Committee Report

Report TR-TAPS-05-15

To: Chair Barfoot and Members of the Transportation and Public Safety Committee
From: M.J. Kelly, Director of Transportation Services
Meeting Date: January 22, 2015
Subject: **Speed Limit Evaluation Policy and Procedure**
Status: Recommendation adopted by Committee as presented per Resolution TAPS25-15; Endorsed by County Council February 3, 2015 per Resolution CC35-15;

Recommendation(s)

WHEREAS the determination of a road speed limit is important to the safety and functionality of a County Road;

AND WHEREAS it is essential that speed limits on Grey Roads are determined consistently;

NOW THEREFORE BE IT RESOLVED THAT Report TR-TAPS-05-15 regarding a Speed Limit Evaluation Policy and Procedure be received;

AND THAT MS-TS-008 being the Speed Limit Evaluation Policy and MS-TS-008-001 being the Speed Limit Evaluation Procedure be approved and be implemented as of February 3, 2015.

Background

In accordance with the Highway Traffic Act, the County of Grey is responsible for posting speed limits on Grey County roads that will meet the function of a county road, driver expectations and engineering principals.

The purpose of the Speed Limit Evaluation Policy and Procedure is to provide the County of Grey with criteria to evaluate posted speed limits. Posted speed limits must consider safety criteria, as well as match the expectations of drivers for a given roadway and surrounding area. This policy and procedure provides evaluation criteria to assess appropriate speed limits based on a variety of factors.

The determination of an appropriate speed limit is not an exact science; there are a variety of components that must be considered and evaluated with regard to risk.

The major function of a county road is to provide the efficient movement of people and goods; therefore, the speed limit on county roads should be maintained as high as possible considering public safety and risk management.

Speed limits that are set too low will result in a greater speed variance which may contribute to accident frequency.

County roads fall under the “Rural Collector Undivided” functional classification of the Ontario Ministry of Transportation, Geometric Design Standards Manual (GDM) and as such, have design speeds ranging from 60km/h to 100km/h. Geometric design parameters, which determine road design speeds, are selected based on functional classification.

Road geometry is typically designed to 10km/h faster than the final posted speed limit, i.e. a road with an 80km/h posted speed limit will be designed to 90km/h; however, on county roads, it is acceptable for the design speed to equal the posted speed limit based on the Transportation Association of Canada, and several United States of America Department of Highways speed limit criteria.

When determining an appropriate speed limit, consistency is important; therefore, it is not recommended to frequently alter the posted speed limit along a roadway. Where such adjustment is required, the change in speed should be no greater than 20km/h. To maintain a posted speed where medium to high risk hazards are present, warning signs may be placed to inform the motorist.

Speed limits should also be set with consideration given to what reasonable drivers feel should be the running speed limit of the roadway, the speed at which the eight-fifth percentile of drivers feel comfortable driving. If speed limits are set unreasonably low, drivers will tend to disregard the posted speed limits.

To determine a speed limit, the following criteria must be considered collectively; a single variable is insufficient to arrive at a final speed limit:

Geometric Criteria

- Horizontal Alignment
- Vertical Alignment
- Stopping Site Distance
- Lane Width
- Shoulder Width

Non-Geometric Criteria

- Road Side Entrances

- Intersecting Roads
- Road Side Hazards
- Operating Speed
- Accident history

In determining a reasonable Speed Limit Evaluation criteria County staff review a variety of criteria from various other jurisdictions; however, the criteria that were evaluated were not applicable to the conditions of Grey County. As a result, staff developed a criteria representative of Grey County.

Financial / Staffing / Legal / Information Technology Considerations

This Speed Limit Evaluation Policy and Procedure establishes a variety of criteria that will be used when assessing the speed limits on all County Roads. As a result, the speed limits should be implemented consistently considering the functionality and safety principles.

Link to Strategic Goals / Priorities

Not Applicable

Respectfully submitted by,

M.J. Kelly
Director of Transportation Services

Attachments

Speed Limit Evaluation Policy

Speed Limit Evaluation Procedure

Corporate Policy

Speed Limit Evaluation

Approved by: County Council
Date Approved:
Last Revision Date:
Replaces:
Scheduled for Review by: 2020

Policy Number: MS-TS-008
Section: Transportation Services
Sub Section: Roads

References and Related Documents

Highway Traffic Act
Speed Limit Evaluation Procedure

Policy Statement

In accordance with the Highway Traffic Act, the County of Grey is responsible for posting speed limits on Grey County roads that will meet the function of a county road, driver expectations and engineering principals.

This policy provides principles to consider when determining an appropriate speed limit for Grey Roads.

Purpose

The purpose of this policy is to provide the County of Grey with criteria to evaluate posted speed limits. Posted speed limits must consider safety criteria as well as match the expectations of drivers for a given roadway and surrounding area. This policy provides evaluation criteria to assess appropriate speed limits based on a variety of factors.

Scope

The determination of an appropriate speed limit is not an exact science; there are a variety of components that must be considered and evaluated with regard to risk.

