MUTCD Update #2

Speed Guide for Members

April 24, 2024

This meeting will be recorded

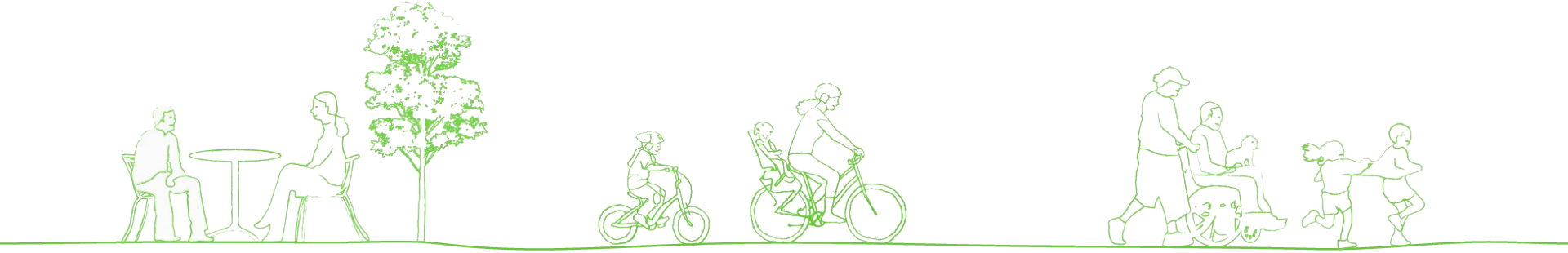
- A recording and copy of the slides will be shared with NACTO members and those registered for today's meeting.
- If you don't want to be on the recording, please keep your camera off.

Post-Webinar:

- All questions will be documented and answers will be sent as a follow up
- Receive AICP credit for attending today's session
  → https://www.planning.org/events/eventsingle/9289010/
- NACTO is unable to provide specialized accreditation for specific licenses and degrees.
  → Email events@nacto.org for a certificate of participation

MUTCD syntheses for our members

- Second webinar about 11th Edition (Feb. 27 MUTCD Update)
- Upcoming Topics for the rest of 2024
  - → City examples of speed guide changes
  - → Crosswalks
  - → Bike design and bike signals
  - → Transit+AV Traffic Control
  - → Signal Warrants
  - → Coordination on state MUTCD adoption

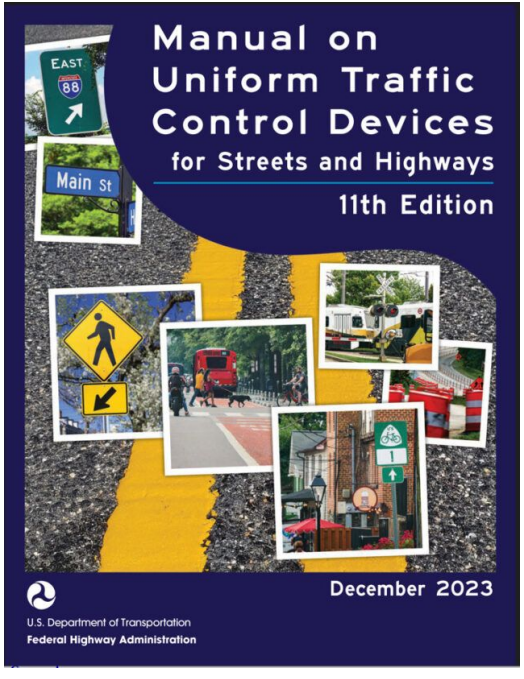


Josh

Jenny

MUTCD 11th Edition Publication

- Released in December 2023, effective as of January 18, 2024
  - → First update since 2009
  - → By law, must be updated every four years going forward
- States have two years to adopt, have their own that is in substantial conformance



MUTCD 11th Edition Application

- The MUTCD applies to:
  - → Pretty much every type of street or roadway
  - → Most rigorously applied on federally-funded projects
- It covers **signs**, **signals**, and **markings**
  - → Precisely how they look
  - → What they are supposed to mean
  - → Some aspects of how you are supposed to use these devices.

