APPENDIX F

Speed Management Guidelines

DILLON CONSULTING

COUNTY OF WELLINGTON

Speed Management Guidelines

August 2021 – 20-3297

August 23, 2021

Corporation of the County of Wellington
74 Woolwich Street
Guelph, ON
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Attention: Mr. Don Kudo, P.Eng.,
County Engineer

Speed Management Guidelines

Please find enclosed the updated and final Speed Management Guidelines, which defines a prescriptive and structured planning process to address speeding concerns raised by residents, councillors and staff within the County of Wellington.

Sincerely,

DILLON CONSULTING LIMITED

Dennis Kar, M.U.P., RPP
Partner

Our file: 20-3297

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1.0 Introduction

The County of Wellington has retained Dillon Consulting Limited (Dillon) to develop a Road Master Action Plan (RMAP). As part of the project's scope, there was an identified need for Speed Management Guidelines to be developed.

The RMAP identifies a draft vision to:

"To connect people and goods across the County safely, conveniently, efficiently and sustainably."

Eight corresponding objectives are also identified to achieve the transportation vision for the County. Three of the eight goals identify the need for the development of a Speed Management Guideline:

Goal #1: Create a Transportation Network with a Focus on Safety

One of the most impactful ways to achieve this goal is to create and ensure there are safe speeds based on a specific road context. Speeding is not just defined as exceeding the posted speed limit; it is also driving too fast for conditions. While speed limits are typically set based on the functional role and geometric design of a roadway, the physical environment of a street can vary by time of day and time of year, resulting in different visibility conditions, vehicle type composition, and increased exposure to non-vehicle activity. The impacts/repercussions of speeding include fatalities, injuries, and property damage. These are not only obvious public health issues but also financial issues. Therefore, the objective of managing vehicle speed is to reduce traffic-related fatalities and serious injury and minimize property damage.

Goal #8: Develop Transparent Policy Tools that Guide Investment Decisions in the Transportation Network

A Speed Management Plan is needed to define a transparent process to identify problems, assess impacts, evaluate appropriate mitigation, and implement appropriate improvements. The plan is typically organized to address the "five E's" of traffic safety: Engineering, Enforcement, Evaluation/Monitoring, Education, and Engagement.

The elements of a Speed Management Plan are identified as follows:

- **Problem Definition** – Speed is acknowledged as a safety problem defined by the relationship of vehicle speed to collision outcome;
- **Implementation of Speed Limits** – The appropriate designation of speed zones on variable environment and road conditions;
- **Measures for Managing Speed** – methods and measures required to provide effective speed management and create safe roads; and
- **Creation of a Speed Management Program** – a guide to a comprehensive program of screening and implementation tools that foster good speed control appropriate for the adjacent community environment.

Goal #7: Create a Culture of Collaboration with Municipal Stakeholders where the County Transportation Network Intersects with Areas of Local Importance

The County needs a Speed Management Plan to address the risk associated with speeding-related issues in urban and rural areas for varying environments and varying trip types and users. The plan also provides a tool for collaboration with municipal stakeholders in areas where the County's road network intersects with the network of local jurisdiction.

The associated Speed Management Guidelines are needed to standardize what constitutes a problem and how that problem is addressed.

The following sections provide the framework and guidelines for developing a Speed Management Plan.

1.1 Purpose

This guideline defines a planning process for responding to speed mitigation requests in the County of Wellington. The intent is that this document will be used to provide context for how to identify a speeding issue and assess and identify the potential for mitigation.

This guideline:

- Provides direction on the appropriateness of posted speed limits across Wellington County, in consideration of the local environment and operating characteristics;
- Defines a process for undertaking a warrant for speed mitigation measures at locations identified by an area's stakeholders;
- Defines a process for assessing the feasibility of introducing speed mitigation measures and deciding on corridors where warranted and how to develop a final solution; and
- Outlines a process to obtain the necessary approvals to implement the required speed mitigation measures.

In all cases, the County reserves the right to apply professional judgement in responding to a speed mitigation request.

1.2 Background

The County of Wellington owns, operates and maintains the county road network. Wellington County OPP as well as Wellington County staff are frequently asked to undertake measures to address speed-related concerns regarding the County's roads. For this reason, the County needs to develop and document a planning and assessment process for responding to speed mitigation and management requests from citizens, council members and representatives from local municipalities, such as staff and/or council.

