AGENDA
BLOOMINGTON TRANSPORTATION COMMISSION
REGULAR MEETING
TUESDAY, AUGUST 21, 2018 4:00 P.M.
COUNCIL CHAMBERS, CITY HALL
109 EAST OLIVE STREET
BLOOMINGTON, ILLINOIS

1. CALL TO ORDER

2. ROLL CALL

3. PUBLIC COMMENT

4. MINUTES: Review and approve the minutes of the June 19, 2018 regular meeting of the Bloomington Transportation Commission.

5. REGULAR AGENDA

A. **TC-2018-02:** Funding Mechanisms for Transportation Projects - Update
B. **TC-2018-04:** Discussion of City Speed Limits and Residential Neighborhoods
C. **Information:** June/July Citizen Comments/Complaints Summary

6. OLD BUSINESS

A. Any old items brought back by the Commission

7. NEW BUSINESS

A. Any new items brought up by the Commission

8. COMMISSIONER COMMENTS

9. ADJOURNMENT

For further information contact:
Philip Allyn, City Traffic Engineer
Department of Public Works
Government Center
115 E. Washington Street, Bloomington, IL 61701
Phone: (309) 434-2225 ; Fax: (309) 434-2201; E-mail: traffic@cityblm.org

MINUTES
BLOOMINGTON TRANSPORTATION COMMISSION
REGULAR MEETING
TUESDAY, JUNE 19, 2018 4:00 P.M.
COUNCIL CHAMBERS, CITY HALL
109 EAST OLIVE STREET
BLOOMINGTON, ILLINOIS

MEMBERS PRESENT: Ms. Angela Ballantini, Ms. Jill Blair, Ms. Maureen (Reenie) Bradley, Ms. Katherine Browne, Mr. Michael Gorman, Ms. Elizabeth Kooba

MEMBERS ABSENT: Ms. Kelly Rumley

OTHERS PRESENT: Mr. George Boyle, City Attorney; Mr. Jim Karch, Director of Public Works; Mr. Kevin Kothe, City Engineer; Mr. Philip Allyn, City Traffic Engineer; and several members of the public.

1. CALL TO ORDER: Mr. Gorman called the meeting to order at 4:01 pm.

2. ROLL CALL: Mr. Allyn called the roll. With six members in attendance, a quorum was established.

3. PUBLIC COMMENT:
No Public Comments were heard.

4. MINUTES: Reviewed and approved the minutes of the May 15, 2018 regular meeting of the Bloomington Transportation Commission. Ms. Blair motioned to approve the minutes. Ms. Kooba seconded the motion. The motion was approved by the Transportation Commission unanimously via voice vote.

5. REGULAR AGENDA:

A. Information: Proposed Improvements: Front Street between East and Madison

Mr. Allyn mentioned that there was an Open House for the proposed Front Street improvements and asked for any comments or questions. Mr. Gorman inquired about general feedback received at the Open House. Mr. Allyn stated that comments received verbally were positive and the project was well received. There was support for the removal of the signals and the concepts that were presented.

Ms. Blair noted from the packet that of the comments received were around 70% supportive. Were there any specific concerns from those opposed of which we should be aware? Mr. Allyn indicated that the most common concern was related to the ability of people to cross Front Street without a button to push to stop cars. This has been mitigated with the various features that are being incorporated. The all-way stop at Center Street will allow crossings at that intersection. The raised center medians and the curb bump-outs at each intersection will mean that pedestrians will only need to cross about 14 feet of pavement with traffic from one direction at a time. In addition, at Main Street, we are looking at installing pedestrian crossing signs with a Rectangular Rapid Flashing Beacons (RRFB) controlled by a product called Blinker Beam. This provides a pushbutton that will activate the RRFB flashing LED's which will give an active warning to drivers that there are pedestrians crossing. One thing that we noticed during the test last week was that most people were stopping when pedestrians were in the crosswalk, which is the law in Illinois. In extreme cases, there will also still be signalized crossings one block in either direction at East and at Madison.

Ms. Blair asked if there was outreach done specifically to disability advocate organizations in addition to the general public. Mr. Allyn indicated that we are still in the process of this. Several comments have

been heard about whether the busses parking with their engines running will keep the visually impaired from hearing when and where traffic is moving that we'll be looking into.

Mr. Allyn indicated that this whole project has been moving quickly and we are still working out design details. For example, the red area in the northwest corner at Center still is an unknown. It may be just pavement markings or stamped colored concrete, or something in between. The key will be having something that contrasts with the black asphalt to visually provide the narrowing effect of the bump outs to calm traffic, while remaining flush to allow southbound right buses to make the turn without hopping up on the curb. Similarly, the wider crosswalks may be a typical high-visibility marking in thermoplastic or a more expensive decorative crosswalk with an artistic pattern. As the costs are determined, these details will be worked out to keep the project within budget.

Mr. Gorman asked about the costs of the RRFB's. Mr. Allyn indicated that he had not yet received back the quote for these signs. He has used them before on two previous projects and they are more expensive than a basic sign due to the Blinker Beam and push buttons; however, they are not crazy expensive and should be significantly less than $20,000. The crosswalk signs will be installed regardless, but if costs are excessively high, the buttons and RRFB's may be dropped or downgraded to a simpler LED outlined sign. Mr. Gorman mentioned that the only other place he has seen them in town is on College Avenue in Uptown at maybe Broadway, and the buttons are rarely if ever used. That is a different setup though with higher traffic speeds and no center median. His main concerns are spending money on something that won't be used and whether it will have an impact on cars. Mr. Allyn indicated that a number of comments that we received during the initial feedback period were from people who either thought that the current buttons weren't working or that they took too long when they did work. That was due to the inherent delay of 8-12 seconds from when the button is pushed to getting a walk signal to allow the opposing walk signal to change to a flashing don't walk, then to cycle through a yellow light for the cars, and then finally a walk signal to cross Front Street. This delay often discouraged the use of the signals by pedestrians. With the RRFB, they will activate instantly upon the button being pushed, which should increase their usefulness. In addition, even if they are not used as much, they will still be an option for those who need them, such as slower walkers.

Mr. Gorman asked if the RRFB's will communicate with each other. Mr. Allyn indicated that was the primary advantage of the Blinker Beam system. The Blinker Beam product will allow the RRFB's on each side of the street to talk with each other so that when the button on one side of the street is pushed, the RRFB's for both directions will flash. At Main Street, there will be two signs facing each direction, with one on each side of the street (four total) and they will all flash simultaneously once a button is pushed.

Ms. Bradley asked how far the crossing distance was from the curb to the center islands. Mr. Allyn indicated that it would be about 14 feet, which is only about 6-7 steps. The center island is about 12 feet wide, so once a pedestrian crosses one lane, they have a safe area where they can shift their attention to traffic coming from the opposite direction before making a second short 14-foot crossing. Ms. Bradley stated that these center islands were the key feature of the improvements that changes the street for the positive, especially for slow walkers. Do the signs have an audio component? Mr. Allyn indicated that he wasn't sure if they had a similar beeping sound with activated like are at some traffic signs but could find out.

Mr. Allyn mentioned that since the center islands provide an easier crossing, the legs with the islands will have the major, wider crosswalks were most pedestrians are encouraged to cross. At Main Street, this east side of the intersection crosswalk aligns with pedestrians exiting the Lincoln Parking Deck and walking north to downtown locations as well as workers traveling between the Government Center and the Law and Justice Building. Regular crosswalks will also be provided on the opposite legs of each intersection (west leg at Main, east leg at Center) for those pedestrians who are comfortable crossing Front Street without the enhanced accommodations. In addition, one thing that has been noticed is that there is very

little crosswalk and pushbutton usage currently; indicating people are generally comfortable crossing the street already with the relatively lower traffic volumes and speeds. However, with the planter box locations, we are attempting to focus them to a more defined point of crossing which helps drivers know where to expect pedestrians to be. It's everyone's responsibility to pay attention when there are two conflicting modes, whether it's cars, bikes or pedestrians, but the more expectations are standardized the easier it is for all.

Mr. Allyn indicated that a vote is not anticipated with this item; the intent is to provide an opportunity for the Commission to provide feedback on the project. In addition, there is a fair amount of information provided in the packets on features such as curb bump outs that, while applicable to this particular project, also pertains to a lot of the sidewalk work that we are continuing to do in the downtown area. Assuming that there are no red flags with this project and its features, Staff will continue to move in this direction as a general practice.

Ms. Blair asked if there was a schedule for this work. Mr. Allyn indicated that the anticipated start date was not known since a number of design details still needed to be worked out and our contractors were currently working in other locations around the City. This work is going to be completed under the annual sidewalk program and the resurfacing program. These projects are set up with general locations of work, but they are bid using pay items. For example, the contractor provides a price for a square foot of sidewalk and a foot of curb that we can then apply where needed. The next step in our process if to determine how to fit want we want to construct into those various pay items and the existing budgets so that we don't need to pull money away from other projects that are just as needed. There was extensive sidewalk work already planned for these three blocks, so this new work is just and extension of that work. For example, with the resurfacing, we will need to upgrade the sidewalk ramps to meet current ADA requirements, so this proposed work just changes how those ramps are re-done. We anticipate this work starting in the late summer or early fall.

B. Information: May Citizen Comments/Complaints Summary

Mr. Gorman requested and comments. Ms. Blair mentioned that several items state that signs are schedule to be installed on or after a particular date an asked if that has been completed. Mr. Allyn indicated that the typical process for sign work is that the Engineering Department marks the location in the field and completes a work order for the sign crews. The same is true for specific pavement marking work (cross walks, etc.). Once the crews receive the work order, they fit it in among their other work as quickly as they can. If there is something that needs to be completed on a specific day such as traffic signal ahead warning signs being install on the day that the signals are activated, then it is mentioned in the work order and scheduled appropriately. The signs on Dunraven have been installed. Mr. Allyn did not believe that the signs on Westport have been installed.

Ms. Bradley asked about the method of submission for most of the comments/complaints/requests. Mr. Allyn indicated that most within the last month (maybe 60%?) have come from the online system via the app or City website. Another maybe 25-30% have come via the Non-Emergency Request Form submitted by email or direct email comments to traffic@cityblm.org. A handful came via mail or drop-off of the Non-Emergency Request Form completed by hand. Maybe one or two came via phone call.

C. Information: Misc. Updates and Information: I-AA Drive Resurfacing, City Transportation Project Funding Overview Discussion

Mr. Allyn indicated that the City would be milling and overlaying I-AA Drive this summer starting approximately at Bandanas and extending up past Country Companies to Vernon Avenue. The most of the current street is 30 feet wide from face of curb to face of curb and marked with two 15-foot wide lanes. There are a number of driveways along this section. We intend to remark it after the overlay with three lanes at 10-foot wide each with a center turn lane. The City standard is 11-foot lanes, so these will be a bit narrower. We are gathering existing speed information with the 15-foot lanes and following construction, we'll get updated data with the 10-foot lanes. We'll measure speeds again after a year or

two. This will allow us to have real world local data on how lane width affects travel speeds both in the near-term right after implementation and long-term after drivers have become accustomed to the change. We anticipate speeds dropping initially. We are interested to see if that decrease occurs and whether it holds or creeps back up.

Mr. Gorman asked how the speed data would be gathered. Mr. Allyn indicated that we have on-pavement devices called Bluestars that measure changes in inductance as large metal objects (cars) pass over them that are able to provide both count and speed data. They are not quite as exact as radar, but are reliable. They are commonly used to determine the average daily traffic counts statewide. They look like a small black piece of rubber flat on the road and are not noticeable to most drivers. We are not using the large radar "your speed is…" boards that would impact how fast drivers are traveling. The Bluestars are anonymous and do not have any way to connect a measured speed to a specific vehicle.

Mr. Allyn provided a status update on the funding discussion. As Staff started evaluating how to compile and present the data to determine needed funding levels for various levels of service, we thought it best to update a number of the tracking and analysis tools to include pricing from the past several years as well as the effects of the rejuvenator that we have begun to use more extensively. By having this data updated with current costs, we can have a more fruitful discussion based on good information which we feel is worth the additional time. This has been moving forward, but not as quickly as we would like given that it is construction season which brings competing priorities. Mr. Allyn hoped to be ready for the next part of the discussion in the next 2-3 weeks, but mentioned that it will still be construction season. Mr. Gorman confirmed the delay was worthwhile to have good information with the scope and importance of the discussion to be had.

6. OLD BUSINESS: None

7. NEW BUSINESS: None

8. COMMISSIONER COMMENTS: None

9. ADJOURNMENT: The meeting adjourned at 4:26 pm unanimously by voice vote; motioned by Ms. Blair and seconded by Ms. Browne.

Respectfully,

Philip Allyn
City Traffic Engineer

CITY OF BLOOMINGTON
REPORT FOR THE TRANSPORTATION COMMISSION
August 21, 2018

CASE NUMBER:	SUBJECT:	ORIGINATING FROM:
TC-2018-02	Funding Mechanisms for Transportation Projects	City Council
REQUEST:	Approval of a four cent per gallon increase in Local Motor Fuel Tax to a total tax of eight cents per gallon.	

STAFF RECOMMENDATION: Approval

Staff recommends the Transportation Commission pass the following motion recommending that:

A. City Council approve the proposed Ordinance amending Bloomington City Code Chapter 39 to increase the Local Motor Fuel Tax by four (4) cents per gallon to a total of eight (8) cents per gallon.

1. ATTACHMENTS:

a. Proposed Ordinance
b. Transportation Commission Meeting Minutes from March 20, 2018

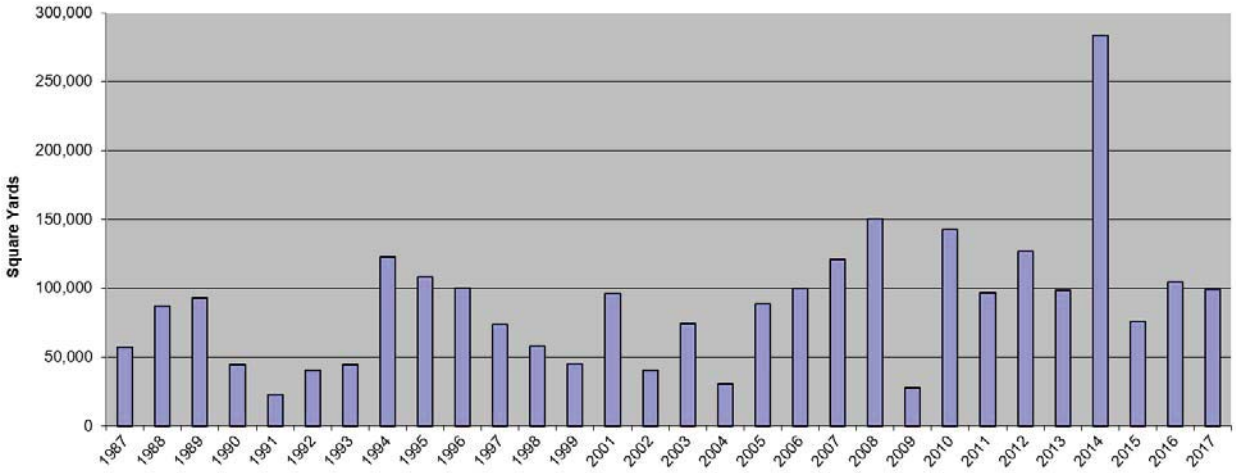
2. BACKGROUND AND SUPPLEMENTAL INFORMATION:

Commissioners are encouraged to review the information provided on this topic from the March, 2018 meeting.

Since discussing this item with the Commission in March, 2018, City Staff has been compiling updated data on the maintenance work completed over the last several years. This will help to establish a baseline of where we are currently operating to help guide the discussion moving forward.

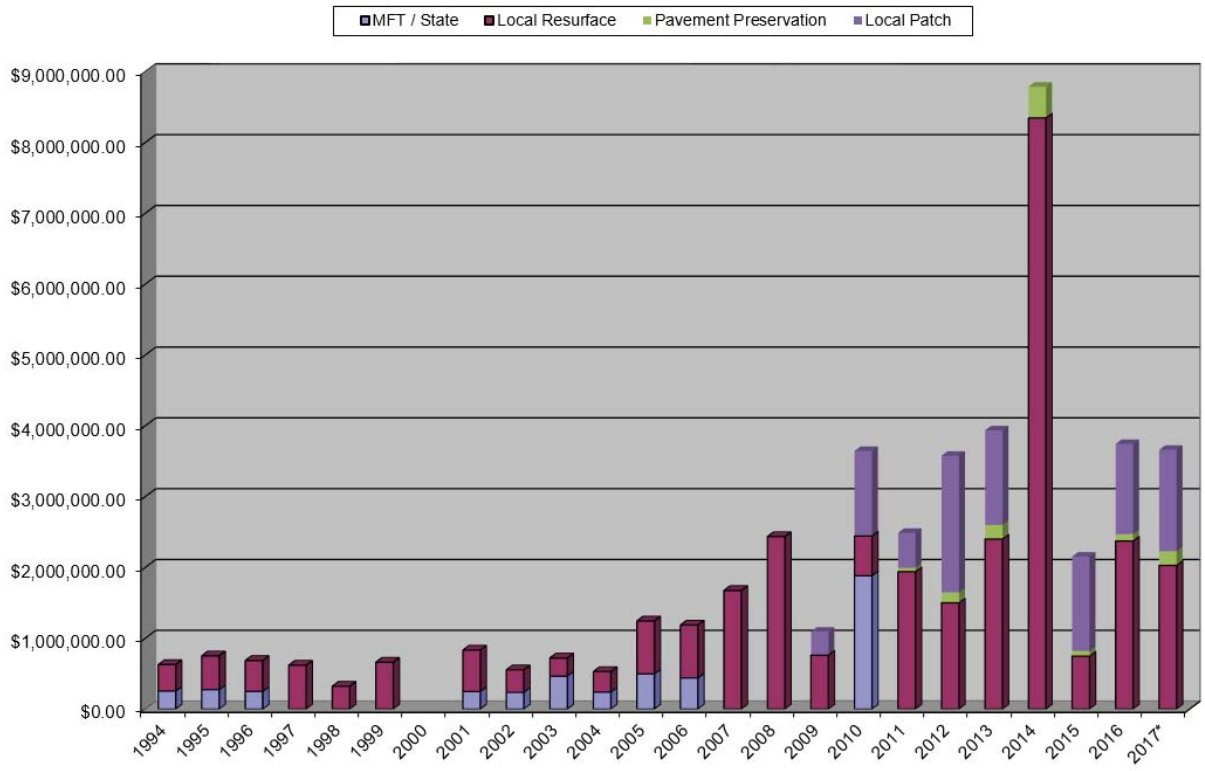
Figures 1 and 2 below show the amount of street resurfacing the City has been completing during the past 20-30 years. The years shown reflect the construction season year rather than the fiscal year (e.g., 2015 corresponds to work completed during the summer of 2015 even though it was part of the FY2016 City Budget). The noticeable spike in 2014 is due to a special one-year increased funded by the issuing of bonds specifically for street and sidewalk work. These bonds are being repaid over a ten year period. Also of note is the increased use of patching and pavement preservation during the last 8-10 years. While final numbers are not yet available, this trend of increased spending on pavement preservation work continues for the 2018 construction season.

Figure 1: Amount Resurfaced per Year



Since 2010, expenditures have averaged approximately $4.1 million for street resurfacing, patching and pavement preservation. This follows a 5-year period from 2005 to 2009 that averaged $1.5 million and a 7-year period from 1998-2004 when funding averaged approximately $500,000.

Figure 2: Resurfacing Dollars Spent per Year



Funding for street work historically has been determined annually during the normal budget process. Since the level of funding was typically not finalized until the spring of each year, there has been a level of difficulty in planning future maintenance work. However, when the City

implemented the original $0.04 per gallon Local-MFT in August 2014 (required to be used on transportation infrastructure projects), and dedicated 0.25 percent of a one percent sales tax increase in January 2016 for street resurfacing, sidewalks, and infrastructure, a dedicated, annual funding source was created that provides a relatively consistent and predictable level of funding into the foreseeable future.

As discussed previously, the use of State MFT funds has not been a part of the annual street resurfacing program since 2010. The City's allotted State MFT funds have been utilized for both construction and engineering on more complex projects such as the recently completed Towanda and Vernon intersection improvements with traffic signals project, the Linden Street Bridge Reconstruction, and the upcoming GE Road and Keaton Ave. intersection improvements with traffic signals project. State MFT funds are also being "banked" to be able to be used for the 20% Local match for the Federally Funded Hamilton Road from Bunn to Commerce and the Fox Creek Road Bridge projects. The City currently also uses State MFT funds through a Maintenance Program to pay for a portion of the electricity for our street lights and traffic signals since very little documentation or inspection is required due to the nature of this item.

Figure 3 and Table 1 below show the changes in the pavement ratings for the street system between 2014 and 2017.

Figure 3: Pavement Surface Condition Changes

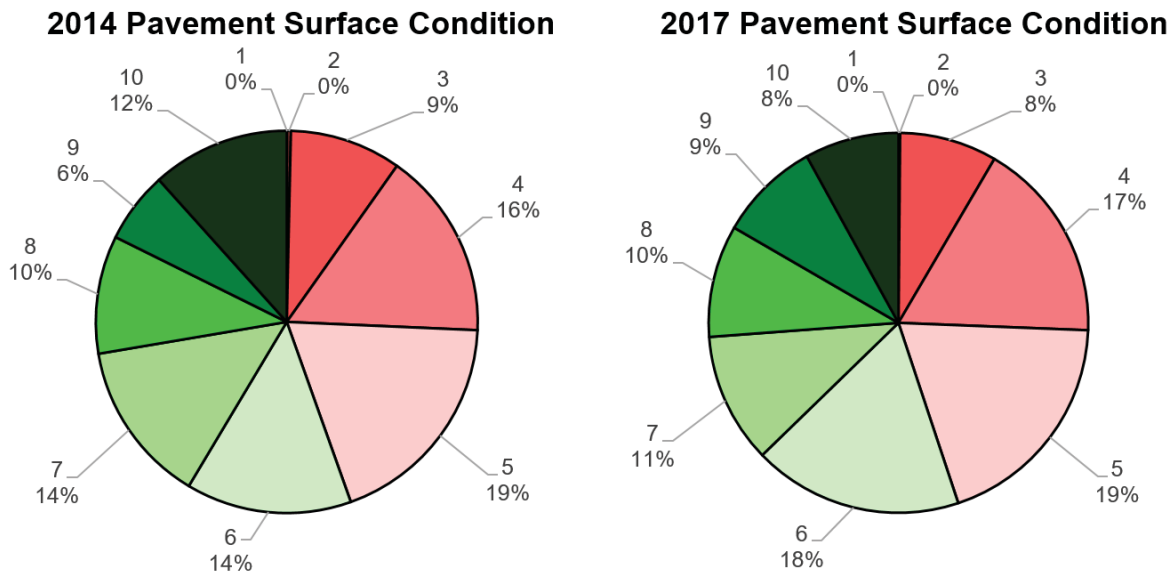


Table 1: Pavement Surface Rating Changes

Surface Condition Rating	Description	2014 Percent of Total	2017 Percent of Total	Change
0				
1	Failed	0%	0%	0%
2	Very Poor	0%	0%	0%
3	Poor	9%	8%	-1%
4	Fair -	16%	17%	1%
5	Fair +	19%	19%	0%
6	Good -	14%	18%	4%
7	Good +	14%	11%	-3%
8	Very Good	10%	10%	0%
9	Excellent	6%	9%	3%
10	New	12%	8%	-4%
Average System-wide Rating:		**6.2**	**6.1**	

City Staff is ultimately seeking a recommendation to Council regarding a potential Local Motor Fuel Tax increase from the current $0.04 per gallon to $0.08 per gallon, which could result in an additional $2.3 million annually for street resurfacing. At this time, this data is presented as an illustration of the current status of the street maintenance funding. The next steps for Staff will be to begin calculating scenarios showing potential costs to maintain certain ratings for the streets, identifying ways to provide lower levels of service with current funding, and determine potential sources of additional funding.

3. STAFF RECOMMENDATION:

Staff recommends the Transportation Commission pass the following motion recommending:
That City Council approve the proposed Ordinance amending Bloomington City Code Chapter 39 to increase the Local Motor Fuel Tax by four cents per gallon to a total of eight (8) center per gallon.

Respectfully submitted,

Philip Allyn, PE, PTOE
City Traffic Engineer

ORDINANCE NO. 2018-

AN ORDINANCE AMENDING BLOOMINGTON CITY CODE CHAPTER 39 TO INCREASE THE LOCAL MOTER FUEL TAX BY FOUR CENTS PER GALLON

BE IT ORDAINED by the Mayor and City Council of the City of Bloomington, Illinois:

SECTION 1. Bloomington City Code Chapter 39, Section 371 (a) shall be amended as follows (additions are indicated by underlining; deletions are indicated by strikeouts):

CHAPTER 39: TAXATION

ARTICLE XVIII: LOCAL MOTOR FUEL TAX

Section 371 Imposition of Tax

(a) There is levied and imposed upon the purchase of each gallon of motor fuel, or fraction thereof, sold at retail within the corporate limits of the City, irrespective of the unit of measure in which it is actually sold, a tax at the rate of ~~four cents ($0.04)~~ eight cents ($0.08) per gallon from and after August 1, ~~2014~~ 2018.

SECTION 2. Except as provided herein, the Bloomington City Code, 1960, as amended shall remain in full force and effect.

SECTION 3. In the event that any section, clause, provision, or part of this Ordinance shall be found and determined to be invalid by a court of competent jurisdiction, all valid parts that are severable from the invalid parts shall remain in full force and effect.

SECTION 4. The City Clerk is hereby authorized to publish this ordinance in pamphlet form as provided by law.

SECTION 5. This ordinance shall be effective immediately after the date of its publication as required by law.

SECTION 6. This ordinance is passed and approved pursuant to the home rule authority granted Article VII, Section 6 of the 1970 Illinois Constitution.

PASSED this ___ day of _____, 2018.

APPROVED this ____ day of _____, 2018.

APPROVED:

_____
Tari Renner
Mayor

ATTEST:

_____
Cherry Lawson
City Clerk

MINUTES
BLOOMINGTON TRANSPORTATION COMMISSION
REGULAR MEETING
TUESDAY, MARCH 20, 2018 4:00 P.M.
COUNCIL CHAMBERS, CITY HALL
109 EAST OLIVE STREET
BLOOMINGTON, ILLINOIS

MEMBERS PRESENT: Ms. Angela Ballantini, Ms. Maureen (Reenie) Bradley, Ms. Katherine Browne, Mr. Michael Gorman, Ms. Kelly Rumley

MEMBERS ABSENT: Ms. Jill Blair, Ms. Elizabeth Kooba

OTHERS PRESENT: Mr. George Boyle, City Attorney; Mr. Jim Karch, Director of Public Works; Mr. Kevin Kothe, City Engineer; Mr. Philip Allyn, City Traffic Engineer; and several members of the public.

1. CALL TO ORDER: Mr. Gorman called the meeting to order at 4:00 pm.

2. ROLL CALL: Mr. Allyn called the roll. With five members in attendance, a quorum was established.

3. PUBLIC COMMENT:
Mr. Justin Boyd mentioned that he mailed a Transportation and Streets form on January 11th with a concern on his street. Mr. Boyd submitted an additional form on February 20th after not receiving a response. Two weeks later, he received a call from someone after speaking with the Commission Chair Mr. Gorman and a Councilman but was not sure if that had any influence on the call or not. The person indicated the request was unlikely, but that it would be reviewed at an internal commission. Mr. Boyd thought that was this Commission and was looking forward to presenting his case here in public but did not get that opportunity. Mr. Boyd indicated it has been an additional two weeks and he has still not received resolution on his request. He had the understanding that all requests would be brought to this Commission to be openly debated and discussed and was disappointed that was not the case. He expressed concern that other people's requests may not be getting addressed.

Mr. Greg Koos indicated that he had reviewed the 5 year budgeting and the current City budget. He noticed considerable dollars shown to be allocated to projects that do not seem to fit the direction of re-investing in the central part of the City but were instead legacy projects of earlier phases of planning intended to meet growth that likely will not occur due to the massive loss of jobs experienced over the recent years including Mitsubishi, State Farm and others. Specifically of concern are the Hamilton Road project and the Fox Creek bridge project. These projects may be funded with special funds; he was reading up on the use of MFT funds and understood the difficulty in determining the best way to use available funds. He would like to see the limited funds available for transportation related funds used for transportation projects that are more in line with the current direction and see more creative uses of available MFT funds such as potentially cut deals with IDOT to fix their roads.

4. MINUTES: Reviewed and approved the minutes of the January 16, 2018 regular meeting of the Bloomington Transportation Commission. Ms. Browne motioned to approve the minutes. Ms. Ballantini seconded the motion. The motion was approved by the Transportation Commission unanimously via voice vote.

5. REGULAR AGENDA

A. TC-2018-02 – City Transportation Project Funding Overview Discussion and Consideration of a Recommendation to City Council regarding a Proposed Local Motor Fuel Tax Increase.

Mr. Allyn summarized information from the agenda packet relating to each current funding source available to the City to transportation project funding: Federal Funds, State Motor Fuel Tax (MFT), Local MFT, a portion of the Local Sales Tax, Tax Increment Financing (TIF) (occasionally available with location restrictions), and several other more rare types and miscellaneous grants that all have different requirements.

Mr. Kothe, City Engineer, indicated when Federal Funds are used, the project cost is typically about 30% higher than a locally funded project due to additional engineering, more stringent construction requirements, and detailed environmental reviews. For State MFT, requirements are still very stringent but not quite to the level of Federal funding. Significant time is spent getting a project approved by the State as well as additional time spent after construction is finished completing State paperwork to close out the project. As an example of the additional effort required, Mr. Kothe indicated that a recent federally funded project resulted in 13 banker's boxes full of paperwork at closeout. Upon completion, the State sends out 2-3 auditors who spend a week verifying everything is correct. With the 2008-2009 Staff reductions due to eight early retirements and two layoffs, we have been unable to finish the closeout of several State MFT projects resulting in the hiring of an outside consultant at a cost of about $90,000. This amount would have paved three streets, including curb and gutter repairs, in our local resurfacing program. This illustrates the significant additional cost that comes with these funding types. Mr. Kothe indicated we try to use the Federal and State MFT fund on projects that require this extra effort due to the complexity of the project and not on smaller projects. In the past, we have used State MFT funds for the resurfacing work, but with the increased lead-time due to IDOT reviews and approvals, we would not be able to bid projects until August, which doesn't leave enough time to complete the work before winter. With this work locally funded, we are able to bid in April with work starting in May and completed in the fall. In addition, we are able to select asphalt mixes that work better in our climate and traffic rather than using the Statewide approved mixes giving us a longer lasting product. For example, the State mix is designed to prevent rutting which is a concern on state highways with heavier truck volumes. However, it is also more brittle and cracks quicker leading to earlier failure. On our local streets, we do not need to extra hardness since we do not have the truck traffic and can instead focus on reduced cracking.

We have utilized special Federal funding on larger arterial projects such as Hamilton from Bunn to Commerce and have then used State MFT funds for the match since we had to meet the higher Federal requirements any way. We also used State MFT funds recently on the Benjamin School Trail, which allowed it to be funded, but delayed the completion by about a year. We try to be selective with which projects are funded with Federal or State MFT to be efficient and not create additional work when it is not needed.

