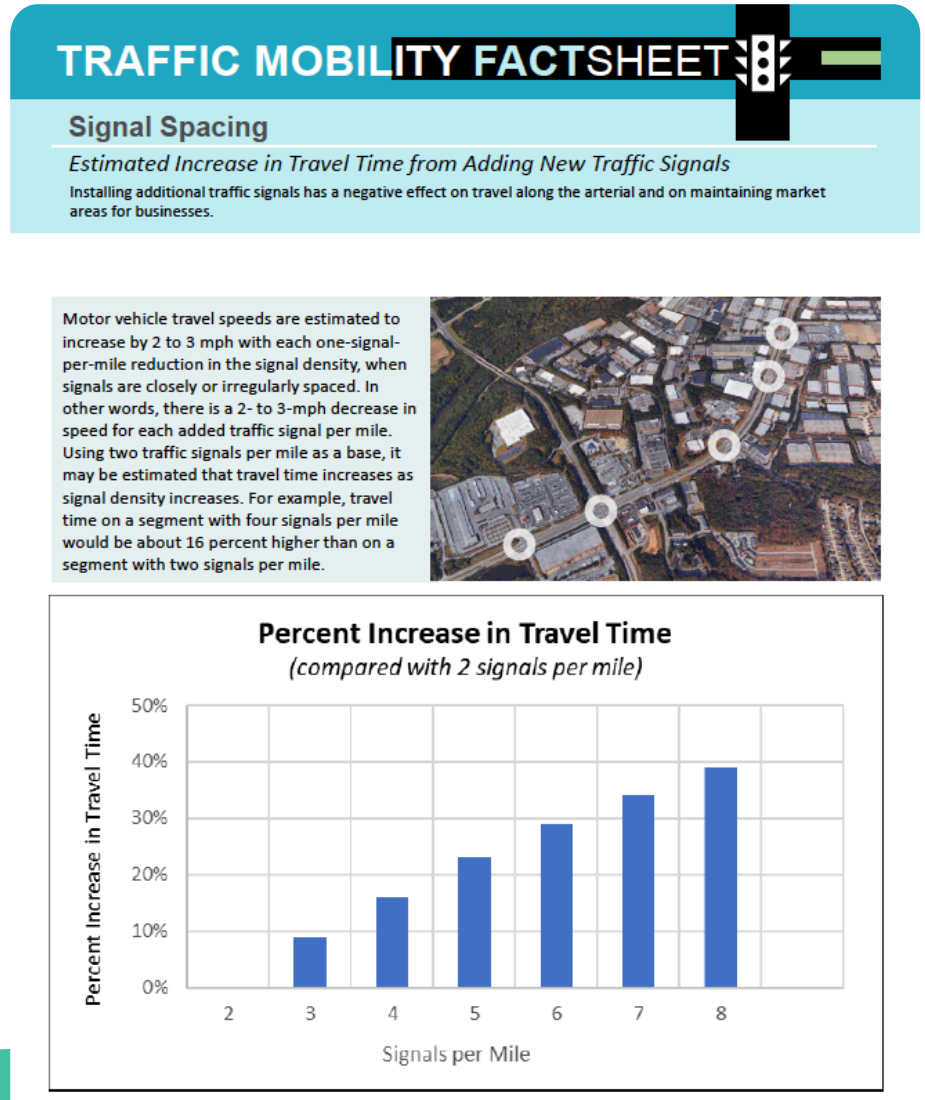
Valid Data Ranges

			Units		Min	Max
1	Current signal density	2	Signals per Mile	-->	2	2
2	Potential signal density	4	Signals per Mile	-->	0	8

Outputs:

Calculations/Data

			Units		% Increase in Signal Density
1	Estimated percent change in travel time	16%		-->	100.0%



TRAFFIC MOBILITY FACTSHEET

Signal Spacing

Estimated Increase in Travel Time from Adding New Traffic Signals

Installing additional traffic signals has a negative effect on travel along the arterial and on maintaining market areas for businesses.

Motor vehicle travel speeds are estimated to increase by 2 to 3 mph with each one-signal-per-mile reduction in the signal density, when signals are closely or irregularly spaced. In other words, there is a 2- to 3-mph decrease in speed for each added traffic signal per mile. Using two traffic signals per mile as a base, it may be estimated that travel time increases as signal density increases. For example, travel time on a segment with four signals per mile would be about 16 percent higher than on a segment with two signals per mile.