The County has several possible measures at its disposal, including physical modifications (e.g., traffic calming, pedestrian crossovers), regulatory changes (e.g., School Zones, Community Safety Zones), temporary measures (speed display signage, flexible bollards) and education and enforcement.

This document will provide a toolkit for receiving, assessing, and identifying appropriate speed mitigation initiatives.

1.3 Scope

The following tasks were undertaken in developing the guideline document:

- Research – review reference documents, plans for similar jurisdictions, current speed policies;
- Define speed as a problem;
- Assess the range of potential risks and outcomes;
- Identify a range of potential mitigation strategies;
- Identify the process whereby appropriate mitigation is selected; and
- Engage stakeholders – public (internal departments, external agencies), private (residents, businesses.

Several published documents were also consulted and offer useful insights into regulatory policies and geometric standards related to community planning related to the physical environment and roadway design that would be required to support roadway role and function. This list is shown in **Table 1.**

Table 1: Reference Documents

Reference Documents	Brief Description	Organization
Speed Management Guide, 2016	Provides the best available factual information and tools to facilitate safer roadway planning, design and operational decisions based on conditions of safety performance and consequences.	Transportation Association of Canada (TAC)
Canadian Guidelines for Establishing Posted Speed Limits, 2009	Guidance and processes developed to enhance consistency in the evaluation of posted speed limits that would match the expectation of drivers for a given roadway and its surrounding area.	Transportation Association of Canada (TAC)
Canadian Guide to Traffic Calming – Second ed. 2018	Traffic calming guidance developed at a national level.	Transportation Association of Canada (TAC) / Canadian Institute of Transportation Engineering (CITE)
Canadian Guide to Neighbourhood Traffic Calming, 1998	The original Canadian Guide to Traffic Calming - traffic calming guidance developed at a national level.	Transportation Association of Canada (TAC) / Canadian Institute of Transportation Engineering (CITE)

Reference Documents	Brief Description	Organization
Geometric Design Guide for Canadian Roads	Guides planners and designers in developing design solutions that meet the needs of a range of road users while addressing the context of policy decisions and the surrounding environment. Design guidelines are included for freeways, arterials, collectors, and local roads, in urban and rural locations, and integrated bicyclist and pedestrian design.	Transportation Association of Canada (TAC)
OTM Books 5, 6, 11, 12, 15 and 18.	Ontario Traffic Manuals (OTMs) OTMs provide guidance relating to regulatory and warning signs (Books 5 and 6), pavement markings (Book 11), traffic signals (Book 12), pedestrian crossing treatments (Book 15) and bicycle facilities (Book 18).	Ministry of Transportation for the Province of Ontario (MTO)
Ontario Highway Traffic Act	The Highway Traffic Act is an Ontario Act that regulates the licensing of vehicles, classification of traffic offences, and administration of loads, classification of vehicles and other transport-related issues. Of particular note is Bill 65 – Safer School Zones Act 2017 and Ontario Regulation 398/19 for Automated Speed Enforcement, enacted in late 2019.	Bills passed by the legislature – Provincial Government of Ontario

1.4 Definitions

85th Percentile Speed: The speed at or below which 85 percent of the drivers are observed to travel in free-flow conditions at a representative location.

95th Percentile Speed: The speed at or below which 95 percent of the drivers are observed to travel in free-flow conditions at a representative location.

Design Speed: A speed selected as a basis to establish appropriate geometric design elements for a particular section of road so that drivers can travel safely at that speed under ideal conditions.

Highway: A common and public highway, street, avenue, parkway, driveway, square, place, bridge, viaduct or trestle, any part of which is intended for or used by the general public for the passage of vehicles and includes the area between the lateral property lines thereof.

Inferred Design Speed: The design speed is calculated by applying current design guidelines to geometric data of the road section derived from the field.

Operating Speed: The speed at which a driver is observed operating a vehicle at a representative location.

Posted Speed Limit: The speed prescribed for motor vehicles on a section of road by municipal by-law in accordance with the Highway Traffic Act.

Rural Sections: Road sections located outside the urbanized or built-up areas, generally characterized by a stormwater management system using open drainage channels (ditches) as well as gravel shoulders.

Speed Mitigation: The implementation of physical, regulatory or educational devices to slow motorists to the desired speed.

Speed Mitigation Plan: Outline of strategies to confront speeding issue.

