13-5-1 Statutory Authority and the Approval Process — November 2024

Speed limits are absolute limits that are established for a roadway under ideal conditions. They also help traffic enforcement by setting standards for what is an unsafe speed. Setting speed limits appropriately helps to reduce the significant risks drivers impose on others – especially vulnerable road users.

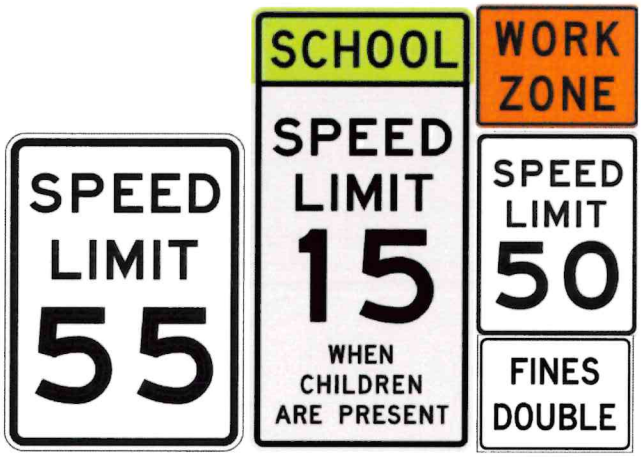
The concept of establishing speed limits is based upon the nationally accepted principle that the majority of drivers are cautious, prudent and drive at speeds that are reasonable, regardless of the posted speed limit. This "reasonable and prudent" theme is part of the Wisconsin State Statutes in ss. 346.57 (4) and ss. 349.11 (7).

The policy described within aligns with Wisconsin State Statutes and the Wisconsin Manual on Uniform Traffic Control Devices (WMUTCD) [1].

13-5-2 Types of Speed Limits — November 2024

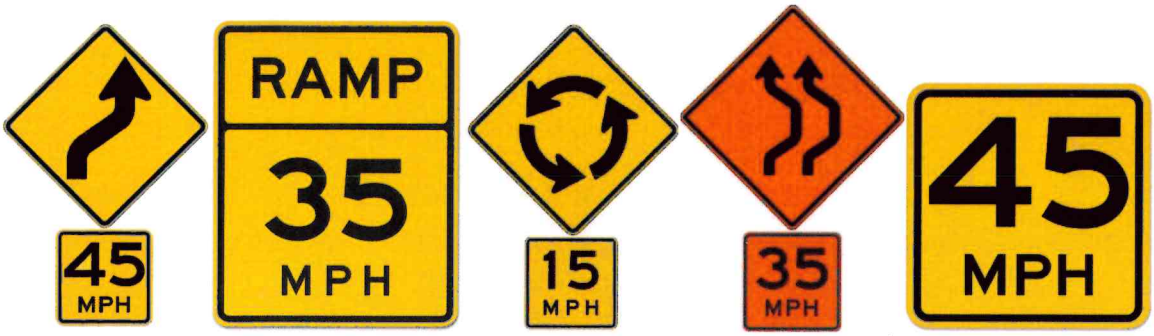
Regulatory

Speed limits posted with a white background and black legend sign are maximum speed limits that a road user must adhere to under average or ideal conditions. These are referred to as regulatory speed limits and examples are shown below. Regulatory speed limits are absolute speed limits, above which it is unlawful to drive regardless of roadway conditions, traffic volumes, pedestrian presence, school activity, highway construction or maintenance workers or other factors.



Advisory

Speed limits posted with a yellow or orange background with black legend sign are warning signs used to advise a road user of a recommended driving speed for an upcoming road condition or hazard. These are used in situations where there is a small section of road that *should* be traveled at a lower speed. These can be used at curves, intersections with reduced visibility, or within work zones. These signs are advisory and not enforceable in Wisconsin unless a driver is driving too fast for conditions. Below are examples of advisory speed limits.



13-5-3 Types of Regulatory Speed Limits — November 2024

Statutory Speed Limits

Statutory speed limits are established by state law and are based on the classification (or type) of roadway (e.g., 70 mph on freeways, 45 mph on rustic roads). Statutory speed limits in Wisconsin are governed by ss. 346.57 which establish maximum/minimum speed limits for all roadways. These limits are established legislatively and are applied throughout Wisconsin on public roadways. Statutory speed limits ensure a limit is in place on all roads.

Modified Speed Limits (Modifications to Statutory Speed Limits)

Modified speed limits are typically established on roadways where the statutory speed limit or existing limit is no longer appropriate due to a change in land use, road design, access, traffic volumes, construction/maintenance activity, or number of crashes or crash potential along a roadway. Modified speed limits *should not* be used to address spot safety issues. Often, other engineering countermeasures are more appropriate to address safety issues.

Unless speed limits are set initially by state statutes (statutory speed limits), all speed limits in Wisconsin must be established through an engineering and traffic investigation.

Speed limits that are not used in Wisconsin are as follows:

- Nighttime speed limits – limits that are adjusted based on day or night conditions.
- Minimum speed limits – limits establishing the lowest allowable speed for a roadway.
- Specialty vehicle speed limits (e.g., trucks, golf carts, etc.) – limits applied to certain classes of vehicles.
    - Exceptions include: All-Terrain Vehicles (ATV) and Utility Terrain Vehicles (UTV)
- Seasonal speed limits – limits that are applied for a specified period(s) during the year, generally at locations with significantly different levels of roadside activity at different times (e.g., high traffic tourist area popular in summer).

13-5-4 Definitions — November 2024

An engineering and traffic investigation is the analysis and evaluation of available pertinent information including, but not limited to, the safety and operational efficiency of all road users, and the application of appropriate principles, provisions, and practices as contained in the WMUTCD.

The following provides definitions of information typically included within an engineering and traffic investigation.

Roadway Context Terminology

Roadway Geometry is information on the roadway facility's features and dimensions such as lane widths, shoulder widths, curb and gutter presence, curves, sidewalk/pathways, presence of lighting, and available sight distance.

Traffic Volume is used to describe the number of vehicles at a given location on an average day of the year. This is often expressed as either an Average Daily Traffic (ADT) or Annual Average Daily Traffic (AADT) count.