This policy will encompass all Grey County Roads as determined by Grey County Council.

Corporate Procedure

Speed Limit Evaluation Procedure

Approved by: County Council
Date Approved:
Last Revision Date:
Replaces:
Scheduled for Review by: 2020

Policy Number: MS-TS-008-001
Section: Transportation Services
Sub Section: Roads

References and Related Documents

Geometric Design Standards for Ontario Highways: Ontario Ministry of Transportation (available by request)
Roadside Safety Manual: Ontario Ministry of Transportation (available by request)
Geometric Design Guide for Canadian Roads: Transportation Association of Canada
Highway Traffic Act

Policy Statement

In accordance with the Highway Traffic Act, the County of Grey is responsible for posting speed limits on Grey County roads that will meet the function of a county road, driver expectations and engineering principals.

Purpose

The purpose of this procedure is to provide the County of Grey with criteria to evaluate posted speed limits. Posted speed limits must consider safety criteria as well as match the expectations of drivers for a given roadway and surrounding area. This policy provides evaluation criteria to assess appropriate speed limits based on a variety of factors.

Scope

The determination of an appropriate speed limit is not an exact science; there are a variety of components that must be considered and evaluated with regard to risk.

The major function of a county road is to provide the efficient movement of people and goods; therefore, the speed limit on county roads should be maintained as high as possible considering public safety and risk management.

Speed limits that are set too low will result in a greater speed variance which may contribute to accident frequency.

Local municipalities are responsible for the movement of pedestrians on County right-of-ways.

Evaluation Criteria

County roads fall under the Rural Collector Undivided functional classification of the Ontario Ministry of Transportation Geometric Design Standards Manual (GDM), and as such have design speeds ranging from 60km/h to 100km/h. Geometric design parameters, which determine road design speed, are selected based on functional classification.

Road geometry is typically designed to 20km/h faster than the final posted speed limit, i.e. a road with an 80km/h posted speed limit will be designed to 100km/h. However, on county roads, it is an acceptable municipal practice for the design speed to equal the posted speed limit.

When determining an appropriate speed limit, consistency is important; therefore, it is not recommended to frequently alter the posted speed limit along a roadway. Where such adjustment is required, the change in speed should be no greater than 20km/h. To maintain a posted speed where medium to high risk hazards are present, warning signs may be placed to inform the motorist.

Speed limits should also be set with consideration given to what reasonable drivers feel should be the running speed limit of the roadway, the speed at which the eighty-fifth percentile of drivers feel comfortable driving. If speed limits are set unreasonably low, drivers will tend to disregard the posted limits.

To determine a speed limit, the following criteria must be considered collectively. A single variable is insufficient to arrive at a final speed limit. Geometric criteria should be applied first, followed by consideration of non-geometric criteria. Geometric criteria will directly and consistently influence the level of risk applied to a vehicle and driver, while non-geometric criteria will intermittently influence the actual and perceived risk to the driver.

Geometric Criteria

- Horizontal Alignment
- Vertical Alignment
- Stopping Site Distance

- Lane Width
- Shoulder Width

Non-Geometric Criteria

- Road Side Entrances
- Intersecting Roads
- Road Side Hazards
- Operating Speed
- Accident history

Geometric Criteria

Horizontal Alignment

The radius, super-elevation and the occurrence density of horizontal curves have an effect on driver comfort and safety, and influence driving risk. The analysis of existing horizontal geometry may justify a lower posted speed limit.

The risk assessment criteria for implementing a speed limit change based on horizontal geometry are as follows:

- High Risk - Curves fail to meet the recommendation by more than 10km/h.
- Medium Risk - Curves fail to meet the recommendation by 10km/h or less.
- Low Risk - Curves meet or exceed the recommendation.

An increase in the occurrence of horizontal curves within a 1.0km length of road will increase driver workload possibly justifying a speed limit reduction. This is known as the curve density (curvature change rate).

The risk assessment criteria for implementing a speed limit change based on curve density are as follows:

- High Risk - More than 6 curves per km.
- Medium Risk - 3 to 6 curves per km.
- Low Risk - Less than 3 curves per km.

In an effort to maintain an existing speed limit through horizontal curves, signage may be installed to mitigate risk, as per the Ontario Traffic Manual.

Vertical Alignment

Steepness of grade, and sharpness and frequency of vertical curves (crest and sag) will increase driver workload. Navigating a road that exhibits significant grade changes presents a greater driving risk.

Depending on the traffic volume, the recommended maximum road grade decreases as the design speed increases.

The vertical geometry of a road is designed with consideration given to stopping sight distance and driver comfort. The rate of change of grade through a crest or a sag relates to the chosen design speed; as vertical curves lengthen and flatten, design speed increases.

The risk assessment criteria for implementing a speed limit change based on vertical curve geometry is as follows:

- High Risk - Curves exceed the recommendation by more than 10km/h.
- Medium Risk - Curves exceed the recommendation by 10km/h or less.
- Low Risk - Curves meet or exceed the recommendation.