Prepared for: National Cooperative Highway Research Program | Transportation Research Board | National Research Council

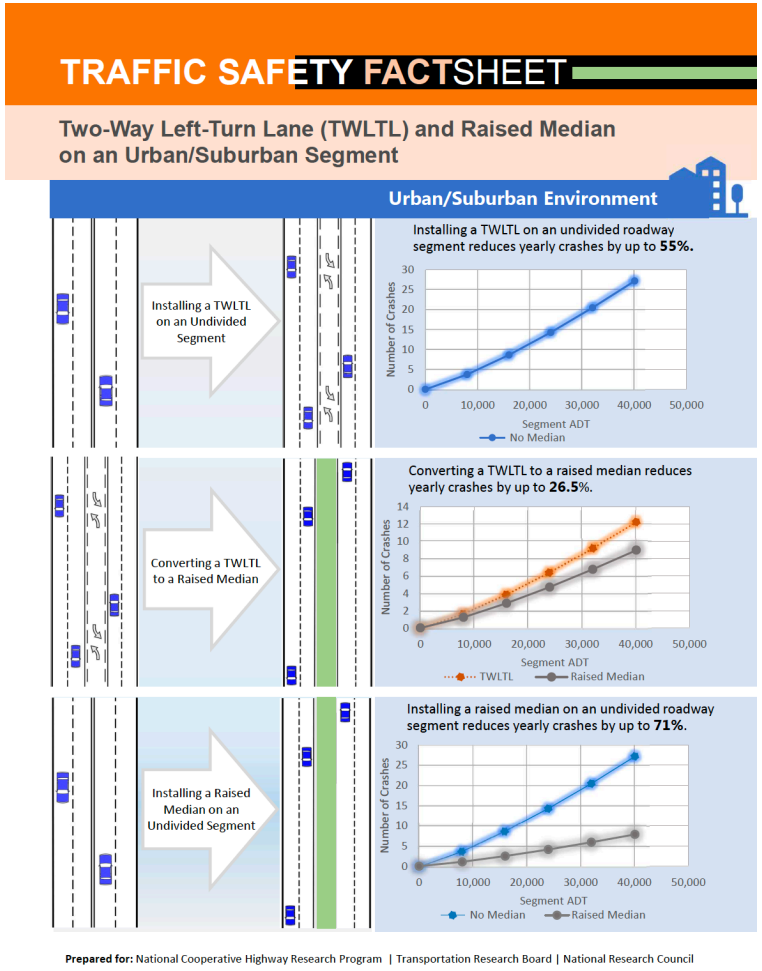
Signal Spacing Fact Sheet

- Illustrates percentage increase in travel time (delay) when adding new traffic signals compared to two signals per mile.

Safety Assessment Tools

- Median Type
- Right-turn Lanes
- Left-turn Lanes
- Unsignalized Intersection and Driveway Density
- Signalized Intersection Density
- Median Opening Near Signalized Intersection

Median Type



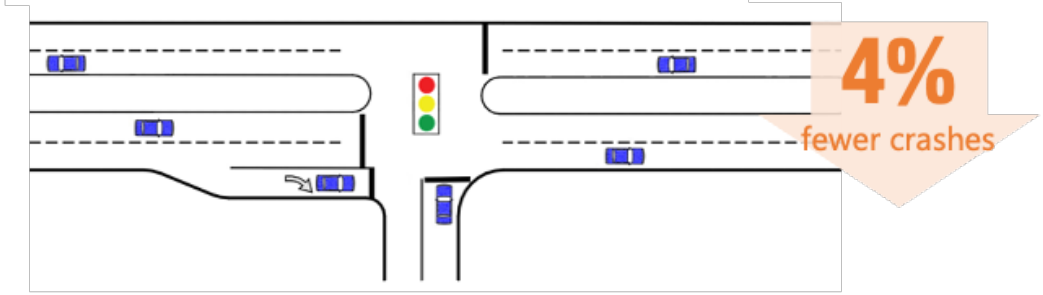
Estimated crash reduction of providing a median versus undivided or TWLTL

Converting a TWLTL to a raised median reduces yearly crashes by **XX%**

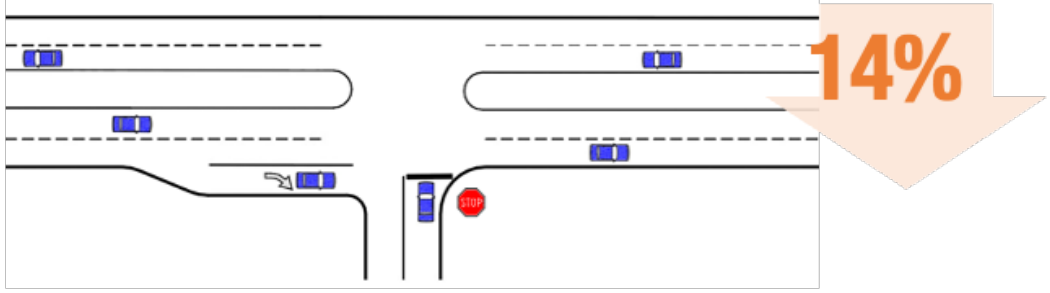
Use spreadsheet to calculate your own values