Speed Study: The collection and analysis of vehicle speed data.

Urban Sections: Road sections located within the urbanized or built-up areas, generally characterized by a stormwater management system using curbs and gutters. For further clarifications of urban sections, locations and boundaries, these items are outlined in the County's Official Plan.

2.0 Context

Speeding is a complex issue characterized by driver behaviour, the conflict between resident and driver attitudes, the impact of vehicle types, and the influence of posted speed and roadway design on local environments. Speed management requires a process by which problems and outcomes are defined and assessed. The process elements are defined as follows:

- Defining the relationship between speed, speeding and safety;
- Applying road design and engineering measures to achieve appropriate speeds;
- Setting speed limits that are safe and reasonable for the roadway environment;
- Encouraging enforcement efforts and appropriate technology that effectively target and deter speeding, thus limiting the potential risks to road users (vehicle occupants, pedestrians, cyclists, and property);
- Effectively marketing and communicating educational messages that focus on high-risk drivers; and
- Seeking and garnering the cooperation, and support of affected stakeholders.

The development of this plan, therefore, considers the following:

- The practice of setting the posted speed limit at the 85th percentile speed generally results in similar operating speeds between different vehicles in the traffic stream;
- Posted speed limits that are set too low will result in a significant number of "reasonable" drivers operating illegally, place unnecessary burdens on law enforcement personnel, lead to a lack of credibility of the posted speed limit and result in increased tolerance by enforcement agencies;
- Posted speed limits should be technically set in accordance with the function that each road is designed to serve;
- Industry research has been shown that raising or lowering the posted speed limit has minimal effect on vehicle operating speeds, and therefore does not result in statistically significant changes in the frequency of collisions. However, aligning the posted speed limit with the 85th percentile speed will increase the compliance of road users compared to a posted speed limit that is set too low (driver expectation and behaviour is more consistent with the design and function of the environment);
- Speed control, encouraging drivers to travel at an appropriate speed for prevailing conditions, encompasses enforcement, education and engineering techniques;
- Drivers tend to operate vehicles at the highest speed that is appropriate for the prevailing roadway and weather conditions;
- The strongest influence on a driver's selection of travel speed is the physical appearance of the road, which is partly influenced by the design speed selected for that particular road section;
- The severity of collisions increases with higher operating speeds;
- Increased travel speeds elevate pressure on the environment due to higher noise levels and greater exhaust emissions;
- Collision potential is lowest when the difference in operating speed between vehicles in the traffic stream is smallest;

- While police enforcement has been the traditional approach to controlling speeds, research has shown that significant increases in enforcement levels are required to influence driver behaviour, and those effects tend not to result in a long-term resolution of the issue.; and
- The Province of Ontario has recently allowed for Automated Speed Enforcement (ASE) to be introduced within School Zones and Community Safety Zones.

3.0 Posted Speed Limit Review

Before assessing corridors from a speed mitigation standpoint, which is covered in **Section 4.0** and subsequent sections, the appropriate baseline for speed limits within the County needs to be established. The County road system should be reviewed and technically assessed to ensure that the posted speed limits within, and through, communities, as well as the specific locations where speed limits may change or transition, are technically appropriate to ensure that expectations and feedback from residents and stakeholders are consistent.

If a road contains an unreasonably high posted speed limit, then it is likely that the safety issues identified will be related to design. If a road features an unreasonably low posted speed limit, then it is likely that the safety issues identified will be related to behaviour and adherence. A review of all posted speed limits that are 70 km/h or lower within the County road network should be undertaken to ensure consistency between design and expected behaviour, thus ensuring that any lack of adherence can be categorized and appropriate mitigation can be identified. This review can be staged, with priority given to locations with known issues.

3.1 Posted Speed Limits Policy

The roadway's design and classification influence posted speed limits on roads. In reviewing for posted speed limits, several factors are considered, such as vehicle operating speeds, adjacent development, collision history, pedestrian activity, driveway spacing and the location of signalized intersections.

The posted speed limit should ideally be set at or near the 85th percentile speed based on field measurements of the operating speed. This is because the uniformity of vehicle speeds increases safety and reduces the risks for vehicle collisions.