- Limits
  - → It does not cover the built aspects of geometric design e.g. turn radius
  - → But….markings are part of geometric design, especially for urban bike, ped, & transit infrastructure.
  - → Traffic laws differ from city to city, so meaning of signals varies
  - → There is no MUTCD police

A coalition pushing for change

- Cities, NACTO staff, LAB, APBP, ITE etc collaborated on a list of 400 specific comments
- NACTO staff elevated comments to FHWA
- Cities and agencies sent comments directly to FHWA
- Member staff participated in our National Standards peer network
- Joined the National Committee on Uniform Traffic Control Devices with three seats

What we requested:

- Restructure the document as a proactive safety regulation
- Modernize method for setting speed zones
- Make it easier to install crosswalks
- Make it easier to install “midblock” signals
- Remove the new section on automated vehicles
- Explicitly allow use of green bike lanes, red transit lanes, and asphalt art
- Eliminate geometric restrictions for urban bikeways
- Change the update process to be more inclusive and transparent

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Two Audiences for Today's Call

1. Non-technical staff who are responsible for educating or convincing decision-makers about the MUTCD's revised regulations for speed limit setting → Stick around until slide 23
2. Technical staff who are responsible for adopting a context-sensitive or safe system approach for setting non-statutory speed limits → Stay with us for a *City Limits* methodology walk-through

Speed Limits in the MUTCD

Introduction: Speed limits

Maximum (or minimum) **speed limits** are typically established by law.

Speed zones are street sections that have a different speed limit than that established by statute. These are set with an *engineering study*.

Section 2B.21: Speed Limit Sign

06 **Speed zones (other than statutory speed limits) shall only be established on the basis of an engineering study that has been performed in accordance with traffic engineering practices. The engineering study shall consider the roadway context.**

07 Among the factors that should be considered when conducting an engineering study for establishing or reevaluating speed limits within speed zones are the following:

A. Roadway environment (such as roadside development, number and frequency of driveways and access points, and land use), functional classification, public transit volume and location or frequency of stops, parking practices, and pedestrian and bicycle facilities and activity;
B. Roadway characteristics (such as lane widths, shoulder condition, grade, alignment, median type, and sight distance);
C. Geographic context (such as an urban district, rural town center, non-urbanized rural area, or suburban area), and multi-modal trip generation;
D. Reported crash experience for at least a 12-month period;
E. Speed distribution of free-flowing vehicles including the pace, median (50th-percentile), and 85th percentile speeds; and
F. A review of past speed studies to identify any trends in operating speeds.

08 When the 85th-percentile speed is appreciably greater than the posted speed limit, and the roadway context does not support setting a higher speed limit, the engineering study should consider whether changes to geometric features, enforcement, and/or other speed-reduction countermeasures might improve compliance with the posted speed limit. A similar approach should be used if the results of past speed studies indicate that the 85th-percentile speed has consistently increased.

09 On urban and suburban arterials, and on rural arterials that serve as main streets through developed areas of communities, the 85th-percentile speed should not be used to set speed limits without consideration of all factors described in Paragraph 7 of this Section.

You are **required** to use an engineering study that considers roadway context.

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On urban and suburban arterials, you **should not** use the 85th percentile speed alone to set speed limits.

You are **required** to use an engineering study that considers roadway context.

You **should** consider roadway environment, roadway characteristics, geographic context, reported crash experience, speed distribution, and a review of past speed studies.

When the 85th percentile speed is greater than the posted speed, or has risen over time, you **should** consider design, enforcement, and other speed management changes to increase compliance.

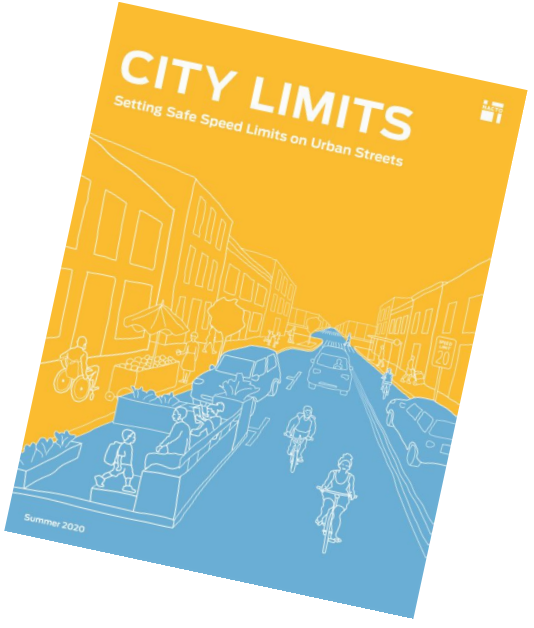
On urban and suburban arterials, you **should not** use the 85th percentile speed alone to set speed limits.

So how should we set speed zones?

04 Jurisdictions can use speed limit setting tools and methods such as expert systems and those consistent with the safe system approach as part of the required engineering study for a non-statutory speed limit. As speed limit setting tools vary, jurisdictions need to be aware of their limitations and advantages, possible variation between the tools and the need to explore gaps or weaknesses of tools, and weigh the output accordingly in consideration of setting speed limits.