Right-turn Lanes

Urban **Signal Controlled Intersection**



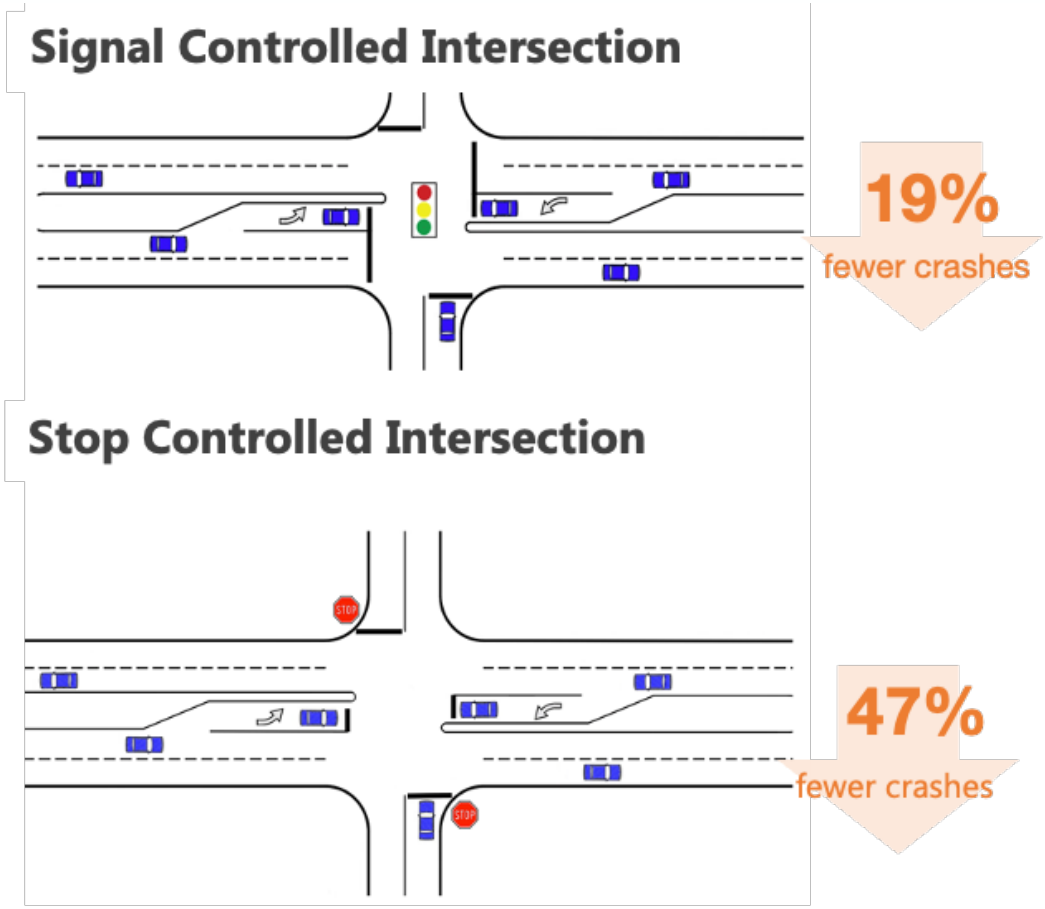
Rural Multi-Lane **Stop Controlled Intersection**



Examples represent AADT Major= 40,000 vpd and AADT Minor = 1000 vpd

Estimated crash reduction of providing right turn lanes at three-leg and four-leg intersections