Area Type is a designation for the setting of the environment where the roadway facility is located. There are three area types:

- Urban – locations that have a population of 5,000 or greater. In urban settings there is minimal undeveloped land and several buildings including schools, commerce centers and others.
- Rural – locations that have a population less than 5,000. In rural settings there are typically large areas of undeveloped land with minimal buildings or residences. These may include small towns and unincorporated communities.
- Suburban – transitional areas between rural and urban settings. These typically are locations that are built up areas on the outskirts of cities and villages.

Functional Classification is a transportation planning term that defines how a route *should* perform in serving the flow of traffic through a highway network. It is the grouping of highways, roads and streets by the character of

service they provide (e.g., principal arterial, minor arterial, collector (major/minor), local street).

Vulnerable Road User encompasses non-motorists including people walking, biking or rolling. These include pedestrians, bicyclists, other cyclists, and individuals utilizing other means of personal transportation.

Speed Terminology

Operating Speed (Free-Flow Speed) is defined as the speed at which a driver operates a typical vehicle, or a speed at which the overall traffic operates during free-flow conditions. Free-flowing speed is defined as conditions in which a driver has the ability to choose a speed of travel without undue influence from other traffic, traffic control devices (e.g., traffic signals, roundabouts), conspicuous police presence, or environmental factors. In other words, the driver of a free-flowing vehicle chooses a speed that they find comfortable on the basis of the appearance of the road [2] [3]. WisDOT measures free-flowing vehicle speeds when there is a gap of five seconds or more between vehicles per lane.

Design Speed is the speed selected during the roadway design process that determines the various geometric design features of the roadway such as horizontal alignment, vertical alignment, and cross-section design elements [4]. This includes lane widths, shoulder widths, curb and gutter presence, curves, and available sight distance.

The following are definitions for speed-related performance metrics:

- 85th Percentile Speed is the speed at or below which 85 percent of the sample of free-flowing vehicles travel.
- 50th Percentile Speed (also known as the median speed) is the speed at which 50 percent of the sample of free-flowing vehicles travel.
- Average speed is the typical speed of the sample of free-flowing vehicles. This is calculated by taking the sum of all observed speeds within the same sample and dividing by the total number of observations.
- Pace is the 10-mph range of travel speeds containing the largest number of observed vehicles. This is a metric used to assess the speed dispersion or spread of vehicle speeds. A normal speed dispersion *should* have approximately 70% of the vehicles within this 10-mph range.
- Speed variance is the difference in travel speeds of vehicles traveling on the same stretch of roadway simultaneously. Large speed variances increase the potential for crashes.

Roadway Classifications

State Trunk Highways (STH) are highways that include both Wisconsin State Highways and United States (US) Highways that are maintained by WisDOT. In Wisconsin, these are highways designated with numbers.

County Trunk Highways are highways maintained by County Highway Departments or other municipalities. In Wisconsin, these are highways designated with letters.

Local Streets are roadways that are maintained by incorporated municipalities (i.e., villages/cities) that serve primarily residential traffic and provide a connection between highway systems.

Town Roads are typically low-volume roadways that are maintained by townships.

Rustic Roads are roadways designated by the Rustic Roads Board which have characteristics that promote natural features or wildlife and low volume for the purposes of recreational enjoyment. For more information see the Rustics Road webpage.

Alleys are roadways that are narrow passages between or behind development.

Freeways are high-speed roadways that are access-controlled, and all crossroads are grade-separated (i.e., interchanges/overpasses).

Expressways are high-speed roadways that are partially access-controlled, and crossroads can be either at-grade intersections or grade-separated (i.e., interchanges/overpasses).

Other

Variable speed limits are limits that can dynamically change based on traffic, weather or other conditions.

Connecting Highways are local streets and roads that carry state highway travel and are marked as STHs through cities and villages.

Outlying district is an area contiguous to any highway within the corporate limits of a city or village where on each side of the highway within any 1,000 feet, buildings are spaced on average more than 200 feet apart.

Semiurban district is an area contiguous to any highway where on either or both sides of the highway within any 1,000 feet, buildings are spaced on average less than 200 feet apart.

13-5-5 Background November 2024

Modified speed limits are typically established on roadways where the statutory speed limit or an existing speed zone is no longer appropriate due to changes in land use, access, traffic volumes, number of crashes or crash potential along the highway. Speed zoning is a means of establishing uniform regulatory speed limits for similar driving conditions throughout the state. It is a means of informing motorists who may be unfamiliar with the road of the "reasonable" driving speeds under ideal operating conditions. Speed limits are established under ideal conditions and not based on temporary situations (e.g., construction, seasonal variations in traffic/pedestrian volumes, special events).

Unreasonably low speed limits, also called irrational speed limits, are not effective in changing driver behavior and have several negative effects. While irrational speed limits do not result in desired driver behavior, resulting negative effects include higher financial cost due to the need for increased enforcement, higher potential for crashes due to larger variability in vehicle speeds, and encouragement of motorist disregard of other, rational posted speed limits. Irrationally low speed limits also promote a false sense of security among residents and pedestrians who may expect that posting lower limits will change drivers' speed behavior.

Driving environment is the main influence on motorists' speeds. Drivers rely heavily on cues from the roadway environment to judge how fast they are traveling. The primary basis for how a motorist estimates their speed is the visual sensation they observe from the roadway geometrics (e.g., lane width, presence of curves, on-street parking, access along the roadway, bicycle and pedestrian activity, sidewalks/pathways, presence of lighting, etc.) and other information about objects in their immediate vicinity. Roadway design and driving environment *should* be balanced to achieve the following goals [2]:

- The driver's perceptual experience of the roadway *should* be consistent with the intended travel speed
- There *should* be some consistency between relevant roadway cues and the posted regulatory speed.

13-5-6 Authority November 2024

The statutory authority for establishment of regulatory speed limits is provided in ss. 346.57 and ss. 349.11. These statutes vest WisDOT with the authority to establish regulatory speed limits on the state trunk highway system. Furthermore, the statutes provide WisDOT with approval authority (refer to ss. 349.11(3)(c)) for some regulatory speed limits that local units of government establish.

Statutes define that all speed limit changes **shall** be based on an engineering and traffic investigation, including modifications allowed under Statute. An engineering and traffic investigation **shall** be performed by a registered professional engineer with appropriate traffic engineering expertise and/or experience in traffic engineering studies, or by an individual working under the supervision of such an engineer, through the application of procedures and criteria established by the engineer. An engineering and traffic investigation **shall** be documented in writing.