Mr. Allyn discussed a project case study of Fairway Drive and Empire Street. After giving a short description of the project in which Fairway Drive is being resurfaced and bike lanes are being added, he indicated that the project is being locally funded as part of the local MFT resurfacing work. However, because this particular intersection is with a State road, we are still required to go through some of their processes and requirements. We submitted a traffic study showing our work would not impact their highway; they approved it, and indicated we just needed to obtain a work permit. When we applied for the permit, we suddenly were told we also needed to complete a full Intersection Design Study (IDS) requiring a higher level of design. We fortunately were able to complete this work in-house. This additional effort has already set the project back in schedule at least 2 months. Had we needed to hire a consultant to complete the IDS, the project delay would have been at least 4 months. Mr. Allyn discussed the increased design effort required due to these IDOT requirements. The entire project, which runs from Robinhood Drive to south of Washington Street is budgeted for $1.4 million. If State MFT funds had been used instead, IDS's would have been required at four of the intersections along this stretch. This would have required hiring a consultant at a cost of $80,000 to$100,000 just for the IDS work. Full construction drawings would have been required as well as one or two full time staff members being

required to be on-site during construction. Construction costs would likely increase to $1.6 million due to using State-specified materials that would likely have a shorter life. The project would have been delayed until the summer of 2019 or 2020. Mr. Allyn presented the three sheets of plans required for the locally funded Washington Street resurfacing compared to the 65 sheets of plans required for the smaller, but MFT funded Towanda Barnes & Ireland Grove project.

Ms. Ballantini indicated that she previously wrote grants and believed that the additional costs for Engineering could be included in the grant amount. Is that the case for these projects? Mr. Allyn indicated that generally, that was the case, but by doing so, you are still increasing the overall cost of the project. There is a limited amount of money available, so it makes more sense to put the extra effort into projects that require the extra effort. With the case study example, the project would have increased from $1.4 million to probably $1.8 million just with the inclusion of State MFT. Ms. Ballantini stated though that the funds are being provided by the State and Federal government from taxes that have already been received. Citizens have already paid that money in and we are just getting it back. Even though the cost is higher, and the process is longer, there is no additional increased cost to residents since there is no new tax. It's hard to accept a new tax. Mr. Karch indicated that the difference between State MFT funds and grants, which are applied for and may or may not be received, is that the State MFT funds are constantly allocated to the City in a set amount regardless. We have a set amount of funding and the goal is to allocate the types of funds in a way that gets the most work completed. The more that you have to spend on administrative costs, the less work that you are able to complete. There are not additional MFT funds that we can request to cover the additional costs. Ms. Ballantini stated she understood the level of frustration and effort that comes with grant funded work. What is the actual money we currently receive? Mr. Allyn and Mr. Karch indicated that we get in local funds 0.25% in local sales tax and $0.04/gallon in local MFT. This amounts to approximately $4.6 million a year that is dedicated to streets and sidewalks. Prior to the sales tax increase and the local MFT, street and sidewalk work funding came out of the general fund. The Council would reapportion differing amounts of general funds to various other priorities each year and there was no dedicated, consistent source of street and sidewalk funding. In order to maintain the streets, we need to be able to plan 5 years out to be able to be proactive with regard to properly planning work and knowing what money is available is important. Ms. Ballantini agreed there needed to be a dedicated source of funding. However, citizens get tired of being taxed over and over again and not seeing any results. The information provided indicated State MFT could go to resurfacing work. We need to think outside the box rather than just taxing people. Mr. Karch confirmed that resurfacing is one thing on which MFT funds can be used. Council has been trying to do more dedicating specific funds to streets. Elected officials have been hearing a lot about the condition of our streets and we are trying to offer a solution that helps. The other option is cuts. Programs could be cut, but that has been a challenge. When Staff reviewed the impact of the implementation of the local MFT, gas prices fluctuated so much due to other factors that there was no noticeable difference. Another benefit is that a Motor Fuel Tax is that it is user based. Vehicles cause the damage to the streets, so by taxing the use of the vehicles, you are putting the cost of the street on the user of the street.

Mr. Gorman mentioned that he knew other local communities take advantage of various grants to help fund projects in addition to local and state MFT. For example, Champaign and Urbana have a very strong Safe Routes to School program. We recently did the Benjamin Trail project using a Safe Routes to School grant. How can we look at other grants more effectively? Mr. Allyn indicated that we try to apply for these when we can, such as the Benjamin Trail project. One that we are currently applying for is related to the Hamilton Road from Bunn to Commerce project. Part of the drive for that project is due to the number of State Farm drivers that are traveling across on Hamilton Road and then taking Rhodes Lanes to Morrissey. The intersection of Rhodes and Morrissey has been a high crash location. There is also a very poor railroad crossing on Morrissey just north of Rhodes. In the latest IDOT crash statistics, this location was named as a 5% accident location. This makes is eligible to apply for Federal Safety funds. The project is already planned to use part of our annual allotment of Federal Surface Transportation Funds

(STU), so we are not adding any additional effort. If we are selected for the Safety funds grant, then we will be able to apply our regularly allotted STU funds elsewhere and we have essentially increased the amount of our total funds available.

Ms. Ballantini acknowledged the additional effort associated with utilizing Federal funds, but didn't want anyone to think that should be a reason not to use them. She reiterated that she thinks there is a big enough hit already on people and that raising the Local MFT isn't the answer. There needs to be another source of money.

Mr. Gorman mentioned that there are projects being funding in Champaign using Safe Routes to School money where the primary goal isn't just focused on the schools. A large majority of our City is within distance of a school. Why aren't we using Safe Routes grants for projects that are by schools even if the primary function isn't school related? Mr. Allyn reiterated that the Safe Routes program is a grant that needs to be applied for; they aren't guaranteed funds. It's important to have a good grant application that meets the goals of the grant program in order to secure the funds as we are competing against other communities. Mr. Kothe mentioned there are a number of federal grant programs such as the Safe Routes, TARP (Truck Access Route Program), Safety funds, etc. We look at the community to see which programs are applicable and apply for those when the opportunity is available. The Benjamin School Trail Safe Routes and the Hamilton Road/Rhodes Lane Safety Fund are examples of that. We haven't done a lot of them in the past, but we are watching for opportunities. When the high-speed rail work was being done in town, we lobbied IDOT and obtained funds to upgrade the pedestrian crossing on the north side of Washington Street. Unfortunately, we were only able to get the crossing at the high-speed rail line and not the other two tracks, which are sidings. We are still working on those with the railroad to get the remaining pedestrian crossings done, but it's taking a lot of time.

Mr. Karch mentioned that we haven't yet brought up a lot of the issues with the street resurfacing. There are grants available to do new things or special projects. There aren't many grants available for maintenance work. With the funding levels that we are currently at, it will take 66 years to resurface everything. We have done a lot of work rating streets to be able to provide a professional recommendation on priorities, but we are not at a good funding level to maintain our infrastructure. We are underpaying for what we have. That means that we need to find ways to start catching back up. If we can't, the quality of the roads will continue to get worse. We are not tied to a particular funding mechanism; we just need more money for the maintenance of our existing pavements. The Local MFT is one mechanism, but there are other ways too. We just need a consistent, sustainable funding source for the community so that there is not the perception that our community is falling apart. People care about curb appeal and having quality infrastructure. There is flexibility on how that happens. We aren't just locked in to one method.

Mr. Gorman mentioned that in the packet it says that the Local MFT increase will take the resurfacing interval from 66 years down to 44 years. He's not interested in half measures and is looking for long-term sustainability. If a pavement only lasts 25-30 years, improving it to 44 years isn't a solution. What we need to do is look at ways to reduce costs in addition to increased funding. For example, over the past couple months as the potholes have been developing, three separate residents asked him if we could switch to gravel roads because they would be safer than pothole-ridden pavement. He doesn't know that gravel roads are the answer, but what can be done to reduce the cost? Do we need curb and gutter on every street? What do we really want out of our streets?

Mr. Karch indicated that thought is not far off. Other communities such as Peoria have gone to tar and chip roads in order to try to keep up. As a country, we have generally overbuilt roads and it's hard to maintain them. Gravel roads probably are not the answer, but tar and chip is not that far from gravel. They are common on County and Township roads. We see a lot of value in that, but most residents do not. There is an expectation of what citizens what for the tax dollars that they pay. For example, we tried CRF

several years ago. It went a long way to keeping a pavement in better condition for a longer period. The problem was citizens hated it. We received more calls and complaints because it was dusty and oily. They all wanted regular asphalt. It's not wrong that we may need to reduce expectations, but it has been difficult in the past. Mr. Gorman stated it's the Commission's goal to help Staff set priorities for the community. It would be difficult to recommend a tax increase without a corresponding cut in service. He's not interested in voting on the tax increase today, but wants to put together a total package of cuts and increased funding that results in a sustainable model that can be recommended to Council. If pavement lasts 25-30 years, then we need to be looking for a 25-30 year schedule. Mr. Karch agreed that we all want a sustainable model where we aren't always fighting an uphill battle. Staff cares about the community, takes pride in the City, and wants things to go well.

Ms. Bradley appreciates the need for consistent dedicated funding. She also sees and hears the community with another tax right on the heels of the solid waste changes. There will be a lot of pushback. She understands it's a complicated issue and it's easier to use local funds, and we understand and appreciate that but the public isn't going to dig that deep. She agrees that we need to look outside what we are doing to try something else. We don't need to go all the way back to dirt or gravel roads, but we need to look at more affordable options that can be done with new construction. We also need to maintain what is already built and maintain the standard of what is already here. That is the puzzling thing. We need to try something else. Raising the tax will not work because the public does not understand the funding sources. They also do not realize that our worst roads are the State highways. Mr. Karch mentioned that the City recently met with State legislators and showed them video of the bad State roads. They understand that there needs to be a Capital Bill and that there are problems. Ms. Bradley asked if they could help with the red tape at IDOT. Mr. Karch indicated that they did offer to meet with Secretary Blankenhorn (head of IDOT statewide) about the relocation of the State Route off of Lee Street specifically. Ms. Bradley asked if they have any power to help with the funding in general. Mr. Karch did not think so, but did not want to speak for them. He reiterated that he understood that no one wants new taxes, but that we have to find some way to get to a sustainable point. Tar and chip is maybe part of that answer. We are also trying to expand pavement preservation to help stretch the life of a road. There are multiple parts of the answer, but we cannot get there without expanding funding.

Ms. Browne asked about the revenue charts shown in the packet on page A-5. The decrease shown from 2016 to 2017 is explained due to increased fuel efficiency, etc. Is the projected decrease from 2017 to 2018 due to the same reason? Mr. Karch indicated that we are anticipating the funding level to remain the same, but it certainly could go down again. Ms. Browne also mentioned that the chart below showing Local MFT rates for other Illinois communities indicates that with the proposed increase, Bloomington with have one of the highest rates, almost double most of the other communities. Normal specifically would be half of the Bloomington rate. Is there any concern that drivers would avoiding Bloomington and buying gas in Normal? Mr. Karch indicated that when Bloomington instituted the initial 4 cents per gallon tax, Normal did not have any Local MFT. We tried to evaluate what the impacts of the new 4-cent change and there wasn't a noticeable change. There is also a study done by IDOT in the packet that is a bit older, but it seems to show that there likely would not be much impact. The 4-cent per gallon change is small compared to the regular fluctuation in price due to other factors that drivers should not see a difference.

Mr. Gorman proposed tabling this discussion to allow Staff to come back with a range of options from giant service reductions to higher taxes to fund higher-level roads. Ms. Browne appreciated Staff's expertise and ability to provide information and professional recommendations, but a lot of this is going to hinge on public perception. If we are going to get a sustainable plan, can we get feedback from the public on what is acceptable and then have Staff evaluate options so that we can present to Council a recommendation from a list of ideas? If we are basing a decision on public opinion, we need to know what public opinion actually is. Mr. Allyn suggested having a series of Open Houses would be an option.

Mr. Gorman indicated that the Commission members also provide public perspective and can talk with people we know through the community. He's not sure we would get much good feedback at an open house.

Mr. Karch brought up that the way the special waste decision was approached was to determine three options: high fee and no service level change, medium fee and medium service level change, and low fee and high service level change. 8-cent MFT increase and we have all paved roads, or 4-cent increase and incorporate some tar and ship, or keep the same fees and we keep doing what we are currently doing. Our end goal is sustainable infrastructure, but we need to work out at what level it should be sustained. This higher-level analysis could be done with a smaller amount of data rather than taking lots of time to gather and analyze lots of data all the while our roads are getting worse and worse.

Ms. Bradley thought it would be good to hear from the public to keep them part of the process and have some type of PR campaign. There may be some good ideas out there that no one has thought of so far. This would also keep citizens informed of what is going on so that if a MFT increase is needed, it's not a surprise and there is a greater level of understanding. This is a big deal needs to be talked about. Mr. Gorman agreed that a big delay isn't good, but in the context of a 30-year fix, a couple month delay is worthwhile to get to the right answer. Ms. Bradly mentioned it would be good to get feedback on topics such as types of streets or if a different type of tax would be more palatable and help people see that there isn't enough income. Mr. Allyn mentioned that one other possibly that was mentioned in the packet is the current Use Tax. The City collects a tax on every new vehicle purchased by a City resident. Raising this tax might be a better option. We have been focusing on the Local MFT, but there are other options out there. The point of this was not to key in on just the Local MFT rate, but to have a larger discussion about overall funding.

Ms. Rumley asked about the Next Door ap potentially being a way to share information with people and get feedback. Mr. Allyn thought it could be useful as the process moves along.

Mr. Karch reminded that a large public outreach does take time. In this case, the streets are a big enough issue that it is worth it, but keep in mind that it is a lot of effort. Streets matter. Mr. Gorman agreed that this discussion relates to a potential major change to how we are doing things and that it warrants the Staff time. Ms. Browne asked for clarification on what the Commissions responsibilities are to connect to the community. Should we be communicating within our neighborhoods soliciting feedback? Mr. Gorman thought as long as we are not engaging with other commissioners, gathering ideas from people is OK. Mr. Boyle confirmed gathering ideas on concepts or proposals are fine. You need to be more careful with doing specific fact-finding or quasi-judicial evidence gathering and making decisions based solely on information obtained "on the record". In this case, soliciting general ideas on the tax proposal and what is the best way to fund the streets, etc. is fine and part of a commissioner's function.

Mr. Gorman summarized that Staff should come back in a month or two with some conceptual plans for what a sustainable model for our streets looks like. The Commission will review and then begin a period of public interaction followed by voting on a recommendation at the following meeting.

Ms. Rumley motioned to table this discussion for approximately two months for Staff to develop additional information. The motion was seconded by Ms. Browne. The motion was approved by the Transportation Commission unanimously via voice vote.

6. OLD BUSINESS: None

7. NEW BUSINESS:
Ms. Rumley requested that an item for Commissioner Comment be added to the Agenda in the future to allow responses or requests to comments received during public comment.

Ms. Rumley also asked for a monthly report on resident requests that have been received by Staff that lays out the request and by whom, the neighborhood or street, the Staff decision and what follow-up has been provided to the resident. If the request was denied, what their appeal was and were they given an appeal process. Is there an appeal form that can mailed or emailed if the request is denied? If the Commission disagrees with a decision on a request, they can review it and bump it up to the Council if needed.

Mr. Allyn reminded everyone of the document in the binders indicating the duties of the Commission and Staff as outlined in the Ordinance establishing the Commission. The Commission generally deals with policy level decisions. For example, if a request comes in for a marked crosswalk as a specific intersection, that is a staff level decision. One of the Commissions duties though is to hear appeals of Staff decisions that the petitioner does not agree with. In notifying a petitioner of a decision, we do let them know of the Commission and that they can appeal if they desire. Ms. Rumley asked that if people are not getting responses in a timely manner, or being told their request is being denied but not why, is there an official process. She wants to see what all is being done each month in which neighborhoods. She wants it to be as clear as possible to the public that the Commission is doing what it was put here to do. When they meet with the Mayor, they were told that the Commission would be hearing all of the requests by citizens and not just appeals and they are being let down because they are not being responded to in an open and timely manner. If it is covered in a monthly report, it will be more clear.

Mr. Allyn responded that this was the first he had heard of a meeting with the Mayor and since he wasn't at it to be able to address specifically was the Commissioners were told regarding the duties of the Commission, all we can go off of is the ordinance that was passed by the Council to establish the Commission. In that ordinance, it clearly states multiple times that the Commission has oversite on Policy-level decisions, not detailed, specific matters. We have been discussing bringing a sort of summary of items with a general overview of the types of requests we get to the Commission as an FYI so that the Commissioners can gain an understanding of what Staff does and the various typical processes. We had been discussing doing this potentially quarterly rather than monthly. Unfortunately, a one-month turnaround on a lot of the requests is not realistic. Data usually needs to be collected, whether it's site gathered like traffic volumes or travel speeds, or researching past requests and current City Code or checking the programming at a traffic signal. Often coordination is required with outside agencies such as IDOT, Connect Transit, McLean County, Ameren/Cornbelt, etc. We typically don't have the ability to respond the day a complaint comes in due to either staffing or outside factors like weather preventing us obtaining traffic counts. Once the data is gathered and analyzed, and code and policies are applied, it usually has been at least 3-4 weeks. It is our practice that once we receive a complaint/request, we will call or email the person depending on what contact information they provided so that we can have a dialogue about what the issue actually is. We try to do this within a week. For example, with the gentleman who spoke during public comment, when the form submitted in February came across my desk, I had our part time technician call him the following week when he was back in the office. He obviously cannot follow-up when he is not working. We have since instituted a new tracking system to help monitor turnaround times and to make sure that requests come to both him and myself rather than just being placed on his desk when he will be off for a week.

Ms. Rumley asked how many requests we get in a month. Mr. Allyn indicated it varies quite a bit, but typically is probably 5-10 a month on average. Ms. Bradley asked if they are typically pothole type complaints or matters that are more involved. Mr. Allyn indicated the potholes go through Public Services. Engineering gets complaints such as sight distance reviews at intersections where we need to visit the site, determine if there are bushes that need trimmed or removed and if so work with Parks to get them taken care of. We get requests for handicap spots to be painted in front of people homes where we will go meet with them, verify they have a valid tag, layout the paint lines and sign location, and coordinate with the sign and paint crews. We get traffic calming requests that require traffic counts and a

speed study. We contact the Police to see if they are aware of speeding problems. We review accident data to the level of detail of the individual policy reports to verify that crashes can be reduced. For example, when reviewing crashes, if two were drunk drivers and one was in an icy condition, they are removed from the evaluation. If certain traffic volume and speeding thresholds specified in the traffic calming policy are met, we poll the neighborhood. This all takes time and unfortunately, we don't have a full time staff person dedicated just to this type of work. Ms. Rumley asked if requests could be forwarded to the Commission when they are received. Mr. Boyle expressed some concerns with forwarding a straight complaint form with personal information in a public body format and suggested that Staff take some time to work out the details on how the requested information can best be presented to the Commission.

Ms. Rumley stated she didn't want people to feel like they had fallen into a black hole. Mr. Allyn reiterated that it is our policy to reach out to people certainly within a week to verify we understand their request and at least let them know that we are looking in to it. On requests that take longer to process, we periodically reach back out to them to let them know that we are still working on their request.

Ms. Ballantini inquired about having a work session, as she is unsure of what the Commission's role is. She was under the impression the Commission was to be a go between with the public. It would be good to have a working relationship where the Commissioners are able to request things. Mr. Allyn indicated that he is more than willing to meet to discuss any items or questions Commissioners have. Doing so with the entire group would get more difficult with the Open Meetings Act. Mr. Gorman mentioned that he emails or talks to Mr. Allyn, Mr. Karch and Mr. Kothe regularly. Commissioners should feel free to reach out to Staff directly to ask questions. Ms. Ballantini had a good experience with previous Board work using work sessions to bounce ideas off each other and brainstorm and could get a lot accomplished. Mr. Karch mentioned that as a Public Commission, we do need to keep minutes and stick to agendas. It would be good for everyone to review the information from the binder on responsibilities and we can discuss further at the next meeting. It can be a bit simplistic to say policy-level and operating-level, but that's really what it is. Staff provides professional recommendations to Council, but Council can still say "no, let's go in a difference direction" and set policy. As a group, for example with speed humps, we can discuss if we want to be more stringent or more relaxed with the policy and Staff will implement it that way. Planning Commission is the same way. They hear larger issues, but Staff doesn't bring every single detail to them such as whether a site needs 20 parking spots or 21. Mr. Gorman reminded that we are still a new Commission and are still working out the details on our role and how we function. Planning Commission has been around a long time and has most of these things worked out.

Ms. Bradley gave the example of the Towanda Barnes project going to Council in a different version than was heard and recommended by the Transportation Commission. There was no commentary back to the Commission or an opportunity to re-vote on the change of direction. Mr. Karch indicated that was a fair criticism and we will strive to do better.

8. ADJOURNMENT: The meeting adjourned at 5:29 pm unanimously by voice vote; motioned by Ms. Rumley and seconded by Ms. Bradley.

Respectfully,

Philip Allyn
City Traffic Engineer

CITY OF BLOOMINGTON
REPORT FOR THE TRANSPORTATION COMMISSION
August 21, 2018

CASE NUMBER:	SUBJECT:	ORIGINATING FROM:
TC-2018-04	Discussion of City Speed Limits and Residential Neighborhoods	Council Member Request for Consideration (Schmidt)
REQUEST:	Item submitted for discussion by the Transportation Commission. Any feedback or comments will be used to develop an updated policy, proposed ordinance or other definitive statement of action or inaction (if required) to be brought back at a later meeting for final discussion and approval.	

STAFF RECOMMENDATION: None at this time
Following initial discussion on this topic at the August 2018 Commission Meeting, Staff will prepare a recommendation concerning proposed changes (or lack thereof), including updated policies, proposed ordinance(s), or other such documents to be voted on by the Commission at a subsequent meeting.

1. ATTACHMENTS:

- **a. Council Member Request for Consideration Form**
- **b. City Code Chapter 29, Article V: Speed Regulations**
- **c. State of Illinois Vehicle Code 625 ILCS 5/11-601 relating to Speed Limits**
- **d. Pages from the MUTCD regarding Speed Regulations**
- **e. World Health Organization (WHO): Facts, Road Safety and Speed**
- **f. FHWA: Effects of Raising and Lowering Speed Limits (abstract and finding)**
- **g. IDOT: Policy on Establishing and Posting Speed Limits on the State Highway System**
- **h. FHWA: Methods and Practices for Setting Speed Limits: An Informational Report (abbreviated)**

2. BACKGROUND AND SUPPLEMENTAL INFORMATION:

To facilitate a general discussion regarding speed limits and provide a framework of rules and regulations currently in place, Staff provides the following and attached information.

The *Manual on Uniform Traffic Control Devices* (MUTCD) contains the following definitions:

a. **Speed Limit** – the maximum (or minimum) speed applicable to a section of highway as established by law or regulation
b. **Statutory Speed Limit** – a speed limit established by legislative action that typically is applicable for a particular class of highways with specified design,

functional, jurisdictional and/or location characteristics and that is not necessarily displayed on Speed Limit signs.

c. **Altered Speed Limit** – a speed limit, other than a statutory speed limit, that is based upon an Engineering Study.
d. **Posted Speed Limit** – a speed limit determined by law or regulation and displayed on Speed Limit Signs.
e. **Speed Zone** – a section of highway with a speed limit that is established by law or regulation, but which might be different from a legislatively specified statutory speed limit.

Attached is the page from the City of Bloomington Municipal Code relating to the Local Statutory Speed Limits and determining Altered Speed Limits. For comparison purposes, the statutory speed limits on urban streets in other Illinois communities similar to the City of Bloomington are provided below. Most communities reviewed had slower statutory speed limits for alleys, generally 15 mph.

Bloomington	**30 mph**
Carbondale	30 mph
Champaign	30 mph
Effingham	A speed that is "reasonable and proper" with rates of speed above the following being considered as prima facie evidence that the travel speed is not "reasonable and proper" - Business District – 20 mph, Residence District – 25 mph, Suburban District – 35 mph
Normal	30 mph
Peoria	As set by State Traffic Laws (currently 30 mph)
Rockford	30 mph
Springfield	30 mph
Urbana	As set by State Traffic Laws (currently 30 mph)

Attached are pages from the State of Illinois Vehicle Code relating to Statutory Speed Limits and determining Altered Speed Limits and Special Speed Zones (e.g. work zones, school zones).

Attached are pages from the MUTCD relating to setting and posting speed limits. The following sections are highlighted as especially pertinent to the discussion:

Section 2B.13 Speed Limit Sign (R2-1)

Standard:

01 **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 include an analysis of the current speed distribution of free-flowing vehicles.**

05 **Speed Limit signs indicating the statutory speed limits shall be installed at entrances to the State and, where appropriate, at jurisdictional boundaries in urban areas.**

Support:

06 In general, the maximum speed limits applicable to rural and urban roads are established:

A. Statutorily – a maximum speed limit applicable to a particular class of road, such as freeways or city streets, that is established by State law; or
B. As altered speed zones – based on engineering studies.

07 State statutory limits might restrict the maximum speed limit that can be established on a particular road, notwithstanding what an engineering study might indicate.

Option:

08 If a jurisdiction has a policy of installing Speed Limit signs in accordance with statutory requirements only on the streets that enter a city, neighborhood, or residential area to indicate the speed limit that is applicable to the entire city, neighborhood, or residential area unless otherwise posted, a CITYWIDE (R2-5aP), NEIGHBORHOOD (R2-5bP), or RESIDENTIAL (R2-5cP) plaque may be mounted above the Speed Limit sign and an UNLESS OTHERWISE POSTED (R2-5P) plaque may be mounted below the Speed Limit sign (see Figure 2B-3).

10 *States and local agencies should conduct engineering studies to reevaluate non-statutory speed limits on segments of their roadways that have undergone significant changes since the last review, such as the addition or elimination of parking or driveways, changes in the number of travel lanes, changes in the configuration of bicycle lanes, changes in traffic control signal coordination, or significant changes in traffic volumes.*

11 *No more than three speed limits should be displayed on any one Speed Limit sign or assembly.*

12 *When a speed limit within a speed zone is posted, it should be within 5 mph of the 85th-percentile speed of free-flowing traffic.*

13 *Speed studies for signalized intersection approaches should be taken outside the influence area of the traffic control signal, which is generally considered to be approximately 1/2 mile, to avoid obtaining skewed results for the 85th-percentile speed.*

Option:

16 Other factors that may be considered when establishing or reevaluating speed limits are the following:

A. Road characteristics, shoulder condition, grade, alignment, and sight distance;
B. The pace;
C. Roadside development and environment;
D. Parking practices and pedestrian activity; and
E. Reported crash experience for at least a 12-month period.

Vehicle Speed has been identified as a key risk factor in road traffic injuries, influencing both the risk of a road crash as well as the severity of the injuries that result from crashes. The relationship between speed and injury severity is particularly critical for vulnerable road users such as pedestrians and cyclists. For example pedestrians have been shown to have a 90% chance of survival when struck by a car traveling at 30 km/h (approximately 18 mph) or below, but less than 50% chance of surviving an impact at 45 km/h approximately 28 mph). See attached World Health Organization (WHO) document entitled *Facts, Road Safety and Speed* for additional information.

It's important to note that there is a distinct difference between vehicle speeds and posted speed limits. Decreasing vehicle travel speeds should result in safer roadways; however, simply lowering a posted speed limit should not be expected to result in these same safety benefits if there isn't a corresponding decrease in vehicle travel speed. The FHWA completed the attached study *Effects of Raising and Lowering Speed Limits.* The study focused on streets and highways posted between 20 and 55 mph rather than the much more heavily studied 55 and 65/70 mph posted limited access facilities (interstates). It looked at 100 locations spread over 22 states and

generally found that lowering posted speed limits by as much as 20 mph or raising them by as much as 15 mph had little effect on motorist's speeds. The majority of motorists did not drive 5 mph above the posted speed limits when they were raised 5 mph, nor did they reduce their speed by 5 or 10 mph when the posted speeds were lowered. Data collected at the study sites indicated that the majority of speed limits are already posted below the average speed of traffic. Lowering speed limits further simply increases the violation rate. This illustrates the importance of a multi-part solution to speeding that includes adequate enforcement and well as engineering controls such as traffic calming.

Historically, it is the City's practice to establish altered speed limits based on a speed study's 85th percentile, or the speed that 85% of vehicles do not exceed. This 85th percentile speed is then adjusted to account for factors such as driveways, pedestrian activity, parking adjacent to the travel lanes and other such criteria to determine the altered speed limit. The use of the 85th percentile to establish speed limits is a well-known, often recommended, method employed by agencies such as the Illinois Department of Transportation (IDOT), the Federal Highway Administration (FHWA) and other municipalities nationwide. However, the 85th percentile method is a recommendation, not a mandate, and other factors can impact speed limits. Additionally, State law actually sets "general" speed restrictions that control in the absence of "altered" speed limits enacted at the local level.

The current version of *Policy on Establishing and Posting Speed Limits on the State Highway System* by the Illinois Department of Transportation (IDOT) is attached for reference. This document provides procedures for conducting an Engineering Study based on the 85th percentile method. This document is generally used to set Altered Speed Limits in the City.

Finally, an abbreviated version of the Federal Highway Administration (FHWA) Safety Program report *Methods and Practices for Setting Speed Limits: An Informational Report* is attached. This report discusses several methods for determining altered speed limits, one of which is the 85th percentile method used in Illinois. The full version can be found on the FHWA website. Please contact the City Traffic Engineer for assistance if needed.

3. STAFF RECOMMENDATION:

Following initial discussion on this topic at the August 2018 Commission Meeting, Staff will prepare a recommendation concerning proposed changes (or lack thereof), including updated policies, proposed ordinance(s), or other such documents to be voted on by the Commission at a subsequent meeting.

Respectfully submitted,

Philip Allyn, PE, PTOE
City Traffic Engineer

City of Bloomington Illinois

CITY OF BLOOMINGTON
COUNCIL MEMBER REQUEST FOR CONSIDERATION

I. TO BE COMPLETED BY ALDERMAN

1. Name of alderman making the proposal: Karen Schmidt

2. Topic summary (attach additional information and documentation to this form:

City speed limits and residential neighborhoods

3. Alderman's priority level: ☐ LOW ☑ MEDIUM ☐ HIGH

II. TO BE COMPLETED BY STAFF

1. Aldermen supporting consideration of this topic (3 additional minimum):

Mwilambwe Buragas Painter Black
Sage Hauman Mathy

2. City Manager review (staff & financial resources required to implement; impact on City priorities, etc.):

3. Recommendation for further action on _____ at the following meeting type:

- ☐ **Committee of the Whole**
- ☐ **Council Consent Agenda**
- ☐ **Council Regular Agenda**
- ☐ **Work Session**
- ☒ **City Board or Commission** Transportation Commission
- ☐ **City Staff Review & Comment**

Proposed agenda items shall be submitted to the City Manager's Office using the Agenda Item Request Form at least 15 days in advance of the next regularly scheduled Council session if quick action is desired. Due to the substantial number of requested items and City projects, it may not be possible for requested items to appear on the next agenda.

Article V : Speed Regulations

Section 32 : Speed Regulations.