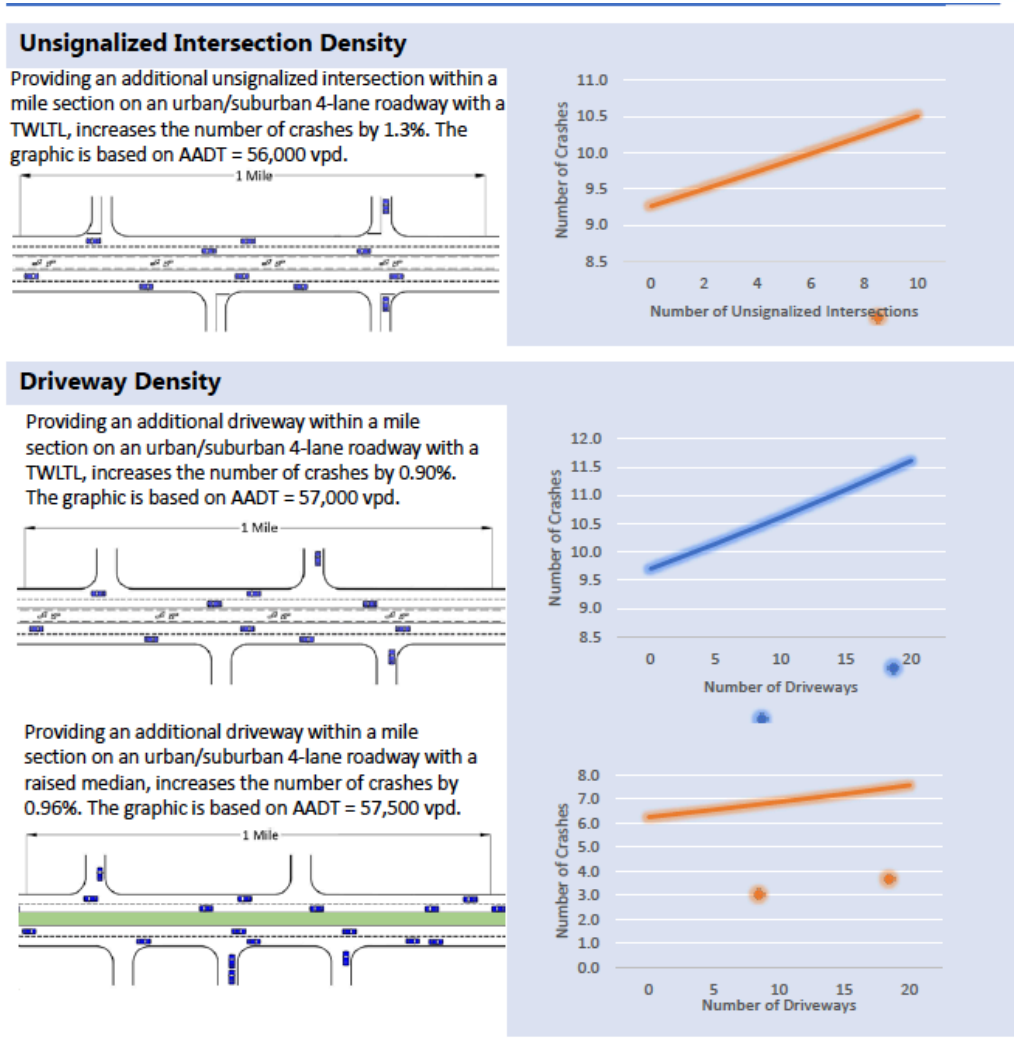
Left-turn Lanes



Examples represent urban/suburban 4-leg, AADT Major=40,000 vpd and AADT Minor= 1000 vpd, left-turn bay on two approaches

Estimated crash reduction from providing left-turn lanes at three-leg and four-leg intersections