The December 2009 *Canadian Guideline for Establishing Posted Speed Limits* was developed by the Transportation Association of Canada (TAC). These guidelines have been established to assist engineers and traffic practitioners with an evaluation tool to assess appropriate posted speed limits based primarily on the classification, function and physical characteristics. These guidelines help make recommendations to the posted speed limit to enhance the effectiveness and credibility of the posted speed limit.

The TAC Canadian Guidelines for Establishing Posted Speed Limits provides tools (e.g. a fillable spreadsheet to automatically calculate recommended speeds for a specific environment) and guidance that can be used to evaluate and confirm the appropriate speed limits both outside and inside a community. The assessment considers several different factors from a risk standpoint. A risk score is developed and considers factors based on the horizontal and vertical geometry of a road, how pedestrians and cyclists may be exposed on the corridor, the number of driveways, intersections and/or traffic control devices along the corridor as well as the presence of on-street parking on the corridor. Based on the roadway classification and type, a recommended posted speed limit will be made based on the calculated risk score.

In 2012, Wellington County adopted the Council-approved use of these TAC guidelines to establish posted speed limits throughout the County. There may be some corridors where the posted speed limit is not consistent with the TAC guidelines if they were last changed before 2012. Some corridors may have also experienced adjacent land-use changes since the last TAC review was completed.

Three factors should be explicitly considered when determining the appropriate location(s) for where the recommended posted speed limits would potentially transition or change from a high-level perspective.

- The location where the surrounding land uses on one or both sides of the corridor changes from rural to urban (either at the property line or the parcel's driveway access);
- The location where the roadway cross-section changes where more urban items become present. This may include curb and gutter, sidewalks, on-street parking., etc.; and
- The differences between the measured average and 85th percentile of traffic speeds (for relevant or appropriate locations along the corridor where a problem is identified).

The authority for Wellington County to set speed limits is granted by the Ministry of Transportation, Ontario (MTO) through the Highway Traffic Act (HTA). Through the HTA, municipalities can set posted speed limits of up to 100 km/h, typically in intervals of 10 km/h. The HTA sets a default speed limit of 50 km/h on roadways within cities, towns, villages or built-up areas, and a higher speed limit of 80 km/h on roadways within undeveloped or rural contexts. On May 30, 2017, Bill 65 – Safer School Zones Act 2017 was passed by the Government of Ontario.

Posted speed limits other than those recommended via the TAC guidelines may be able to be considered in the following cases:

- The frequency or severity of collisions attributable to an abundance of speeding is higher than what is typically seen based on available collision data;
- In areas requiring lower speeds for safety purposes (i.e., School Zones);
- Where physical geometry or characteristics present hazards or constraints;
- Where adjacent land use activities or development accesses present constraints;
- For temporary construction zone safety; and
- If justified through analysis of the 85th percentile speed, collision history and inferred design speed, the posted speed limit may be set higher than recommended levels.

Additional consideration should be given to the following when setting posted speed limits:

- The ideal minimum length of a speed limit zone should be 500 metres; and
- Instead of reducing the speed limits at locations with a drastic change in the physical characteristics of the road (i.e., a sharp curve), appropriate warning signs (with appropriate advisory speed tabs and/or flashing lights) should be considered, as it may be perfectly safe to operate at a higher speed immediately before or after these areas.

In some areas, where there may be vulnerable users along the corridor, it may be prudent to consider a posted speed limit that may be lower than what is recommended, or lower than the statutory urban speed limit of 50 km/h. However, it may not be practical to achieve 40 km/h or lower operating speeds on a 24/7 basis without introducing significant traffic calming devices. It is recognized that the TAC Canadian Guidelines for Establishing Posted Speed Limits do not take into account factors such as historical collision data and/or vulnerable users that may be found on some parts of the corridor.

As a result, where schools or developed parks may be adjacent to a county road corridor, there may be a need to introduce a posted speed limit that may be lower than what is recommended for the overall road section. Additionally, time-of-day reduced speed limits with flashing lights could be introduced near or around schools. The reduced speed limit would only be in effect when the lights are flashing. It could be programmed to illuminate only during arrival or departure periods or when students are outside of the school building (i.e., when higher-risk activities take place and when more vulnerable users are present). This type of measure is discussed in **Section 5.1.2.**

4.0 Assessing Need for Speed Management

4.1 Overview of Speed Management Process

After a technical review of posted speed limits that are 70 km/h or lower has occurred and the confirmation that appropriate speed limits have been applied consistently across the County and/or are then potentially modified generally following the TAC guidelines, there may be a need to assess corridors for potential speed mitigation. Potential issues arise where driver behaviour is not consistent with the design, or where the design is not consistent with the local environment. Further mitigation will be required in these locations.