Connecting Highway

Connecting highways are local streets and roads that carry state highway traffic and are marked as State Trunk Highways. Wisconsin ss. 84.02(11) and ss. 86.32(1) define connecting highways and the funding provided to maintain these roadways. Connecting Highway funding aids are used to maintain these streets and roads at state trunk highway system standards and compensate local governments for the incremental costs of through-traffic routed over municipal streets. For more information see the Connecting Highway webpage.

Connecting Highway speed limits are maintained by the respective municipality. Wisconsin ss. 86.32 states such maintenance, operation and traffic control of the connecting highways and swing and lift bridges **shall** be subject to review and approval by WisDOT.

Municipalities that maintain connecting highways are responsible for the maintenance and traffic control of the roadway which includes establishing speed limits. Thus, local authorities responsible for these roadways **shall** follow information within Table 6.1 to establish speed limits. Proposed changes to speed limits on these facilities

that impact the operation of connecting highways **shall** be subject to review and approval by WisDOT.

Approval Authority

Local Government

- Local units of government, under their respective maintenance jurisdictions, can approve speed limit modifications as allowed in Table 6.1.
- When speed limits are recommended outside of the approval authority defined by ss. 349.11, local units of government are required to coordinate with WisDOT. For information on how to request WisDOT to review a speed limit modification, see TEOpS 13-5-7.1.
- Local units of government *should* follow the guidance outlined within TEOpS 13-5 to satisfy the requirements of an engineering and traffic investigation.

Table 6.1 Speed Limits and Local Authority

Statutory (Fixed) Limits per ss. 346.57(4)	What Local Governments[a] can do per ss. 349.11(3) and (7)
70 mph – Freeway/Expressway	N/A
65 mph – Freeway/Expressway	N/A
55 mph – State Trunk Highway	N/A
55 mph – County Trunk Highway	Lower the speed limit to 50 or 45 mph
55 mph – Town Road	Lower the speed limit to 50 or 45 mph
45 mph – Rustic Road	Lower the speed limit to 40, 35 or 30 mph
35 mph – Town Road with average driveway spacing less than 150 feet	Lower the speed limit to 30 or 25 mph
25 mph – Inside corporate limits of a city or village	Raise the speed limit up to 55 mph Lower the speed limit to 20 or 15 mph
15 mph – Street or Town Road adjacent to a public park	Lower the speed limit to 10 or 5 mph
15 mph – Alley	Lower the speed limit to 10 or 5 mph
15 mph – Pedestrian Safety Zone (with a public transit stop)	No changes permitted
Construction or temporary maintenance zones	See TEOpS 13-5-16 and 13-5-17
School zone/School crossing	See TEOpS 13-5-12
Connecting Highway	Subject to WisDOT approval

(a) All speed limit changes shall be based on an engineering and traffic investigation, including modifications allowed under Statute. Local governments can implement speed limit changes on the local road system without WisDOT approval when proposals are within the constraints identified above.

WisDOT Regional offices

- Regional offices are authorized to approve speed limit changes on local roads and streets, including county trunk highways, where those changes fall outside the authorized limits that the local authorities *may* exercise as specified in the statutes.
- Regional offices are authorized to establish reductions in speed limits in construction zones on a temporary basis while the need for the reduction exists.
- Regional offices are authorized to approve speed limits which fall within 5 mph of the measured 85th percentile speed and no more than 2 mph below the measured average speed, or where speed limits are established based on statutory requirements. In the absence of speed information, regional staff **shall** coordinate with WisDOT Bureau of Traffic Operations (BTO). Exceptions include:
    - Adjusting speed limits due to relocations from development, access modifications or adjusting due to signage requirements. Extensions *should not* exceed 300' without BTO approval. Speed studies *may* be required for extensions due to these changes.
    - Construction of new roadway facilities or reconstruction of existing facilities in which speeds are posted in accordance with the design speed. If speeds are posted below the design speed, coordination with BTO is required.

WisDOT Bureau of Traffic Operations (BTO)

- The following **shall** be approved by the Traffic Analysis and Safety Unit (TASU) within BTO:
  - Speed limits not meeting the criteria defined above and within Table 6.1.
  - Speed studies that are not able to collect speed data (e.g., short roadways).
  - Modifications or proposed modifications on expressways/freeways with posted speeds greater than or equal to 65 mph.
  - Use of variable speed limits.

13-5-7 Engineering and Traffic Investigation Procedure — November 2024

Request Process

Requests to review a speed zone on the State Trunk Highway (STHs) **shall** be submitted in writing by a local unit of government or County Traffic Safety Commission and include the following:

- Current regulatory speed limit and begin/end points
- Proposed regulatory speed limit
- Proposed begin/end points of proposed zone(s)
- Reasoning for the request (e.g., change in land use, access, traffic volumes, crash trends)