Unsignalized Intersection and Driveway Density

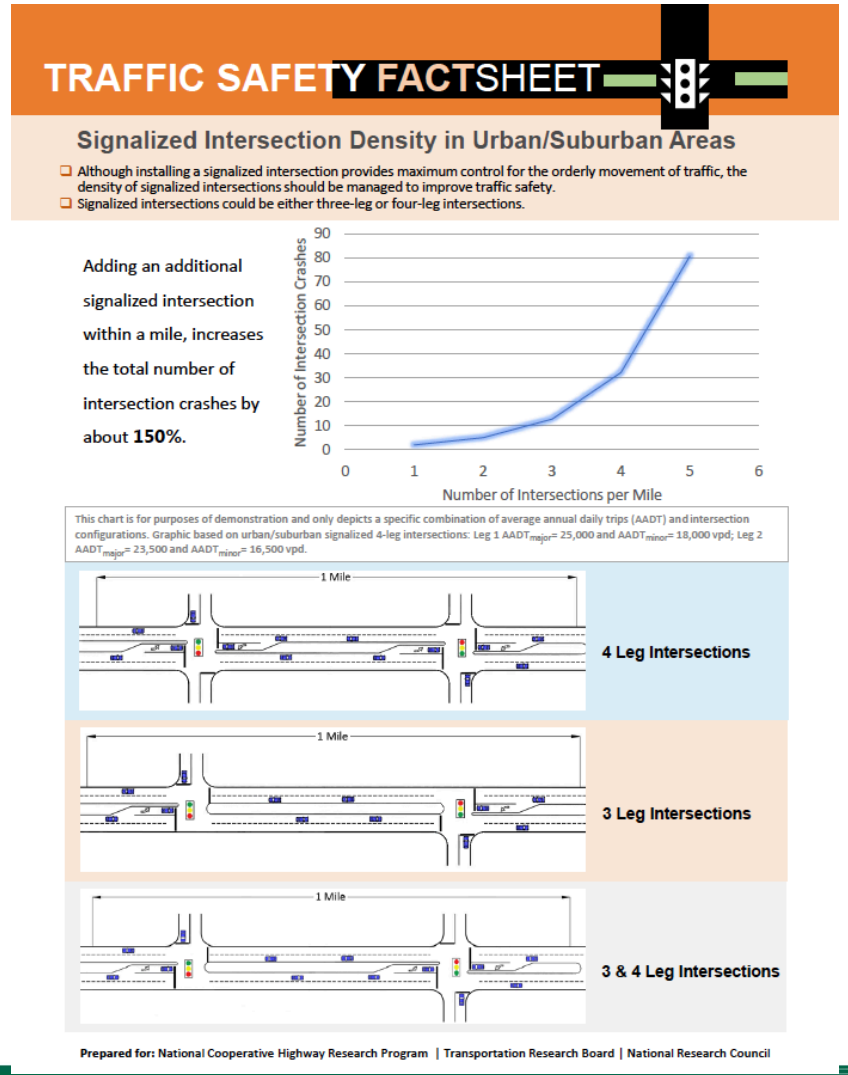


Estimated number of crashes for different access densities on:

(a) urban/suburban 4-lane roadways with TWLTL or

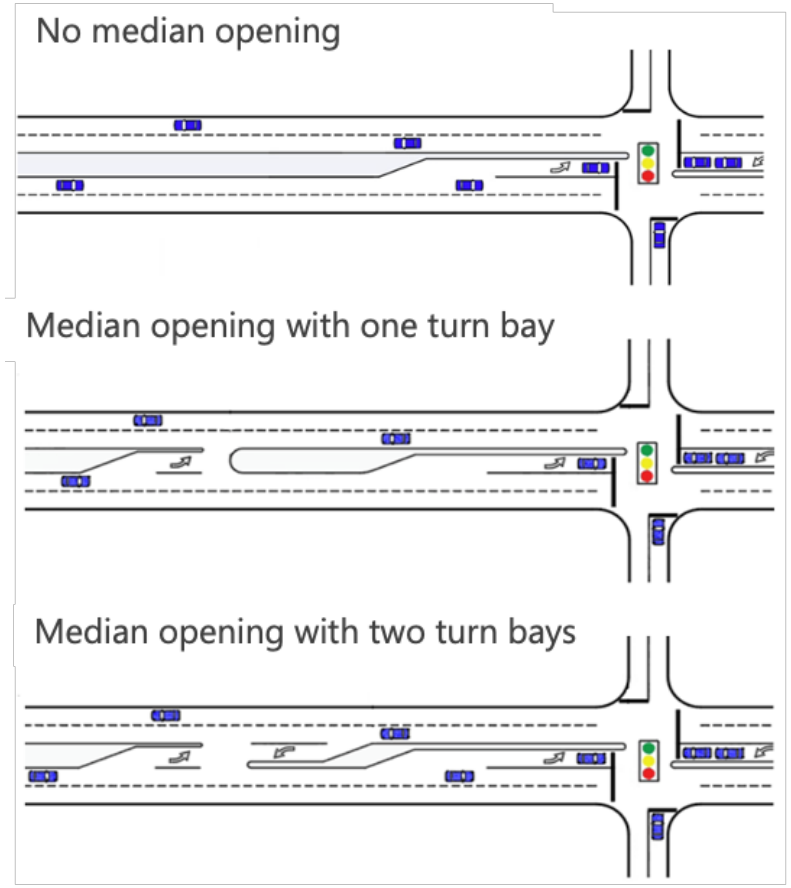
(b) by median type

Signalized Intersection Density



Estimated number of crashes by changing density of four-leg and three-leg intersections per mile