(a) It shall be illegal for any person to drive a motor vehicle at a speed greater than 30 m.p.h. on any public street within the City of Bloomington, except as a greater or lesser speed limit may be posted as established by law or ordinance. (Ordinance No. 1983-85)

(b) It shall be illegal for any person to drive a motor vehicle at a speed greater than 15 m.p.h. in any alley within the City of Bloomington. (Ordinance No. 1990-97)

(c) On the basis of an engineering or traffic investigation conducted by the Department of Engineering of the City of Bloomington, it has been determined that on various portions of city streets the speed permitted by state law is greater or lesser than is reasonable or safe under the conditions found to exist on such streets. The maximum speed limit on such streets or parts of streets enumerated in Section 156.5 (Schedule XVII) of this Chapter shall be as therein stated, which speeds declared shall be effective when signs are erected giving notice thereof. It shall be illegal for any person to drive a motor vehicle in excess of the speed therein stated. (Ordinance No. 2004-39)

(d) Pursuant to Section 11-605 of the Illinois Vehicle Code, school speed zones within which the maximum speed is 20 m.p.h. are hereby established in Section 156.6 (Schedule XVIII) of this Chapter. It shall be illegal for any person to drive a motor vehicle therein at a speed in excess of 20 m.p.h. on school days when children are present when signs are erected giving notice of such speed zones. (Ordinance No. 1983-85)

employees of the Department or local authorities, police officers, contractors and their employees engaged in a highway construction contract or work on the highway approved by the Department or local authority, it is unlawful for any person to possess such sign, signal, or marker so identified.

P.A. 76–1586, § 11–313, added by P.A. 77–1230, § 1, eff. Aug. 24, 1971. Amended by P.A. 77–2830, Art. 73, § 1, eff. Jan. 1, 1973; P.A. 80–526, § 1, eff. Oct. 1, 1977; P.A. 80–911, § 1, eff. Oct. 1, 1977; P.A. 80–1364, § 36, eff. Aug. 13, 1978; P.A. 91–512, § 5, eff. Aug. 13, 1999.

Formerly Ill.Rev.Stat.1991, ch. 95 ½, ¶ 11–313.

ARTICLE VI. SPEED RESTRICTIONS

5/11–601. General speed restrictions

§ 11–601. General speed restrictions.

(a) No vehicle may be driven upon any highway of this State at a speed which is greater than is reasonable and proper with regard to traffic conditions and the use of the highway, or endangers the safety of any person or property. The fact that the speed of a vehicle does not exceed the applicable maximum speed limit does not relieve the driver from the duty to decrease speed when approaching and crossing an intersection, approaching and going around a curve, when approaching a hill crest, when traveling upon any narrow or winding roadway, or when special hazard exists with respect to pedestrians or other traffic or by reason of weather or highway conditions. Speed must be decreased as may be necessary to avoid colliding with any person or vehicle on or entering the highway in compliance with legal requirements and the duty of all persons to use due care.

(b) No person may drive a vehicle upon any highway of this State at a speed which is greater than the applicable statutory maximum speed limit established by paragraphs (c), (d), (e), (f) or (g) of this Section, by Section 11–605 or by a regulation or ordinance made under this Chapter.

(c) Unless some other speed restriction is established under this Chapter, the maximum speed limit in an urban district for all vehicles is:

1. 30 miles per hour; and
2. 15 miles per hour in an alley.

(d) Unless some other speed restriction is established under this Chapter, the maximum speed limit outside an urban district for any vehicle is (1) 65 miles per hour (i) for all highways under the jurisdiction of the Illinois State Toll Highway Authority, unless some other speed limit is designated, and (ii) for all or part of highways that are designated by the Department, have at least 4 lanes of traffic, and have a separation between the roadways moving in opposite directions and (2) 55 miles per hour for all other highways, roads, and streets.

(d–1) Unless some other speed restriction is established under this Chapter, the maximum speed limit outside an urban district for any vehicle is (1) 70 miles per hour on any interstate highway as defined by Section 1–133.1 of this Code; (2) 65 miles per hour for all or part of highways that are designated by the Department, have at least 4 lanes of traffic, and have a separation between the roadways moving in opposite directions; and (3) 55 miles per hour for all other highways, roads, and streets. The counties of Cook, DuPage, Kane, Lake, Madison, McHenry, St. Clair, and Will may adopt ordinances setting a maximum speed limit on highways, roads, and streets that is lower than the limits established by this Section.

(e) In the counties of Cook, DuPage, Kane, Lake, McHenry, and Will, unless some lesser speed restriction is established under this Chapter, the maximum speed limit outside an urban district for a second division vehicle designed or used for the carrying of a gross weight of 8,001 pounds or more (including the weight of the vehicle and maximum load) is 55 miles per hour.

(e–1) (Blank).

(f) Unless some other speed restriction is established under this Chapter, the maximum speed limit outside an urban district for a bus is:

1. 65 miles per hour upon any highway which has at least 4 lanes of traffic and of which the roadways for traffic moving in opposite directions are separated by a strip of ground which is not surfaced or suitable for vehicular traffic, except that the maximum speed limit for a bus on all highways, roads, or streets not under the jurisdiction of the Department or the Illinois State Toll Highway Authority is 55 miles per hour;

1.5. 70 miles per hour upon any interstate highway as defined by Section 1–133.1 of this Code outside the counties of Cook, DuPage, Kane, Lake, McHenry, and Will; and

2. 55 miles per hour on any other highway.

(g) (Blank).

P.A. 76–1586, § 11–601, eff. July 1, 1970. Amended by P.A. 77–66, § 1, eff. July 1, 1971; P.A. 78–954, § 1, eff. Feb. 25, 1974; P.A. 79–267, § 1, eff. July 14, 1975; P.A. 84–730, § 1, eff. July 1, 1986; P.A. 89–444, § 5, eff. Jan. 25, 1996; P.A. 89–551, § 5, eff. Jan. 1, 1997; P.A. 96–524, § 5, eff. Jan. 1, 2010; P.A. 97–202, § 5, eff. Jan. 1, 2012; P.A. 98–511, § 5, eff. Jan. 1, 2014.

Formerly Ill.Rev.Stat.1991, ch. 95 ½, ¶ 11–601.

5/11–601.5. Driving 26 miles per hour or more in excess of applicable limit

§ 11–601.5. Driving 26 miles per hour or more in excess of applicable limit.

(a) A person who drives a vehicle upon any highway of this State at a speed that is 26 miles per hour or more but less than 35 miles per hour in excess of the applicable maximum speed limit established under this Chapter or a local ordinance commits a Class B misdemeanor.

(b) A person who drives a vehicle upon any highway of this State at a speed that is 35 miles per hour or more in excess of the applicable maximum speed limit established under this Chapter or a local ordinance commits a Class A misdemeanor.

P.A. 76–1586, § 11–601.5, added by P.A. 91–469, § 5, eff. Jan. 1, 2000. Amended by P.A. 96–1002, § 5, eff. Jan. 1, 2011; P.A. 96–1507, § 5, eff. Jan. 27, 2011; P.A. 98–511, § 5, eff. Jan. 1, 2014.

5/11–602. Alteration of limits by Department

§ 11–602. Alteration of limits by Department. Whenever the Department determines, upon the basis of an engineering and traffic investigation concerning any highway for which the Department has maintenance responsibility, that a maximum speed limit prescribed in Section 11–601 of this Chapter is greater or less than is reasonable or safe with respect to the conditions found to exist at any intersection or other place on such highway or along any part or zone thereof, the Department shall determine and declare a reasonable and safe absolute maximum speed limit applicable to such intersection or place, or along such part or zone. However, such

limit shall conform with the maximum speed limit restrictions provided for in Section 11–601 of this Code. Where a highway under the Department's jurisdiction is contiguous to school property, the Department may, at the school district's request, set a reduced maximum speed limit for student safety purposes in the portion of the highway that faces the school property and in the portions of the highway that extend one-quarter mile in each direction from the opposite ends of the school property. A limit determined and declared as provided in this Section becomes effective, and suspends the applicability of the limit prescribed in Section 11–601 of this Chapter, when appropriate signs giving notice of the limit are erected at such intersection or other place, or along such part or zone of the highway. Electronic speed-detecting devices shall not be used within 500 feet beyond any such sign in the direction of travel; if so used in violation hereof, evidence obtained thereby shall be inadmissible in any prosecution for speeding. However, nothing in this Section prohibits the use of such electronic speed-detecting devices within 500 feet of a sign within a special school speed zone indicating such zone, conforming to the requirements of Section 11–605 of this Act, nor shall evidence obtained thereby be inadmissible in any prosecution for speeding provided the use of such device shall apply only to the enforcement of the speed limit in such special school speed zone.

P.A. 76–1586, § 11–602, eff. July 1, 1970. Amended by P.A. 77–101, § 1, eff. Jan. 1, 1972; P.A. 78–954, § 1, eff. Feb. 5, 1974; P.A. 79–267, § 1, eff. July 14, 1975; P.A. 89–444, § 5, eff. Jan. 25, 1996; P.A. 89–551, § 5, eff. Jan. 1, 1997; P.A. 93–624, § 5, eff. Dec. 19, 2003; P.A. 96–524, § 5, eff. Jan. 1, 2010; P.A. 98–511, § 5, eff. Jan. 1, 2014.

Formerly Ill.Rev.Stat.1991, ch. 95 ½, ¶ 11–602.

5/11–603. Alteration of limits by Toll Highway Authority

§ 11–603. Alteration of limits by Toll Highway Authority. Whenever the Illinois State Toll Highway Authority determines, upon the basis of an engineering and traffic investigation concerning a toll highway under its jurisdiction, that a maximum speed limit prescribed in Section 11–601 of this Chapter is greater or less than is reasonable or safe with respect to conditions found to exist at any place or along any part or zone of such highway, the Authority shall determine and declare by regulation a reasonable and safe absolute maximum speed limit at such place or along such part or zone, and the speed limit shall conform with the maximum speed limit restrictions provided for in Section 11–601 of this Code. A limit so determined and declared becomes effective, and suspends the application of the limit prescribed in Section 11–601 of this Chapter, when (a) the Department concurs in writing with the Authority's regulation, and (b) appropriate signs giving notice of the limit are erected at such place or along such part or zone of the highway. Electronic speed-detecting devices shall not be used within 500 feet beyond any such sign in the direction of travel; if so used in violation hereof, evidence obtained thereby shall be inadmissible in any prosecution for speeding.

P.A. 76–1586, § 11–603, eff. July 1, 1970. Amended by P.A. 77–643, § 1, eff. Aug. 4, 1971; P.A. 78–954, § 1, eff. Feb. 25, 1974; P.A. 79–267, § 1, eff. July 14, 1975; P.A. 89–444, § 5, eff. Jan. 25, 1996; P.A. 98–511, § 5, eff. Jan. 1, 2014.

Formerly Ill.Rev.Stat.1991, ch. 95 ½, ¶ 11–603.

5/11–604. Alteration of limits by local authorities

§ 11–604. Alteration of limits by local authorities.

(a) Subject to the limitations set forth in this Section, the county board of a county may establish absolute maximum speed limits on all county highways, township roads and district roads as defined in the Illinois Highway Code, except those under the jurisdiction of the Department or of the Illinois State Toll Highway Authority, as described in Sections 11–602 and 11–603 of this Chapter; and any park district, city, village, or incorporated town may establish absolute maximum speed limits on all streets which are within its corporate limits and which are not under the jurisdiction of the Department or of such Authority, and for which the county or a highway commissioner of such county does not have maintenance responsibility.

(b) Whenever any such park district, city, village, or incorporated town determines, upon the basis of an engineering or traffic investigation concerning a highway or street on which it is authorized by this Section to establish speed limits, that a maximum speed limit prescribed in Section 11–601 of this Chapter is greater or less than is reasonable or safe with respect to the conditions found to exist at any place or along any part or zone of such highway or street, the local authority or park district shall determine and declare by ordinance a reasonable and safe absolute maximum speed limit at such place or along such part or zone, which:

(1) Decreases the limit within an urban district, but not to less than 20 miles per hour; or

(2) Increases the limit within an urban district, but not to more than 55 miles per hour; or

(3) Decreases the limit outside of an urban district, but not to less than 35 miles per hour, except as otherwise provided in subparagraph 4 of this paragraph; or

(4) Decreases the limit within a residence district, but not to less than 25 miles per hour, except as otherwise provided in subparagraph 1 of this paragraph.

The park district, city, village, or incorporated town may make such limit applicable at all times or only during certain specified times. Not more than 6 such alterations shall be made per mile along a highway or street; and the difference in limit between adjacent altered speed zones shall not be more than 10 miles per hour.

A limit so determined and declared by a park district, city, village, or incorporated town becomes effective, and suspends the application of the limit prescribed in Section 11–601 of this Chapter, when appropriate signs giving notice of the limit are erected at the proper place or along the proper part or zone of the highway or street. Electronic speed-detecting devices shall not be used within 500 feet beyond any such sign in the direction of travel; if so used in violation of this Section evidence obtained thereby shall be inadmissible in any prosecution for speeding. However, nothing in this Section prohibits the use of such electronic speed-detecting devices within 500 feet of a sign within a special school speed zone indicating such zone, conforming to the requirements of Section 11–605 of this Act, nor shall evidence obtained thereby be inadmissible in any prosecution for speeding provided the use of such device shall apply only to the enforcement of the speed limit in such special school speed zone.

(c) A county engineer or superintendent of highways may submit to the Department for approval, a county policy for establishing altered speed zones on township and county highways based upon engineering and traffic investigations.

(d) Whenever the county board of a county determines that a maximum speed limit is greater or less than is reasonable or safe with respect to the conditions found to exist at any place or along any part or zone of the highway or road, the county board shall determine and declare by ordi-

nance a reasonable and safe absolute maximum speed limit at that place or along that part or zone. However, the maximum speed limit shall not exceed 55 miles per hour. Upon receipt of an engineering study for the part or zone of highway in question from the county engineer, and notwithstanding any other provision of law, the county board of a county may determine and declare by ordinance a reduction in the maximum speed limit at any place or along any part or zone of a county highway whenever the county board, in its sole discretion, determines that the reduction in the maximum speed limit is reasonable and safe. The county board may post signs designating the new speed limit. The limit becomes effective, and suspends the application of the limit prescribed in Section 11–601 of this Chapter, when appropriate signs giving notice of the limit are erected at the proper place or along the proper part of the zone of the highway. Electronic speed-detecting devices shall not be used within 500 feet beyond any such sign in the direction of travel; if so used in violation of this Section, evidence obtained thereby shall be inadmissible in any prosecution for speeding. However, nothing in this Section prohibits the use of such electronic speed-detecting devices within 500 feet of a sign within a special school speed zone indicating such zone, conforming to the requirements of Section 11–605 of this Act, nor shall evidence obtained thereby be inadmissible in any prosecution for speeding provided the use of such device shall apply only to the enforcement of the speed limit in such special school speed zone.

P.A. 76–1586, § 11–604, eff. July 1, 1970. Amended by P.A. 77–50, § 1, eff. Jan. 1, 1972; P.A. 77–101, § 1, eff. Jan. 1, 1972; P.A. 77–643, § 1, eff. Aug. 4, 1971; P.A. 77–2829, § 40, eff. Dec. 22, 1972; P.A. 78–255, § 61, eff. Oct. 1, 1973; P.A. 78–954, § 1, eff. Feb. 25, 1974; P.A. 78–1297, § 58, eff. March 4, 1975; P.A. 79–267, § 1, eff. July 14, 1975; P.A. 80–693, § 1, eff. Oct. 1, 1977; P.A. 81–875, § 1, eff. Jan. 1, 1980; P.A. 85–547, § 1, eff. Jan. 1, 1988; P.A. 87–217, § 4, eff. Jan. 1, 1992; P.A. 89–444, § 5, eff. Jan. 25, 1996; P.A. 95–574, § 5, eff. June 1, 2008; P.A. 95–788, § 5, eff. Aug. 7, 2008.

Formerly Ill.Rev.Stat.1991, ch. 95 ½, ¶ 11–604.

P.A. 95–788 incorporated the amendment by P.A. 95–574.

5/11–605. Special speed limit while passing schools

§ 11–605. Special speed limit while passing schools.

(a) For the purpose of this Section, "school" means the following entities:

(1) A public or private primary or secondary school.

(2) A primary or secondary school operated by a religious institution.

(3) A public, private, or religious nursery school.

On a school day when school children are present and so close thereto that a potential hazard exists because of the close proximity of the motorized traffic, no person shall drive a motor vehicle at a speed in excess of 20 miles per hour while passing a school zone or while traveling on a roadway on public school property or upon any public thoroughfare where children pass going to and from school.

For the purpose of this Section a school day shall begin at seven ante meridian and shall conclude at four post meridian.

This Section shall not be applicable unless appropriate signs are posted upon streets and highways under their respective jurisdiction and maintained by the Department, township, county, park district, city, village or incorporated town wherein the school zone is located. With regard to the special speed limit while passing schools, such signs shall give proper due warning that a school zone is being approached and shall indicate the school zone and the maximum speed limit in effect during school days when school children are present.

(b) (Blank).

(c) Nothing in this Chapter shall prohibit the use of electronic speed-detecting devices within 500 feet of signs within a special school speed zone indicating such zone, as defined in this Section, nor shall evidence obtained thereby be inadmissible in any prosecution for speeding provided the use of such device shall apply only to the enforcement of the speed limit in such special school speed zone.

(d) (Blank).

(e) A first violation of this Section is a petty offense with a minimum fine of $150. A second or subsequent violation of this Section is a petty offense with a minimum fine of $300.

(f) When a fine for a violation of subsection (a) is $150 or greater, the person who violates subsection (a) shall be charged an additional $50 to be paid to the unit school district where the violation occurred for school safety purposes. If the violation occurred in a dual school district, $25 of the surcharge shall be paid to the elementary school district for school safety purposes and $25 of the surcharge shall be paid to the high school district for school safety purposes. Notwithstanding any other provision of law, the entire $50 surcharge shall be paid to the appropriate school district or districts.

For purposes of this subsection (f), "school safety purposes" includes the costs associated with school zone safety education, the Safe Routes to School Program under Section 2705–317 of the Department of Transportation Law of the Civil Administrative Code of Illinois, safety programs within the School Safety and Educational Improvement Block Grant Program under Section 2–3.51.5 of the School Code, and the purchase, installation, and maintenance of caution lights which are mounted on school speed zone signs.

(g) (Blank).

(h) (Blank).

P.A. 76–1586, § 11–605, eff. July 1, 1970. Amended by P.A. 77–101, § 1, eff. Jan. 1, 1972; P.A. 82–124, § 1, eff. Jan. 1, 1982; P.A. 89–251, § 5, eff. Jan. 1, 1996; P.A. 89–559, § 5, eff. Jan. 1, 1997; P.A. 91–531, § 5, eff. Jan. 1, 2000; P.A. 92–242, § 5, eff. Jan. 1, 2002; P.A. 92–619, § 10, eff. Jan. 1, 2003; P.A. 92–780, § 5, eff. Aug. 6, 2002; P.A. 93–955, § 5, eff. Aug. 19, 2004; P.A. 96–52, § 5, eff. July 23, 2009.

Formerly Ill.Rev.Stat.1991, ch. 95 ½, ¶ 11–605.

5/11–605.1. Special limit while traveling through a highway construction or maintenance speed zone

§ 11–605.1. Special limit while traveling through a highway construction or maintenance speed zone.

(a) A person may not operate a motor vehicle in a construction or maintenance speed zone at a speed in excess of the posted speed limit when workers are present.

(a–5) A person may not operate a motor vehicle in a construction or maintenance speed zone at a speed in excess of the posted speed limit when workers are not present.

(b) Nothing in this Chapter prohibits the use of electronic speed-detecting devices within 500 feet of signs within a construction or maintenance speed zone indicating the zone, as defined in this Section, nor shall evidence obtained by use of those devices be inadmissible in any prosecution for speeding, provided the use of the device shall apply only to

the enforcement of the speed limit in the construction or maintenance speed zone.

(c) As used in this Section, a "construction or maintenance speed zone" is an area in which the Department, Toll Highway Authority, or local agency has posted signage advising drivers that a construction or maintenance speed zone is being approached, or in which the Department, Authority, or local agency has posted a lower speed limit with a highway construction or maintenance speed zone special speed limit sign after determining that the preexisting established speed limit through a highway construction or maintenance project is greater than is reasonable or safe with respect to the conditions expected to exist in the construction or maintenance speed zone.

If it is determined that the preexisting established speed limit is safe with respect to the conditions expected to exist in the construction or maintenance speed zone, additional speed limit signs which conform to the requirements of this subsection (c) shall be posted.

Highway construction or maintenance speed zone special speed limit signs shall be of a design approved by the Department. The signs must give proper due warning that a construction or maintenance speed zone is being approached and must indicate the maximum speed limit in effect. The signs also must state the amount of the minimum fine for a violation.

(d) A first violation of this Section is a petty offense with a minimum fine of $250. A second or subsequent violation of this Section is a petty offense with a minimum fine of $750.

(e) If a fine for a violation of this Section is $250 or greater, the person who violated this Section shall be charged an additional $125, which shall be deposited into the Transportation Safety Highway Hire-back Fund in the State treasury, unless (i) the violation occurred on a highway other than an interstate highway and (ii) a county police officer wrote the ticket for the violation, in which case the $125 shall be deposited into that county's Transportation Safety Highway Hire-back Fund. In the case of a second or subsequent violation of this Section, if the fine is $750 or greater, the person who violated this Section shall be charged an additional $250, which shall be deposited into the Transportation Safety Highway Hire-back Fund in the State treasury, unless (i) the violation occurred on a highway other than an interstate highway and (ii) a county police officer wrote the ticket for the violation, in which case the $250 shall be deposited into that county's Transportation Safety Highway Hire-back Fund.

(e–5) The Department of State Police and the local county police department have concurrent jurisdiction over any violation of this Section that occurs on an interstate highway.

(f) The Transportation Safety Highway Hire-back Fund, which was created by Public Act 92–619, shall continue to be a special fund in the State treasury. Subject to appropriation by the General Assembly and approval by the Secretary, the Secretary of Transportation shall use all moneys in the Transportation Safety Highway Hire-back Fund to hire off-duty Department of State Police officers to monitor construction or maintenance zones.

(f–5) Each county shall create a Transportation Safety Highway Hire-back Fund. The county shall use all moneys in its Transportation Safety Highway Hire-back Fund to hire off-duty county police officers to monitor construction or maintenance zones in that county on highways other than interstate highways.

(g) For a second or subsequent violation of this Section within 2 years of the date of the previous violation, the Secretary of State shall suspend the driver's license of the violator for a period of 90 days. This suspension shall only be imposed if the current violation of this Section and at least one prior violation of this Section occurred during a period when workers were present in the construction or maintenance zone.

P.A. 76–1586, § 11–605.1, added by P.A. 93–955, § 5, eff. Aug. 19, 2004. Amended by P.A. 94–814, § 5, eff. Jan. 1, 2007; P.A. 97–830, § 5, eff. Jan. 1, 2013; P.A. 98–337, § 5, eff. Jan. 1, 2014.

5/11–605.2. Delegation of authority to set a special speed limit while traveling through highway construction or maintenance zones

§ 11–605.2. Delegation of authority to set a special speed limit while traveling through highway construction or maintenance zones.

(a) A local agency may delegate to its superintendent of highways the authority to set and post a reduced speed limit for a construction or maintenance zone, as defined in Section 11–605.1, under subsection (c) of that Section.

(b) If a superintendent of highways sets a reduced speed limit for a construction or maintenance zone in accordance with this Section, the local agency must maintain a record that indicates:

(1) the location of the construction or maintenance zone;

(2) the reduced speed limit set and posted for the construction or maintenance zone; and

(3) the dates during which the reduced speed limit was in effect.

P.A. 76–1586, § 11–605.2, added by P.A. 93–947, § 90, eff. Aug. 19, 2004. Amended by P.A. 96–1000, § 575, eff. July 2, 2010.

5/11–605.3. Special traffic protections while passing parks and recreation facilities and areas

§ 11–605.3. Special traffic protections while passing parks and recreation facilities and areas.

(a) As used in this Section:

(1) "Park district" means the following entities:

(A) any park district organized under the Park District Code;

(B) any park district organized under the Chicago Park District Act; and

(C) any municipality, county, forest district, school district, township, or other unit of local government that operates a public recreation department or public recreation facilities that has recreation facilities that are not on land owned by any park district listed in subparagraphs (A) and (B) of this subdivision (a)(1).

(2) "Park zone" means the recreation facilities and areas on any land owned or operated by a park district that are used for recreational purposes, including but not limited to: parks; playgrounds; swimming pools; hiking trails; bicycle paths; picnic areas; roads and streets; and parking lots.

(3) "Park zone street" means that portion of any street or intersection under the control of a local unit of government, adjacent to a park zone, where the local unit of government has, by ordinance or resolution, designated and approved the street or intersection as a park zone

street. If, before the effective date of this amendatory Act of the 94th General Assembly, a street already had a posted speed limit lower than 20 miles per hour, then the lower limit may be used for that park zone street.

(4) "Safety purposes" means the costs associated with: park zone safety education; the purchase, installation, and maintenance of signs, roadway painting, and caution lights mounted on park zone signs; and any other expense associated with park zones and park zone streets.

(b) On any day when children are present and within 50 feet of motorized traffic, a person may not drive a motor vehicle at a speed in excess of 20 miles per hour or any lower posted speed while traveling on a park zone street that has been designated for the posted reduced speed.

(c) On any day when children are present and within 50 feet of motorized traffic, any driver traveling on a park zone street who fails to come to a complete stop at a stop sign or red light, including a driver who fails to come to a complete stop at a red light before turning right onto a park zone street, is in violation of this Section.

(d) This Section does not apply unless appropriate signs are posted upon park zone streets maintained by the Department or by the unit of local government in which the park zone is located. With regard to the special speed limit on park zone streets, the signs must give proper due warning that a park zone is being approached and must indicate the maximum speed limit on the park zone street.

(e) A first violation of this Section is a petty offense with a minimum fine of $250. A second or subsequent violation of this Section is a petty offense with a minimum fine of $500.

(f) When a fine for a violation of this Section is imposed, the person who violates this Section shall be charged an additional $50, to be paid to the park district for safety purposes.

(g) The Department shall, within 6 months of the effective date of this amendatory Act of the 94th General Assembly, design a set of standardized traffic signs for park zones and park zone streets, including but not limited to: "park zone", "park zone speed limit", and "warning: approaching a park zone". The design of these signs shall be made available to all units of local government or manufacturers at no charge, except for reproduction and postage.

P.A. 76–1586, § 11–605.3, added by P.A. 94–808, § 5, eff. May 26, 2006.

The introductory paragraphs of P.A. 94–808 provided:

"WHEREAS, The Illinois General Assembly finds that laws protecting school-age children with legislation limiting speed limits near schools has successfully protected Illinois children for decades, and a considerable number of recreational facilities in Illinois often border or are in close proximity to educational facilities and do not have the same protections afforded to educational facilities; and

"WHEREAS, The Illinois General Assembly finds that ensuring Safe Streets near educational and recreational facilities is a goal requiring the full attention of this General Assembly and the full cooperation of the federal, State, and local units of government and their respective executive departments and agencies; therefore [P.A. 94–808 is enacted.]"

ARTICLE IX. RIGHT–OF–WAY

5/11–908. Vehicle approaching or entering a highway construction or maintenance area or zone

§ 11–908. Vehicle approaching or entering a highway construction or maintenance area or zone.

(a) The driver of a vehicle shall yield the right of way to any authorized vehicle or pedestrian actually engaged in work upon a highway within any highway construction or maintenance area indicated by official traffic-control devices.

(a–1) Upon entering a construction or maintenance zone when workers are present, a person who drives a vehicle shall:

(1) proceeding with due caution, make a lane change into a lane not adjacent to that of the workers present, if possible with due regard to safety and traffic conditions, if on a highway having at least 4 lanes with not less than 2 lanes proceeding in the same direction as the approaching vehicle; or

(2) proceeding with due caution, reduce the speed of the vehicle, maintaining a safe speed for road conditions, if changing lanes would be impossible or unsafe.

(a–2) A person who violates subsection (a–1) of this Section commits a business offense punishable by a fine of not less than $100 and not more than $10,000. It is a factor in aggravation if the person committed the offense while in violation of Section 11–501 of this Code.

(a–3) If a violation of subsection (a–1) of this Section results in damage to the property of another person, in addition to any other penalty imposed, the person's driving privileges shall be suspended for a fixed period of not less than 90 days and not more than one year.

(a–4) If a violation of subsection (a–1) of this Section results in injury to another person, in addition to any other penalty imposed, the person's driving privileges shall be suspended for a fixed period of not less than 180 days and not more than 2 years.

(a–5) If a violation of subsection (a–1) of this Section results in the death of another person, in addition to any other penalty imposed, the person's driving privileges shall be suspended for 2 years.

(a–6) The Secretary of State shall, upon receiving a record of a judgment entered against a person under subsection (a–1) of this Section:

(1) suspend the person's driving privileges for the mandatory period; or

(2) extend the period of an existing suspension by the appropriate mandatory period.

(b) The driver of a vehicle shall yield the right of way to any authorized vehicle obviously and actually engaged in work upon a highway whenever the vehicle engaged in construction or maintenance work displays flashing lights as provided in Section 12–215 of this Act.

(c) The driver of a vehicle shall stop if signaled to do so by a flagger or a traffic control signal and remain in such position until signaled to proceed. If a driver of a vehicle fails to stop when signaled to do so by a flagger, the flagger is authorized to report such offense to the State's Attorney or authorized prosecutor. The penalties imposed for a violation of this subsection (c) shall be in addition to any penalties imposed for a violation of subsection (a–1).

P.A. 76–1586, § 11–908, added by P.A. 81–312, § 1, eff. Jan. 1, 1980. Amended by P.A. 84–873, § 1, eff. Jan. 1, 1986; P.A. 86–611, § 1, eff. Sept. 1, 1989; P.A. 92–872, § 5, eff. June 1, 2003; P.A. 93–705, § 5, eff. July 9, 2004.

Formerly Ill.Rev.Stat.1991, ch. 95 ½, ¶ 11–908.

ARTICLE X. PEDESTRIANS' RIGHTS AND DUTIES

5/11–1001. Pedestrian obedience to traffic control devices and traffic regulations

§ 11–1001. Pedestrian obedience to traffic control devices and traffic regulations.

Manual on Uniform Traffic Control Devices

for Streets and Highways

2009 Edition

Including Revision 1 dated May 2012
and Revision 2 dated May 2012

U.S.Department of Transportation
Federal Highway Administration

02 Highway agencies may develop and apply criteria for determining the applicability of In-Street Pedestrian Crossing signs.

Standard:

03 **If used, the In-Street Pedestrian Crossing sign shall be placed in the roadway at the crosswalk location on the center line, on a lane line, or on a median island. The In-Street Pedestrian Crossing sign shall not be post-mounted on the left-hand or right-hand side of the roadway.**

04 **If used, the Overhead Pedestrian Crossing sign shall be placed over the roadway at the crosswalk location.**

05 **An In-Street or Overhead Pedestrian Crossing sign shall not be placed in advance of the crosswalk to educate road users about the State law prior to reaching the crosswalk, nor shall it be installed as an educational display that is not near any crosswalk.**

Guidance:

06 *If an island (see Chapter 3I) is available, the In-Street Pedestrian Crossing sign, if used, should be placed on the island.*

Option:

07 If a Pedestrian Crossing (W11-2) warning sign is used in combination with an In-Street or an Overhead Pedestrian Crossing sign, the W11-2 sign with a diagonal downward pointing arrow (W16-7P) plaque may be post-mounted on the right-hand side of the roadway at the crosswalk location.