Speed Limit Setting Tools

- NACTO's *City Limits*
  → Data-supported, draws from real examples in North American cities, covers multiple types of speed setting and management tools
- FHWA's USLIMITS2
  → An online expert systems tool, where data is processed by web-based software to recommend a speed limit based on volume, speed, and contextual data
- More guidance coming from FHWA in 2024
  → Likely to be better than other federal guidance, but still imperfect



City Limits Quick Guide

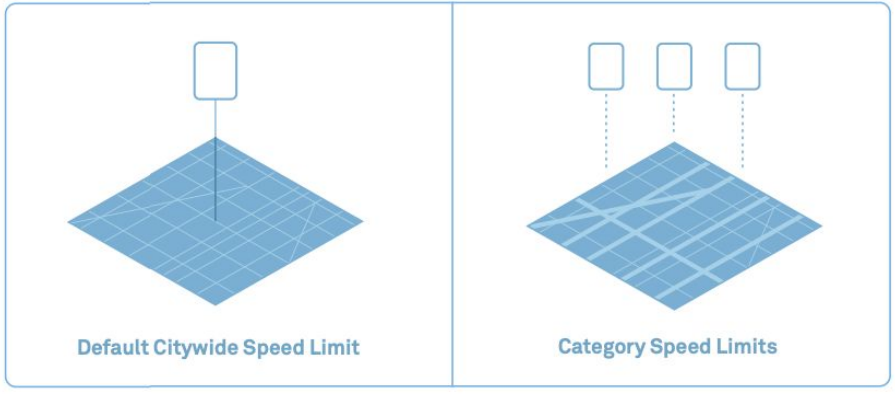
Introduction

- Guidance on how to set speed limits on urban streets using a Safe System approach
- Offers three tools for setting speed limits on urban streets:
  - Setting Default Speed Limits on many streets at once
  - Designating Slow Zones in sensitive areas
  - Setting Corridor Speed Limits using a Safe Speed Study

Part I

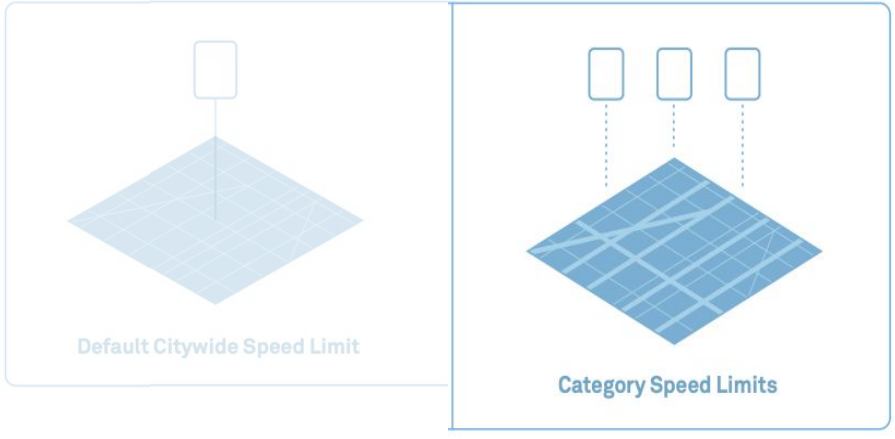
3 Tools for Setting Speed Limits on Urban Streets

Default Speed Limits



- Two options for setting default speed limits: **citywide** or by **street category** (e.g., major, minor, alley).
- **Citywide** speed limits are generally easier to implement and may be easier for drivers to follow. However, setting speed limits based on **category of street** can sometimes allow cities to lower speed limits on a large number of streets below what would be allowable citywide (i.e., 20 mph on minor streets vs. 25 mph citywide).

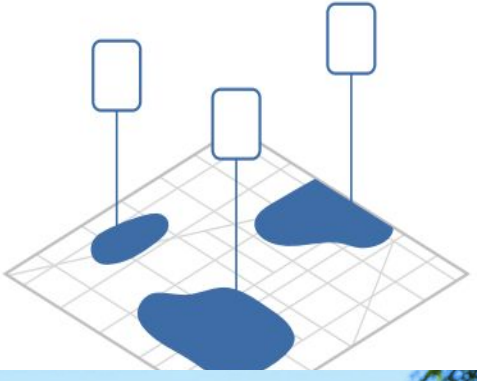
Default Speed Limits



- **Category speed limits** are a powerful tool, and can be achieved using a Safe Speed Study (i.e., engineering study) from *City Limits*.
- More on that shortly…