Median Opening near Signalized Intersection

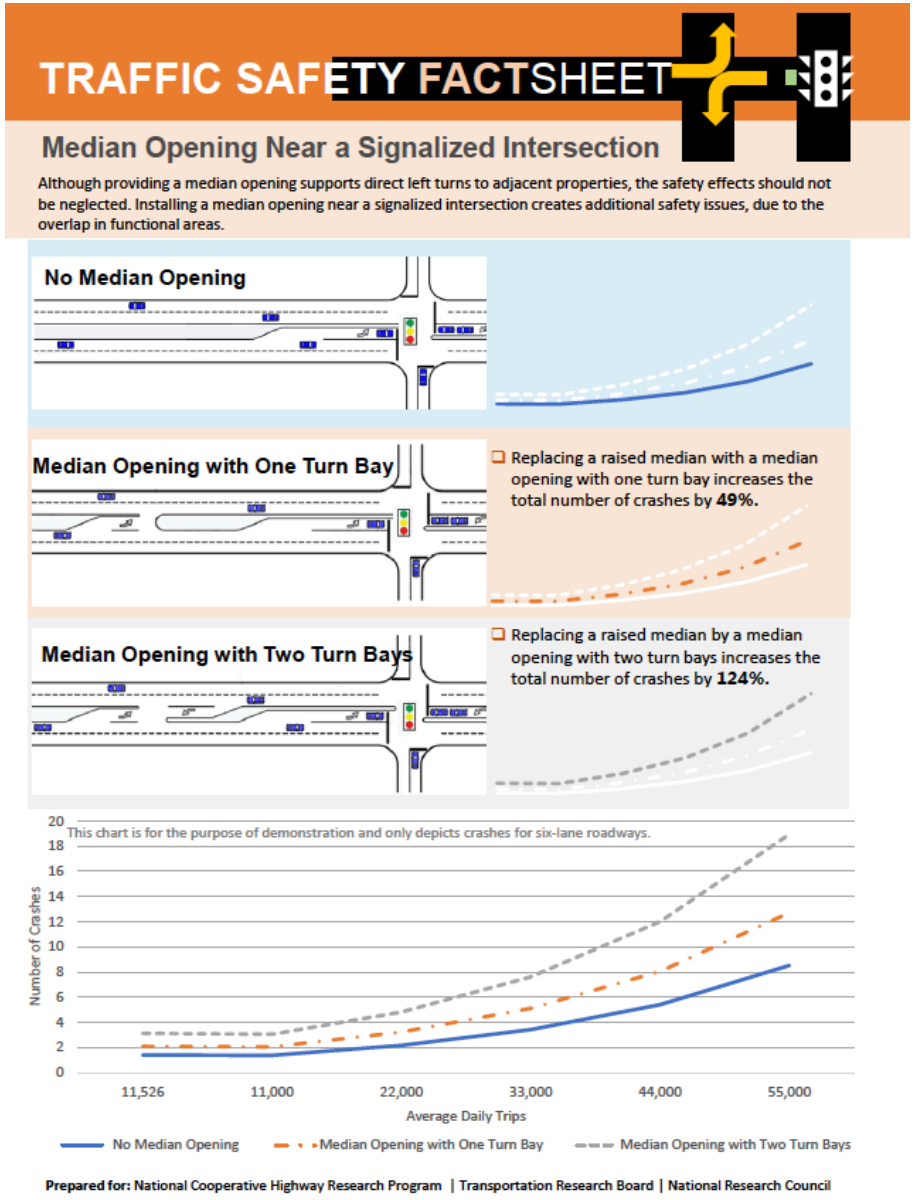


Estimated number of crashes from providing a median opening near a signalized intersection.

Median Opening Near Signalized Intersection Module

Inputs:			Valid Data Ranges	
			Min	Max
1	Median Opening Type	Median Opening with one Turn Bay		
2	AADT	22,000	11,525	55,000
3	Number of Arterial Through Lanes (both directions)	4		

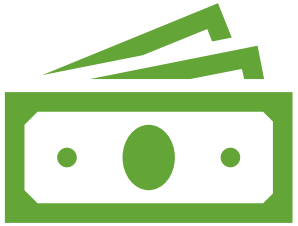
Outputs:	
Total Number of Crashes	3.23



Median Opening Near Signalized Intersection Fact Sheet

- Illustrates relative increase in crashes when:
  - Installing a median opening with one turn bay
  - Installing a median opening with two turn bays

Economic Value Assessment Tools



Safety Economic Value

monetized value of crash reduction in 2020 dollars

benefit-cost ratio: the monetary value of the reduction in number of crashes and expenditures to construct and maintain the facility

Mobility Economic Value

applies a value of time for a daily and annual cost of increase in travel times due to changes in signal spacing

Safety and Mobility Economic Value

Scenario	Calculated Change in Crashes (Unknown If Injured)	Monetized Value of Change in Fatalities and Injuries ($2020)
Left-Turn Lane(s) at Three-Leg Intersections	0.00	$0
Left-Turn Lane(s) at Four-Leg Intersections	0.00	$0
Right Turn Lane(s) at Three-Leg Intersections	0.00	$0
Right Turn Lane(s) at Four-Leg Intersections	0.00	$0
Median Addition	3.00	$412,800
Other Situation: Crashes, unknown if injured	11.00	$1,513,600
Property Damage Only	1.00	$4,500

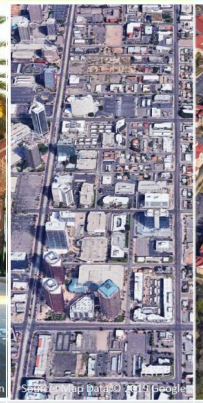
Signal Spacing	
Data from Mobility Spreadsheet Tool	
Estimated percent change in travel time	16%
Other Inputs Needed	
Segment Length (miles)	1
Current Speed (mph)	26
Average Annual Daily Traffic (AADT)	20,750
Default Values	**$2020**
Recommended Hourly Value of Travel Time Savings ($/person hour)	$17.30
Average Passenger Vehicle Occupancy	1.67
Change in Travel Time	
Vehicle Miles Traveled (VMT)	20,750
Current Vehicle Hours Traveled (VHT)	798
Current Value of Time	$23,057
Increased Value of Time Due to Signal Density	$26,746
Output	
Daily Cost of Additional Travel Time	**$3,689**
Annual Cost of Additional Travel Time	**$1,346,543**

Livability

LIVABILITY FACTSHEET

What we do improves livability.