Standard:

08 **The In-Street Pedestrian Crossing sign and the Overhead Pedestrian Crossing sign shall not be used at signalized locations.**

09 **The STOP FOR legend shall only be used in States where the State law specifically requires that a driver must stop for a pedestrian in a crosswalk.**

10 **The In-Street Pedestrian Crossing sign shall have a black legend (except for the red STOP or YIELD sign symbols) and border on a white background, surrounded by an outer yellow or fluorescent yellow-green background area (see Figure 2B-2). The Overhead Pedestrian Crossing sign shall have a black legend and border on a yellow or fluorescent yellow-green background at the top of the sign and a black legend and border on a white background at the bottom of the sign (see Figure 2B-2).**

11 **Unless the In-Street Pedestrian Crossing sign is placed on a physical island, the sign support shall be designed to bend over and then bounce back to its normal vertical position when struck by a vehicle.**

Support:

12 The Provisions of Section 2A.18 concerning mounting height are not applicable for the In-Street Pedestrian Crossing sign.

Standard:

13 **The top of an In-Street Pedestrian Crossing sign shall be a maximum of 4 feet above the pavement surface. The top of an In-Street Pedestrian Crossing sign placed in an island shall be a maximum of 4 feet above the island surface.**

Option:

Known Error 14 The In-Street Pedestrian Crossing sign may be used seasonably to prevent damage in winter because of plowing operations, and may be removed at night if the pedestrian activity at night is minimal.

15 In-Street Pedestrian Crossing signs, Overhead Pedestrian Crossing signs, and Yield Here To (Stop Here For) Pedestrians signs may be used together at the same crosswalk.

Section 2B.13 Speed Limit Sign (R2-1)

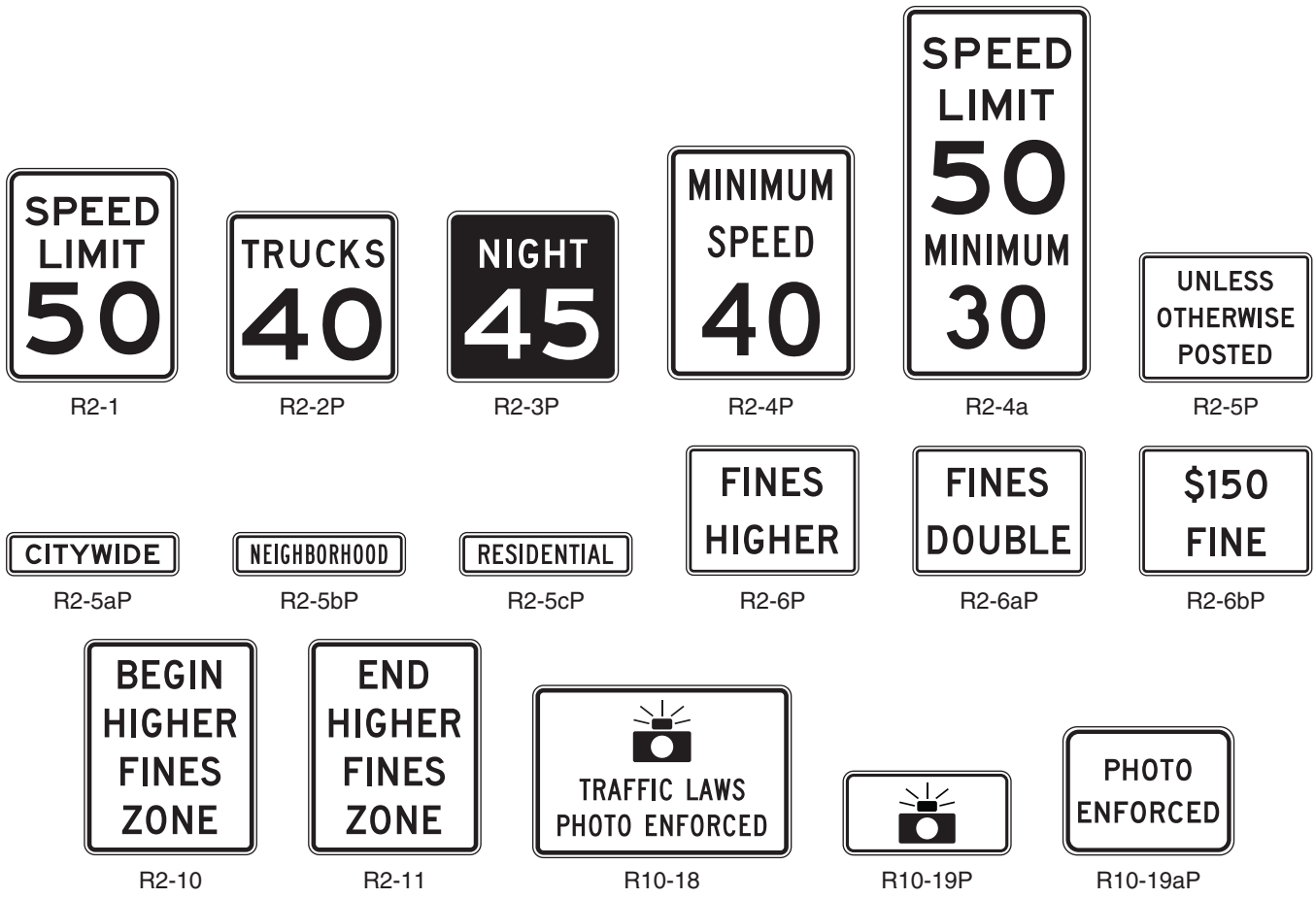
Standard:

01 **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 include an analysis of the current speed distribution of free-flowing vehicles.**

02 **The Speed Limit (R2-1) sign (see Figure 2B-3) shall display the limit established by law, ordinance, regulation, or as adopted by the authorized agency based on the engineering study. The speed limits displayed shall be in multiples of 5 mph.**

03 **Speed Limit (R2-1) signs, indicating speed limits for which posting is required by law, shall be located at the points of change from one speed limit to another.**

Figure 2B-3. Speed Limit and Photo Enforcement Signs and Plaques



04 **At the downstream end of the section to which a speed limit applies, a Speed Limit sign showing the next speed limit shall be installed. Additional Speed Limit signs shall be installed beyond major intersections and at other locations where it is necessary to remind road users of the speed limit that is applicable.**

05 **Speed Limit signs indicating the statutory speed limits shall be installed at entrances to the State and, where appropriate, at jurisdictional boundaries in urban areas.**

Support:

06 In general, the maximum speed limits applicable to rural and urban roads are established:

A. Statutorily – a maximum speed limit applicable to a particular class of road, such as freeways or city streets, that is established by State law; or
B. As altered speed zones – based on engineering studies.

07 State statutory limits might restrict the maximum speed limit that can be established on a particular road, notwithstanding what an engineering study might indicate.

Option:

08 If a jurisdiction has a policy of installing Speed Limit signs in accordance with statutory requirements only on the streets that enter a city, neighborhood, or residential area to indicate the speed limit that is applicable to the entire city, neighborhood, or residential area unless otherwise posted, a CITYWIDE (R2-5aP), NEIGHBORHOOD (R2-5bP), or RESIDENTIAL (R2-5cP) plaque may be mounted above the Speed Limit sign and an UNLESS OTHERWISE POSTED (R2-5P) plaque may be mounted below the Speed Limit sign (see Figure 2B-3).

Guidance:

09 *A Reduced Speed Limit Ahead (W3-5 or W3-5a) sign (see Section 2C.38) should be used to inform road users of a reduced speed zone where the speed limit is being reduced by more than 10 mph, or where engineering judgment indicates the need for advance notice to comply with the posted speed limit ahead.*

10 *States and local agencies should conduct engineering studies to reevaluate non-statutory speed limits on segments of their roadways that have undergone significant changes since the last review, such as the addition or elimination of parking or driveways, changes in the number of travel lanes, changes in the configuration of bicycle lanes, changes in traffic control signal coordination, or significant changes in traffic volumes.*

11 *No more than three speed limits should be displayed on any one Speed Limit sign or assembly.*

12 *When a speed limit within a speed zone is posted, it should be within 5 mph of the 85th-percentile speed of free-flowing traffic.*

13 *Speed studies for signalized intersection approaches should be taken outside the influence area of the traffic control signal, which is generally considered to be approximately 1/2 mile, to avoid obtaining skewed results for the 85th-percentile speed.*

Support:

14 Advance warning signs and other traffic control devices to attract the motorist's attention to a signalized intersection are usually more effective than a reduced speed limit zone.

Guidance:

15 *An advisory speed plaque (see Section 2C.08) mounted below a warning sign should be used to warn road users of an advisory speed for a roadway condition. A Speed Limit sign should not be used for this situation.*

Option:

16 Other factors that may be considered when establishing or reevaluating speed limits are the following:

A. Road characteristics, shoulder condition, grade, alignment, and sight distance;
B. The pace;
C. Roadside development and environment;
D. Parking practices and pedestrian activity; and
E. Reported crash experience for at least a 12-month period.

17 Two types of Speed Limit signs may be used: one to designate passenger car speeds, including any nighttime information or minimum speed limit that might apply; and the other to show any special speed limits for trucks and other vehicles.

Offic. Interp. 18 A changeable message sign that changes the speed limit for traffic and ambient conditions may be installed provided that the appropriate speed limit is displayed at the proper times.

Offic. Interp. 19 A changeable message sign that displays to approaching drivers the speed at which they are traveling may be installed in conjunction with a Speed Limit sign.

Guidance:

20 *If a changeable message sign displaying approach speeds is installed, the legend YOUR SPEED XX MPH or such similar legend should be displayed. The color of the changeable message legend should be a yellow legend on a black background or the reverse of these colors.*

Support:

21 Advisory Speed signs and plaques are discussed in Sections 2C.08 and 2C.14. Temporary Traffic Control Zone Speed signs are discussed in Part 6. The WORK ZONE (G20-5aP) plaque intended for installation above a Speed Limit sign is discussed in Section 6F.12. School Speed Limit signs are discussed in Section 7B.15.

Section 2B.14 Truck Speed Limit Plaque (R2-2P)

Standard:

01 **Where a special speed limit applies to trucks or other vehicles, the legend TRUCKS XX or such similar legend shall be displayed below the legend Speed Limit XX on the same sign or on a separate R2-2P plaque (see Figure 2B-3) below the standard legend.**

Section 2B.15 Night Speed Limit Plaque (R2-3P)

Standard:

01 **Where different speed limits are prescribed for day and night, both limits shall be posted.**

Guidance:

02 *A Night Speed Limit (R2-3P) plaque (see Figure 2B-3) should be reversed using a white retroreflectorized legend and border on a black background.*

Option:

03 A Night Speed Limit plaque may be combined with or installed below the standard Speed Limit (R2-1) sign.

Section 2B.16 Minimum Speed Limit Plaque (R2-4P)

Standard:

01 **A Minimum Speed Limit (R2-4P) plaque (see Figure 2B-3) shall be displayed only in combination with a Speed Limit sign.**

Option:

02 Where engineering judgment determines that slow speeds on a highway might impede the normal and reasonable movement of traffic, the Minimum Speed Limit plaque may be installed below a Speed Limit (R2-1) sign to indicate the minimum legal speed. If desired, the Speed Limit sign and the Minimum Speed Limit plaque may be combined on the R2-4a sign (see Figure 2B-3).

Section 2B.17 Higher Fines Signs and Plaque (R2-6P, R2-10, and R2-11)

Standard:

01 **If increased fines are imposed for traffic violations within a designated zone of a roadway, a BEGIN HIGHER FINES ZONE (R2-10) sign (see Figure 2B-3) or a FINES HIGHER (R2-6P) plaque (see Figure 2B-3) shall be used to provide notice to road users. If used, the FINES HIGHER plaque shall be mounted below an applicable regulatory or warning sign in a temporary traffic control zone, a school zone, or other applicable designated zone.**

02 **If an R2-10 sign or an R2-6P plaque is posted to provide notice of increased fines for traffic violations, an END HIGHER FINES ZONE (R2-11) sign (see Figure 2B-3) shall be installed at the downstream end of the zone to provide notice to road users of the termination of the increased fines zone.**

Guidance:

03 *If used, the BEGIN HIGHER FINES ZONE sign or FINES HIGHER plaque should be located at the beginning of the temporary traffic control zone, school zone, or other applicable designated zone and just beyond any interchanges, major intersections, or other major traffic generators.*

Standard:

04 **The Higher Fines signs and plaque shall have a black legend and border on a white rectangular background. All supplemental plaques mounted below the Higher Fines signs and plaque shall have a black legend and border on a white rectangular background.**

Guidance:

05 *Agencies should limit the use of the Higher Fines signs and plaque to locations where work is actually underway, or to locations where the roadway, shoulder, or other conditions, including the presence of a school zone and/or a reduced school speed limit zone, require a speed reduction or extra caution on the part of the road user.*

Option:

06 Alternate legends such as BEGIN (or END) DOUBLE FINES ZONE may also be used for the R2-10 and R2-11 signs.

07 The legend FINES HIGHER on the R2-6P plaque may be replaced by FINES DOUBLE (R2-6aP), $XX FINE (R2-6bP), or another legend appropriate to the specific regulation (see Figure 2B-3).

08 The following may be mounted below an R2-10 sign or R2-6P plaque:

A. A supplemental plaque specifying the times that the higher fines are in effect (similar to the S4-1P plaque shown in Figure 7B-1), or
B. A supplemental plaque WHEN CHILDREN (WORKERS) ARE PRESENT, or
C. A supplemental plaque WHEN FLASHING (similar to the S4-4P plaque shown in Figure 7B-1) if used in conjunction with a yellow flashing beacon.

Support:

09 Section 6F.12 contains information regarding other signs and plaques associated with increased fines for traffic violations in temporary traffic control zones. Section 7B.10 contains information regarding other signs and plaques associated with increased fines for traffic violations in designated school zones.

facts

Road safety - Speed

Speed has been identified as a key risk factor in road traffic injuries, influencing both the risk of a road crash as well as the severity of the injuries that result from crashes.

Excess speed is defined as exceeding the speed limit. Inappropriate speed is defined as driving at a speed unsuitable for the prevailing road and traffic conditions. Excess and inappropriate speed are responsible for a high proportion of the mortality and morbidity that result from road crashes. In high-income countries, speed contributes to about 30% of deaths on the road, while in some low-income and middle-income countries, speed is estimated to be the main contributory factor in about half of all road crashes.

Controlling vehicle speed can prevent crashes happening and can reduce the impact when they do occur, lessening the severity of injuries sustained by the victims.

HOW DOES SPEED AFFECT TRAFFIC COLLISIONS AND INJURY?

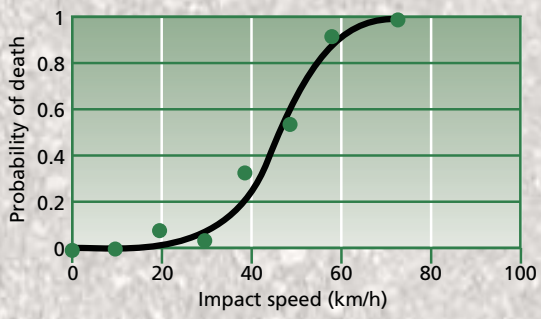
— The higher the speed of a vehicle, the shorter the time a driver has to stop and avoid a crash. A car travelling at 50 km/h will typically require 13 metres in which to stop, while a car travelling at 40 km/h will stop in less than 8.5 metres.

— An increase in average speed of 1 km/h typically results in a 3% higher risk of a crash involving injury, with a 4–5% increase for crashes that result in fatalities.

— Speed also contributes to the severity of the impact when a collision does occur. For car occupants in a crash with an impact speed of 80 km/h, the likelihood of death is 20 times what it would have been at an impact speed of 30 km/h.

— The relationship between speed and injury severity is particularly critical for vulnerable road users such as pedestrians and cyclists. For example, pedestrians have been shown to have a 90% chance of survival when struck by a car travelling at 30 km/h or below, but less than 50% chance of surviving an impact at 45 km/h. Pedestrians have almost no chance of surviving an impact at 80 km/hr.

Pedestrian fatality risk as a function of the impact speed of a car



Source: Pasanen E, 1991.

WHAT FACTORS AFFECT SPEED?

Drivers' speed choice is influenced by a number of factors that can be considered as:

— driver-related factors (age, gender, alcohol level, number of people in the vehicle);

— those relating to the road and the vehicle (road layout, surface quality, vehicle power, maximum speed);

— traffic- and environment-related (traffic density and composition, prevailing speed, weather conditions).

ROAD SAFETY IS NO ACCIDENT

World Health Organization

THE WORLD BANK

WHAT CAN BE DONE TO MANAGE THE ADVERSE EFFECTS OF SPEED?

A number of interventions have been identified to be effective in the management and control of vehicle speed:

- Setting and enforcing speed limits are two of the most effective measures in reducing road traffic injuries.
- Studies suggest that a 1 km/h decrease in travelling speed would lead to a 2–3% reduction in road crashes.
- Experience in many countries has shown that the introduction of speed limits will only have a short lived effect on reducing speeds unless accompanied by sustained, visible enforcement of these limits.
- Speed cameras are a highly cost-effective means of reducing road crashes.
- In some countries, speed limits are posted that vary according to weather, traffic conditions, and time of day. This ensures that speed limits are responsive to local conditions and traffic circumstances, and are therefore more likely to be kept.
- Speed levels can also be affected by developing a safer infrastructure. This can involve modifying the road environment to reduce traffic flow and vehicle speed, thereby providing protection from crashes and reducing injury rates. Such measures include segregating high- and low-speed road users, or discouraging vehicles from entering certain areas.
- Traffic-calming measures have been widely used to reduce crash frequency in many high-income countries. These include the installation of physical speed-reducing measures, such as roundabouts, vertical changes in the road (for example speed humps), horizontal changes in the road (such as road narrowings or rumble strips). Proven traffic-calming measures can be particularly useful where enforcement of speed control laws may be ineffective.
- The transition from high-speed to low-speed roads can create areas of high risk for crashes – for example, where vehicles exit motorways. Design features can be used to mark transition zones on busy roads approaching towns and villages that can influence drivers' speed. Slower-speed zones and roundabouts are examples of features that are useful in reducing the speed of vehicles.
- Appropriate speed can be imposed on traffic through design features that limit the speed of the vehicle itself. Legislation can be used to encourage the use of such features. This is already being done in many countries with heavy goods vehicles and coaches, and is estimated to contribute to a 2% reduction in the number of injury crashes. Corresponding action is needed for cars and other light vehicles.

WHO recommends that member countries set and enforce speed limits appropriate to the function of specific roads.

This information is taken from the *World report on road traffic injury prevention.* To download the report, or for more information on road safety, please visit http://www.who.int/violence_injury_prevention or e-mail: traffic@who.int

Effects of Raising and Lowering Speed Limits

(Part of the Reasonable Drivers Unanimous site)

Full Text

Plain Text Version

Final Report

(Abstract and Finding)

Report No. FHWA-RD-92-084 **October 1992**

U.S. Department of Transportation
Federal Highway Administration

Research, Development, and Technology
Turner-Fairbank Highway Research Center
6300 Georgetown Pike
McLean, Virginia 22101-2296

The objectives of this research was to determine the effects of raising and lowering posted speed limits on driver behavior and accidents for non-limited access rural and urban highways. Speed and accident data were collected in 22 States at 100 sites before and after speed limits were altered. Before and after data were also collected simultaneously at comparison sites where speed limits were not changed to control for the time trends. Repeated measurements were made at 14 sites to examine short - and long-term effects of speed limit changes.

The results of the study indicated that lowering posted speed limits by as much as 20 mi/h (32 km/h), or raising speed limits by as much as 15 mi/h (24 km/h) had little effect on motorist' speed. The majority of motorist did not drive 5 mi/h (8 km/h) above the posted speed limits when speed limits were raised, nor did they reduce their speed by 5 or 10 mi/h (8 or 16 km/h) when speed limits are lowered. Data collected at the study sites indicated that the majority of speed limits are posed below the average speed of traffic. Lowering speed limits below the 50th percentile does not reduce accidents, but does significantly increase driver violations of the speed limit. Conversely, raising the posted speed limits did not increase speeds or accidents.

Introduction

This study was conducted to examine driver behavior and accident effects of raising and lowering posted speed limits on nonlimited access rural and urban highways. While much research in recent years has focused on the effects of the 55 and 65 mi/h (89 and 105 km/h) speed limits on limited access facilities, the major emphasis of this research is on streets and highways that were posted between 20 and 55 mi/h (32 and 89 km/h)

A maximum speed limit is posted or set by statute on a highway to inform motorists of the highest speed considered to be safe and reasonable under favorable road, traffic, and weather conditions.

A review of early vehicles speed legislation in the United States suggests that regulations were established to improve public safety. The rational for government regulation of speed is based on the fact that unreasonable speed may cause damage and injury. Speed laws also provide a basis for punishing the unreasonable behavior of an individual driver.

Every State has a basic speed statute requiring drivers to operate their vehicles at a speed that is reasonable and prudent under existing conditions. This law recognizes that the maximum safe speed varies due to traffic, roadway, weather, light and other conditions, and places the responsibility of selecting a safe and reasonable speed on the driver.

The majority of motorists select a speed to reach their destination in the shortest time possible and to avoid endangering themselves, others, and their property. In selecting their speed, motorist consider roadway, traffic, weather, and other conditions. The collective judgment of the majority of motorists represents the level of reasonable travel and acceptable risk. Prior research has shown that the upper region of acceptable risk is in the vicinity of the 85th percentile speed.

Most traffic engineers believe that speed limits should be posted to reflect the maximum speed considered to be safe and reasonable by the majority of drivers using the roadway under favorable conditions. Procedures used to set speed limits have

evolved through years of experience and research. Most States and localities set safe and reasonable maximum speed limits based on the results of an engineering and traffic investigation. While all States and most jurisdictions use the 85th percentile speed as a major factor n selecting the appropriate speed limit for a given street or highway, other factors such as roadside development, accident experience, and design speed are often subjectively considered.

The lack of consensus on how to establish safe and reasonable speed limits has led to nonuniform limits. While newspapers and scientific articles dating to the early 1900's discuss the problem and need for uniform limits, engineers such as Bearwald, in 1964, criticized traffic engineers for using nonuniform limits in both rural and urban areas and called for the establishment of speed zones of a factual and scientific basis as opposed to opinion and political expediency. Bearwald's suggestion apparently received little attention. For example, Harkey recently examined speed limits in rural and urban areas in four States and found that speed limits were set from 6 to 14 mi/h (10 to 23 km.h) below the 85th percentile speed.

One primary reason for setting speed limits lower than speed considered safe and reasonable by the majority of motorists is based on the belief that lower speed limits reduced seeds and accidents. Also it has been frequently suggested that most motorists drive 5 to 10 mi/h (8 to 16 km/h) over the posted speed limit, so lower limits should be established to account for this condition.

Conversely, it is believed that raising the speed limit increases speeds and accidents. For example, following a severe accident, one of the most frequent requests made to highway jurisdictions is to lower the speed limit. These requests are founded on public knowledge that accident severity increases with increasing vehicle speed because in a collision, the amount of kinetic energy dissipated is proportional to the square of the velocity. Simply stated, when a vehicle is involved in a crash the higher the vehicle speed, the greater the chance of being seriously injured or killed. However, as noted by a number of researchers, the potential for being involved in an accident is highest when traveling at speed much lower or much higher than the majority of motorists.

Arbitrary, unrealistic and nonuniform speed limits have created a socially acceptable disregard for speed limits. Unrealistic limits increase accident risks for persons who attempt to comply with limit by driving slower or faster than the majority of road users, Unreasonably low limits significantly decrease driver compliance and give road users such as person not familiar with the road and pedestrians, a false indication of actual traffic speeds.

Unrealistically high speed limits increase accident risk for drivers who are inexperienced or who disregard the basic speed law. Unrealistic limits also place enforcement officials and judges in the position of subjectively selecting and punishing violators. This practice can result in punishing average drivers, as well as high-risk violators.

For years, traffic engineering texts have supported the conclusion that motorists ignore unreasonable speed limits. Both formal research and informal operational observations conducted for many years indicate that there is very little change in the mean or 85th percentile speed as the result of raising or lowering the posted limit. Very few accident studies have been conducted to determine the safety effects or altering posted speed limits.

Highway administrators, enforcement officials, the judiciary system, and the public need factual information concerning the effects of speed limits to address pertinent issues. For example, do lower posted speed limits reduce vehicle speeds and accidents? If the speed limit is raised, will speeds and accidents increase? Do most motorists driver 5 to 10 mi/h (8 to 16 km/h) above the posted speed limit. What are the effects or lowering and raising speed limits on driver compliance? Answers to these questions and related issues are addressed in this report.

Summary of Findings

The pertinent findings of this study, conducted to examine the effects of lowing and raising posted speed limits on nonlimited access rural and urban highways, are listed below:

- Based on the free-flow speed data collected for a 24-h period at the experimental and comparison sites in 22 States, posted speed limits were set, on the average, at the 45th percentile speed or below the average speed of traffic
- Speed limits were posted, on average, between 5 and 16 mi/h (8 and 26 km/h) below the 85th percentile speed.
- Lowering speed limits by 5, 10, 15, or 20 mi/h (8, 16, 24, or 26 km/h) at the study sites had a minor effect on vehicle speeds. Posting lower speed limits does not decrease motorist's speeds.

- Raising speed limits by 5, 10, or 15 mi/h (8, 16, or 25 km/h) at the rural and urban sites had a minor effect on vehicle speeds. In other words, an increase in the posted speed limit did not create a corresponding increase in vehicle speeds.
- The average change in any of the percentile speeds at the experimental sites was less than 1.5 mi/h (2.4 m/h), regardless of whether the speed limit was raised or lowered.
- Where speed limits were lowered, an examination of speed distribution indicated the slowest drivers (1st percentile) increased their speed approximately 1 mi/h (1/6 km/h). There were no changes on the high-speed drivers (99th percentile)
- At sites where speed limits were raised, there was an increase of less than 1.5 mi/h (2.4 km/h) for drivers traveling at and below the 75th percentile speed. When the posted limits were raised by 10 and 15 mi/h (16 and 24 km/h), there was a small decrease in the 99th percentile speed.
- Raising speed limits in the region of the 85th percentile speed has an extremely beneficial effect on drivers complying with the posted speed limits.
- Lowering speed limits in the 33rd percentile speed (the average percentile that speed were posted in this study) provides a noncompliance rate of approximately 67 percent.
- After speed limits were altered at the experimental sites, less than one-half of the drivers complied with the new posed limits.
- Only minor changes in vehicles following as headways less than 2s were found at the experimental sites.
- Accidents at the 58 experimental sites where speed limits were lowered increased by 5.4 percent. The level of confidence of this estimate is 44 percent. The 95 percent confidence limits for this estimate ranges from a reduction in accidents of 11 percent to an increase of 26 percent.
- Accidents at the 41 experimental sites where speed limits were raised decreased by 6.7 percent. The level of confidence of this estimate in 59 percent. The 95 percent confidence limits for this estimate ranges from a reduction in accidents of 21 percent to an increase of 10 percent.
- Lowering speed limits more than 5 mi/h (8 km/h) below the 85th percentile speed of traffic did not reduce accidents.
- The indirect effects of speed limit changes on a sample of contiguous and adjacent roadways was found to be very small and insignificant.

Conclusion

The primary conclusion of this research is that the majority of motorist on the nonlimited access rural and urban highways examined in this study did not decrease or increase their speed as a result of either lowering or raising the posted speed limit by 4, 10, or 15 mi/h (8, 16, or 24 km/h). In other words, this nationwide study confirms the results of numerous other observational studies which found that the majority or motorist do not alter their speed to conform to speed limits they perceive as unreasonable for prevailing conditions.

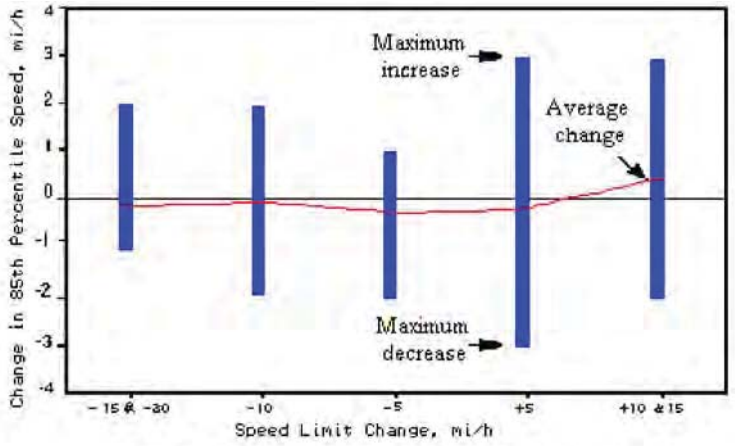


Figure 10. Maximum and average changes in the 85th percentile speeds at the experimental sites.

The data clearly show that lowering posted speed limits did not reduce vehicle speeds or accidents. Also, lowering speed limits well below the 86th percentile speed did not increase speeds and accidents. Conversely, raising the posted speed limits did not increase speeds and accidents. The majority of motorist did not drive 5 to 10 mi/h (8 to 16 km/h) above the posted speed limit when speed limits were raised, nor did they reduce their speed by 5 or 10 mi/h (8 to 16 km/h) when speed limits were lowered.

Because there were few changes in the speed distribution, it is not surprising that the overall effects of speed limit changes on accidents were minor. It is interesting to note that compliance decreased when speed limits were lowered and accidents tended to increase. Conversely, when compliance improved after speed limits are raised, accidents tended to decrease.

Based on the sites examined in 22 States, it is apparent that the majority of highway agencies set speed limits below the average speed of traffic as opposed to setting limits in the upper region of the minimum accident risk band or about 85th percentile speed. This practice means that more than one-half of the motorist are in technical violation of the speed limits laws.

Although there are variations from State to State, on average, speed limits were posed 5 and 16 mi/h (8 and 26 km/h) below the 85th percentile speed. As all States use the 85th percentile as a major criterion for establishing safe and reasonable speed limits, it is surprising that the new speed limits posted on the experimental sections examined in this study deviated so far from the 85th percentile speed. There are several plausible reasons. Once commonly cited reason for posting unreasonably low speed limits is public and political pressure. While individuals and politicians clearly influence some speed limit decision, there are other factors involved.

Although the 85th percentile speed is used as the major guideline in setting speed limits, other factors such as land use, pedestrian activity, accident history, etc., are often subjectively considered in the decision making process. Together, these factors can account for sped limits that are set 10 mi/h (16 km/h) below the 85th percentile speed. In addition, the 85th percentile speed is often estimated based on a minimum of 200 vehicles or 2 h sample. This process does not take into account the wide hourly fluctuations in the 85th percentile speed over a 24-h period. Furthermore, the vehicle selection process use of radar which is detected by motorist contribute to a bias sample, i.e., usually lower then the average 24-h 85th percentile speed.