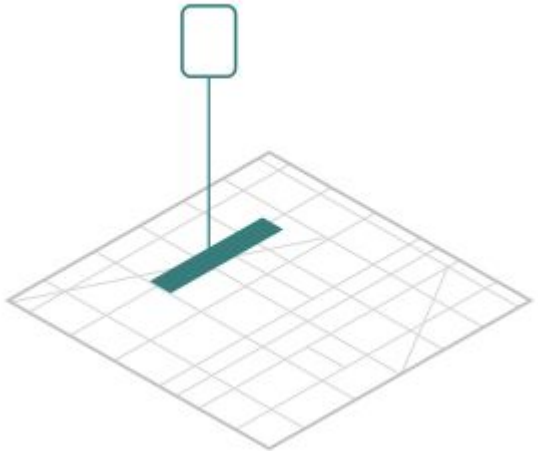
Area-wide Slow Zones

- Specifically designated areas with slower speeds than otherwise similar streets in the same jurisdiction.
- Neighborhood-scale or site-specific zones are useful for addressing high priority areas such as areas with elevated collision rates or sensitive land uses such as schools.
- Common slow zones include:
  - Downtown slow zones
  - School slow zones
  - Neighborhood slow zones



Corridor Speed Limits

- Speed limits on major streets* that do not fit well within existing default speed limits
- Are determined using a **safe speed study** (i.e., a Safe System-based engineering study)



* Safe speed studies can also be used on minor streets in order to justify a lower default speed limit on *all minor streets.* More on that shortly…

Part II

Conducting a Safe Speed Study

Safe Speed Study Introduction

- A contextually sensitive tool for determining the correct speed limit on a corridor.
- The Safe Speed Study methodology analyzes **conflict density** and **activity level**, among other contextual factors, to determine the speed limit that will **best minimize the risk** of a person being killed or seriously injured.

Safe Speed Study Introduction

CONFLICT DENSITY

How frequently potential conflicts arise on a given street

ACTIVITY LEVEL

How active a street currently is or is expected to be

High conflict, high activity streets will require lower speed limits since the risk of a crash is high, while somewhat higher speeds can be tolerated on low conflict, low activity streets.

Safe Speed Study Overview

A Safe Speed Study has four components:

1. Collect before data
2. Analyze existing conditions
3. Determine best option for speed management
4. Conduct an evaluation

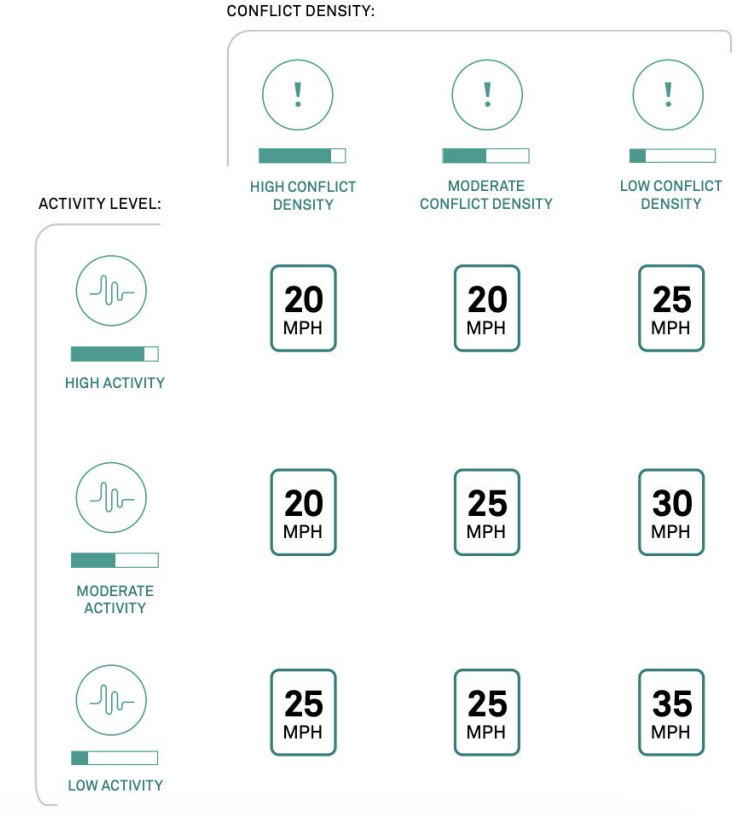
Step 1: Collect Before Data

Begin by collecting data about corridor conditions and crash history:

- Existing speeds
  - Evaluate a range of metrics, including high-end speeding, speeding, standard deviation, median speed, and 50th percentile speed.
- Speeding opportunities
  - Locations where drivers are comfortable exceeding a safe speed because of the design and environment of the street.
- History of fatal and serious injury crashes
  - A five-year history (if possible) of all crashes that resulted in a fatality or a serious injury, including the location of the crash and the circumstances of the crash.
- Conflict counts
  - How often two people or vehicles are on a collision course and must take evasive action to prevent a crash.