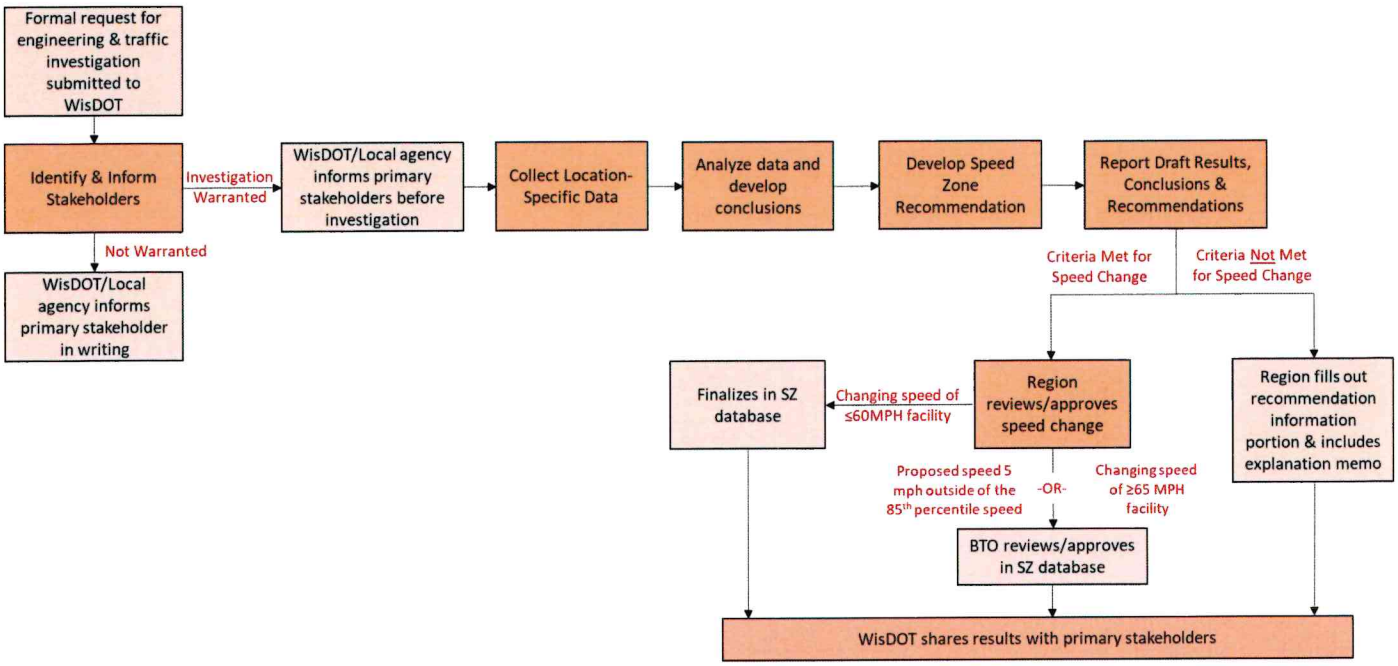
For contact information, please see the WisDOT Speed Limits webpage.

Upon receipt of request, WisDOT will then determine if a review of the speed limit is appropriate. WisDOT does not entertain requests to modify speed limits from individual citizens or advocacy groups. Considerations for speed limit adjustments **shall not** be based solely on the following:

- Noise complaints
- Accommodating specialty vehicles (e.g., ATV/UTV)
- Correcting spot safety concerns
- Future concerns that have not yet occurred (e.g., future development, future roadway improvements)

If an engineering and traffic investigation is warranted, WisDOT will then follow a process outlined in Figure 7.1.

Figure 7.1 Engineering and Traffic Investigation Process



Requirements

For a speed limit to be effective, it *should*:

- Reflect consistent application of traffic engineering principles
- Be a reasonable speed so the majority of drivers will comply voluntarily
- Be based on ideal or average conditions and not temporary situations (e.g., construction, seasonal variations in traffic/pedestrian volumes, special events)
- Local units of government *should* follow the guidance outlined within this manual to satisfy the requirements of an engineering and traffic investigation.
- For state-maintained highways, a traffic engineer with a Wisconsin Professional Engineer License is required to approve a speed limit modification.

An engineering and traffic investigation **shall** include the following section headings. Include information within each section as appropriate based on the study location.

1. Roadway Context Information
    - Primary function or purpose of roadway (e.g., residential street, thoroughfare, commuter route, freight route, recreational route, etc.)
    - Roadway environment (e.g., development adjacent to the road, average building setback, and types of land use)
    - Roadway characteristics (e.g., number of lanes, lane widths, shoulder type and width, roadway curvature, median type, sight distance, presence of curb and gutter, etc.)
    - Roadside features (e.g., presence of and distance to roadside hazards including trees, rock outcrops, street furniture, embankments, edge drop-off, side slopes, water bodies, etc.)
    - Area Type (e.g., urban, suburban, rural)
    - Access density (e.g., number and type of driveways and intersections, etc.)
    - Road users (e.g., pedestrians, bicyclists, ATV/UTV, horse and buggies, other vulnerable road users, etc.)
    - Traffic Volumes (e.g., AADT/ADT, truck volumes and proportions, pedestrian and bicycle volumes, etc.)
    - Public transit volume and location or frequency of stops
    - Other information relevant to the roadways purpose and function (e.g., parking practices, functional classification, design speed, etc.)
2. Safety Information
    - Years reviewed (minimum of 3 years of reported crash history)
    - Number and type of crashes
    - Number of injury and fatal injury crashes
    - Number of vulnerable road user crashes
3. Speed performance metrics
    - 85th percentile speed
    - 50th percentile speed
    - Average speed
    - Pace
4. Other relevant information
    - Review of past speed studies to identify any trends in operating speeds

- Recent significant changes (traffic control changes, speed limit adjustments, lane adjustments, new development, etc.)
- Current level of enforcement

For urban and suburban roadways, and on rural roadways that serve as main streets through developed areas of communities, speed performance metrics *should not* be used as the sole criterion to establish speed limits without consideration of roadway context factors described above. On a freeway, expressway, or rural highway (outside urbanized locations or conditions), the speed limit that is posted *should* be within 5 mph of the 85th percentile speed of free-flowing traffic as long as all the factors described within the roadway context section of this policy have been considered and determined to be non-mitigating.

After analyzing information collected above as part of an engineering and traffic investigation, the analyst **shall** use it to develop and support speed zone recommendations. The engineering and traffic investigation **shall** provide a recommendation indicating whether conditions warrant a need to modify the speed limit of the studied section of roadway or not. Decisions regarding the potential change in a speed limit *should* be based on the objective findings of the engineering and traffic investigation and on conditions that exist at the time of the evaluation.

There are expert system tools available to aid in the process of determining appropriate speed limits which can be used to supplement the requirements listed above:

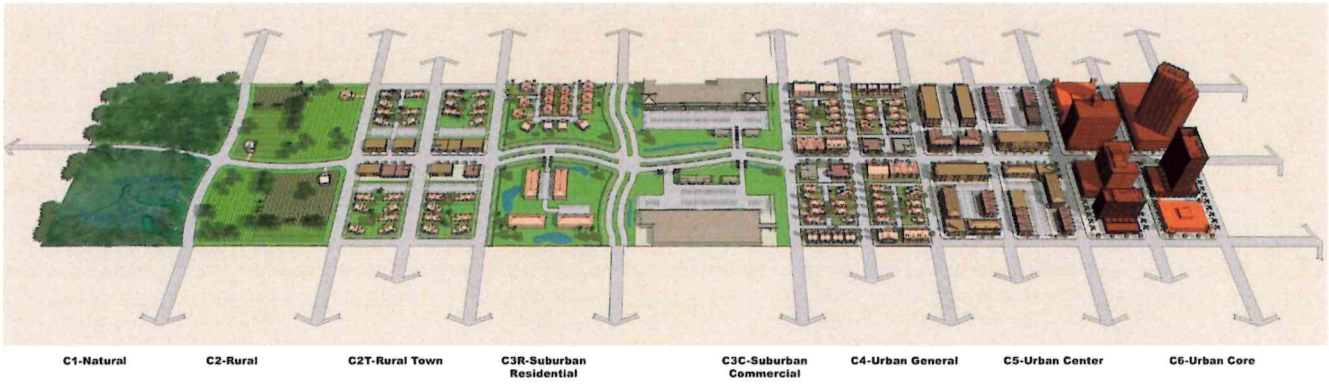
- USLIMITS2
- NCHRP 966: Posted Speed Limit Setting Procedure and Tool

13-5-8 Transitioning between Speed Limits — November 2024

Roadway context and environmental factors play a critical role in establishing appropriate speed limits. Drivers must perceive the need to transition from one speed to another. Development density adjacent to the roadway, building setback distance, the number of streets and driveways that access the roadway, sight distance, roadway features including the presence of curb and gutter, shoulders, medians, sidewalks, pedestrians, bicyclists, and other vulnerable road users provide cues to the driver based on their past experiences. Other aspects considered when setting appropriate speed limits are the number and type of crashes observed, traffic volumes, and observed speeds.

Figure 8.1 illustrates several different roadway context scenarios.

Figure 8.1 Roadway Context Classifications



Source: *Florida DOT's context classification, 2020* [5]

Table 8.1 provides planning-level speed limit recommendations based on the roadway context classifications.

Table 8.1 Design speeds based on context classifications

Context Category	Design Speeds (mph)
Natural	55
Rural	45, 50, 55
Rural Town	40, 45
Suburban Residential	35, 40, 45
Suburban Commercial	35, 40, 45
Urban General	25, 30
Urban Center	20, 25, 30
Urban Core	20, 25, 30

Minimum speed zone lengths *should* follow the guidance in Table 8.2. Engineering judgement *should* be used in determining the appropriate length given the roadway context. If conditions require lengths shorter than those described below, coordinate with BTO's Traffic Analysis and Safety Unit for approval.

Table 8.2 Minimum length of speed zones

Speed Limit (mph)	Minimum Length (miles)
≤40	0.3
45, 50, 55	0.6
60, 65, 70	1.0

Note: *Adjusted values from Methods and Practices for Setting Speed Limits* [6]

Speed Zone Termination Points

The begin and end points of a speed zone *should* be located in locations with adequate sight distance and in advance of where the roadway environment changes (e.g., driveway density, lane transitions, curb and gutter presence, etc.) such that a driver may expect a different speed.

When the roadway environment or roadway characteristics change (e.g., driveway density, lane transitions, curb and gutter presence), the regulatory speed limit sign **shall** be located at the changed condition. Examples include placing speed limit signage within straight sections of roadway or prior to entering a community where there is minimal development, but the roadway characteristics change (e.g., unpaved shoulders to curb and gutter). In advance of the of changed condition, the reduced speed limit sign **shall** be located based on TEOpS 2-3-30. The location of the reduced speed limit sign *should* be adjusted based on engineering judgement such that it is located where adequate sight distance is available or in advance of the changed condition based on site conditions.

Both travel directions of speed zones *should* begin and end at the same location to align with driver expectation. Roadway conditions, existing signage and other factors play a role in locating where speed limit signs can be placed in the field. When posted, the beginning and end points of a speed zone **shall** match the ordinance/declaration description as close as possible.

Roadway characteristics such as access points and intersections sometimes prevent speed zones from being aligned in both directions. In situations where a speed zone is written to change at an intersection, the signs **shall** be posted on either side of the intersection. When reviewed as part of a study or within an improvement project, efforts *should* be made to modify these speed zones to align on one side of the intersection.

- For situations in which the separation of the begin and end points is significant or different speeds are posted for each direction, engineering judgement *should* be used.
- If conditions require an offset speed zone coordinate with BTO's Traffic Analysis and Safety Unit for approval.

Gateway Treatments

Gateway treatments are used to capture the attention of a driver to provide awareness of changes in the roadway environment and encourage them to reduce their speed. Examples of this include enhanced signing (e.g., additional warning signage, beacons, dynamic speed display signs), median islands, curb extensions/bump-outs, roundabouts, chicanes, etc. Gateway treatments are important tools to consider in areas where there are large reductions in the posted speed due to an abrupt change in the roadway environment.

13-5-9 Data Collection Best Practices November 2024

A speed investigation *should* be performed during non-peak traffic conditions, during daylight hours, and under ideal weather conditions on a typical weekday, when motorists are likely to be traveling at uninterrupted/free-flow speeds. Collecting speed data during peak commute times, unique events, weekends, or holidays may unintentionally capture more variable travel characteristics.

A template for summarizing and reporting speed performance metrics is available on the Speed Limit References and Resources webpage.

Below are best practices for collecting speed performance metrics:

- The observer or speed-measuring device *should* be inconspicuous to the observed traffic so unusual driver behavior does not skew data.
- Speed data *should* be collected away from factors that might influence vehicle speeds, such as railroad crossings, intersections, horizontal and vertical curves, and work zones.
- Vehicle headway (the time between successive vehicles per lane) of five or more seconds *should* be present for reliable speed observations. Measurements collected with smaller headways may not reflect free-flow conditions, as the lead vehicle may influence the speed of the vehicle(s) behind it.

Sample Size Requirements

Selecting a sample size (number of observations) is an important step in collecting speed performance metrics. Below are requirements to help set an appropriate sample size:

- A minimum sample size for speed data collection *should not* be less than 100 vehicles per lane per direction. For example:
  - 200 vehicles for a roadway with one through lane in each direction
  - 400 vehicles for a roadway with two through lanes in each direction
- For roadways classified as very-low volume local roads, the minimum sample size *should not* be less than 30 vehicles. If the analyst anticipates that a sample of 30 vehicles cannot be collected within a reasonable amount of time, coordinate with BTO's Traffic Analysis and Safety Unit to identify alternative data sources or collection methods.