Although the study sites could not be randomly selected, they represent a wide range of rural and urban conditions, traffic volume, and regional situations. As large changes in the posted speed limit did not create a meaningful increase or decrease in the motorists' speeds at the study sites, it is plausible that this effect would also be found on other nonlimited rural and urban access highways.

The data collected during this study indicate that there are no benefits, either from a safety or operational point of view, from establishing speed limits less than the 85th percentile speed. This does not mean that all speed limits should be raised. Traffic and engineer investigations should be conducted to obtain an accurate measure of the speed distribution. Greater emphasis should be placed on using the 85th percentile speed in setting safe and reasonable speed limits. These studies should be repeated as land use and traffic characteristics change.

The information provided in this report will be useful to highway agencies, enforcement officials, and other involved in establishing uniform safe and reasonable speed limits on the nation's highways. The graphics, such as figure 10 on p.15 [above], can be used to illustrate the effects of speed limit changes on vehicle speeds. As shown below, figure 41 (which shows the changes in accidents, as well as the 95th percentile confidence limits of the changes) can be used to illustrate the effects of lowering and raising speed limits in accidents. This figure should only be used by persons who have read the accident analysis section in this report and have a basic understanding of the analysis results.

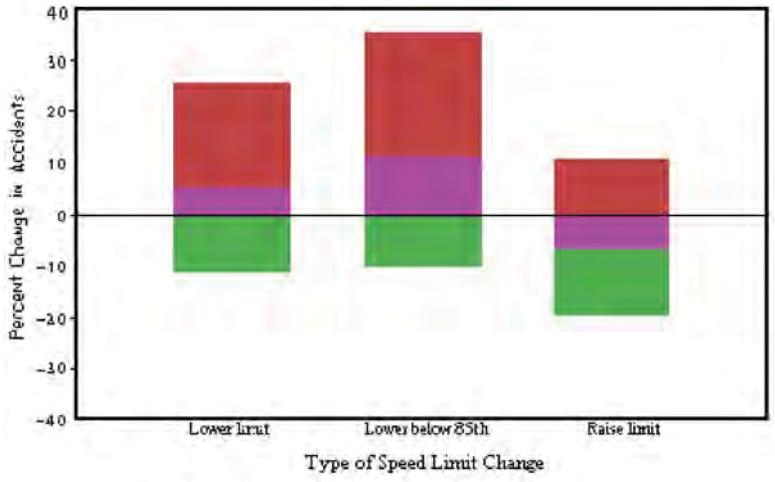


Figure 41. Summary of accident effects of altering posted speed limits.

Performing Organization Name and Address:
Martin R. Parker & Associates, Inc.
38549 Laurenwood Drive
Wayne, Michigan 48184-1073

Sponsoring Agency Name and Address:
Office of Safety and Traffic Operations R&D
Federal Highway Administration
6300 Georgetown Pike
McLean, Virginia 22101-2296

Contracting Officer's Technical Representative (COTR): Howard H. Bissell, HSR-30 and Davey L. Warren, HSR-10.
Contract or Grant Number: DTFH61-85-C-00136.
Type of report and dates covered: Final, October 1985 - June 1992

The entire report is 84 pages long. You can try calling the National Technical Information Service (general info 703-487-4770, sales 703-487-4650) and asking for this report. Even with the report number they won't be able to find it. It's being buried since it says things that certain organizations (both governmental and private) don't want to be made public. However, NMA is selling this report for $15 plus $4 shipping and handaling. They can be contacted at 608/849-6000; nma@motorists.com ; or 6678 Pertzborn Road, Dane, Wisconsin 53529.

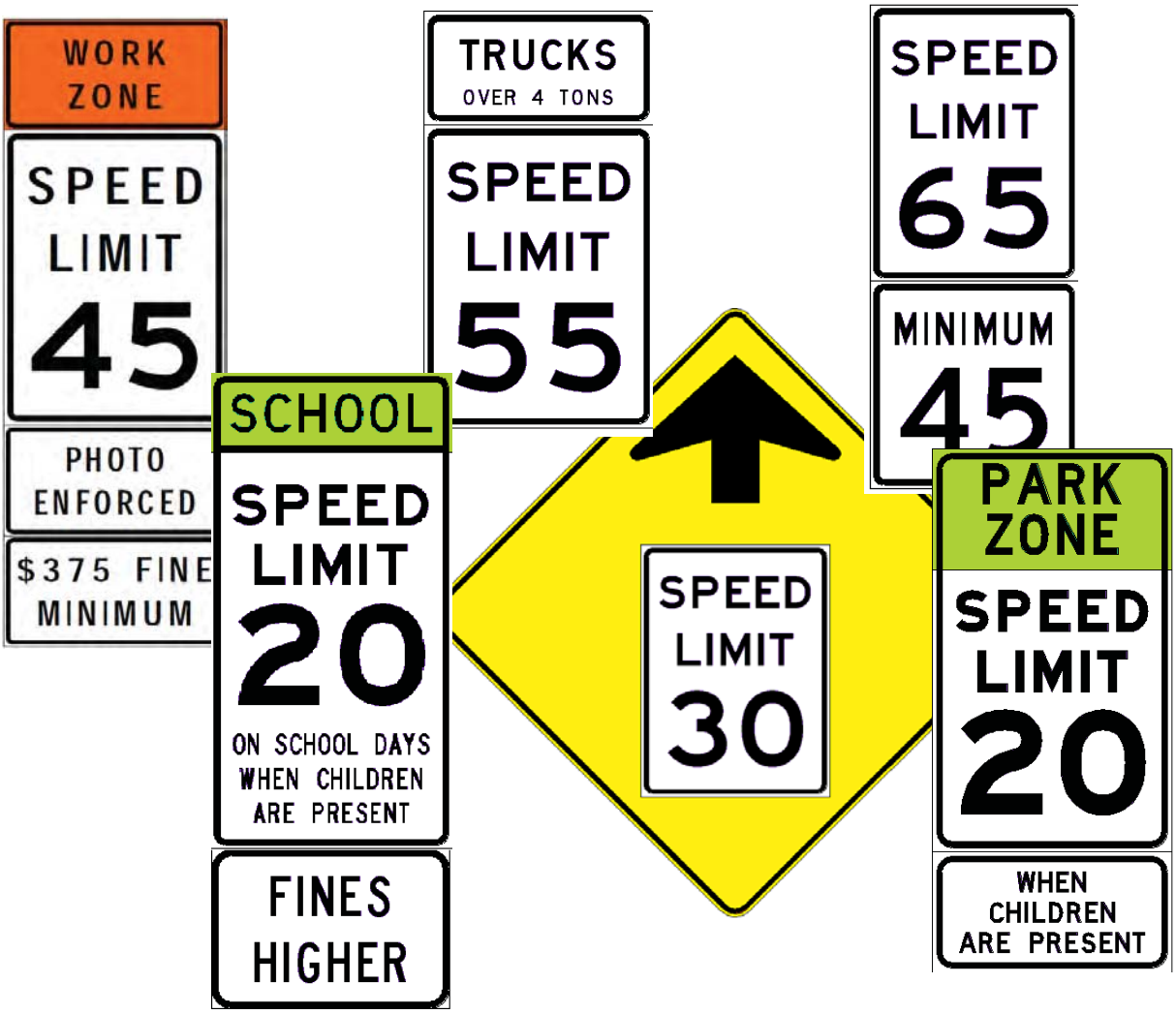
Related Documents

- NMA's Model Speed Zoning Law
- Other studies on the effect of altering speed limits
- Driver Speed Behavior on US Streets and Highways
- Did the 65 mph Speed Limit Save Lives?

Related Pages

- Speed Limits

Back Home | Start



Policy on Establishing and Posting Speed Limits on the State Highway System

March 2013

Illinois Department of Transportation

POLICY ON ESTABLISHING AND POSTING SPEED LIMITS ON THE STATE HIGHWAY SYSTEM

ILLINOIS DEPARTMENT OF TRANSPORTATION – BUREAU OF OPERATIONS

APPLICATION OF POLICY TO CITIES, COUNTIES AND OTHER LOCAL AGENCIES

The Illinois Vehicle Code does not require local agencies to obtain department approval for speed zones on roads under their respective jurisdictions. While the procedures contained in this policy may be used for altering speed limits on any public highway, use of such procedures by local agencies is not required by statute. If a local agency wishes to ask a district for review of a speed zone, the district may, of course, do so. However, when responding back to the agency, a statement should be included indicating that the comments are not to be considered as either approval or disapproval. Local Agencies should refer to Section 11-604 of the Illinois Vehicle Code for additional information and specific regulations regarding the alteration of speed limits on local roads.

GENERAL SPEED LIMITS

Speed limits on highways under the jurisdiction of the department shall be established on the basis of the latest revisions/editions to Article VI of the Illinois Vehicle Code (IVC), the Illinois Manual on Uniform Traffic Control Devices (IMUTCD), the Standard Specifications for Road and Bridge Construction, the Highway Standards and this policy. Night speed limits shall not be used.

A. Statutory Speed Limits

Section 11-601 of the IVC spells out the statutory speed limits in effect in Illinois. These limits may be enforced without any signing.

Outside Urban Districts

Freeways/Expressways

This category is defined as highways designated by the department which have at least 4 lanes of traffic where the traffic moving in opposite directions is separated by a strip of ground which is not surfaced or suitable for vehicle traffic. For the purposes of this policy, this includes all full freeways (Interstate and interstate-type freeways).

Passenger cars, buses, motorcycles, and trucks with gross weights of 4 tons or less	65 mph
Trucks with gross weights of over 4 tons	
(Outside of Cook, Dupage, Kane, Lake, McHenry, and Will Counties)	65 mph
(Within Cook, Dupage, Kane, Lake, McHenry, and Will Counties)	55 mph

This also allows the department to apply these limits to designated sections of rural expressways with full control of access and at-grade intersections rather than interchanges. In general, this should only be done where engineering judgment indicates such limits may be safely accommodated. Short sections should be avoided.

Conventional Highways

All vehicle types	55 mph

Inside Urban Districts (All vehicle types)

All streets and highways	30 mph
Alleys	15 mph

"Urban District" is defined in Section 1-214 of the IVC as "The territory contiguous to and including any street which is built up with structures devoted to business, industry or dwelling houses situated at intervals of less than 100 feet for a distance of a quarter of a mile or more." *Note that whether the street or highway in question is inside or outside of the corporate limits of a community is not included in this definition and therefore, is not applicable to the determination of where such statutory speed applies. This means that the statutory speed on an unposted street within the corporate limits of a community but outside an urban district would be 55 miles per hour.*

B. Altered Speed Limits

State statutes allow the department to alter certain of the statutory speeds either up or down (statutory speeds of 55 and 65 miles per hour may only be altered downward). State statutes and the Illinois Manual on Uniform Traffic Control Devices require that such altered speed limits be based on "… an engineering study that has been performed in accordance with traffic engineering practices. The engineering study shall include an analysis of the current speed distribution of free-flowing vehicles."

The following investigation and selection criteria shall be used to determine altered speed limits on streets and highways under the jurisdiction of the department. While it is not mandatory that local agencies use this format and criteria, it is recommended. Regardless of the form the engineering and traffic investigation takes, it should be based on valid traffic engineering principals, an analysis of the speed distribution of free-flowing vehicles, and be well documented.

Perceived speed enforcement tolerances shall not be taken into account in the setting of speed limits.

Prevailing Speed

The determination of the prevailing speed of free-flowing traffic is the basic step in establishing an altered speed limit either lower or higher than the statutory limit (statutory speeds of 55 and 65 miles per hour may only be altered downward). This is based on the nationally accepted premise that a majority of the drivers will drive at a speed which they judge to be safe and proper. The prevailing speed is the computed average of the following three sets of data, measured during free-flowing traffic conditions:

1. EIGHTY-FIFTH PERCENTILE SPEED: The 85th percentile speed is defined as the speed at or below which 85 percent of the vehicles are traveling. This speed is determined on the basis of spot speed studies, normally made with a concealed radar or laser speed meter.

Spot speed studies should be made as close as practical to the center of the zone which is being studied. If the zone is in excess of one mile in length in rural areas or 1/2 mile in urban areas, studies should be made at two or more locations. Care must be exercised to be sure that the data are collected in such manner and at such times that they are a true indication of normal conditions. Such conditions normally prevail under good weather conditions, on dry pavement, during daylight hours, outside of rush periods, and on any day except weekends or holidays. Observations should not be made immediately following a crash, when traffic is influence by construction or maintenance operations, or during a period of greater than normal enforcement. Every effort should be made to conceal the fact that speeds are being recorded.

Speeds should be observed for at least 100 passenger cars/vans and pickup trucks in each lane in each direction. Speeds of vehicles over four tons in size should not be used in determining altered speed zones. On lower-volume roads where it would be difficult to sample 100 vehicles in each direction, the study may be terminated after three hours. When traffic is travelling in platoons, the speed of the lead vehicle(s) should be used. Following vehicles tend to base their speeds on the lead vehicle. Use of following vehicles will tend to bias the recorded speeds downward. Care should also be taken to avoid recording the speeds of a disproportionate number of high speed vehicles to avoid an upward speed bias.

2. UPPER LIMIT OF THE 10 MILES PER HOUR PACE: The 10 mph pace is defined as the 10 mph range containing the most vehicles. This is determined on the basis of the spot speed studies discussed above.

3. AVERAGE TEST RUN SPEED: Average test run speeds are determined on the basis of five vehicle runs in each direction over the length of the proposed zone. It is not necessary to use an unmarked vehicle, however the use of any vehicle which might be mistaken for a law enforcement vehicle should be avoided. Observations should be made under the same general conditions noted above for spot speed studies. The prime consideration in use of test runs is to approximate the median speed. To accomplish this, the driver should try to "float" in the traffic stream. On multi-lane roads, the driver should pass as many vehicles as pass the test car. Use of test run speed is optional on lower-volume roads and should not be included when determining the prevailing speed for very short zones or for any specific type of vehicle other than passenger cars/vans.

The prevailing speed, to the nearest 5 miles per hour, may be used directly as the Altered Speed Limit, subject to any further adjustment resulting from reviewing the Anticipated Violation Rate as set forth below. However, in certain cases, a lower altered speed limit may be justified on the basis of supplementary investigations.

Optional Supplementary Investigations

The selected Altered Speed Limit may differ from the established prevailing speed (not the proposed posted speed) by up to 9 miles per hour when justified by further investigation. Such investigations shall be limited to studying any or all of the following four conditions:

1. HIGH-CRASH LOCATIONS: If the zone being studied contains a portion of a high-crash segment or contains a high-crash intersection as shown on the most recent 5% report as distributed by the Bureau of Safety Engineering, the prevailing speed may be reduced by 10%.

2. ACCESS CONTROL: The effect of driveways and other entrances is determined by using an "access conflict number." For this purpose, field entrances or driveways to single-family dwellings shall have a conflict number of 1. Minor commercial entrances and driveways serving multi-family residential units and minor street intersections shall have a conflict number of 5. Major commercial entrances, driveways serving large multi-family developments and major street intersections shall have a conflict number of 10. If the total access conflict number within a proposed zone exceeds those shown in the following table, the prevailing speed may be reduced by the percentages indicated.

Access Conflicts Per Mile	Percent Reduction in Speed
40 or less	0
41 - 60	5
61 or more	10

3. PEDESTRIAN ACTIVITY: Where no sidewalks are provided or where sidewalks are located immediately behind the curb and the total pedestrian traffic exceeds ten per hour for any three hours within any eight-hour period, the prevailing speed may be reduced by 5 percent. Pedestrians crossing the route at intersections or established crossing points may be included if the point of crossing is not controlled by a STOP or YIELD sign on the route in question, or does not have traffic signals.

4. PARKING: The prevailing speed may be reduced by 5 percent where parking is permitted adjacent to the traffic lanes.

5. MISCELLANEOUS: Other factors may be included in the investigation based on engineering judgment. Normally, isolated curves and turns, areas of restricted sight distances, no-passing zones, etc., should not to be considered as the basis for alteration of speed limits.

Selection of Altered Speed Limit

To determine the proposed altered speed limit, either use the calculated prevailing speed, or apply the percentage corrections resulting from any or all of the above optional factors to the prevailing speed, and select the closest 5 mile per hour increment. In no case, however, should the proposed altered limit differ either upward or downward from the prevailing speed by more than 9 miles per hour or by more than 20 percent, whichever is less. Next, compare the proposed altered speed limit to the speeds collected in the spot speed study and determine the anticipated violation rate. If the anticipated violation rate exceeds 50 percent, the proposed altered speed limit should be revised in 5 mile per hour increments until the anticipated violation rate is equal or less than 50 percent. If this results in a proposed altered speed limit which exceeds a 30 mph statutory speed for the highway in question, either the statutory speed or the proposed altered speed may be used to set the speed limits. If the speed selected results in a violation rate greater than 50 percent, the appropriate police agency(ies) should be notified that extra enforcement efforts may be necessary.

Differences in posted speeds between adjacent altered speed zones should not be more than 10 miles per hour.

C. Posting of General Speed Limits

Speed Reduction Signs

A Speed Reduction sign (W3-5) shall be erected in advance of any speed zone that is 10 miles per hour or more under the passenger car limit in a preceding statutory or altered limit of 45 miles per hour or more and should be erected at other locations where engineering judgment indicates the need. It shall be placed approximately 500 to 600 feet in advance of the lower speed zone and shall always be followed by a basic speed limit sign erected at the beginning of the zone.

On divided and one-way facilities having two or more lanes in one direction, the Speed Reduction signs, where used, and the first basic speed limit sign for the altered speed zone, shall be installed on both sides of the roadway except in situations where insufficient room exists in a median. Red 18-inch metal retroreflectorized "flags" shall be installed on the Speed Reduction signs preceding any transition from a 60 or 65 miles per hour zone to a lower speed zone.

When speed zones on rural highways extend only through signalized intersections, speed limit signs for the altered zones shall be installed at least 1,000 feet prior to the intersections on both sides of the roadway except in situations where insufficient room exists in a median. Normally, such altered zones should be terminated approximately 500 feet beyond the intersection.

Speed Limit Signs

Speed limit signs shall be posted at points of entry to the state even where the preceding speed limit in the adjacent state is the same. The signs should be placed as close to the state line as possible. On conventional rural highways, speed limit signs should also be posted after major highway intersections, and at such other locations as necessary to ensure that there is at least one sign every 10 miles. On Interstate highways and other full freeways, speed limit signs should be placed following the entrance ramps from all except very closely spaced interchanges, and at such other locations as necessary to ensure that there is at least one sign every 10 miles.

The prohibition on the use of electronic speed detection devices within 500 feet beyond certain speed limit signs in the direction of travel (Section 11-602 of the IVC) shall not be taken into account in the placement of speed limit signs.

The following spacings for speed limit signs are recommended in altered speed zones and for 30 mph zones in urban areas. All speed zones, either altered or statutory, shall be posted on state highways.

Posted Speed	Recommended Sign Spacing
30 mph or less	660 ft to 1,320 ft (2 to 4 blocks)
35 or 40 mph	990 ft to 1,980 ft (3 to 6 blocks)
45 or 50 mph	1,320 ft to 2,640 ft (4 to 8 blocks)
55 mph or above	2 to 10 miles

Some speed limit signs for freeways/expressways where the speed limit differs between trucks over 4 tons and all other vehicles shall include an additional 'Trucks Over 4 Tons' R2-I109 plaque. This plaque shall be installed above the first 55 mph speed limit sign entering the dual speed zone and the first speed limit sign exiting the dual speed zone. Red 18-inch metal retroreflectorized flags shall also be installed on the first 55 mph speed limit sign entering a dual speed zone.

Minimum Speed Limit Signs

A MINIMUM 45 mph speed plaque (R2-I101) shall be placed below each basic 60 or 65 mph speed limit sign (R2-1) for fully access-controlled freeways only. It may be omitted where closely spaced interchanges or volume/capacity restraints make compliance with a 45 mph minimum speed limit impractical. A minimum speed shall not be used with 55 mph or lower speed limits.

SCHOOL SPEED LIMITS

School speed limits on highways under the jurisdiction of the department shall be established on the basis of Article VI of the Illinois Vehicle Code (IVC), Part 7 of the Illinois Manual on Uniform Traffic Control Devices (IMUTCD) and this policy.

Section 11-605 of the IVC allows establishment of 20 miles-per-hour speed limits on streets and highways passing schools or upon any street or highway where children pass going to and from school. Such established limit is to be in effect "On a school day when school children are present and so close thereto that a potential hazard exists because of the close proximity of the motorized traffic..." It further defines school days as beginning at 7 a.m. and ending at 4 p.m. Such a zone may be established for public, private and religious nursery, primary or secondary schools.

An engineering and traffic investigation shall be conducted to determine whether or not a school speed zone is warranted. The investigation shall consider such factors as the existing traffic control, whether school crosswalks are present or not, the type, character, volume and crash history of vehicular traffic, and the ages and numbers of schoolchildren likely to be present. It shall also consider where the children would be located in relation to the traffic.

Speed zones should be limited to those locations where school buildings or grounds devoted primarily to normal school day activities are adjacent to the highway or where groups of children cross the highway on their way to and from a school. Areas devoted primarily to athletic or other extracurricular activities should not be zoned.

The limits of school speed zones should be determined based upon where children are likely to be present and not based upon the limits of the school property. There are situations, primarily in rural areas, where the school-owned property line is some distance from the actual portion of the property occupied by the school and there are no children walking or present along that portion of the property. Establishing a 20 mile-per-hour school speed limit based solely on the location of the property line would be inappropriate. Conversely, it might be appropriate to impose a 20 mile-per-hour school speed limit some distance ahead of the property line where children walk close to the highway on their way to and from school and such path is part of a planned school walk route.

Speed zones should not be established for crossings where schoolchildren are protected by devices such as stop signs or traffic signals. An exception may be made when the speed zone serves to protect children walking on or immediately adjacent to the roadway in the school area.

Speed zones should not be established when the school or school grounds are completely isolated from the highway by means of a fence or other barrier, and no access to the highway is provided. They should also not be established for crossing where an underpass or overpass is provided or for school entrances used for buses or private vehicles carrying children to and from school.

The beginning of a school speed zone should be marked with a school speed limit 20 mph sign (S4-I100 or S4-I101) with a FINES HIGHER sign (R2-6P) mounted underneath. The end of a school speed zone should be marked with the appropriate standard speed limit sign (R2-1) and an END SCHOOL ZONE sign (S5-2) mounted underneath.

If requested by a local agency, CELL PHONE USE PROHIBITED signs (R2-I110) may be placed below Reduced School Speed Limit Ahead signs (S4-5) on state highways provided the local agency has a policy of placing such signs in conjunction with any school speed zones on roads under their jurisdiction. Where Reduced School Speed Limit Ahead signs are not used, the CELL PHONE USE PROHIBITED sign may be installed separately or below the school sign. (S1-1).

WORK ZONE SPEED LIMITS

A. Altered Speed Limits

- All roadway types with no lane closure.

  The existing speed limit should not be lowered when there is no lane closure. A work zone speed limit which matches the existing regulatory speed limit may be established except for intermittent/moving operations and work along ramps.

  If a justification from Section C is met and cannot be immediately corrected, a reduction of up to10 mph should be considered. This reduction shall be based on engineering judgment and shall be approved by the District Operations Engineer.

- Existing 65 or 60 mph - Multilane: Speed Limit Reduction to 55 mph

  55 mph Work Zone Speed Limit signs (see Art. 701.14(b) of the Standard Specifications for Road and Bridge Construction) shall be used to reduce posted speed limits from 65 or 60 mph to 55 mph in construction work zones with lane closures or crossovers as shown on the Highway Standards or as noted in the traffic control plans. For this requirement to be added to an ongoing contract, it must be approved by the District Operations Engineer. Work Zone Speed Limit signs may also be used to reduce the existing speed limit to 55 mph if engineering judgment indicates the reduced speeds are necessary (See Section C). Approval of the District Operations Engineer is required. These signs shall be removed or covered when the reduced speed limit is not applicable.

- Existing 65 or 60 mph - Multilane: Speed Limit Reduction to 45 mph When Workers are Present

  45 mph Work Zone Speed Limit signs (see Art. 701.14(b) of the Standard Specifications for Road and Bridge Construction) within the lane closure shall be used when workers are present in the closed lane adjacent to traffic and are not protected by temporary concrete barrier. This sign may be used in conjunction with other Work Zone Speed signs to drop the 55 mph Work Zone Speed Limit to 45 mph.

If conditions that warrant these signs develop during construction, the signs may be added to the contract upon approval of the District Operations Engineer (See Section C). These signs shall be utilized as indicated in the Highway Standards and as noted by the designer in the traffic control plans. The signs shall be covered, turned or removed when workers are no longer present.

- Existing 45 - 55 mph – Multilane: Work Zone Speed Limit 45 established

  Work Zone Speed Limit signs for existing multilane 45 to 55 mph speed limits shall be as shown on the Highway Standards and as noted in the traffic control plans. The signing changes an existing 45 mph speed limit to a 45 mph work zone speed limit. A reduction in the speed limit beyond 10 mph is not recommended and design changes should be considered that will allow traffic to safely move at 45 mph.

- No Speed Limit Reduction – Multilane with speed limit below 45 mph and lane closure

  The existing speed limit should not be lowered. A work zone speed limit which matches the existing regulatory speed limit may be established except for intermittent/moving operations with a moving lane closure.

  If a justification from Section C is met and cannot be immediately corrected, a reduction of up to 10 mph should be considered. This reduction shall be based on engineering judgment and shall be approved by the District Operations Engineer.

- No Speed Limit Reduction – All 2-Lane roadways with lane closure

  The existing speed limit should not be lowered and a work zone speed limit should not be established.

  If a justification from Section C is met and cannot be immediately corrected, a reduction of up to 10 mph should be considered. This reduction shall be based on engineering judgment and shall be approved by the District Operations Engineer.

B. Increased Fines and Cell Phone Use Restrictions in Work Zones

The applicable highway construction or maintenance speed limit fines are specified in Section 11-605.1 of the IVC. The applicable restrictions of cell phone use in highway construction or maintenance speed zones are specified in Section 12-610.1 of the IVC.

The work zone must be posted according to the requirements for Work Zone Speed Limit signs. For the increased fines and cell phone restrictions to be enforceable, the Minimum Fine Sign, and the WORK ZONE Sign must be present as shown in the applicable Highway Standards.

C. Justifications for Work Zone Speed Limit Reductions

The following may be additional reasons for reducing an existing speed limit in a work zone or for establishing a work zone speed limit in excess of 10 mph below the existing speed limit. This reduction should be based on engineering judgment, documented, and approved by the District Operations Engineer.

- Narrow lane width of 10 feet or less
- Drop-offs
- Temporary road alignment where a design for higher speed operation is not feasible due to space requirements or other factors
- Inadequate sight distance

D. **Posting of Work Zone Speed Limit Signs**

Work Zone Speed Limit Signs shall be posted according to Article 701.14(b) of the Standard Specifications for Road and Bridge Construction, the applicable Highway Standards, and as shown on the design plans. When Work Zone Speed Limit Signs which match the existing regulatory speed limit are installed, the permanent speed limit signs shall be removed or covered. The following reasons should be considered when determining whether to install **optional** work zone speed limit signs where the work zone speed limit matches the existing regulatory speed limit,

- Duration of work
- Ease of installation of work zone speed limit signs and removal or covering of existing speed limit signs
- If there is adequate space to install signs
- If there is adequate sight distance
- If installing optional work zone speed limit signs may put workers in undue danger from traffic

MISCELLANEOUS SPEED POLICIES

A. Blanket Speed Limit Signs

Posting of signs indicating general municipal speed limits, such as "SPEED LIMIT 25 ON VILLAGE STREETS," shall not be used on state highways. Section 11-604 of the IVC requires that speed limit signs be placed "...at the proper place or along the proper part or zone of the highway or street." The Office of Chief Counsel has determined that this requires each individual altered speed zone be signed.

B. Radar Warning Signs

SPEED RADAR TIMED, or other similar signs, shall not be used on state highways. An Illinois Attorney General's Opinion (1966-196) stated that such signs were not necessary for enforcement.

C. Aerial Speed Check Markings

Where requested by the Illinois State Police, aerial speed check markings on state highways may be placed in accordance with the guidelines contained in Section 7-401.21 of the Bureau of Operations Traffic Policies and Procedures Manual.

D. Design, Posted, and Operating Speeds

To prevent potential safety issues, the design speed selected to determine the design features of a roadway should equal or exceed the anticipated posted speed after construction as determined by the requirements of this policy. The designer should coordinate the design speed selection with the District Bureau of Operations anticipated posted speed limit selection. If the proposed design speed will be less than the anticipated posted speed, the designer must choose one of the following approaches:

- Seek a design exception
- Increase the design speed to equal the anticipated posted speed
- Post the project with a legal speed limit equal to the design speed
  (The legal speed limit shall be determined in accordance with:
  Section 625 ILCS 5/11-602 of the Illinois Vehicle Code
  Section 23 CFR 655 of the US Code of Federal Regulations
  The requirements of this policy)

The designer should avoid artificially selecting a design speed low enough to eliminate any design exceptions. For example, if IDOT criteria yield a design speed of 60 mph and one or more geometric features are adequate only for 55 mph, the design speed should be 60 mph and not 55 mph. The designer will then be required to seek design exceptions for 55 mph geometric features.

Curbed Sections

Sections with continuous barrier curbs at or near the edge of pavement should be avoided in areas where operating speeds can be expected to be greater than 45 mph. However, where a speed study justifies a speed limit of 50 mph or greater, the posted limit may be reduced to 45 mph upon the written approval of the District Operations Engineer. If the curbed section is short, such as with channelizing in conjunction with a freeway interchange, the operating speed should be used.

E. Two-Way Left Turn Lanes

Two-way left turn lanes should be avoided in areas where operating speeds can be expected to be greater than 45 mph. However, where a speed study justifies a speed limit of 50 mph or greater, the posted limit may be reduced to 45 mph upon the written approval of the District Operations Engineer.

F. Park Zone Speed Limits

Park Zone speed limits on roads under the jurisdiction of local agencies may be established on the basis of Section 11-605.3 of the IVC and part 2 of the Illinois Manual on Uniform Traffic Control Devices (IMUTCD).

Section 11-605.3 of the IVC allows local agencies to establish Park Zones and Park Zone Speed Limits by ordinance or resolution on streets and highways under their jurisdictions which abut parks. It does not allow the posting of a 20 mph Park Zone Speed Limit along streets or roads under the jurisdiction of the Illinois Department of Transportation.

A reduction in the speed limit along an abutting street under the jurisdiction of the department could be established in accordance with Section 11-602 of the IVC where warranted by a speed study. However, such a reduction in the speed limit would be signed as a normal speed limit and not as a “park zone speed.”

If requested by local agencies, districts may post Illinois Standard W15-I100 PARK ZONE signs on abutting streets and highways under the jurisdiction of the department if the local agency has established and signed a park zone. These signs may be installed regardless of whether a “park zone speed limit” has been established or not.