Step 2: Analyze Existing Conditions

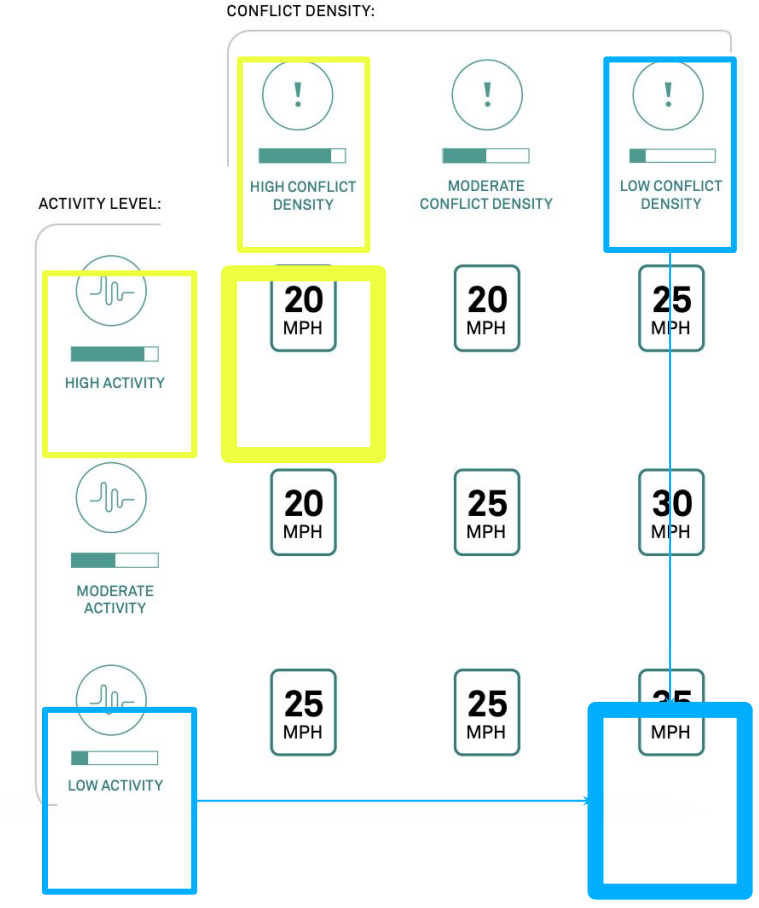
Analyze the corridor, focusing on the frequency of conflict and the amount of activity, and use the *City Limits* **risk matrix** to determine the appropriate posted speed.



How to Analyze Conditions Using the Risk Matrix

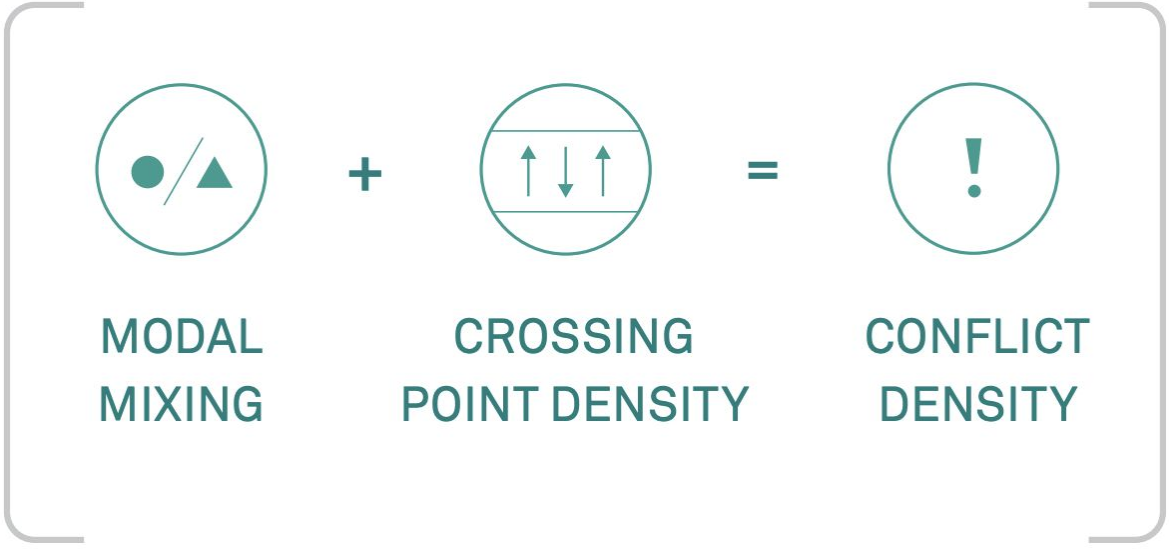
Risk Matrix Overview

The risk matrix is based on the idea that **high conflict, high activity** streets will require lower speed limits since the risk of a crash is high, while **low conflict, low activity** streets can tolerate somewhat higher speed limits.