Installing landscaped medians, limiting driveways on major roads, using roundabouts, managing the location and spacing of signals, and organizing land uses on a connected network all increase livability in a variety of ways.

Medians	Signals	Driveways	Network
			
Photo by F. Broen	Source: Map Data © 2019 Google	Source: Map Data © 2019 Google	
Medians provide space for landscaping, art, and other aesthetic treatments that improve the character of a roadway corridor or gateway to a community. Combining medians with roundabouts improves safety while offering more possibilities for art and aesthetic treatments.	Managing the spacing of signalized and unsignalized access can reduce the need to widen major roadways. Signal spacing improves signal coordination, greatly reducing emissions and fuel consumption, which spike when vehicles decelerate and accelerate.	Fewer access connections increase the area for landscaping and enhance the appearance of major corridors. Landscaping also provides a buffer between vehicular traffic and pedestrians on heavily travelled roads.	Access management can be achieved through land use strategies that organize land uses into activity centers on a connected street network. These same strategies promote a more livable and accessible built environment.

LIVABILITY FACTSHEET

What we do improves livability.

Making a corridor safer for non-motorized users benefits the environment and supports social priorities like Safe Routes to School, Vision Zero, and Complete Streets.

A 4-lane road with good access management and supporting network may delay or even prevent the need for a 6-lane road that decreases the livability of a community.

Managing signals and driveways helps reduce congestion, which reduces fuel consumption and emissions.

Medians and fewer driveways increase the area for landscaping and aesthetic treatments.

Where would you want to live or shop?

Here?

Or here?

Photos by J. Malone

LIVABILITY FACTSHEET

Placemaking on a network

Access management can be achieved through land use strategies that discourage strip development and promote activity centers organized on a street network. This creates a more accessible built environment that supports bicycle, pedestrian, and transit mobility.

- Access management promotes accessibility while preserving local and regional mobility.
- **Accessibility** = land use proximity + network connectivity.
- **Mobility** = the ability to move around via multiple alternative paths and modes
- **Access** = the ability to enter and exit a site.

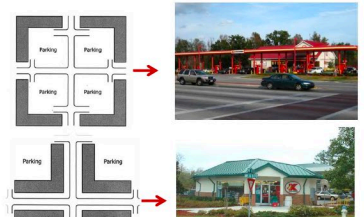
Context matters! Access management strategies vary by land use context. Livability is enhanced regardless of context.

Source: Duany Plater-Zyberk & Company 2003

In rural and coastal areas, poorly planned access roads and driveways can damage landscapes and sensitive ecosystems. Working together on a network plan can preserve the natural beauty of these areas.

Pedestrian Access and Building Line

Buildings are more accessible to transit when they are closer to the curb. Parking can be placed in the rear of the property.



Videos and Case Examples

1 AMC Toolkit Trailer

The National Academies

2 AMC Toolkit Introduction

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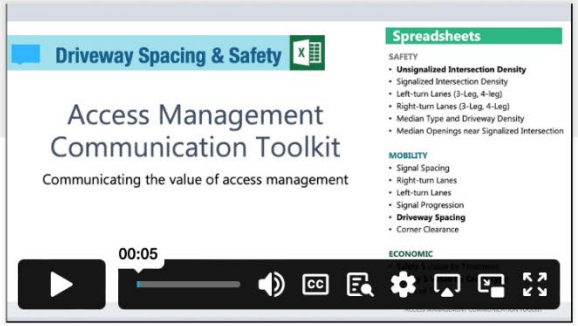

3 AMC Toolkit Planning

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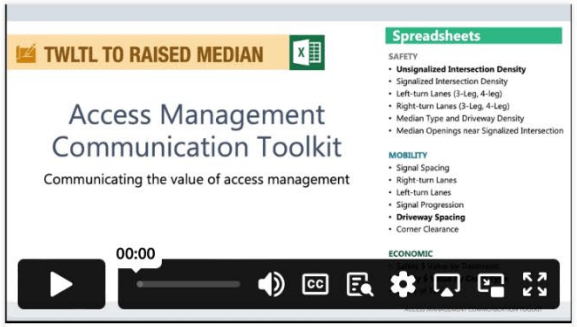