SPOT SPEED STUDY

DIST: ____ CITY/LOCATION: ____ ROUTE: ____ DATE: ____ DAY: ____

CHECK NO.	RECORDER	HOURS FM: ___M TO: ___M	WEATHER	SURFACE WET DAMP DRY	___ FT. MI. E W N S OF	METER ON E W N S SIDE	TRAFFIC CHECKED: EB WB NB SB	85TH PERCNTLE	UPPER LIMIT 10 MPH PACE	POSTED LIMIT MPH	VIOLATION RATE

NUMBER OF VEHICLES

MPH	5	10	15	20	25	30	35	40	45
20									
21									
22									
23									
24									
25									
26									
27									
28									
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85									

ABOVE 85 MPH, LIST INDIVIDUALLY: ________________

ESTABLISHMENT OF SPEED ZONE
DISTRICT _____

ROUTE: _____ **FROM:** _____

TO: _____ **LENGTH:** _____

CITY: _____ **COUNTY:** _____

I SPOT SPEED STUDIES (Attached)

CHECK NO.	85TH %	UPPER LIMIT 10 MPH PACE

II TEST RUNS

RUN NO.	AVG. SPEED	DIRECTION
1		
2		
3		
4		
5		

III PREVAILING SPEED

85TH % AVG. : _____ MPH
UPPER LIMIT OF
10 MPH PACE: _____ MPH
TEST RUN AVE. : _____ MPH
PREVAILING SPEED: _____ MPH

IV EXISTING SPEED LIMIT

ZONE BEING STUDIED: _____ MPH
VIOLATION RATE: _____ %
ADJACENT ZONE N or W: _____ MPH
LENGTH: _____ MILES
ADJACENT ZONE S or E: _____ MPH
LENGTH: _____ MILES

V ACCESS CONFLICTS

RESIDENTIAL DRIVES: _____ X 1 = _____
SMALL BUSINESS DRIVES: _____ X 5 = _____
LARGE BUSINESS DRIVES: _____ X10 = _____
ACCESS CONFLICT NO. TOTAL: _____

STUDY LENGTH: _____ = _____
(MILES) CONFLICTS / MILE

VI MISC. FACTORS

PEDESTRIAN VOLUME: _____
HIGH-CRASH LOCATION: _____ YES _____ NO
PARKING PERMITTED: _____ YES _____ NO

VII PREVAILING SPEED ADJUSTMENT

DRIVEWAY ADJUSTMENT: _____ %
PEDESTRIAN ADJUSTMENT: _____ %
CRASH ADJUSTMENT: _____ %
TOTAL (MAX 20%): _____ %

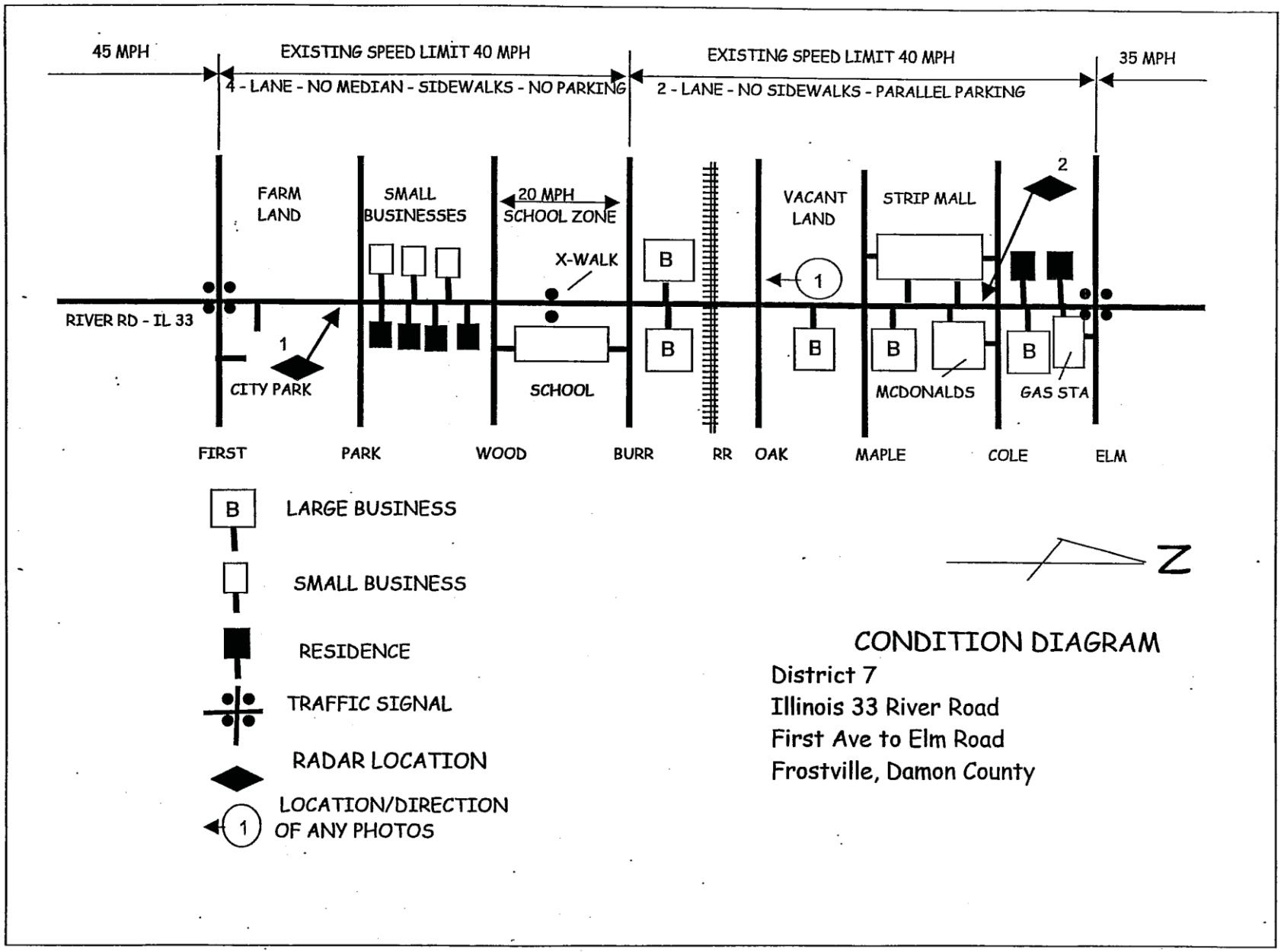
_____ MPH X _____ % = _____
(Prevailing Speed) (adjust.) (Max. 9 MPH)

ADJUSTED PREVAILING SPEED: _____

VIII REVISED SPEED LIMIT

RECOMMENDED SPEED LIMIT: _____ MPH
ANTICIPATED VIOLATION RATE: _____ %

RECOMMENDED BY: _____
DATE: _____
APPROVED BY: _____
DATE: _____


45 MPH
EXISTING SPEED LIMIT 40 MPH
4 - LANE - NO MEDIAN - SIDEWALKS - NO PARKING
EXISTING SPEED LIMIT 40 MPH
2 - LANE - NO SIDEWALKS - PARALLEL PARKING
35 MPH
FARM LAND
SMALL BUSINESSES
20 MPH SCHOOL ZONE
X-WALK
VACANT LAND
STRIP MALL
RIVER RD - IL 33
CITY PARK
SCHOOL
MCDONALDS
GAS STA
FIRST
PARK
WOOD
BURR
RR
OAK
MAPLE
COLE
ELM
LARGE BUSINESS
SMALL BUSINESS
RESIDENCE
TRAFFIC SIGNAL
RADAR LOCATION
LOCATION/DIRECTION OF ANY PHOTOS
N
CONDITION DIAGRAM
District 7
Illinois 33 River Road
First Ave to Elm Road
Frostville, Damon County

Methods and Practices for Setting Speed Limits:
An Informational Report

FHWA Safety Program

U.S. Department of Transportation
Federal Highway Administration

FHWA-SA-12-004

Institute of Transportation Engineers

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16. Abstract

This informational report describes four primary practices and methodologies that are used in establishing speed limits (engineering approach, expert systems, optimization, and injury minimization). It also reviews the basic legalities of speed limits and presents several case studies for setting speed limits on a variety of roads.

Despite the general acceptance and wide-spread use of speed limits throughout the world, there has been no consensus among practitioners concerning the methods and techniques that should be used to select the most appropriate speed limit for a particular facility. At the current time, it appears unlikely that any consensus will be achieved in the near future. This leaves practitioners without definitive guidance on this important issue, and in search of information to assist them. This report provides the information necessary for practitioners to make informed decisions in selecting a method for setting speed limits in their jurisdiction.

This report presents the procedures that highway agencies can and do use to set speed limits. As an informational report it provides a broad overview of the different speed limit setting methods that are available for use, but it makes no specific policy recommendations or suggestions.

Special situations, such as advisory, school zone, and work zone speeds are discussed. Speed limit enforcement and reevaluation of speed limits are discussed briefly. The design speed for the roadway will not be discussed, except as it may relate to the setting of speed limits. This is because design speed is a characteristic of the roadway that is essentially "built-in" to the road, and is not easily modified.

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THE SAFETY OF SPEED

It is important to understand how speed impacts safety, because setting speed limits is primarily a road safety measure. While the laws of physics make it very clear that speed and crash severity are inextricably linked (i.e., severity increases geometrically as speed increases), there has been a good deal of controversy over the impact of speed on crash occurrence. This is primarily because the variety of road design and operating characteristics can obscure the precise relationship between speed and crash occurence. Numerous studies and research efforts on this topic that have presented conflicting results on this important relationship. However, the most recent and statistically robust research on speed and crash occurrence fairly definitively indicates that, all other factors being equal, increased speeds increase crash occurrence.[7] The magnitude of the increase is dependent on the specifics of each case, with urban areas having the most pronounced relationship and controlled-access facilities the weakest.

One of the most statistically robust efforts to uncover the relationship between speed and safety was a meta-analysis conducted by the Norwegian Institute of Transport Economics.[7] The information and conclusions from the meta-analysis form the basis for the statements made in this section.

For a given roadway type, there is a strong statistical relationship between speed and crash risk for speeds in the range of 15 mph to 75 mph (25 km/h to 120 km/h). When the mean speed of traffic is reduced, the number of crashes and the severity of injuries will almost always go down. When the mean speed of traffic increases, the number of crashes and the severity of injuries will usually increase. The relationship between mean travel speed and crash risk can be adequately described in terms of the following model:

$$CMF = \left(\frac{V_a}{V_b}\right)^x$$

CMF = Crash modification factor

V_a = Mean speed in the after condition

V_b = Mean speed in the before condition

X = 3.6 for fatal crash frequency
2.0 for injury crash frequency
1.0 for property-damage-only crash frequency
4.5 for fatalities
2.7 for personal injuries

The relationship between speed and crash risk can be modified to some extent by road environment, vehicle-related factors, and driver behavior. But, the effects of speed on crash risk are remarkably consistent across different contexts.

The above relationship between speed and crash risk is significantly different from the traditional U-shaped relationship that has defined much of the current North American thinking on speed limits and speed management. The U-shaped relationship (Solomon curve) between speed and crash risk can be questioned for two reasons:

1. The U-shape is generally expected to be an artifact of errors in the measurement of speed[8,9]; and
2. There is a strong correlation between mean speed and speed variance, so it is difficult to separate the effects of mean speed and speed variance on crash risk.[10]

This discussion describes the relationship between travel speed and crash risk, but it does not necessarily reflect the relationship between speed limits and crash risk.

A change in the speed limit almost always changes the mean speed of traffic. However, the changes are not always proportional. For the most part, the change in the mean speed of traffic created by a change in speed limit is around 25 percent of the change in the speed limit.[7] In other words, a speed limit increase or reduction of 6 mph (10 km/h) yields about a 1.5 mph (2.5 km/h) raising or lowering of the mean speed, respectively. When this statistic is combined with the power formula equating change in mean speed to crash risk, it is evident that lowering the speed limit will reduce crash risk, and raising the speed limit will increase crash risk.

Whether the safety gains/losses associated with the change in the speed limit is worthwhile must be examined in the context of maintaining reasonable mobility, and other system objectives. In addition, the policy context must be considered because the relationship between travel speed and speed limits indicates that the percentage of violators increases when speed limits are lowered and decreases when speed limits are increased.

SPEED LIMIT BASICS

Setting speed limits in the United States has always been a responsibility of State and local governments. The unrestricted freedom to exercise that authority was interrupted by the Federal Government during World War II, and more recently with the National Maximum Speed Limit of 55 mph (90 km/h). The National Maximum Speed Limit was repealed in 1995.

Every State has a basic speed statute requiring drivers to operate their vehicles at a speed that is reasonable and prudent for conditions. This basic rule is contained in the *Uniform Vehicle Code (UVC)*, which provides a model set of motor vehicle laws to encourage uniformity in State traffic regulation. State statutes authorize maximum speed limits that may vary by highway type (e.g., interstate highways) or location (e.g., urban district).[11]

The *UVC* is a set of model traffic laws that was originally developed by the National Committee on Uniform Traffic Laws and Ordinances (NCUTLO), a now defunct, private, non-profit organization. The NCUTLO's members were mainly State governments and some related organizations. The extent to which the code is used varies by State. The *UVC* and most State motor vehicle laws include a basic speed law with wording similar to the following: No person shall drive a vehicle at a speed greater than is reasonable and prudent under the conditions and having regard for the weather, visibility, traffic, and the surface and width of the roadway.[11]

Article VIII—Speed Restrictions

11-801—Basic rule

No person shall drive a vehicle at a speed greater than is reasonable and prudent under the conditions and having regard to the actual and potential hazards then existing. Consistent with the foregoing, every person shall drive at a safe and appropriate speed when approaching and crossing an intersection or railroad grade crossing, when approaching and going around a curve, when approaching a hill crest, when traveling upon any narrow or winding roadway, and when special hazards exist with respect to pedestrians or other traffic or by reason of weather or highway conditions. (Revised, 1968)

Uniform Vehicle Code and Model Traffic Ordinance, 2000, National Committee on Uniform Traffic Laws and Ordinances, Evanston, Illinois.

Section 11-803 of the *UVC* recommends States establish speed zones upon the basis of an engineering and traffic investigation. Section 11-804 outlines recommended practices on how local authorities may alter maximum limits.[12]

Types of Speed Limits

Speed limits may be classified as default/statutory regulations, or speed zoning regulations established on the basis of engineering studies. In all cases, a speed limit must be legislated (i.e., established by legislative authority).

Statutory Speed Limits

Statutory limits are based on the concept that uniform categories of highways can operate safely at certain maximum speeds under ideal conditions. State motor vehicle laws specify speed limits on specific categories of streets and highways. For example, a vehicle code might limit speeds to 25 mph (40 km/h) in residential areas, 30 mph (50 km/h) in business districts, and 55 mph (90 km/h) on all other roads. Generally, statutory limits apply throughout a political jurisdiction.[11] Table 1 contains examples of statutory limits for three States and for the *Uniform Vehicle Code*.

Table 1. Examples of Speed Limit Statutes

Jurisdiction	Speed Limit Statute
Uniform Vehicle Code	55 mph (90 km/h) in locations other than urban districts 35 mph (60 km/h) in urban districts
Delaware	Where no special hazard exists, the following speeds shall be lawful, but any speed in excess of such limits shall be absolute evidence that the speed is not reasonable or prudent and that it is unlawful: All types of vehicles: 25 mph (40 km/h) in any business district 25 mph (40 km/h) in any residential district 20 mph (30 km/h) at all school zones where 20 mph (30 km/h) regulatory signs are in effect during specific periods 50 mph (80 km/h) on 2-lane roadways 55 mph (90 km/h) on 4-lane roadways and on divided roadways
Minnesota	10 mph (15 km/h) in alleys 30 mph (50 km/h) on streets in urban districts 70 mph (110 km/h) on rural interstate highways 65 mph (105 km/h) on urban interstate highways 65 mph (105 km/h) on expressways 55 mph (90 km/h) on other roads
Oregon	15 mph (25 km/h) – alleys; narrow residential roadways 20 mph (30 km/h) – business districts, school zones 25 mph (40 km/h) – residential districts, public parks, ocean shores 55 mph (90 km/h) – open rural highways, trucks on interstate highways 65 mph (105 km/h) – passenger vehicles, light trucks, motor homes, and light duty commercial vehicles on interstate highways.

Statutory speed limits allow for speed limits to be in effect even when it is not practical to post them.

There are two types of statutory speed limits: (a) absolute limits and (b) *prima facie* limits. The principle difference between the two types is whether someone who is charged with driving over the speed limit can defend her/his actions. An absolute speed limit is a limit above which it is unlawful to drive regardless of roadway conditions, the amount of traffic, or other influencing factors. There is no recourse to contend a charge. A *prima facie* speed limit is one above which drivers are presumed to be driving unlawfully but, if charged with a violation, they may contend that their speed was safe for conditions existing on the roadway at that time. And, therefore, that they are not guilty of a speed limit violation.

Prima facie limits provide greater flexibility to drivers to determine an appropriate speed for conditions and place a greater burden of proof on the enforcement community that a violation has occurred.

Approximately two-thirds of the States have absolute speed limits.[11]

Speed Zones

Where statutory limits do not fit specific road, traffic, or land uses conditions, most road authorities have the power to establish speed zones to reflect the safe maximum reasonable speed. These alternative speed limits may be higher or lower than those prescribed by the *UVC* or the statutory limits of the jurisdiction. Alternative maximum legal speed limits are established by legislating the speed zone, typically founded on the basis of an engineering study, and becoming effective when the limits are posted and properly recorded.[11] Agencies process resolutions, traffic control orders, or other formal documents to properly record the legal speed limit. An example of a Traffic Control Order is shown in Appendix B.

To encourage compliance and effectively manage risk, many agencies set speed limits to reflect the "reasonable and prudent" behavior of the majority of motorists acting in an appropriate manner. This encourages drivers to obey the posted speed limit and travel at a reasonable speed. It also targets limited enforcement resources at the occasional violator who disproportionately contributes to crash risk. The concept of a rational speed limit involves a formal engineering review, during which drivers' free-flowing speeds are observed. The assumption is that by reflecting actual driver speeds, most people will consider the speed limit appropriate. Such speed limits are desirable because they encourage public compliance, reduce speed differences among drivers, and offer a defensible enforcement tool.

SETTING SPEED LIMITS

This section describes the main objectives and guiding principles of setting speed limits and provides a detailed description of the principal available methods.

Speed limits are set to inform motorists of appropriate driving speeds under favorable conditions. Drivers are expected to reduce speeds under certain conditions (e.g., poor visibility, adverse weather, congestion, warning signs, or presence of bicyclists and pedestrians). Legislation and statutes generally reflect this requirement. All speed control regulations provide the legal basis for adjudication and sanctions for violations of the law. Road authorities may also post advisory speed signs, which do not have the force of law but warn motorists of suggested safe speeds for specific conditions at a particular location (e.g., a turn or an intersection approach).[11] Having stated the above, however, a motorist exceeding an advisory speed could still be cited under the basic speed rule (i.e., driving too fast for the prevailing conditions).

The primary purpose of the speed limit is to advise drivers of the maximum reasonable and safe operating speed under favorable conditions. It provides a basis for enforcement and ought to be fair in the context of traffic law.

Methodologies for setting speed limits typically are designed to result in recommended speed limits that:

- Are related to crash risk;
- Provide a reasonable basis for enforcement;
- Are fair in the context of traffic law; and
- Are accepted as reasonable by a majority of road users.

The selected methodology is generally applicable on all road types and capable of being implemented with existing resources.

Factors that affect safe speeds along roadways, and also influence the speed selected by motorists, include:

- A vehicle's mechanical condition and characteristics;
- Driving ability/capabilities;
- Traffic volume: vehicles, pedestrians, and bicycles;
- Weather and visibility;
- Roadway design elements, including:
  - » Road function/purpose;
  - » Lane and shoulder width;
  - » Horizontal and vertical curves;
  - » Available sight distances;
  - » Driveways with restricted visibility and other roadside developments;

    - » High driveway density;
    - » Rural residential or developed areas; and
    - » Paved or improved shoulders.
- Pavement conditions; and
- Crash frequency and severity.

All of these factors should be considered when designing appropriate speed limits at locations where the speed limits need to be varied from the statutory limits. Special situations also exist that necessitate nighttime, school zone, work zone, minimum and variable speed limits or advisory speeds.

The above-mentioned factors to be considered in selecting a speed limit are also heavily influenced by geometric design features of the road and roadside development/activity. This is largely because drivers tend to select operating speeds based on the visual scene presented to them. Therefore, the speed limit and design of the road must work in concert if desired operating speeds are to be achieved.

Due to the lack of specific guidance and procedures from the *Manual on Uniform Traffic Control Devices* (MUTCD) and other documents, engineers often rely on their experience and judgment when considering factors that affect decisions about setting appropriate speed limits. The use of subjective procedures by decision-makers with various levels of experience, and the use of different procedures across jurisdictions, may lead to inconsistencies in how speed limits are set in different jurisdictions.

Methods of Setting Speed Limits

Within the traffic engineering community, there are four general approaches to setting speed limits:

- **Engineering approach:** A two-step process where a base speed limit is set according to the 85th percentile speed, the design speed for the road, or other criterion. This base speed limit is adjusted according to traffic and infrastructure conditions such as pedestrian use, median presence, etc. Within the engineering approach there are two approaches; 1) Operating Speed Method and 2) Road Risk Method.
- **Expert system approach:** Speed limits are set by a computer program that uses knowledge and inference procedures that simulate the judgment and behavior of speed limit experts. Typically, this system contains a knowledge base containing accumulated knowledge and experience (knowledge base), and a set of rules for applying the knowledge to each particular situation (the inference procedure).
- **Optimization:** Setting speed limits to minimize the total societal costs of transport. Travel time, vehicle operating costs, road crashes, traffic noise, and air pollution are considered in the determination of optimal speed limits.
- **Injury minimization or safe system approach:** Speed limits are set according to the crash types that are likely to occur, the impact forces that result, and the human body's tolerance to withstand these forces.

Engineering and expert system approaches are widely used in North America, injury minimization methods are gaining wide-spread use in countries that are at the forefront of global road safety (i.e., Sweden,

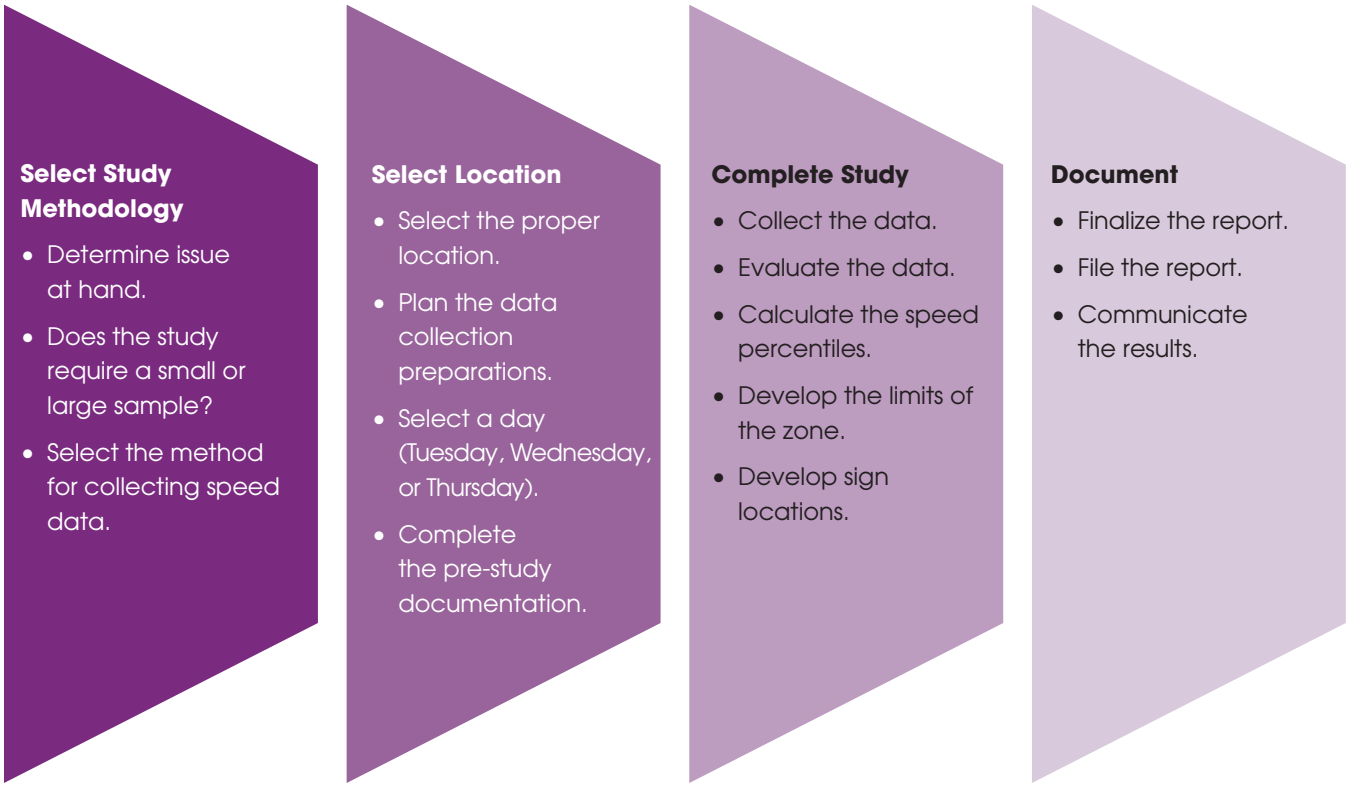

Figure 1. Speed Limit Study Process for Engineering and Expert Systems Methods.

Australia, etc.). The concept of setting optimal speed limits has been studied by some jurisdictions, but is not known to have been adopted by any road authority. However, the optimal speed limits approach seems applicable within the context of providing context sensitive solutions (CSS)—an approach that considers the total context within which a facility will exist—and has been considered for application on some New Jersey roads.[13]

Speed limits set by either an engineering method or an expert system use similar basic tenets. The engineering method is often limited to a basic study, while the expert system approach employs a more structured set of decision and judgment rules. For both methods, the speed limit is determined by considering the existing speed, roadway, and crash information. Figure 1 shows the steps that lead to producing the final report for either an engineering or an expert systems type of speed study.

Speed limit studies are most often undertaken in response to a request for a lower speed limit than currently posted. In some instances, however, the road authority finds itself in the position of recommending a higher speed limit than the one currently posted. In these latter instances, some jurisdictions require a road safety audit be conducted prior to a higher speed limit being approved.[14]

The following sections detail the steps to setting speed limits using the four methods.

Engineering Approach

The steps in the engineering approach to setting speed limits include planning, coordination, data collection and analysis, and finally, determination of the speed limits. A traffic engineering study is the observation and analysis of road and traffic characteristics to guide the application of traffic engineering principles. The study of speed limits includes the following:

- Review of the road's environment, features, and condition and traffic characteristics.
- Observation and measurement of vehicle speeds at one or more representative spots along the road in ideal weather and under free-flowing traffic conditions.
- Analysis of vehicle speeds to determine 85th percentile speed and other characteristics.
- Review of the road's crash history.
- Review of any unusual conditions not readily apparent.

Setting speed limits is complex and often controversial. The engineering approach requires the use of engineering judgment based on the engineering and traffic investigation. Quality data and good documentation provides support for the judgments that are made.

Within the engineering approach to setting speed limits there are two basic methods: the operating speed method and the road risk method. Each of these is detailed below.

Operating Speed Method

Most engineering approaches to speed limit setting are based on the 85th percentile speed—the speed at which 85 percent of free-flowing traffic is traveling at or below. The typical procedure is to set the speed limit at or near the 85th percentile speed of free-flow traffic. Adjustments to either increase or decrease the speed limits may be made depending on infrastructure and traffic conditions.

Setting a speed limit based on the 85th percentile speed was originally based on safety. Specifically, research at the time had shown that traveling at or around one standard deviation above the mean operating speed (which is approximately the 85th percentile speed) yields the lowest crash risk for drivers. Furthermore, crash risk increases rapidly for drivers traveling two standard deviations or more above or below the mean operating speed. Therefore, the 85th percentile speed separates acceptable speed behavior from unsafe speed behavior that disproportionately contributes to crash risk.*

The 85th percentile speed method is also attractive because it reflects the collective judgment of the vast majority of drivers as to a reasonable speed for given traffic and roadway conditions. This is aligned with the general policy sentiment that laws (i.e., speed limits) should not make people acting reasonably into law-breakers. Setting a speed limit even 5 mph (8 km/h) below the 85th percentile speed can make almost half the drivers illegal; setting a speed limit 5 mph (8 km/h) above the 85th percentile speed will likely make few additional drivers legal.

Under the operating speed method of setting speed limits, the first approximation of the speed limit is to set the speed limit at the 85th percentile speed. The MUTCD recommends that the speed limit be within 5 mph (8 km/h) of the 85th percentile speed of free-flowing traffic. The posted speed limit shall be in multiples of 5 mph[15], or 10 km/h for jurisdictions that employ metric.[22]

While the MUTCD recommends setting the posted speed limits near the 85th percentile speed, and traffic engineers say that agencies are using the 85th percentile speed to set speed limits, in reality the speed limit is often set much lower. At these locations, the 85th percentile operating speeds exceed the

* The original research between speed and safety which purported that the safest travel speed is the 85th percentile speed is dated research and may not be valid under scrutiny. See the section titled "The Safety of Speed" for a synopsis of current thinking on the relationship between speed and safety.

posted speed limits; and, in many cases, the 50th percentile operating speed is either near or exceeds that posted speed limit as well.[16] Many agencies deviate from their agency's written guidelines and instead post lower speed limits. According to an ITE Engineering Council Technical Committee survey, these reduced speed limits are often the result of political pressures.[17] ***However, it is important to note that setting speed limits lower than 85th percentile speed does not encourage compliance with the posted speed limit.***[16]

The 85th percentile speed can be adjusted on the basis of engineering and traffic investigation. The following are typical adjustments made by several States:

- Adjustments made for roadway factors and/or crash data may be lower than the 85th percentile speed, but normally no more than 7 mph (11 km/h) lower.[18]
- Adjustments for roadway factors may reduce the 85th percentile speed by as much as 10 mph (16 km/h) below the 85th percentile speed based on sound and generally accepted engineering judgment that includes consideration of the following factors:
  - » Narrow roadway pavement widths (20 feet (6 m) or less, for example).
  - » Horizontal and vertical curves (possible limited sight distance).
  - » Driveways with restricted visibility and other developments (possible limited sight distance).
  - » High driveway density (the higher the number of driveways, the higher the potential for encountering entering and turning vehicles).
  - » Rural residential or developed areas (higher potential for pedestrian and bicycle traffic).
  - » Narrow shoulder widths (constricted lateral movement).
- If the crash rate for a two-year period is much higher than the average for other highways of similar classifications, adjustments are considered.[18]
- Adjustments can be made based on crash data when enforcement agencies will assure a degree of enforcement that will make the speed zone effective.[19]
- A 12 mph (20 km/h) reduction for locations where roadway factors and crash rates are higher than the statewide average.[19]

After the 85th percentile speeds and zone lengths have been selected, some jurisdictions recommend that several test runs be made through the area in both directions driving at the selected speeds. This should show any irregularities in the zoning that need correction before the speed zone is implemented.[19]

The last step in the analysis process for the operating speed method is to draw conclusions based on the observed data and to prepare a report. The report can be elaborate or very basic depending on why the study was performed and how the results will be used.