Determining Conflict Density

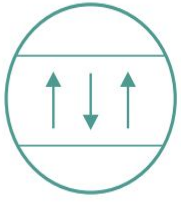
Two primary factors determine how frequently potential conflicts between motor vehicles and people walking or bicycling arise on the street: **modal mixing** and **crossing point density**.



Components of Conflict Density

MODAL MIXING

How much physical separation the street offers people walking, biking, and rolling along the street.



CROSSING POINT DENSITY

How closely spaced intersections and other crossing locations are.

Modal Mixing

MODAL MIXING

High

- No sidewalks or sidewalks directly adjacent to moving motor vehicle traffic
- Bicycle traffic expected to use a mixed-traffic lane or a designated shared bike/motor vehicle lane (e.g., sharrows)

Moderate

- Urban Street Design Guide (USDG)-compliant sidewalk, and/or a curbside loading/parking lane and sidewalk
- If designated as a bike route, a marked bike lane or better
- If not designated as a bike route, a full sidewalk that also permits bicycle use

Low

- If designated as a bike route, a sidewalk compliant with the Urban Street Design Guide plus a vertically and horizontally protected bike lane, or a shared-use path/trail
- If not designated as a bike route, a full sidewalk that also legally permits bicycle use
- Passengers exiting parked or loading vehicles are not directly in motor vehicle traffic lanes

Crossing Point Density

CROSSING POINT DENSITY

High	Moderate	Low
3 or more "through" or "X" intersections (signalized or unsignalized), "T" intersections, driveways, curb cuts, or other crossing points per ¼ mile	**1-3** "through" or "X" intersections (signalized or unsignalized), "T" intersections, driveways, curb cuts, or other crossing points per ¼ mile	**0** "through" or "X" intersections (signalized or unsignalized), "T" intersections, driveways, curb cuts, or other crossing points per ¼ mile

Conflict Density Example A

Minimal separation between modes → **HIGH modal mixing**

Short blocks → **HIGH crossing point density**

Conflict Density Example B

Separated sidewalk → **MODERATE modal mixing**

Moderate length blocks → **MODERATE crossing point density**

Determining Activity Level

ACTIVITY LEVEL

High

Streets with lots of existing or expected pedestrian activity, active public spaces, important bike routes or planned bike routes, high curbside demand, and high density of transit stops

- Downtown / Central Business Districts
- Retail corridors
- High density residential and commercial streets

Moderate

Streets with moderate existing or expected pedestrian activity, moderately used public spaces, some existing or expected bike traffic, frequent driveways, curbside parking/loading, and moderate density of transit stops

- Moderate density residential and commercial streets
- Streets with light retail activity
- Mixed use corridors

Low

Streets with minimal expected pedestrian volumes, minimal expected or planned bike activity, low curbside demand, and few, if any, transit stops

- Low density industrial and residential streets

Activity Level Example A

Downtown context w/ high-density residential, commercial, and retail along both sides of corridor → **HIGH activity**