Data Collection Methods

An analyst can use a variety of data collection devices. These devices can be grouped into three categories, which for these purposes, are based on the location that the speed data collection device is installed.

- Manually operated handheld devices that are portable and can be used in most places (e.g., radar gun and laser gun).
- In-road devices that are installed into or on top of the roadway surface (e.g., pneumatic road tube).
- Out-of-road devices that are installed overhead or to the side of the roadway surface (e.g., radar recorders).

Each device has distinct advantages and disadvantages for collecting and analyzing data that may factor in determining the appropriate device to use for a particular location. See WisDOT's Data Collection Methods document on the Traffic Operations Manual webpage for more information.

13-5-10 Documentation November 2024

Speed Zone Database

The approval process for speed limit modifications proposed by WisDOT on the State Trunk Highway system is conducted electronically within the Speed Zone Database. The following summarizes the different levels of review and approval.

1. If an engineering and traffic investigation is completed on an established speed zone, the investigation findings and other relevant documents **shall** be stored within the database.
2. If WisDOT Regional office authority is met (see TEOpS 13-5-6.2), the designated Regional approver **shall** electronically sign/approve the speed zone declaration.
3. If WisDOT Bureau of Traffic Operations (BTO) approval is needed, coordinate with BTO's Traffic Analysis and Safety Unit for approval of the speed zone declaration.

Format

Speed zone declarations **shall** reference recognizable and permanent landmarks (e.g., intersections or highways) and denote a distance to or from these landmarks. Landmarks that change (e.g., construction limits, city limits, building names, railroad crossings, etc.,) **shall not** be used.

13-5-11 Local Speed Limits November 2024

Request Process

Coordinate with the appropriate government agency to discuss concerns or proposed modifications on county highways, city or village roads, or town roads. Upon receipt of request, local authorities can initiate action to modify a speed limit and create a new speed zone on a local road through an engineering and traffic investigation. TEOpS 13-5 is provided to help guide local agencies in establishing appropriate speed limits. Wisconsin ss. 346.57 and ss. 349.11 are most applicable to modification of regulatory speed limits. These statutes, and local government authority are summarized in Table 6.1.

The following are common examples for local agencies:

- The roadway does not currently have a posted speed and is rural in nature (e.g., sparse development, no curb and gutter, gravel shoulders and grass ditches). In this scenario, by ss. 346.57, the speed limit is 55 mph.
- Lowering a 55-mph county trunk highway or rural roadway to 50 or 45 mph. In this scenario, the county or township *may* lower the speed limit to either 50 or 45 mph under the approval authority listed in ss. 346.57 and ss. 349.11 without WisDOT approval, but an engineering and traffic investigation is required to support the change.

Ordinances

It is recommended that the local approval process include legal adoption of the speed zone recommendation through passage of an ordinance. This establishes a legal record of the speed limit modification and allows the speed zone to be enforceable by law enforcement agencies. Proposed changes that lie outside the constraints presented in Table 6.1 **shall** be reviewed and approved by WisDOT before legal adoption by local authorities. It is recommended that the local process conclude with the local authority responding to the submitting party in writing, providing notification of approval or an explanation of the reasons for denial. The following is an example county ordinance.

Sample Ordinance

Establishment of Speed Zones

The Board of Supervisors of the County of Alpha do ordain as follows:

A traffic and engineering investigation having been made on the following described highways, the maximum permissible speed at which vehicles *may* be operated on said highways, which speed is herewith established as reasonable and safe pursuant to Section 349.11, Wisconsin Statutes, **shall** be as set forth herein subject to approval by the Wisconsin Department of Transportation, and upon the erection of standard signs giving notice thereof, all in Alpha County Wisconsin:

1. County Trunk Highway "A", Town of Soup, Alpha County.

   Forty-five miles per hour from its intersection with County Trunk Highway "B", northerly to its intersection with State Trunk Highway 201.

2. County Trunk Highway "B", Town of Blank, Alpha County.

   Thirty miles per hour from the intersection of Rabbit's Foot Ave, northerly to a point 0.35 miles north of said intersection.

Documentation

Typical documentation of an engineering and traffic investigation can include a cover letter, memo describing the background and roadway context, , map and/or photos of the area, safety information, speed performance metrics, findings, methodologies, and any other documentation to help support the recommendation. Contact the local WisDOT Regional office for an example of an engineering and traffic investigation or for any questions on the speed limit setting process. See WisDOT's Speed Limit webpage for contact information.

Speed Limits Within and Outside Incorporated Areas (Outlying District and Semiurban District)

Outlying District and Semiurban Districts are defined in ss. 346.57(1)(ar) and 346.57(1)(b) respectfully. These statutes are meant to establish speed limits based on access (building) density and *should not* be used as the sole criteria to establish a speed limit without consideration of other factors listed within TEOpS 13-5-7.2.

13-5-12 School Zones November 2024

Wisconsin State Statutes require that school advance warning signs be installed and maintained on every highway where a school ground is contiguous to the highway. There is no requirement that a school speed limit be posted except where it differs from the 15-mph provision in ss. 346.57 (4)(a) and (b). These two provisions place the requirement on the motorist to reduce speed to 15 mph when children are present, even in the absence of speed limit signs.

Sign Requirements

School speed limits require the use of a regulatory school speed zone sign. For more information on school signage, see TEOpS 2-3-54. If used, they *should* be posted at 10 mph less than the posted regulatory speed limit of the roadway.

The physical arrangements of schools along state trunk highways vary greatly. The following are examples to help illustrate guidelines within this policy. Other locations not fitting these will have to be reviewed to determine the appropriate use of school zone signs.

Urban Areas

- In a built-up section of a city or village, where the roadway speed limit is low (i.e., ≤30 mph) and sidewalks are present, many or most of the children walk to school. However, some children may be transported by vehicles which can lead to congestion.
- In developed areas, sudden stoppages and slowdowns are common. If the roadway is a higher speed facility (e.g., 35 mph or greater) it would be desirable to study the location to determine the appropriate school speed limit for the roadway.

Rural Areas

- In a rural area, the school may be the only development along the roadway. In these areas, speed limits often are higher and there are few to no children who bike or walk to school. It is WisDOT's policy to refrain from posting school speed limits under these conditions.
- Since children are unlikely to be present in vicinity of the roadway, school speed limit signs are ineffective at changing a motorist's behavior. If there are no children present, do not post a school speed limit sign. See TEOpS 2-3-54 for information on school signage.