The use of the 85th percentile speed as the primary criterion for selecting a suitable speed limit is founded on the following fundamental concepts deeply rooted in government and law:

- Driving behavior is an extension of social attitude, and the majority of drivers respond in a safe and reasonable manner as demonstrated by their consistently favorable driving records.
- The normally careful and competent actions of a reasonable person should be considered legal.
- Laws are established for the protection of the public and the regulation of unreasonable behavior on the part of individuals.
- Laws cannot be effectively enforced without the consent and voluntary compliance of the public majority.[20]

The operating speed method has the added advantage that a properly set speed limit will provide residents, businesses, and pedestrians with a realistic expectation of actual vehicular speeds on the street.

Criticisms of the operating speed method of setting speed limits are largely targeted at the use of the 85th percentile speed as the starting point for establishing the speed limit. They include:

- This criterion assumes that motorists are aware of and select the safest speed.
- Drivers are generally bad at accounting for the externalities of their driving.

A further criticism that has been leveled against the 85th percentile speed as a primary determinant of the speed limit is that this practice may lead to an upward drift or creep in average operating speeds over time.[52]

The engineering approach to setting speed limits has manifested itself in North America as the setting of "rational" speed limits. The premise is that speed limits based on a formal, analytical review of traffic flow, roadway design, local development, and historical crash data will result in a high percentage of drivers complying with the speed limit and traveling at about the same speed.

Despite wide-spread use of the operating speed method for setting speed limits in North America, there are few jurisdictions that have quantitative criteria for the adjustments to the 85th percentile speed. For example, how much should a speed limit be reduced if there is a high volume of pedestrian traffic on the street? For the most part, the analyst is to use "engineering judgment" to make such valuations. Two notable exceptions to the qualitative procedures are the *Policy on Establishing and Posting Speed Limits on the State Highway System* by the Illinois Department of Transportation (DOT)[21], and the Northwestern Speed Zoning Technique (which is a procedure used by several municipalities).

The Illinois procedure considers access, pedestrian traffic, curbside parking, and safety performance, in addition to existing speed profile to establish the recommended speed limit. Specific numerical adjustments are specified in the procedure for each of the above criterion. The Illinois procedure is described in Appendix C.

The Northwestern Speed Zoning Technique is similar to the Illinois DOT procedure mentioned above, but it considers a wider range of traffic and infrastructure factors including presence of a median, lane width, vertical alignment, etc. Again, numerical direction is provided concerning the adjustments that are required for different road features, making the process repeatable and reliable. The Northwestern Speed Zoning Technique is detailed in Appendix D.

Road Risk Method

Another method of setting speed limits using an engineering approach is the road risk method in which the speed limit is determined by the risks associated with the physical design of the road and the expected traffic conditions. This method has numerous guises, but the core methodology is to set the speed limit according to the function or classification of the road (which also tends to dictate the design of the road), and then to adjust the speed limit based on the relative risk introduced by various road and roadside design features. This method is currently employed by Canada and New Zealand.

The road risk method is the same as the operating speed method in that a selected base speed limit is adjusted by various factors to determine the recommended speed limit. The main difference between the two engineering methods is that the operating speed method uses the 85th percentile speed as the base speed limit, and the road risk method uses a base speed limit that is predicated on the functional classification of the road and its setting.

Under the road risk method to setting speed limits the level of roadside development and the function of a road are the primary determinants of the appropriate speed limit.[14] Although road geometry is also a factor in determining a speed limit, it is secondary to roadside development. In situations where the road design encourages users to travel at a higher speed than the speed limit determined by roadside development, engineering techniques should be used to lower vehicle speeds. When a road in a built-up area primarily serves through traffic, engineering and access control techniques should be used to provide safety at the higher speeds that will prevail.[14]

Table 2 provides the base speed limits for different land use and road classifications as used in the road risk methodology used in Canada.[22]

Table 2. Base Speed for the Classification and Land Use Combination

Classification		Land Use							
		Rural				Urban			
		Undivided		*Divided*		*Undivided*		*Divided*	
		1 lane per direction	2+ lanes per direction	1 lane per direction	2+ lanes per direction	1 lane per direction	2+ lanes per direction	1 lane per direction	2+ lanes per direction
Arterial	Major	55 mph (90 km/h)	60 mph (100 km/h)	60 mph (100 km/h)	70 mph (110 km/h)	50 mph (80 km/h)		55 mph (90 km/h)	
	Minor	50 mph (80 km/h)	55 mph (90 km/h)	55 mph (90 km/h)	60 mph (100 km/h)	45 mph (70 km/h)		50 mph (80 km/h)	
Collector	Major	45 mph (70 km/h)	50 mph (80 km/h)	50 mph (80 km/h)	55 mph (90 km/h)	45 mph (70 km/h)		50 mph (80 km/h)	
	Minor	35 mph (60 km/h)	45 mph (70 km/h)	45 mph (70 km/h)	50 mph (80 km/h)	35 mph (60 km/h)		45 mph (70 km/h)	
Local		35 mph (60 km/h)				30 mph (50 km/h)			

Lane = through lane

Divided = a median that separates travel lanes of traffic in opposing directions, which may be flush with, raised above, or depressed below adjacent travel lanes

By using the land use and functional classification of the road as the primary determinants of the desirable speed limit, road authorities that use the road risk method are attempting to reconcile the legislated speed of the road with the function of the road.

The road risk method used in New Zealand sets out the method for calculating the speed limit for a section of road from the following information:

- The existing speed limit;
- The character of the surrounding land environment (e.g., rural, fringe of city, fully developed);
- The function of a road (i.e., arterial, collector, or local);
- Detailed roadside development data (e.g., number of houses, shops, schools, etc.);
- The number and nature of side roads;
- Roadway characteristics (e.g., median divided, lane width and number of lanes, road geometry, street lighting, sidewalks, cycle lanes, parking, setback of fence line from the road);
- Vehicle, cycle, and pedestrian activity;
- Crash data; and
- Speed survey data.

The road risk method employed in New Zealand is detailed in Appendix E and includes a working example.

Despite the fact that the road risk method downplays operating speed as a factor in developing the speed limit, it is noted that the road risk method should recommend speed limits that are consistent with operating speeds.

Expert System—USLIMITS2:

An expert system is one approach that can be used to identify the appropriate speed limit for a speed zone. Transportation Research Board's (TRB) *Special Report 254* argues that the expert system approach deserves consideration because it provides a systematic and consistent method of examining and weighing factors other than vehicle operating speeds in determining an appropriate speed limit.[11]

Expert systems aim to mimic the expert's thought process in solving complex problems.

The original expert system for setting speed limits was developed by the Australian Road Research Board and was based on site studies at over 60 locations. The field data were reviewed by a panel of experts who used this information to come up with decision rules for appropriate speed limits for different types of roads and traffic conditions. This information was coded into a computer program which prompts users to respond to a series of questions, which the system uses to recommend a speed limit. It is important to note that the Australian expert system logic is hard coded, and this system does not learn from previous experience, as some other "smart" expert systems do.

Federal Highway Administration (FHWA) developed a knowledge-based expert system for recommending speed limits in speed zones that are considered to be credible and enforceable. The

expert system (known as USLIMITS2) was developed based on results from previous research, responses from practitioners to hypothetical case studies as part of two web-based surveys, input from experts from three panel meetings, and lessons learned from the first generation expert system developed by the Australian Road Research Board for FHWA.

USLIMITS2 is designed to determine speed limits in speed zones on all types of roadways, from rural two-lane segments to urban freeway segments. Speed limits not addressed by the system include statutory limits (such as maximum limits set by State legislatures for interstates and other roadways), temporary or part-time speed limits (such as limits posted in work zones and school zones), and variable speed limits that are raised or lowered based on traffic, weather, and other conditions.

Based on input from the user, USLIMITS2 employs a decision algorithm to advise the user of the speed limit for the specific road section. Appropriate warnings are also provided in a summary report that may suggest that additional information and/or action is necessary to address areas of concern. The system is meant to assist the user in making the speed limit decision for a road segment, but will not make the decision for him or her.

Overview of the Decision Rules and Data Requirements of USLIMITS2

A brief overview of the logic flow and decision rules that are used in the expert system is described in the following section, along with the data requirements. For brevity, flow charts describing the decision rules are not provided here, they are available in the National Cooperative Highway Research Program's (NCHRP) *Research Results Digest 318*.[23] The user is first asked to enter information about the location of the project and then indicate whether the road is a limited access freeway, road section in an undeveloped area, or a road section in a developed area (photographs illustrating the roadway types and definitions are provided in the User Guide, which can be downloaded from http://safety.fhwa.dot.gov/USLIMITS). The following are the roadway types:

- Limited access freeway
- Road section in undeveloped areas
- Road section in developed areas
  - » Residential subdivision/neighborhood street
  - » Residential collector street
  - » Commercial street
  - » Street serving large complexes

After users select the roadway type, they are taken to a window where they are asked to enter the site characteristics. Table 3 shows the site characteristics users are prompted to enter for each road type.

Table 3. USLIMITS2 Data Inputs for Road Types

Road Type	Site Characteristics
Limited access freeway	Operating Speed: 85th percentile speed and 50th percentile speed. Presence/absence of adverse alignment. Is this section transitioning to a non-limited access highway? Section length. Current statutory limit for this type of road. Terrain. Annual average daily traffic. Number of interchanges within this section. Crash statistics (if available).
Road sections in undeveloped areas	Operating speed: 85th percentile speed and 50th percentile speed. Presence/absence of adverse alignment. Current statutory limit for this type of road. Annual average daily traffic. Roadside hazard rating. Number of lanes and presence/type of median. Crash statistics (if available).
Road sections in developed areas	Operating speed: 85th percentile speed and 50th percentile speed. Current statutory limit for this type of road. Annual average daily traffic. Presence/absence of adverse alignment. Area type. Number of driveways in the section. Number of traffic signals within the section. Presence/usage of on-street parking. Extent of pedestrian/bike activity. Crash statistics (if available).

For each roadway type, the program calculates a speed limit using one of two approaches:

Approach 1—Based on operating speeds and results from the crash module.

In the crash module, the user is asked to enter the total number of crashes and total number of injury crashes. In addition, the user is asked to enter the average crash rate and the average rate of injury and fatal crashes for similar sections in the same jurisdiction. If data on average rates are not available, the program makes use of average rates calculated with data from eight States that are part of the Highway Safety Information System (HSIS) (http://www.hsisinfo.org). Using the average crash rate and the average rate of injury and fatal crashes, the program calculates the critical crash rate and critical injury rate at a 95 percent level of confidence.

If the crash or injury rate is higher than the corresponding critical rates, or at least 30 percent higher than the corresponding average rates, the user is asked to indicate if traffic and geometric measures can reduce the crash and/or injury rate in this section. If the user answers "Yes" to this question, the recommended speed limit from this module is the 5 mph (8 km/h) multiple closest to the 85th percentile speed. If the user answers "No" or "Unknown," the recommended speed limit from this module is the 5 mph (8 km/h) increment obtained by rounding down the 85th percentile speed (if crash or injury rate is at least 30 percent higher than the average rate) or closest to the 50th percentile speed (if the crash or injury rate is higher than the critical rate).

Approach 2—Based on operating speeds and other site characteristics (also called safety surrogates).

The surrogates were chosen based on input from the Expert Panel and evidence (based on previous research) of a relationship between these surrogates and crash statistics. For freeways, safety surrogates include interchange spacing and annual average daily traffic (AADT). Based on the research team's judgment in interpreting the results of the work of Bared et al.,[24] recommended speed limits are the following:

- If AADT is higher than 180,000 and the average interchange spacing is between 0.5 and 1 mile (0.80 and 1.6 kms), the recommended speed limit from this approach will be the 5 mph (8 km/h) multiple obtained by rounding down the 85th percentile speed.
- If AADT is higher than 180,000 and the average interchange spacing is less than 0.5 mile (0.8 kms), the recommended speed limit is the 5 mph (8 km/h) multiple closest to the 50th percentile speed.

For other situations in freeways, the recommended speed limit from this approach will be the 5 mph (8 km/h) multiple closest to the 85th percentile speed.

For road sections in undeveloped areas, the roadside hazard rating[25] was selected as the safety surrogate. The recommended speed limits are the following:

- For roadside hazard ratings of 1, 2, or 3, the recommended speed limit is the 5 mph (8 km/h) multiple closest to the 85th percentile speed.
- For roadside hazard ratings of 4 or 5, the recommended speed limit is the 5 mph (8 km/h) multiple obtained by rounding down the 85th percentile speed.

- For roadside hazard ratings of 6 or 7, the speed limit is the 5 mph (8 km/h) multiple closest to the 50th percentile speed.

For road sections in developed areas, extent of pedestrian/bicycle activity, presence/usage of on-street parking, number of traffic signals, and the number of driveways and unsignalized access points were selected as surrogates. Based on the FHWA-sponsored work on the Benefits of Access Management,[26] and the opinions of the Expert Panel, the following rules are used to calculate the recommended speed limit for road sections in developed areas:

If at least one of the following is true, the speed limit is the 5 mph (8 km/h) multiple closest to the 50th percentile speed:

- Signals per mile > 4.
- Pedestrian/bike activity is High (definitions are available in the USLIMITS2 User Guide).*
- Parking activity is High (definitions are available in the USLIMITS2 User Guide).*
- Driveways per mile > 60.

If Driveways per mile > 40 and ≤60, and Signals per mile > 3, and Area Type is (commercial or residential-collector) then the speed limit is the 5 mph (8 km/h) multiple obtained by rounding down the 85th.

For all other conditions, the speed limit is the 5 mph (8 km/h) multiple closest to the 85th percentile speed.

The lower value of the speed limit from Approaches 1 and 2 is reported as the recommended speed limit in the output window. The expert system does not recommend speed limits higher than the 5 mph (8 km/h) increment closest to the 85th percentile speed; it also does not recommend speed limits lower than the 5 mph (8 km/h) increment closest to the 50th percentile speed. The system also provides warnings if the 85th percentile speed is unusually low or high for a particular road type.

In the output window, the program provides the recommended speed limit and some additional warnings depending on the site characteristics that were entered by the user. For example, warnings are provided if the following conditions occur:

- The length of the section is shorter than the minimum section length for the recommended speed limit.
- The final recommended speed limit is higher than the statutory limit for that type of road.
- There is adverse alignment in the section.
- The crash rate is higher than the critical crash rate or at least 30 percent higher than the average crash rate.
- The rate of injury and fatal crashes is higher than the critical injury rate or at least 30 percent higher than the average injury rate.

*Available at http://Onlinepubs.trb.org/onlinepubs/trbnet/acl/NCHRP 0367_FinalReport.pdf.

Appendix F is a sample case study that outlines the data inputs and shows the applicable screens.

USLIMITS2 can be accessed through the Internet at http://safety.fhwa.dot.gov/USLIMITS.

Optimal Speeds

The concept of optimal speed limits is one that suggests speed limits that are optimized from a societal perspective considering the impacts that operating speeds have on the various societal objectives. It is recognized that individual drivers, in most instances, do not consider the risks imposed on others by their choice of driving speeds, or on the cumulative effects of their speed choice on the environment (i.e., fuel consumption, emissions, noise, etc.). The optimal speed for an individual driver may be different from the optimal speed for a community.[27]

Determining socially optimal speed limits is more complicated than calculating speed limits that have been optimized for the individual driver. However, this method is congruent with and considers overall transportation objectives and is thus appealing from a context sensitive solutions (CSS) perspective.

The optimum speed limit is the speed limit that yields the minimum total societal cost, which includes vehicle operation costs, crash costs, travel time costs, and other social costs. This method of setting speed limits is rarely used due to the difficulty of quantifying key variables.

As with any complex topic, whether a system is truly optimal is dependent on the perspective of the analyst. The road user, the taxpayer, the local community, and society all have differing views and values affecting the output of any optimization process. For example, the societal cost of noise caused by motor vehicle operation does not have a fixed price, but has a monetary value that is mainly established by means of stated preference. Motorists would likely place a lower value on noise than a local resident, perhaps leading to different optimal speeds for the same road.

In optimal speed limit setting, a total cost model is developed to express cost per mile of travel as a function of the posted speed limit. The total cost includes crash cost, travel time cost, fuel consumption cost, and vehicle emissions cost. Each of these costs varies with the posted speed limit, and cost curves are obtained based on the relationship between costs and speeds. The optimal speed limit is then determined as the minimum point on the total cost curve. This minimum total cost indicates the minimum social cost of transportation based on a particular set of conditions.

In general, the road user perspective and the taxpayer perspective result in higher speed limits, while the residential perspective results in the lowest. In some cases, particularly for motorways (freeways), variation in the total costs of travel is found to be very small for speeds in the range of 45 to 70 mph (70 to 110 km/h), making the choice of an optimal speed limit in this range almost an individual agency preference.

Optimal speed limits have been explored for use on shared-use roadways in New Jersey.[13] This method of setting speed limits seems particularly useful in situations where pedestrians, cyclists, and motorized traffic share the road, and motorists may not be fully aware of the externalities of their speed on other road users—in particular, the harm borne by pedestrians and cyclists when struck by a motor vehicle moving at a rapid speed. The Yang model for calculating the optimal speed limit is shown in Figure 2.

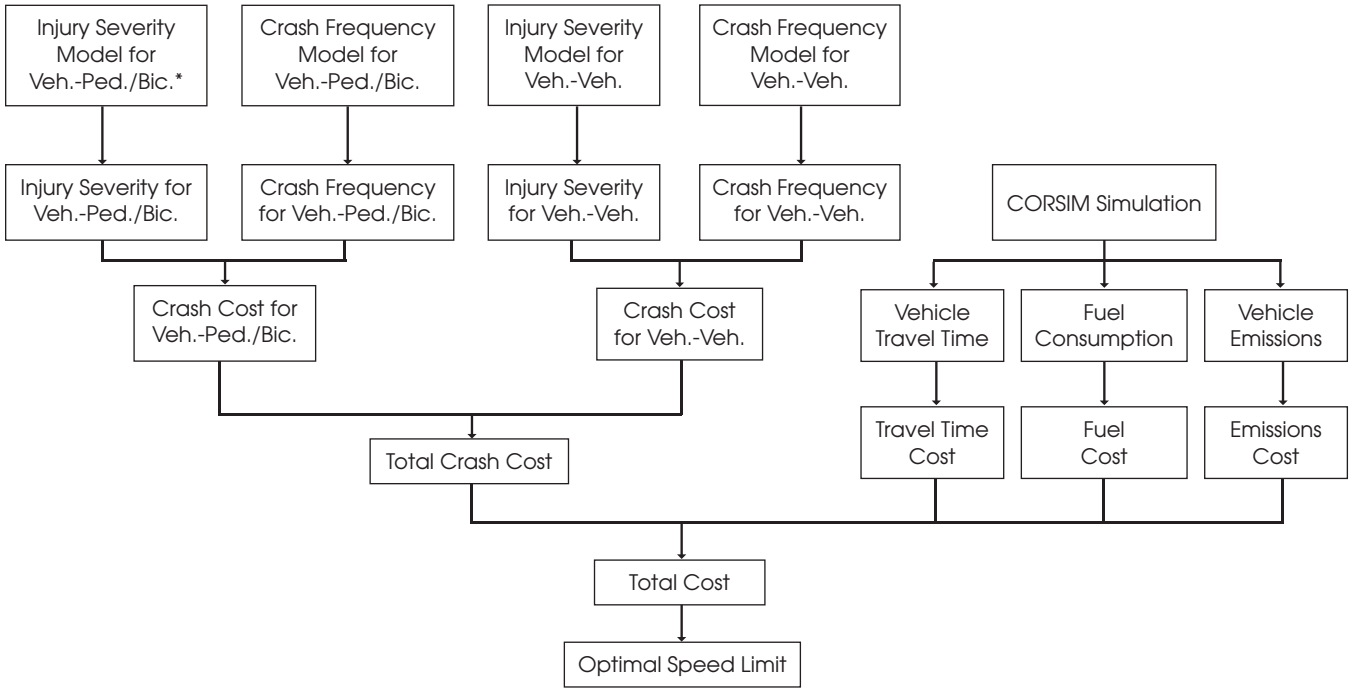

Figure 2. Optimal Speed Limit Process.[13]
*Vehicle-Pedestrian/Bicycle

In addition to the difficulty of achieving consensus on the costs, another characteristic of the optimal speed methodology is that proposed speed limits may not be immediately apparent to road users, they may not be congruent with the design of the road, and ultimately may result in an inordinate percentage of drivers exceeding the speed limit.

The optimal speed limit methodology has also been considered as an appropriate method of setting seasonal speed limits in jurisdictions with snow. The calculation showed that it is possible to apply the optimal speed limits to all road and traffic conditions, except for urban expressways for which the optimal speed limit obtained was too low to be viable.

Injury Minimization

The cornerstone of the injury minimization approach to setting speed limits is the tolerance of the human body to injury during a crash. It is based solely on a road safety platform and takes the position that it is unethical to create a situation where fatalities are a likely outcome of a crash in order to reduce delay, fuel consumption, or other societal objectives.

The principal challenge in an injury minimization approach to speed limits is to manage crash energy so that no user is exposed to impact forces capable of causing death or serious injury. Thus vehicles cannot legally travel at speeds where, in the event of a crash, the release of kinetic energy can produce a serious or fatal injury.[28] Under the current road system and vehicle fleet, this would limit speeds to those shown in Table 4.

Table 4. Speed Limits for Injury Minimization (Adapted from Reference 28)

Road type	Speed Limit, mph (km/h)
Roads with a mix of motorized and unprotected road users (i.e., pedestrians and cyclists)	20 (30)
Roads with uncontrolled access where side impact crashes can result	30 (50)
Undivided roads where head-on crashes can result	45 (70)
Controlled access facilities with a physical median separation, where at-grade access and non-motorized road users are prohibited	>60 (>100)

A safe system strategy does not imply that crashes are caused solely (or even mainly) by speed and it recognizes that any given crash event is likely to be the result of an interplay of many factors. Accordingly, a safe system approach requires that all aspects of the system work together for the safest possible outcome, with speed representing but one component, albeit a critical one.[28]

The injury minimization approach to speed limit setting results in speed limits that are lower than those traditionally used in North America (which are generally set by engineering and expert system methods). Thus implementing an injury minimization approach to speed limits would be problematic. The road authority cannot simply lower the speed limit and expect immediate or substantial compliance. Drivers are unlikely to fully respond except in the face of almost constant enforcement.

As mentioned throughout this report, speed limits need to be credible—they must generally reflect driver expectancies regarding travel speed. So while obtaining safe travel speeds is the prime objective of the injury minimization approach (as well as the major challenge), it should be noted that many jurisdictions need to understand they are starting from a point where driver expectancies result in operating speeds that are higher than the target speeds of an injury minimization approach.

In order to achieve safe speeds and make the associated speed limits credible for the driving population, road authorities need to:

- Make the road and its environment more "self-explaining" through traffic control devices, publicity and education campaigns, and reconstruction where required; and
- Build a case over time for a new paradigm as to what is regarded and legislated as a safe speed limit for the street network.

A summary of each method for setting speed limits and the advantages and disadvantages of each are shown in Table 5.

Table 5. Approaches to Setting Speed Limits

Approach	Jurisdictions	Basic Premise	Data Required	Advantages	Disadvantages
Engineering (Operating Speed)	United States	The speed limit is based on the 85th percentile speed, and may be slightly adjusted based on road and traffic conditions and crash history.	The existing speed profile as well as data on accesses, pedestrian/bicycle traffic, curbside parking, safety performance, etc.	Using the 85th percentile speed ensures that the speed limit does not place an undue burden on enforcement, and provides residents and businesses with a valid indication of actual travel speeds.	Drivers may not be adequate judges of the externalities of their actions, and may not be able to self-select the most appropriate travel speed. Speed limits are often set lower than the 85th percentile speed.
Engineering (Road Risk)	Canada, New Zealand	The speed limit is based on the function of the road and/or the adjacent land use and then adjusted based on road and traffic conditions and crash history.	Functional classification of the road, setting (urban/rural), surrounding land uses, access, design features of the road.	The speed limit and the function of the road are aligned. The function of the road also dictates many of the design elements of the road, so this method aligns the speed limits with the design of the road.	The road risk methods may result in speed limits that are well below the 85th percentile speeds, resulting in an increased burden on enforcement if remedial measures are not employed (i.e., traffic calming, etc.).
Expert System	United States, Australia	Speed limits are set by a computer program that uses knowledge and inference procedures that simulate the judgment and behavior of speed limit experts.	Data needs depend on the system, but generally expert systems require the same data as used in the engineering approaches.	A systematic and consistent method of examining and weighing factors other than vehicle operating speeds in determining an appropriate speed limit. It is reproducible and provides consistency in setting speed limits within a jurisdiction.	Practitioners may need to rely on output from the expert system without applying a critical review of the results.
Optimal Speed Limits	---	The selected speed limit minimizes the total societal costs of transport when considering travel time, vehicle operating costs, road crashes, traffic noise, air pollution, etc.	Cost models and input data to account for air pollution, crashes, delay, etc.	Provides a balanced approach to setting speed limits that is considerate of many (if not all) of the impacts that speed has on society. Allows for the consideration of pedestrian and cyclist traffic in setting speed limits. May be particularly useful in a context sensitive situation.	Data collection and prediction models may be difficult to develop and are subject to controversy among professionals. Resulting speed limits may not be immediately obvious to the user.
Injury Minimization/ Safe System	Sweden, Netherlands	Speed limits are set according to the crash types that are likely to occur, the impact forces that result, and the tolerance of the human body to withstand these forces.	Crash types and patterns for different road types, and survivability rates for different operating speeds.	There is a sound scientific link between speed limits and serious crash prevention. Places a high priority on road safety.	This method is based solely on a road safety premise and may not be accepted as appropriate in some jurisdictions.

Minimum Length of Speed Zones

The length of any section or zone set for a particular speed is typically as long as possible and still consistent with the underlying methodology. Applying minimum road lengths aims to prevent having frequent changes in speed limit along a road with varying characteristics. This section discusses the approaches several jurisdictions take in determining speed zone length.

Massachusetts and Ohio both recommend that the minimum length of a new zone, not contiguous to an existing speed zone, be greater than or equal to 0.5 miles (0.8 kms) in length.[18,29] Extensions of existing warranted zones may be shorter. In rural areas of Massachusetts, each zone in a series of graduated speed zones normally is at least 0.2 miles (0.3 kms) in length, and, if the speed limit is reduced from one zone to the next by 15 mph (25 km/h) or greater, a REDUCED SPEED AHEAD sign is erected in advance of the lower limit in order to inform motorists to adjust their speeds accordingly.[18]

The State of Florida has no required minimum length for any speed zone, rather it is suggested that engineering judgment be applied. With respect to graduated speed limits, the Florida guidelines indicate that the buffer speed zones should not be so short that they require a driver to apply his/her brakes to comply with the posted speed limit.[30]

Graduated or buffer zones may be used on approaches to cities and towns to accomplish a gradual reduction of highway speeds to the speed posted at the city limits. The change in speed between two adjacent zones should not normally be greater than 15 mph (24 km/h), because the change in speed would be too abrupt for driver observance. If adjacent 85th percentile speeds show an abrupt change of more than 15 mph (24 km/h), Texas requires graduated zones, and recommends that a transition zone of approximately 0.2 miles (0.3 kms) or more in length should be used.[19]

States may specify the minimum incremental length of a speed zone. For example, Massachusetts requires all zones to be computed to the nearest tenth of a mile (0.16 kms).[18]

In Texas, school zones are exceptions and may be as short as reasonable in urban areas, depending on approach speeds. School zones in urban areas where speeds are 30 mph (50 km/h) or less may have school zones as short as 200 to 300 feet (60 to 90 meters).[19]

Alaska's general rule for speed zone length is that the minimum length of a speed zone is the distance traveled in 25 seconds at the posted limit. While speed limit changes in Alaska are permitted in increments of 5, 10, or 15 mph (8, 16, or 24 km/h), it is preferable to use 10 or 15 mph (16 or 24 km/h) changes with relatively long zones rather than multiple short zones with 5 mph (8 km/h) increments. When multiple speed studies made on a continuous segment of road result in 85th percentile speeds within 5 mph (8 km/h) of each other, the results are typically averaged to minimize the number of speed limit changes. It may be helpful to plot a speed profile along a road using the 85th percentile speeds from the spot speed checks. Different combinations of speed zone lengths and speed limit change increments may then be compared to see which combination minimizes the number of speed limit changes while still conforming as closely as practical to spot speeds.[31]

The Canadian guidelines for setting speed limits recommend a minimum length of speed zone of 0.6 miles (one kilometer) where the speed limit is 45 mph (70 km/h) or higher. Shorter lengths may be used at slower speeds, but speed zone lengths of less than one-third of a mile (500 meters) should be avoided.[22]

Practice in Australia and New Zealand is to vary the minimum length of a speed zone with the proposed speed limit. To provide reasonable consistency while avoiding excessive variations in speed limits, a balance needs to be achieved between:

- Roadside development;
- Road environment; and
- The number of changes of speed limit.

The desirable minimum typical lengths, shown in Table 6, have been developed with these needs in mind.[32]

Table 6. Minimum Lengths of Speed Zones in New Zealand

Speed Limit, mph (km/h)	Minimum Length of Zone, miles (km)
25 (40)	0.1 (0.2)
30 (50)*	Not applicable**
30, 35 (50, 60)	0.3 (0.5)
45, 50, 55 (70, 80, 90)	1.25 (2.0)
60 (100)	2.0 (3.0)
70 (110)	6.0 (10.0)

*This is the urban default limit.
**If urban default limit is used the minimum length of the zone is not used in this procedure.

The level of development should be reasonably consistent along the entire length of a speed limit, especially in areas with sparse development. For example, it is not appropriate to install a 0.3 mile (500 m long), 45 mph (70 km/h) speed restriction in a rural area if the only development is located in a 300-foot (100 m) section of road in the middle of the proposed speed limit. In these circumstances, road users see no reason for the change in speed limit, compliance will be poor, variations in operating speeds will increase, and judgments of speed and distance become more difficult for all road users. Such conditions will usually contribute to a reduction in safety, especially for pedestrians and cyclists.[14]

Table 7. Minimum Length of Road for a Speed Limit [14]

Speed Limit, mph (km/h)	Nature of Road and Adjacent Speed Limits	Minimum Length, miles (kms)
30 (50)	Urban street, adjacent speed limits 45 mph (70 km/h) or less. Urban fringe, adjacent speed limits greater than 45 mph (70 km/h).	0.3 (0.5) 0.6 (1.0)
35 (60)	Urban arterial route, adjacent speed limits 50 mph (80 km/h) or less. Other situations.	0.6 (1.0) 0.3 (0.5)
45 (70)	Partly built-up, adjacent speed limits 50 mph (80 km/h) or less. Other situations.	0.6 (1.0) 0.3 (0.5)
50 (80)	Arterial route, adjacent speed limits 45 mph (70 km/h) or less. Other situations.	0.6 (1.0) 0.5 (0.8)
60 (100)	All situations.	1.2 (2.0)

All boundary points between speed limits must be at, or close to, a point of significant change in the roadside development or the road environment to emphasize the change in speed limit. Appropriate locations include a marked change in the level or type of roadside development, a change in the road geometry, a bridge, a threshold or other feature that affects speed (e.g., a roundabout or a curve). A threshold treatment may be necessary to reinforce a change in the speed limit where there is no obvious change in the road environment.