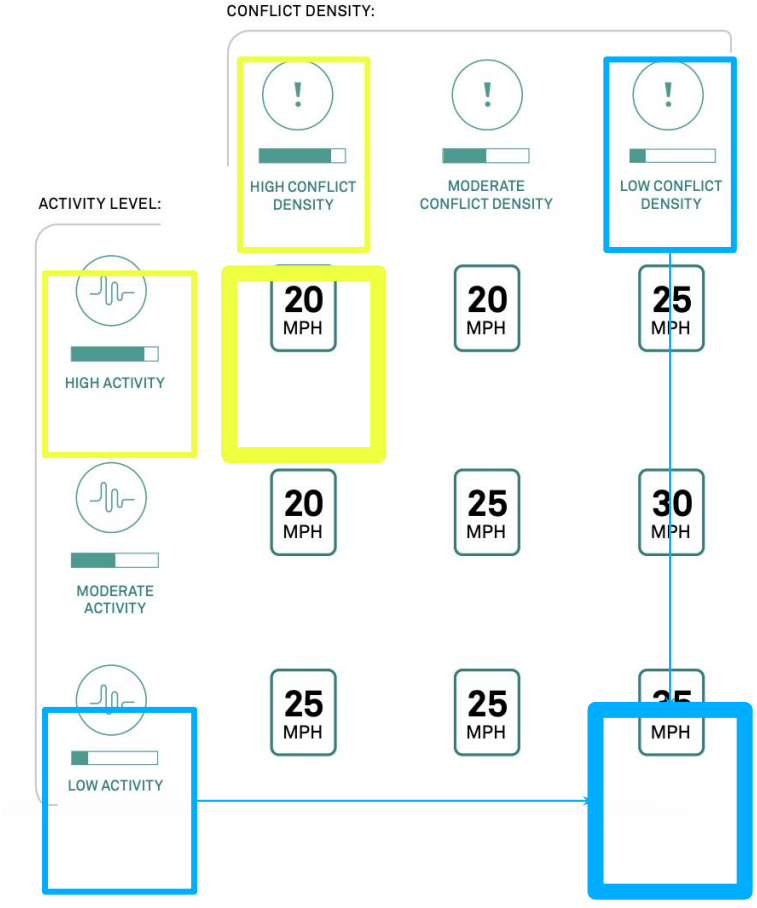
Activity Level Example B

Moderate-density residential and mixed uses along both sides of corridor → **MODERATE activity**

Combining Analyses to Determine Speed Limit

- **high conflict, high activity → lower speed limits**

- **low conflict, low activity → somewhat higher speed limits.**



Combining Analyses Example A

HIGH CONFLICT DENSITY + HIGH ACTIVITY = 20 MPH

Combining Analyses Example B

MODERATE CONFLICT DENSITY + MODERATE ACTIVITY = 25 MPH

Finishing up the Safe Speed Study

Step 3: Determine the Best Option for Speed Management

- Speed limit changes are often implemented alongside other speed management tools:
  - **Signs & markings** to communicate the speed limit and encourage safe speeds
  - **Design & operations** to alter the geometry of the street and achieve slower operating speeds
  - **Speed cameras** to enforce the speed limit and understand where operating speeds and posted limits are misaligned
  - **Messaging & education** to support design and policy changes

Step 3: Determine the Best Option for Speed Management

Is the street's operating speed at or below the maximum safe speed, as determined by the risk matrix?

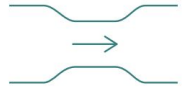
Yes

Is the posted speed limit **within the recommended range?** → No priority speed action

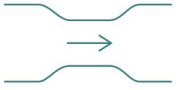
Is the posted speed limit **higher than the operating speed?** → Reduce the posted **speed limit** to the recommended level

No

Is the posted speed limit **within the recommended range?** → Use **design and operations** to manage the speeds down to the speed limit or lower.



Is the posted speed limit **equal to or higher than the operating speed?** → Reduce **speed limit** AND use **design and operations** to manage speeds downward over time



Step 4: Conduct an Evaluation

Consider evaluating changes in

- number of high-end or top-end speeders
- operating speed (95th percentile)
- number of speeding opportunities
- number of people killed or severely injured
- conflict counts

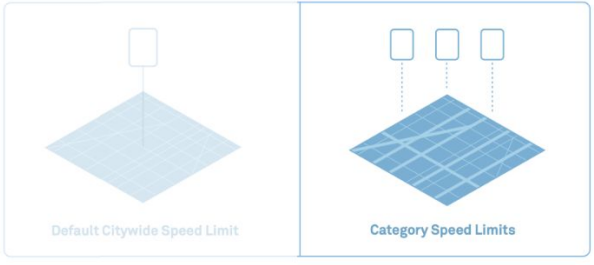
Reminder: if you want to do a before-after evaluation, you also have to collect this data before implementing lower speed limits.

Part III

Applying the Safe Speed Study on a Category of Streets

Back to this…

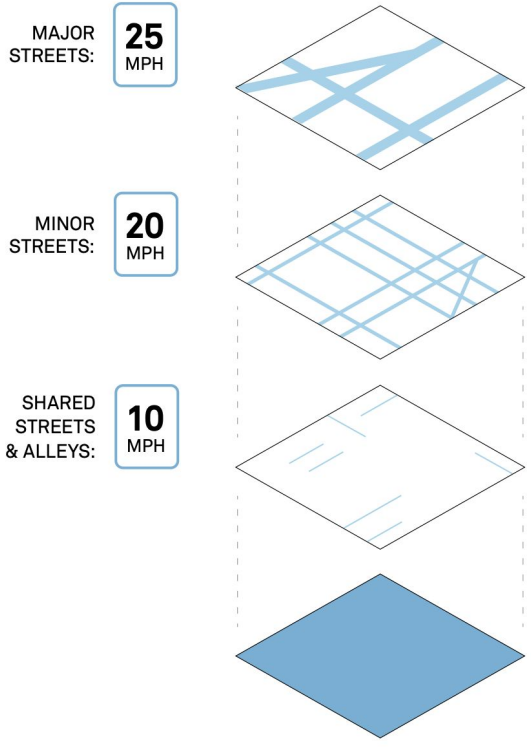
Default Speed Limits



- **Category speed limits** are a powerful tool, and can be achieved using a Safe Speed Study (i.e., engineering study) from *City Limits*.
- More on that shortly…