Conflicts with signs

Where school speed limits are posted, it is considered good practice to omit the full-time regulatory speed limit signs in the school zone to prevent confusion or avoid giving motorists grounds for disobeying the school speed limit.

13-5-13 Dynamic Speed Display Signs — November 2024

See TEOpS 2-1-7 regarding policy for dynamic speed display signs.

13-5-14 Posted versus Design Speeds — November 2024

Design speed is used to establish design parameters for the various features of the roadway. The selected design speed *should not* be based on speed measurements but *should* be established based on factors such as the anticipated adjacent land use, topography, crash risks, and operating speed of the roadway. The posted speed **shall not** exceed the statutory speed limit and *should* be equal to or 5 mph lower than the selected design speed. When conditions prevent a roadway feature or element from meeting design speed requirements, the posted speed **shall not** be based on the individual design speed of the feature.

Local agencies *should* coordinate with the WisDOT regional offices if they have any questions with respect to design speeds and approval authorities outlined in Table 6.1.

Policy

For construction of new roadway facilities or reconstruction of existing facilities, the posted speed limit *should* be posted in accordance with the design speed. Below are considerations for establishing appropriate speed limits on new or reconstructed facilities:

- For WisDOT improvement projects, the project team **shall** coordinate with the regional traffic and planning sections to mutually agree upon an appropriate speed limit. The regional traffic unit **shall** document the speed zone with a speed zone declaration. See TEOpS 13-5-10.
- Posted speeds *should* generally be equal to or within 5 mph of the selected design speed.
    - There are cases, however, where the posted speeds *may* be higher or lower than the design speed for a section of highway.
    - For speed limits posted below the design speed, coordination with the Traffic Analysis and Safety Unit (TASU) in the Bureau of Traffic Operations (BTO) is required.
- Isolated intersections with reduced speed limits **shall** be investigated for design modifications rather than maintaining a posted reduced speed. See TEOpS 13-5-15.
- Conversion of a two-lane roadway to a four-lane roadway **shall not** automatically constitute changing the speed limit from 55 mph to 45 mph.
- Where local roads are converted to state highways or built on relocation, such as bypasses, the speed limit *should* be based on the new geometrics of the roadway and the function and purpose of the highway as either an expressway or conventional highway.
    - The function of the highway includes adjacent land use, spacing of access points and proximity to the roadway.
    - The speed limit that existed prior to the conversion to a state highway *may not* necessarily be retained.

Design parameter considerations

Design parameters and features of the roadway are initially based on a design speed but careful consideration *should* be used to design a roadway to achieve an appropriate operating speed. Design speeds are used to design a roadway to operate safely and efficiently to serve its intended purpose. In some situations, there may be features that are unable to meet these design thresholds and may require a motorist to travel at a reduced speed. See FDM 11-10-1.5 for more information and documentation requirements.

Individual design features such as isolated horizontal and vertical curves **shall not** dictate posted speed limits unless safety issues are identified post-construction. Other examples include:

- **Free-flow ramps at system and service interchanges** - Ramps are signed with advisory speeds mounted under a horizontal alignment sign and ramp speed warning sign.
- **Curves and/or turns with a speed rating less than design speed on a section of highway** – Curves and/or turns are signed with horizontal alignment signs and an advisory speed that provides a motorist with the recommended safe operating speed of the curve or turn.
    - Example: A 55 mph rural section of highway often has turns and curves that necessitate the driver to lower their speed in order to safely negotiate the curve or turn. The regulatory speed limit is not changed for each one of these turns or curves.
- **At transition sections from 4 to 2 lanes** - The transition area where a divided highway becomes an undivided highway *should* use engineering judgement to determine the proper location of where these speed limit transitions occur.
- **Other design features** - such as the presence and offset of curb, curb type (e.g., vertical face, sloped face), wider or narrower shoulders, or other design features **shall not** be a determining factor in establishing an appropriate speed limit in isolation.

13-5-15 Speed Limits on Approach to Controlled Intersections — November 2024

Sections of the state highway system in the immediate vicinity of a controlled intersection *should not* be considered for a speed zone reduction due strictly to the presence (or planned presence) of an intersection control condition. Intersection control conditions include stop conditions (one-way, two-way or all-way), traffic signals, roundabouts, or access restrictions (controlled either by regulatory signs or channelizing islands).

If requests for a modified speed limit in advance of a controlled intersection stem from safety concerns, roadway improvements *should* be considered that pertain to the specific site (e.g., channelized or extended turn lanes, modification to signal phasing or timing, rumble strips, advance warning signs, warning beacons, signing/marking enhancements, etc.). Speed limit reductions in advance of the intersection will likely not influence safety and may even promote poor engineering decisions in the future (e.g., signal equipment placement, signal timing or sign placement).

Existing locations that do not comply **shall** be allowed to remain until such time as the intersection is resurfaced or reconstructed.

Rather than establishing a lower speed limit in advance of a controlled intersection, consider design features such as:

- Stop Conditions – Proper placement of advance warning signs (per WMUTCD).
- Traffic Signals – Intersection lighting (per TEOpS 11-4-2) and Dilemma zone detection on high-speed approaches (per Traffic Signal Design Manual (TSDM) 8-1-6).
- Roundabouts – Proper geometric design of splitter islands, roadway curvature (per FDM 11-26) and lighting (per TEOpS 11-4-3).
- Corridor Access Management – Proper geometric design principles (per FDM 7-35).

13-5-16 Temporary Traffic Control Zones (Construction Work Zone Speed Limits) — November 2024

Refer to Section 6B.01, Temporary Traffic Control Plans, of the WMUTCD for more information on reducing the speed in temporary traffic control zones (i.e., construction work zones). Reductions in speed limits for temporary traffic control zones *should* be evaluated according to the criteria in this policy. Table 16.1 provides an illustration of different temporary traffic control zone scenarios.

There is often less need for reduced speed limits in temporary traffic control zones on rural conventional highways. On rural conventional highways, drivers do not have the same expectation for free-flowing traffic as they do on rural freeways. With driveway access and crossing movements on conventional highways, drivers tend to be alert to such movements and other similar conflicts even without reduced speed limits.