Special Situations

Several situations not covered earlier in this document are covered in this section. Certain geometric conditions, school zones, and work zones are examples of situations that may require considerations in addition to the concepts already presented.

Advisory Speeds

Advisory speeds are used on short sections of road where the physical conditions of the roadway restrict safe operating speed to something lower than the maximum legal speed (e.g., a horizontal curve). Advisory speeds are typically used because the feature that dictates the lower speed is isolated, and it is not feasible or desirable to adjust the legal speed for a short section of road. The posted regulatory speed limit is not lowered to conform to the advisory speed. Similarly, an advisory speed within a regulatory speed zone is not posted if the advisory speed is higher than the posted speed limit.

In erecting advisory speed signs, care should be taken not to install a regulatory speed limit sign so near the advisory speed sign that drivers may become confused by two different speed values. More importantly, regulatory speed signs should not be located between an advisory speed sign and the location to which the advisory speed applies.[19] The separation between signs should be in accordance with the MUTCD.

The most common use of advisory speeds is on horizontal curves. More information on advisory speeds can be found in the ITE Informational Report *Methodologies for the Determination of Advisory Speeds* and the FHWA handbook *Procedures for Setting Advisory Speeds on Curves*.[38, 49]

Nighttime Speed Limits

Speeds are normally posted on the basis of daylight speed values determined under good weather conditions. It is permissible, however, for different day and night speeds to be posted for speed zones where it can be shown to be necessary by an engineering study.

Nighttime speed limits generally begin 30 minutes after sunset and end 30 minutes before sunrise, although this may vary by jurisdiction. Nighttime speed limits are generally established on roads where safety problems require a speed lower than what is prescribed by the daytime limit, and the operating speed that is self-selected by drivers. Examples of roads that might require nighttime speed limits are non-illuminated roads with relatively high operating speeds and an overrepresentation of crashes during "dark" environmental conditions, or roads crossing the routes and movement patterns of large-sized, nocturnal wildlife.

Where different speed limits are prescribed for day and night, both limits shall be posted. A Night Speed Limit sign (R2-3)* may be combined with or installed below the standard Speed Limit (R2-1) sign.[15]

School Zone Speed Limits

Reduced speed limits should be considered for school zones during the hours when children are going to and from school. Usually such school speed zones are only considered for schools located adjacent to highways or visible from highways. However, school-age pedestrian activity should be the primary basis for implementing reduced school zone speed limits. This includes irregular traffic and pedestrian movements that may result from children being dropped off and picked up from school.[19]

A review of U.S. State school zone speed limits showed that most States use a school zone speed limit of 15 to 25 mph (25 to 40 km/h) in urban and suburban areas, with 20 mph (30 km/h) being the most common.[39] VicRoads Australia proposes the following:

- Outside schools on 30 mph (50 km/h) roads: A permanent 25 mph (40 km/h) speed limit. In some special cases, such as on high traffic volume streets, a time-based 25 mph (40 km/h) limit may be applied.
- Outside schools on 35 and 45 mph (60 and 70 km/h) roads: A time-based 25 mph (40 km/h) speed limit that is in effect during school entry and exit times on school days.
- Outside schools on 50, 55 and 60 mph (80, 90 and 100 km/h) roads: A time-based 35 mph (60 km/h) speed limit that is in effect during school entry and exit times on school days.[40]

Since school zone speed limits are active only for certain times of the day, it is desirable that the school zone speed limit be no more than 12 mph (20 km/h) below the speed limit on the approaches. This removes the requirement for a MAXIMUM SPEED AHEAD sign (which would only be valid when the SCHOOL ZONE MAXIMUM SPEED sign is activated).[41]

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*Numbers in parentheses refer to the corresponding sign number in the MUTCD.

Ultimately, school zone speed limits, like other speed limits, ought to be based on an engineering study and traffic investigation to determine whether they are warranted, as well as an appropriate reduced speed limit for the study area. The investigation normally considers factors such as existing traffic control, whether school crosswalks are present, the type and volume of vehicular traffic, the ages and volume of school children likely to be present, and the location of children in relation to motorized traffic. The most common factors considered in the engineering study are:

- Children walking along or crossing the roadway;
- Fencing around school property;
- Number and size of gaps in traffic for school-age pedestrians to cross the street;
- Presence of crossing guards;
- Average pedestrian demand per appropriate gap;
- Student enrollment at the school;
- Location of school property (i.e., abutting the road allowance or visible from street); and
- Presence of sidewalks.

A School Speed Limit assembly or a School Speed Limit (S5-1) sign shall be used to indicate the speed limit where a reduced speed zone for a school area has been established (in accordance with law based upon an engineering study) or where a speed limit is specified for such areas by statute.[15] The School Speed Limit assembly or School Speed Limit sign shall be placed at, or as near as practical, the point where the reduced speed zone begins. According to the MUTCD, the reduced speed zone should begin either at a point 200 ft (120 m) in advance of the school grounds, a school crossing, or other school-related activities. This distance should be increased if the reduced school speed limit is 30 mph (50 km/h) or more below the speed limit on the approach.[15] Local regulations may provide more stringent guidance, requiring greater distances than specified above.

The School Speed Limit assembly shall be either a fixed-message sign assembly or a changeable message sign. The fixed-message School Speed Limit assembly shall consist of a top plaque (S4-3P) with the legend SCHOOL, a Speed Limit (R2-1) sign, and a bottom plaque (S4-1P, S4-2P, S4-4P, or S4-6P) indicating the specific periods of the day and/or days of the week that the school speed limit is in effect.[15]

A Reduced School Speed Limit Ahead (S4-5, S4-5a) sign is normally used to inform road users of a school zone speed limit where the speed limit is 10 mph (15 km/h) or more below the speed limit on the approach road, or where engineering judgment indicates that advance notice is appropriate. If used, the advance warning assembly is typically installed not less than 150 ft (45 m) nor more than 700 ft (210 m) in advance of the school grounds or school crossings.

The end of an authorized and posted school speed zone shall be marked with an End School Speed Limit (S5-3) sign and may be marked with a standard Speed Limit sign showing the speed limit for the section of highway that follows.[15]

Work Zone Regulatory Speeds

Traffic control in work sites is designed on the assumption that drivers will only reduce their speeds if they clearly perceive a need to do so; therefore, reduced speed zoning ought to be avoided as much as practicable. Speed Limit signs are erected only for the limits of the section of roadway where speed reduction is necessary for the safe operation of traffic and protection of construction personnel. The reduced speed limits are effective only within the limits where signs are erected. If reduced speed limits are not necessary for the safe operation of traffic during certain construction operations or those days and hours when the contractor is not working, the regulatory construction Speed Limit signs are typically made inoperative. In selecting the speeds to be posted, consideration is given to safe stopping sight distances, construction equipment crossings, the nature of the construction project, and any other factors which affect the safety of the traveling public and construction workers.

The regulatory Speed Limit sign (R2-1) shall be used.[19]

Truck Speed Limits

Speeds are normally posted on the basis of all motorized traffic. It is permissible, and in some cases desirable, for trucks and other heavy commercial vehicles to have different (i.e., lower) maximum speeds than passenger cars. The need for a lower speed limit for trucks is primarily demonstrated as necessary by an engineering study considering factors such as magnitude and length of roadway grades, horizontal curvature, etc. Where different speed limits are prescribed for trucks and passenger cars, both limits shall be posted. A Truck Speed Limit sign (R2-2) may be combined with or installed below the standard Speed Limit (R2-1) sign.[15]

The safety effectiveness of differential speed limits for trucks is inconclusive.

Minimum Speed Limits

Minimum speed limits are generally justified when studies show that slow-moving vehicles on any part of a highway consistently impede the normal and reasonable movement of traffic to such an extent that they contribute to unnecessary lane changing or passing maneuvers. The maximum speed limits and the need for minimum speed limits must be determined from the same speed check data. Whenever minimum speed zones are used, the minimum posted speed should be within 5 mph (8 km/h) of the 15th percentile value.[19] The Minimum Speed Limit (R2-4) sign may be installed below a Speed Limit (R2-1) sign to indicate the minimum legal speed. If desired, these two signs may be combined on one sign panel (R2-4a).[15]

Variable Speed Limits

Variable speed limits are speed limits that change, using dynamic sign messages, based on road, traffic, and weather conditions. Variable speed limits offer considerable promise in restoring the credibility of speed limits and improving safety by restricting speeds during adverse conditions. Variable speed limit systems may use sensors to monitor prevailing traffic and/or weather conditions, and input from transportation professionals and law enforcement in posting appropriate enforceable speed limits on dynamic message signs.

The most common conditions that warrant variable speed limits are traffic congestion, road construction, incident management, fog, snow, ice, and other weather-related situations.

Variable speed limits are being successfully used in Europe, and are used or are being tested by several State departments of transportation such as Colorado, New Jersey, Utah, Washington, and Wyoming. The speed limit that is to be posted depends on the purpose for installing the variable speed limit. In cases where congestion or post-incident management are the impetus for use, the recommended speed limit for the condition is generally a function of the average speed of traffic, and an attempt to minimize speed differentials in the traffic stream. Weather-related variable speed limits often are determined by an algorithm that uses data gathered from road weather monitoring stations.

Transition Zone Speed Limits

Transition zone speed limits are generally considered when there is a speed reduction of more than 25 mph (40 km/h) between adjacent zones, and may be considered at other locations if a field assessment has determined that a transition zone speed limit may improve safety or traffic operations. The following factors may be considered in determining the need for a transition zone speed limit:

- Roadway operating speeds in advance of speed reduction.
- Existing operational/safety issues (i.e., due to speed differential between vehicles, speed exceeding that which is considered suitable for the roadway environment).
- History of overly aggressive braking at the entrance to the reduced speed limit area.
- Low speed limit compliance in the lower speed limit area.
- Expected compliance with a transition speed zone (i.e., will motorists perceive it to be justified by the surrounding roadway environment?).

In situations where rural roads approach and continue through urban areas and villages, there is a need for a commensurate reduction in the speed limit that reflects the change in the roadway and the roadside character. In many instances these speed transitions can be sizable, and the road authority needs to post an intermediate or transition zone speed limit to assist drivers in slowing down.

Transition zone speed limits are typically set to divide the overall speed reduction approximately in half. For instance, a speed limit decrease from 60 mph (100 km/h) to 30 mph (50 km/h) might use a transition speed limit of 45 mph (70 km/h) or 50 mph (80 km/h).

The minimum transition speed zone length usually allows for the placement of REDUCED SPEED AHEAD signs and a sufficient speed zone length to achieve compliance.

An excellent source of information on high-to-low speed transition zones that includes speed limits and other measures is available from the National Cooperative Highway Research Program.[50]

Seasonal or Holiday Speed Limits

A seasonal or holiday speed limit applies for a specified period or periods during a year, generally at locations with significantly different levels of roadside activity at different times—for example, a beach resort that is popular in summer, but only sparsely populated for the remainder of the year. Typically, when the level of activity is at its highest, a relatively low speed limit would be appropriate, while the level of activity would justify the relatively high speed limit otherwise.

Reevaluation

After a speed limit is established, changes in the roadway geometry, land uses, or other circumstances could prompt a need for further study to determine if the limit needs to be raised or lowered. The MUTCD recommends that engineering studies be conducted to reevaluate non-statutory speed limits on roads that have undergone significant changes since the last review, such as the addition or elimination of parking or driveways, changes in the number of travel lanes, changes in the configuration of bicycle lanes, changes in traffic control signal coordination, or significant changes in traffic volumes.[15] ITE provides similar guidance regarding the importance of revisiting sites to conduct speed studies every five years or when changes are made to roadways to ensure that the speed limits are still appropriate.[17]

In Texas, periodic rechecks of all zones are desirable at intervals of about three to five years in urban areas regardless of roadway improvements, roadside developments, or increases in traffic volumes. Trial runs or rechecks of every third speed check station may be made. In rural areas, rechecks are desirable at intervals of 5 to 10 years. In many instances, trial runs may be sufficient. If the speed checks or trial runs indicate a need for revision of the zone, rechecks of speeds should be made at all speed check stations for that particular section and a revised strip map made and submitted.[19]

Massachusetts recommends that consideration be given to revising numerical limits that vary by 7 mph (11 km/h) from the 85th percentile speed when rechecks are performed. They also feel it is beneficial to make a comparison of the crash experience for zones that have been in effect for a year or more.[18]

SPEED LIMIT ENFORCEMENT

While a properly selected speed limit is hopefully self-enforcing, the reality is that an effective speed limit generally relies in part on enforcement of the limit. The engineering community has four main roles in speed enforcement:

- Communicate with those responsible for enforcement during the setting of speed limits;
- Provide data to enforcement officials so they may effectively deploy enforcement resources;
- Provide and maintain automated speed enforcement (ASE) equipment and technologies (where allowed); and
- Integrate features in the road design to facilitate speed enforcement (i.e., laybys and median openings that assist enforcement personnel).

Because speed limits and enforcement are intertwined, it is important for the road authority to liaise with enforcement personnel before setting a speed limit for a facility. Enforcement personnel have experience and unique insights into the enforceability of speed limits that may be used to ensure that rational speed limits are applied.

Speed enforcement is essentially a crash countermeasure and therefore benefits from a proper understanding of the persons, place, time, and conditions that foster speeding. Engineering personnel can provide speed and crash data as well as citizen complaints to enforcement personnel so that appropriate enforcement strategies are identified. This data-driven approach to resource deployment can target specific scenarios of speeding or types of speeding activities (e.g., commuters, after-school, racing, deliveries, etc.).

Automated speed enforcement uses equipment to monitor speeds and photograph offenders to produce citations that are mailed to the registered owner of the vehicle. ASE is particularly effective at locations where the roadway geometry or traffic volumes make it difficult to use more traditional methods (e.g., requiring a traffic stop). This strategy requires enabling legislation, if such legislation has not already been passed. NHTSA's *Speed Enforcement Camera Systems Operational Guidelines* is a useful reference.[48]

The engineering community is generally involved in ASE, as it requires speed cameras that are maintained by the road authority. In all cases, enforcement personnel need to be involved and an integral part of any ASE activities.

A combination of the various enforcement strategies described above, in addition to engineering and communications countermeasures, may contribute to ongoing compliance with the speed limit. When an effective speed enforcement program is sustained, it can continue to deter speeders. The NHTSA and FHWA *Speed Enforcement Program Guidelines* is a useful reference.[42]

APPENDIX A: GLOSSARY

The following definitions are provided to aid in the understanding of setting speed limits. They may or may not coincide with terms and definitions found in related State statutes.

10 mph Pace: The 10 mph pace is the 10 mph range encompassing the greatest percentage of all the measured speeds in a spot speed study.

85th Percentile Speed: The 85th percentile speed is the speed at or below which 85 percent of the free-flowing vehicles travel.

Advisory Speed: Advisory speeds warn drivers to proceed at a speed lower than the speed limit due to geometrics, surface, sight distance, or other conditions.

Annual Average Daily Traffic: Commonly abbreviated as AADT, the total number of vehicles traversing a point or facility in one year divided by 365.

Average Speed: The average (or mean) speed is the most common measure of central tendency. Using data from a spot speed study, the average is calculated by summing all the measured speeds and dividing by the sample size.

Design Speed: The design speed is a selected speed used to determine the various geometric design features of the roadway.

Differential Speed Limit: A system that prescribes different maximum speed limits for different vehicle types or user groups. This is usually applied as one maximum speed limit for light passenger vehicles, and a lower maximum speed limit for trucks and heavy commercial vehicles.

Free-flow Speed: Free-flow speed is the speed a driver chooses when there are no influences from other vehicles, conspicuous enforcement, or environmental factors; in other words, this is the speed the driver finds comfortable based on the appearance of the road.

Injury Minimization Speed Limit: Also known as a speed limit for safe systems, it is a speed limit that is set so that the forces experienced by the human body in the event of a crash will not exceed biomechanical tolerances resulting in death or a severe personal injury.

Optimal Speed Limit: A speed limit that yields the minimum total cost to society, including vehicle operating costs, crash costs, travel time costs, and other societal costs.

Rational Speed Limit: A speed limit that is based on a formal, analytical review of traffic flow, roadway design, local development, and crash data. For existing roads, it uses the 85th percentile speed of free-flowing vehicles operating under normal traffic, weather, and roadway conditions as the speed limit, adjusted down by factors that can affect safety, such as road design features and roadside development and are not readily apparent to the motorist. The analysis also considers crash history and the influence of speed as a contributing factor. The 85th percentile speed is based on the premise that the vast majority of drivers will select a speed that is reasonable, safe, and prudent for a given road. Drivers who exceed the 90th percentile have a significantly higher risk of crashing.

Road Safety Audit: A formal safety performance examination of an existing or future road or intersection by an independent audit team.

Speed Dispersion: The speed dispersion refers to the normal spread in vehicle speeds observed in a study section.

Speed Limit, Absolute: An absolute speed limit is a numerical value, the exceeding of which is always in violation of the law, regardless of the conditions or hazards involved.

Speed Limits, Environment: An environmental speed limit is a speed limit created for the purpose of meeting federal air quality standards.[19]

Speed Limit, Posted: The posted speed limit is the value conveyed to the motorist on a black-on-white regulatory sign. Standard engineering practice is to post speed limits for freeways, arterials, and any roadway or street where speed zoning has altered the limit from the statutory value.

Speed Limit, Prima Facie: A prima facie speed limit is one above which drivers are presumed to be driving unlawfully. Nevertheless, if charged with a violation, drivers have the opportunity to demonstrate in court that their speed was safe for conditions at the time and not in violation of the speed limit, even though they may have exceeded the numerical limit.

Speed Limits, Statutory: Numerical speed limits specifically provided for under a State's traffic codes that apply to various classes or categories of roads (e.g., rural expressways, residential streets, primary arterials, etc.). State laws may or may not require that these limits be posted.[15]

Speed Zoning: Speed zoning is the process of performing and engineering a study and establishing a reasonable and safe speed limit for a section of roadway where the statutory speed limits given in the motor vehicle laws do not fit the road or traffic conditions at a specific location.

Speeding: The legal definition of speeding is exceeding the posted speed limit. In the road safety community, speeding is defined as exceeding the posted speed limit or speed too fast for conditions.

Test Run: A speed test run is performed by driving through a study area (potential speed zone) at a reasonable free-flow speed and collecting speed data, then using this data to confirm speed limits or speed data collected from other vehicles in the study area.

APPENDIX C: ILLINOIS POLICY ON SETTING SPEED LIMITS

(The material in this section is adapted from Policy on Establishing and Posting Speed Limits on the State Highway System, *published by the Illinois Department of Transportation (March 2011).)*

Illinois statutes and the *State Manual on Uniform Traffic Control Devices* require that speed limits other than statutory speed limits be based on "… an engineering study that has been performed in accordance with traffic engineering practices. The engineering study shall include an analysis of the current speed distribution of free-flowing vehicles."

The following procedure ***shall*** be used to determine speed zones on streets and highways under the jurisdiction of the DOT. The same procedure is recommended for local agencies.

STEP 1: Establish the Prevailing Speed

The prevailing speed is the average of the following three metrics, measured during free-flowing traffic conditions:

- *85th Percentile Speed:* The speed at or below which 85 percent of the vehicles are traveling.
- *Upper Limit of the 10 mph Pace:* The 10 mph range containing the most vehicles.
- *Average Test Run Speed:* Determined on the basis of five vehicle runs in each direction over the length of the proposed speed zone.

The prevailing speed is the nearest 5 mph increment to the average of the above three values.

STEP 2: Supplementary Investigations (Optional)

Adjustment factors for determining the proposed posted speed limit may be determined by further investigation of any or all of the following four conditions:

- Elevated Crash Risk: If the speed zone being studied contains a portion of a high-crash segment or contains a high-crash intersection as determined by the Bureau of Safety Engineering, the prevailing speed may be reduced by 10 percent.
- Access Control: The access conflict number (ACN) is calculated for the speed zone, and this number is used to determine the percent reduction of the prevailing speed as shown below.

ACN*	Reduction (%)
< 40	0
41 to 60	5
> 60	10

$$*ACN = \frac{N_s + 5N_m + 10N_i}{L}$$

Where:

N_s = Number of field entrances and driveways to single-family dwellings

N_m = Number of driveways to minor commercial entrances, multi-family residential units, and minor street intersections

N_i = Number of driveways to major commercial entrances, large multi-family developments, and major street intersections

- Pedestrian Activity: Where no sidewalks are provided or where sidewalks are located immediately behind the curb and the total pedestrian traffic exceeds 10 per hour for any 3 hours within any 8-hour period, the prevailing speed may be reduced by 5 percent. Pedestrians crossing the route at intersections or established crossing points may be included if the point of crossing is not controlled by a STOP or YIELD sign on the route in question, or does not have traffic signals.
- Parking: The prevailing speed may be reduced by 5 percent where parking is permitted adjacent to the traffic lanes.

The adjustment factors from the four different factors are added together to produce a single percentage adjustment that shall not exceed 20 percent.

Step 3: Selection of Preliminary Speed Limit

The preliminary speed limit is either the calculated prevailing speed (from Step 1), or if the optional investigation was undertaken, it is the prevailing speed as adjusted by application of the percentage corrections from the optional investigation (Step 2). The following rules apply to the outcome:

- The preliminary posted speed limit should be the closest 5 mph increment to the (adjusted) prevailing speed.
- The preliminary posted speed limit shall not differ from the prevailing speed (from Step 1) by more than 9 mph or by more than 20 percent, whichever is less.

Step 4: Violation Check

Using the spot speed data collected in Step 1, determine the median speed (the 50th percentile). The proposed speed limit should be either the preliminary posted speed limit or the 50th percentile speed, whichever is greater.

If the proposed speed limit exceeds the statutory speed limit for the highway in question, either the statutory speed or the proposed speed limit may be posted. If the selected speed limit results in a violation rate greater than 50 percent, the appropriate police agency(ies) should be notified that extra enforcement efforts may be necessary.

It is noted that differences in posted speeds between adjacent speed zones should not be more than 10 mph. However, the Illinois policy permits a larger difference provided that adequate speed reduction signs are posted.

CITY OF BLOOMINGTON
REPORT FOR THE TRANSPORTATION COMMISSION
August 21, 2018

CASE NUMBER:	SUBJECT:	ORIGINATING FROM:
INFORMATION	**Summary of Citizen Comments/Complaints Received June and July, 2018**	**Philip Allyn, PE, PTOE City Traffic Engineer**
REQUEST:	**Item submitted as information for the Transportation Commission. Any feedback or comments are welcome.**	

STAFF RECOMMENDATION: N/A

Staff submits the following information to the Commission. Any comments or feedback is appreciated.

1. ATTACHMENTS:

a. None

2. BACKGROUND AND SUPPLEMENTAL INFORMATION:

The following comments were received by the Engineering Department between June 10 and August 17, 2018 or are updates of previous comments (additions to previous updates are **Bold-Underlined**:

1) Received request to increase parking restrictions on Lee at Chestnut due to lack of sight distance when turning from Chestnut to Lee. Called petitioner to discuss: He indicated the problem was both to north and south, and for both westbound and eastbound. Phil indicated parking currently is restricted via in-place signage: no parking on west side Lee to south all the way to Locust, no parking on east side Lee to south for ~100', no parking on east side Lee north for 80'. Parking on west side of Lee to the north is not currently restricted via signage, but City Code and State Statute restricts parking within 20' of the cross walk. We'll look into signing northwest side, but the rest needs enforcement by Police as restrictions are already in place. We'll notify the Police of the concern. He should call Police if cars are parked illegally. He indicated he has a co-worker who has similar difficulties with sight distance that he would have call me with additional information. Received call from Ms. Kelley Luckey in late April who expressed concern that the sight distance obstruction is a combination of parked cars and existing trees. Will visit site for further evaluation.

2) Received request from Dunraven Homeowner's Associate to restrict parking on west side of Glenbridge between Ballybunion and Dunloe. Letters were delivered to neighborhood requesting feedback on proposed parking ban on west side of street.

Responses received overwhelmingly favor restricting parking. Mailed letter to residents notifying them that the parking restriction would be put in place. Engineering will evaluate over next 90-120 days and incorporate into City Code provided there are no unintended consequences that arise. Signs scheduled to be installed on or after April 24; no additional comments received to date. Continuing to monitor until August 30, 2018.

3) Received request to review restricting parking to one side of street and install traffic calming on Tanner between Park Lake and Springfield. Speed and traffic data to be gathered to evaluate request when weather and staffing allows.

4) Received request to remove a No Parking sign in front of a house and an old utility pole which no longer has any lines on it along the back of the property. Reviewed request: parking restriction required to allow room for school buses and garbage trucks to turn around (house is on the end of a street without a cul-de-sac). Currently verifying owner of the pole, believed to be Ameren about its removal. Confirmed Ameren owned pole and contacted them about removal; also provided contact info to resident. Resident indicated school buses no longer use her street (child no longer school age) and garbage trucks use alley. Discussed further with internal staff on sign and confirmed that parking restriction needed to allow garbage trucks to turn from the alley. Staff to replace existing faded sign.

5) Received request to allow parking along the south side of Westport Court. Reviewed current restrictions and signing. Letters being developed to be delivered to neighborhood requesting feedback on proposed parking changes. Feedback received in favor of allowing additional parking. Signs scheduled to be installed on or after May 3; no additional comments received to date. Continuing to monitor until September 30, 2018.

6) Received request from multiple residents along the 1300 and 1400 blocks of Oak Street to restrict parking with a Tow Away Zone on both sides of the street from 6 am to 6 pm, Monday through Friday. Letters being developed to be delivered to neighborhood requesting feedback on proposed parking ban. Results returned with enough votes to put in the requested parking ban. However, some of the comments against the parking ban indicated a significant hardship (i.e., at least one house without a driveway who needs to be able to park in the street). We are working to contact these individuals to discuss potential options. **Implemented requested parking ban on July 17, continuing to monitor until October 30, 2018.**

7) Received request for handicap spot on 1200 block of Oak Street. Waiting to receive supporting documentation of plaque or license plate from requestor.

8) Received Request for a Street Light via phone call. No location or name provided. Message left on voicemail seeking additional information, no response yet. **Left additional voicemail with no response yet.**

9) Received Request to replace faded parking restriction signs along Washington Street. **Need to visit site and evaluate.**

10) Received complaint of people driving down the alley between Van Schoick Street and Tanner Street west from Springfield Road and proceeding through a yard back to Van Schoick after the alley ends mid-block. Request for Dead End sign installed at Springfield Road. Sign scheduled to be installed on or after May 7; no additional comments received to date.

11) Received complaint of speeding and request for traffic calming on Grove Street between Clinton and Mercer. Grove is a classified street with higher traffic volumes, so it does not meet the requirements for traffic calming. **Coordinating with Police Department for enforcement.**

12) Received complaint of speeding on E. Oakland east of Hershey, especially around Watford. Due to hill east of Warford, can be worrisome turning from Watford onto Oakland and being overtaken. Request reduction from 40 mph to 30 mph. Completed field check. There is a hill to the east of Watford limiting the view of the intersection from westbound Oakland. There is also an existing "intersection warning" sign with a 30 mph plaque. Could consider speed reduction, but would need speed study. 85th percentile likely closer to 40 mph than 30 mph. Will gather speed data and review crash data.

13) Received request for increased pedestrian warnings at US 51 (Madison) and Front Street. To be reviewed and likely referred to IDOT for consideration.

14) Received request for clearly marked drop-off at the Arena on US 51 (Madison). To be reviewed and responded to but likely unable to provide due to moving lanes of traffic.

15) Received request for crosswalk warnings at East and Locust for crossing from BCPA to/from north parking lot. To be reviewed and responded to.

16) Received request to relocate “CT” to Front Street by Arena. Need to contact submitter and clarify.

17) Received request for temporary traffic signals at Rhodes Lane and US 150. To be reviewed and likely referred to IDOT for consideration.

18) Received four coordinated requests for an all-way stop or other pedestrian warning enhancements at Stone Mountain and College for pedestrians walking north and south to/from Tipton Park. To be reviewed and data collected when staff availably allows.

19) Received complaint about truck traffic on Fort Jesse Road. Need to review.

20) Received request for traffic signals at Fort Jesse Road and Airport Road. Intersection currently 4-way stop with plans to signalize in near future.

21) Received complaint of speeding and request for "Children at Play" signs on Gill Street at pass-through-cul-de-sac west of Airport. Need to evaluate Yield sign usage for clarity.

22) **NEW**: Received complaint of Park Drive on Chestnut being blocked by park traffic. Need to contact resident and clarify concern.

23) **NEW**: Received request for traffic calming on Eastport Drive between Clearwater and Empire. Need to gather speed and traffic volume data and compare to Traffic calming policy.

24) **NEW**: Received request for traffic calming on Gloucester Circle between Hersey and Dover. Have started gathering speed and traffic volume data and need to compare to Traffic calming policy.

25) **NEW**: Received request for traffic calming on W. Oakland between Livingston and Euclid. Need to gather speed and traffic volume data and compare to Traffic calming policy.

26) **NEW**: Received request to add flashing yellow arrows at Emerson and Towanda due to confusion of eastbound left turn drivers and non-90 degree angle of intersection. Contacted requester and indicated flashing yellow arrows are beginning to be incorporated as other signal maintenance work is completed at an intersection. This particular location will be reviewed closed due to unique geometry.

27) **NEW**: Received report of missing no parking sign at McGregor and Oakland. Need to visit site and review.

28) **NEW**: Received report of missing intersection lane use sign on eastbound Washington at Hersey. Visited site and confirmed; need to complete work order for replacement.

29) **NEW**: Received report of defaced handicapped parking sign on University. Need to complete work order for replacement.

30) **NEW**: Received request to remove school zone on southbound Center Street by Thornton's for Corpus Christi is no longer needed due to school closing. Need to confirm if this zone was just for Corpus Christi and not also Bent Elementary.

31) **NEW**: Received request for school crossing sign added at Washington and Darrah. Need to determine which intersection leg is being requested and evaluate request.

32) **NEW**: Received concern about an increase in collisions on GE Road between Golden Eagle and Towanda Barnes Road. Need to pull accident data, review for trends and evaluate options.

33) **NEW**: Received two separate concerns about commercial parking on residential portion of Norma Drive. Need to contact residents and discuss.

34) **NEW**: Received request for stop or yield sign at Ark and Matthew.

35) **NEW**: Received request for no parking in front of a residence on Colton due to constant blocking of driveway.

36) **NEW**: Received complaint of landscaping creating a sight obstruction at Peirce and Mercer.

37) **NEW**: Received complaint of out of town school buses parking and blocking alley behind Elmwood Road and the BHS football/baseball fields during school sports activities.

38) **NEW**: Received request for a "censored light on the pole". Need to contact for more information.

39) **NEW**: Received complaint about new power poles at Hershey and Jumer causing a sight obstruction.

40) **NEW**: Received report of signals at Four Seasons and Oakland not detecting northbound left turns.

41) **NEW**: Received complaint of fence creating a sight obstruction at Cornelius and Airport.

3. STAFF RECOMMENDATION:

Staff submits the above information to the Commission. Any comments or feedback is appreciated.

Respectfully submitted,

Philip Allyn, PE, PTOE
City Traffic Engineer