16

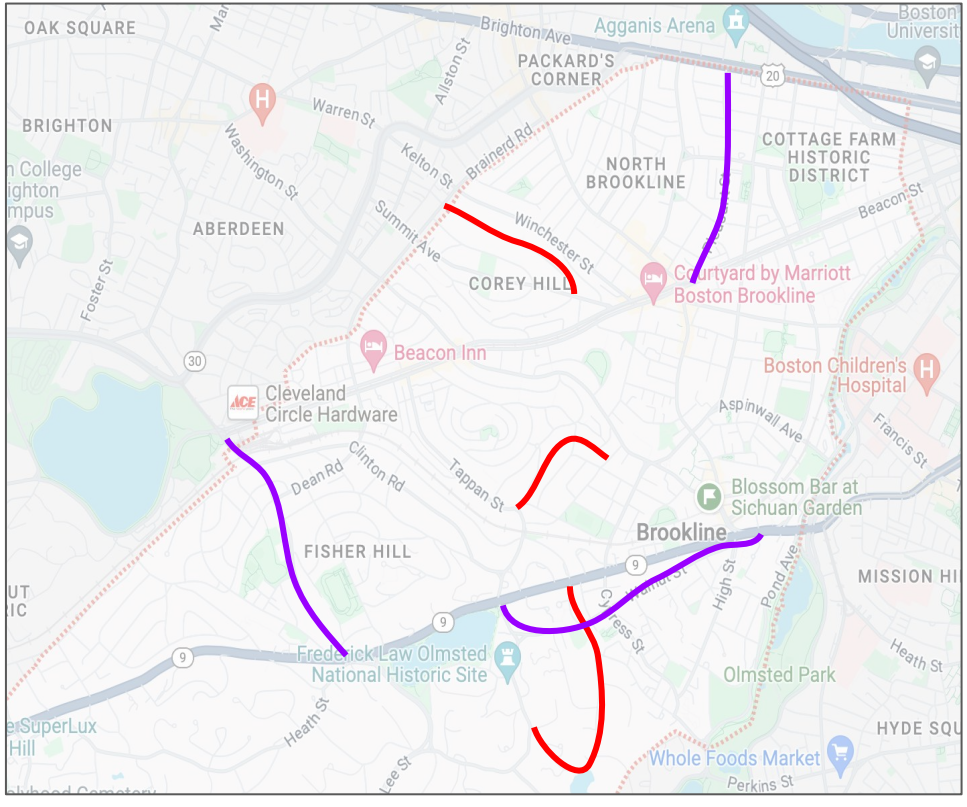
Category Speed Limits



- Speed limits for specific categories of streets, such as **arterials, local streets,** and **alleys.**
- Benefit is setting a small number of speed limits that apply to nearly all streets.
- Allows for relatively quick adjustment of speed limits on most streets, and frees up resources to focus on high-crash corridors or places where site-by-site analysis is necessary.

Using a Safe Speed Study for Category Speed Limits

- Select a small group of like-streets across a large geographic area
- Use the risk matrix to determine the recommended posted limit on each corridor
- *(can do this using any other local process, too)*



Category Speed Limits in Austin

Other Tools

USLIMITS2 Overview

- FHWA-developed online tool that employs a decision algorithm to advise the user of the appropriate maximum speed limit for the specific road section of interest.
- For Road Sections in Developed Areas, USLIMITS2 often recommends a posted speed limit at the 50th percentile.

USLIMITS2 Benefits

- USLIMITS2 is considered an ‘expert system’ tool, and is FHWA-approved and recognized since FHWA developed the tool
- Can be straightforward for local engineers / decision-makers to accept results from USLIMITS2 since FHWA developed it

USLIMITS2 Required Inputs

Required input variables for Road Sections in Developed Areas:

- Operating Speed: 85th percentile speed and 50th percentile speed
- Section Length
- Annual Average Daily Traffic
- Presence/absence of adverse alignment
- Current statutory speed limit for this type of road
- Whether it is a One-Way Street?
- Number of Through Lanes (in both directions)
- Area Type
- Number of driveways within the section
- Number of traffic signals within the section
- Presence/usage of on-street parking
- Extent of ped/bike activity
- Crash Statistics

Stay in touch:

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