4 AMC Toolkit Median Pro…

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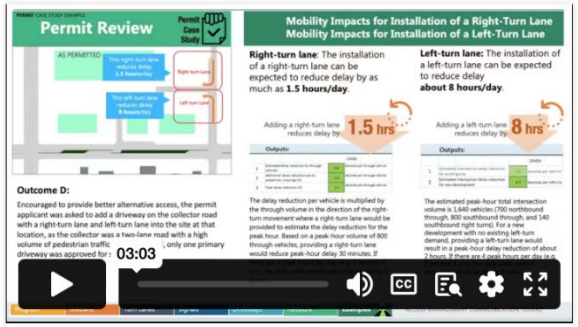

5 AMC Toolkit Permit

The National Academies

https://vimeo.com/showcase/10163881

NCHRP 1032:
How to Measure and Communicate the Value of Access Management

KMW ASSOCIATES
Transportation + Land Use

Texas A&M Transportation Institute

AECOM

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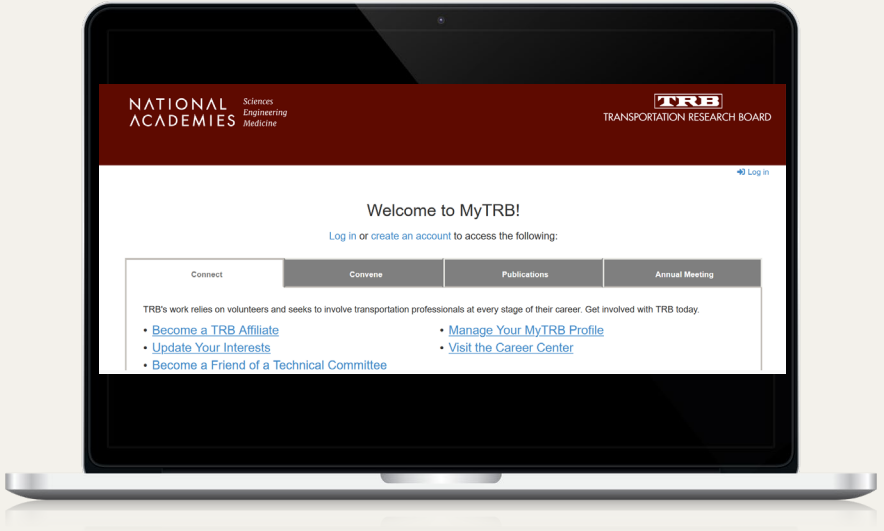

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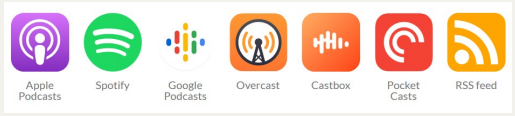

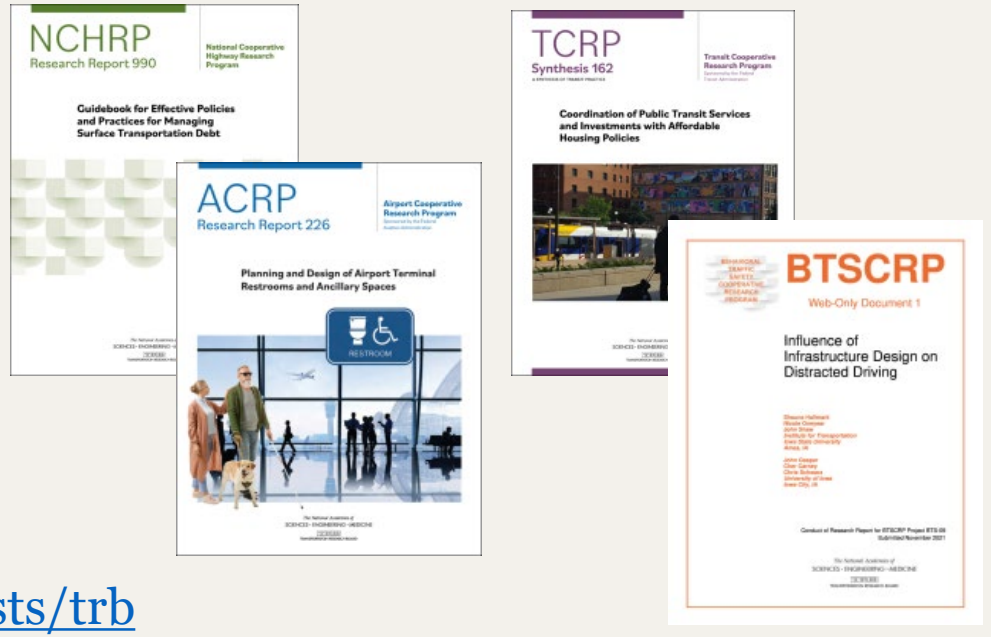

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