Stopping Sight Distance

A minimum sight distance must be available to a driver to stop before reaching an object in their path. Stopping sight distance must be maintained through both horizontal and vertical curve sections of road.

The risk assessment criteria for implementing a speed limit change based on stopping sight distance is as follows:

- High Risk - Curves exceed the recommendation by more than 10km/h.
- Medium Risk - Curves exceed the recommendation by 10km/h or less.
- Low Risk - Curves meet or exceed the recommendation.

Lane Width

Narrow lanes provide less room for maneuverability and, as a result, driver comfort and safety is reduced. Lane width, together with traffic volume and vehicle type can be used to assist in the selection of a speed limit. Generally, the wider the travelled way, and the lesser the traffic volume, the greater the design speed.

The risk assessment criteria for implementing a speed limit change based on lane width is as follows:

- High Risk - Average lane width less than 0.25m less than recommendation.
- Medium Risk - Average lane width between 0m and 0.25m less than recommendation.
- Low Risk - Average lane width equal to or greater than recommendation.

Shoulder Width

Narrow shoulders create an illusion of narrower traffic lanes which result in reduced driver comfort. Shoulder width, together with traffic volume and vehicle type, can be used to assist in the selection of a speed limit.

The risk assessment criteria for implementing a speed limit change based on shoulder width is as follows:

- High Risk - Average shoulder width less than 0.5m less than recommendation.
- Medium Risk - Average shoulder width between 0m and 0.5m less than recommendation.
- Low Risk - Average shoulder width equal to or greater than recommendation.

Non-Geometric Criteria

Road Side Entrances

The number and density of entrances may increase the number of vehicles encountering conflicts and justify a reduction to the posted speed limit.

Given that a roadway conforms to minimum geometric design standards, the risk assessment criteria for implementing a speed limit change are as follows:

- High Risk - More than 50 residential or 20 commercial entrances per side per km.
- Medium Risk - Between 30 and 50 residential, or 10 to 20 commercial entrances per side per km.
- Low Risk - Less than 30 residential or 10 commercial entrances per side per km.

Intersecting Roads

A change in the number, spacing and traffic volume of intersecting roads may affect the number of vehicles encountering conflicts which may justify a modification to the posted speed limit.

Given that a roadway conforms to the established minimum geometric design standards, the risk assessment criteria for implementing a speed limit change are as follows:

- High Risk - More than 3 intersections with AADT greater than 1000, or more than 5 intersections with AADT greater than 200.
- Medium Risk - 3 intersections with AADT greater than 1000, or more than 5 intersections with AADT greater than 200.
- Low Risk - Less than 3 intersections with AADT greater than 1000, or less than 4 intersections with AADT greater than 200.

Road Side Hazards

Road side hazards create an illusion of a narrower roadway resulting in reduced driver comfort. A hazard free clear zone along the roadway should be maintained wherever possible. It is always preferable to remove road side hazards, or install suitable

shielding, rather than to reduce speed limits; however, where removal or shielding is impossible, or clear zone areas are not available, speed limit reductions may be justified.

Given that a roadway conforms to the established minimum geometric design standards, the risk assessment criteria for implementing a speed limit change are as follows:

- High Risk - 10 or more hazards per km per side, or continuous hazards on more than 50% of the road segment length. This does not include curb and gutter signage.
- Medium Risk - 5 to 9 hazards per km per side or continuous hazards from 25%-50% of the road segment length. This does not include curb and gutter signage.
- Low Risk - Less than 5 hazards per km per side or continuous hazards on less than 25% of the road segment length. This does not include curb and gutter signage.

Site Specific conditions must be taken into consideration when assessing road side hazards to determine if a speed limit reduction will sufficiently reduce risk.

Operating Speed

The operating speed of a vehicle will generally be less than the desired speed of the driver since driving conditions are not usually ideal; however, operating speed may become excessive when the design speed is less than the desired speed as may occur on long flat sections of roadway.

Given that a roadway conforms to established minimum geometric design standards, the risk assessment criteria for implementing a speed limit change are as follows:

- High Risk - Operating speed appears to be greater than the posted speed.
- Medium Risk - Operating speed is equal to the posted speed.
- Low Risk - Operating speed is less than the posted speed.

Accident History

Accident history can be used to justify a speed limit adjustment using the criteria below:

- High Risk - There has been an average of 4 or more accidents per year for the previous 3 years as a direct result of speed in excess of the posted speed limit.
- Medium Risk - There has been an average of 2 to 4 accidents per year for the previous 3 years as a direct result of speed in excess of the posted speed limit.
- Low Risk - There has been an average of 2 or less accidents per year for the previous 3 years as a direct result of speed in excess of the posted speed limit.

Proximity of Development

The density and the closeness of development to the property line increases the amount of activity that a driver must observe. As a result, the location and the activities from the development play a factor in identifying an appropriate speed limit.

Assessment

Once all of the above criteria are rated, the Director of Transportation Services will make a recommendation in a report to the Transportation and Public Safety Committee regarding the proposed speed limit.