Temporary traffic control zones which require lower operating speeds due to changes in alignment (e.g., crossovers and transitions) or other work activities that occupy a short work area, *should* use warning signs with advisory speed plaques in lieu of regulatory speed limit signs.

Authority

The WisDOT work zone operations engineer within BTO has approval authority for temporary traffic control zone speed limits on all interstates and facilities with a posted speed of 65 mph or greater. The WisDOT regional work zone engineer has the authority to approve and establish temporary traffic control zone speed limits on all other roadways.

Policy

Engineering judgment **shall** be used when determining appropriate speed zones. This policy is intended to assist with the development of an appropriate work zone speed limit. Contact the regional work zone engineer or BTO for assistance with applying this policy.

Speed zones provide drivers an indication of what is considered a reasonable speed for that section of roadway. Proximity to construction activities, drop offs, lane closures, narrow lanes/shoulders and pavement condition all influence the driver's determination of a reasonable speed. The type of construction work, project length, area type (i.e., urban vs. rural), facility type, occurrence of night work and traffic mix (e.g., commuter, recreational, truck percentages) all impact driver expectations and the determination of what is a reasonable speed. The policy criteria described below *should* only be used for facilities during intermediate-term and long-term work activities as defined in Part 6 of the WMUTCD.

Speed reductions in segments without active work can lead to disregard of the posted speed. Work with your project manager to incorporate standard special provisions for removing temporary speed zones when active work is not taking place.

Policy criteria 1 through 6 *should* be evaluated, along with engineering judgment, to develop an appropriate work zone speed limit. The most restrictive work zone impact *should* be used as the determining condition.

All reduced work zone speed limits **shall** be approved prior to approval of the 90% Transportation Management Plan (TMP).

Temporary Traffic Control Zone Policy Criteria

1. Interstates and Expressways with 70 or 65 mph speed limit:
    - If bi-directional traffic separated by concrete barrier temporary precast, then speed limit *may* be lowered to 60 mph if warranted.
    - If bi-directional traffic separated by tubular markers, then reduce to 55 mph.
    - If workers are present within 12 feet of live traffic without positive protection* for any length or work area, then reduce to 55 mph.
    - If work area is less than or equal to 0.5 miles in length with lane shifts or narrowed travel lanes and has positive protection*, then post warning signs with an advisory speed plaque.
    - If work area is less than or equal to 0.5 miles in length with no lane shifts or narrowed travel lanes and has positive protection*, then do not lower the speed limit.
    - If work is taking place outside the clear zone, then do not lower the speed limit.
    - During periods of no work activity, restore speed limit to posted speed. Such speed limit reduction **shall** be subject to documented approval by the BTO work zone operations engineer. When a reduced work zone speed limit is recommended in the TMP, a temporary speed zone declaration **shall** be completed and sent to BTO for approval.
2. Expressways and other multi-lane highways with 55 or 50 mph speed limit:
    - Reduce to 45 mph only in situations that have a combination of extreme lane shifts, narrowed lanes, bi-directional traffic, or milled surfaces.

- Restore speed limit to normal posted speed when reduction criteria are not present.

3. Multi-lane highways with 45 mph speed limit:
   - Reduce speed limit to 35 mph only in situations that have a combination of extreme lane shifts, narrowed lanes, bi-directional traffic, or milled surfaces.
4. Two-lane rural highways with 55 mph speed limit:
   - Reduce to 45 mph only in situations that have a combination of extreme lane shifts, narrowed lanes or milled surfaces.
   - A flagging operation in and of itself would typically not warrant a reduced speed limit since motorists are controlled by the flagging devices.
5. Two-lane rural roadways with speed limit of 45 mph or less:
   - Typically, no reduction in speed limit.
   - *May* consider a speed reduction up to 10 mph in increments of 5 mph in situations that have a combination of extreme lane shifts, narrowed lanes or milled/gravel surfaces.
6. Two-lane urban roadways with speed limit of 40 mph or less
   - No change in speed limit except reduction to 35 mph *may* be considered in situations that have a combination of extreme lane shifts, narrowed lanes or milled/gravel surface.

*Positive protection is defined by FHWA as a temporary precast concrete barrier that contains or redirects vehicles and separates workers from the active travel lanes.

Table 16.1 Example Temporary Traffic Control Zone Scenarios

	Bi-directional traffic separated by flexible tubular markers
	Active work areas within 12-ft. of live traffic without positive protection
	Lane shift to shoulder or temporary pavement
	Lane closure without positive protection

Work Zone Temporary Speed Zone Declarations

Reduced speed limits in temporary traffic control zones are subject to approval by the BTO work zone operations engineer. A Temporary Speed Zone Declaration (TSZD) **shall** be submitted through the Department's online Wisconsin Transportation Management Plan (WisTMP) system.

- Complete the Temporary Speed Zone Declaration Form and attach it to Section 4 of the TMP.
- The TSZD will be approved by BTO and/or the regional work zone engineer by signing the 90% TMP.

13-5-17 Maintenance Work Zones November 2024

Wisconsin ss. 349.11(10) provides that a county *may* establish a speed limit through a maintenance work zone on a state trunk highway less than the authorized speed limit. This includes all freeways and interstate highways. The State Patrol will enforce the speed limit but need to be informed of its inauguration and the ordinance, resolution, or action enacting it.

Follow TEOpS 13-5-16, policy criteria 1-6 when establishing a temporary speed zone reduction for maintenance activities.

Document the reduced regulatory speed in the Wisconsin Lane Closure system (WisLCS).

13-5-18 References November 2024

[1] **Federal Highway Administration**. *Manual on Uniform Traffic Control Devices for Streets and Highways, 11th Edition*, FHWA, December 2023.

[2] **National Cooperative Highway Research Program.** *Human Factors Guidelines for Road Systems*, Washington D.C., NCHRP, 2012.

[3] **Federal Highway Administration**. *Safe System Approach for Speed Management*, FHWA, May 2023.

[4] **American Association of State Highway and Transportation Officials**. *A Policy on Geometric Design of Highways and Streets, 7th Edition*, AASHTO, 2018.

[5] **Florida Department of Transportation**. *FDOT Context Classification Guide*, FDOT, July 2020.

[6] **Federal Highay Administration**. *Methods and Practices for Setting Speed Limits*, FHWA, 2012.