Figure 1 shows the coordinated planning process for responding to speed management requests.

4.2 Screening Process

It is proposed that the County adopt a process for managing requests for further speed mitigation and speed management as follows:

1. The County and/or the OPP receives the request from a stakeholder (via a phone call, email, fillable form or on a mapping-based tool found on their representative websites).
2. The County and/or the OPP verifies whether the road in question is a Municipal or County road. If it is a Municipal road, the raised concern will be referred to the Local Municipality for review following their own separate procedures. If it is a County road, the OPP will forward the request to County staff to continue with the screening process to verify the request.
3. The County verifies whether the concern identified had been identified previously. If so, the County verifies whether the concern identified has been received at this location within the last three years. If a similar concern has already been raised that leads to a review, no action is necessary, and it shall be noted regarding the prior process. If circumstances or conditions have changed, the County proceeds to the next step. If a similar concern has been made that did not satisfy the review trigger, the County communicates the review requirements to the initiating party (the "party"). If a concern has not been made within the last three years, the County communicates with the party to confirm the parameters of the request and proceeds to establish the study area.

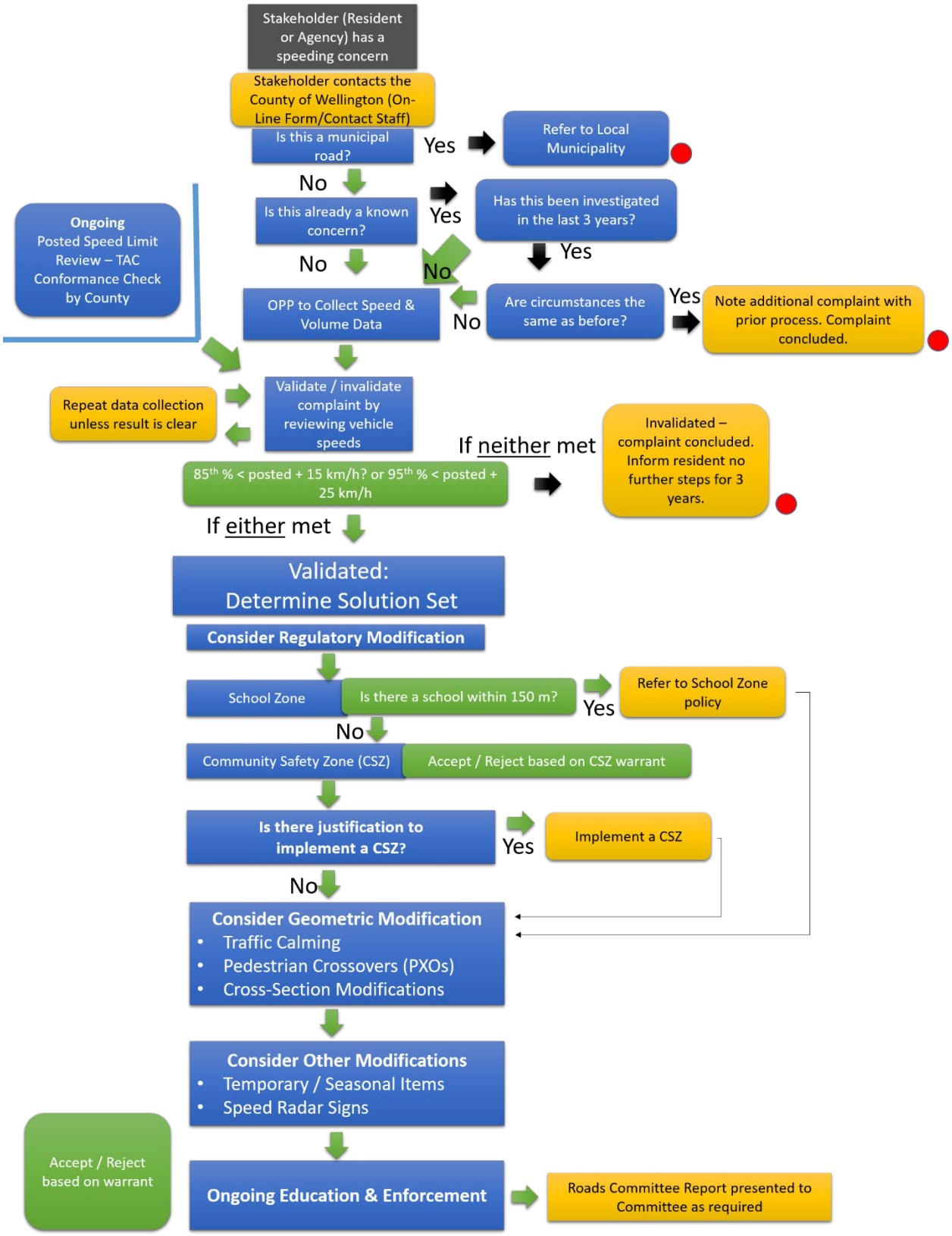

Figure 1: Speed Management Process

4.3 Establish Study Area

The implementation of traffic calming or another speed mitigation measure shall be assumed to be limited to urban or transition areas as defined by County staff through their technical review.

The study area should include both the immediate roadway section and the area of influence of a specific problem and area where modifications to a road cross-section are to be made. Expanding the study area to assess the effects on the adjacent area enable the County to consider the logistical network connection needs for additional infrastructure (e.g., active transportation).

4.4 Assessing Speed Profile of Street

The County will request that the OPP moves forward with the necessary collection of the required speed, volume, and vehicle classification data at one or more locations along the corridor where operating speeds are anticipated to be the highest.

1. Data Collection – note that data shall not be collected if it has already been collected within the last three years. However, exceptions can be made if the corridor has seen significant changes in terms of development or changes to the road cross-section within the last three years.
    a. 24-hour studies – the OPP will deploy the BlackCat Automatic Traffic Recorder (ATR) for not less than one full week and up to two full weeks.
2. Data Benchmark[1] – establish if the collected data demonstrate one or both of the following:
    a. 85th percentile speed > posted speed[2] + 15 km/h; or
    b. 95th percentile speed > posted speed + 25 km/h.
3. Summary of Initial Review – If the condition described in (2) does not exist, the assessment is considered complete as no quantifiable speed issue has been identified. No subsequent investigation should be considered for at least three years. The OPP will need to provide a summary of the BlackCat Automatic Traffic Recorder data to the County. The County shall contact the party to inform them of the findings of the assessment. Should either condition described in (2) exists, the party should be informed that a Speed Management Plan will be developed and that further communication will occur once a preferred solution(s) is developed.

[1] If the data benchmark was met as per data collected during peak hour radar spot speed studies, there would be value to undertake a full 24-hour study as noted under 1a) to ensure the benchmarks are met consistently.
[2] Prior to these assessments taking place, the posted speed limit should have been reviewed and potentially modified as described in **Section 3.0**.

4.5 Document Context / Characteristics of the Street

Where speed mitigation is required, the following factors should be considered in the review process:

- Physical characteristics of the road;
- Adjacent land uses;
- Planning context;
- Driveway spacing;
- Pedestrian activity;
- Collision frequency and severity;
- Inferred design speed; and
- Active transportation infrastructure provided.

Input from the Wellington County OPP would be valuable to help understand the potential issue from an enforcement lens. The appropriate Speed Management Plan should be developed to limit the need for future enforcement, allowing for policing services and resources to be redistributed or sent to different areas.

4.6 Investigate/ Consider Root Source of Speed Issue

As stated in the Introduction, speeding is not just defined as exceeding the posted speed limit; it is also driving too fast for conditions. While speed limits are typically set based on the functional role and geometric design of a roadway, the physical environment of a street can vary by time of day and time of year, resulting in different visibility conditions, vehicle type composition, and increased exposure to non-vehicle activity.

The following considerations should be explored to determine the root source of the concerns:

- Vehicle classification – what percentage of vehicles on the corridor are heavy vehicles (Trucks, Farm Equipment, School Buses or other transit buses)?
- Mode share – are there demands for cycling and walking along the corridor? Are there conflicts between vehicles and other road users? Are there buses (school or conventional transit) stopping on the corridor to pick-up/drop-off passengers?
- Land uses – how dense / built-out is the corridor on one or both sides of the corridor? What types of land uses are adjacent to the corridor? What is the frequency and nature of roadway access?
- Design – is the alignment straight and flat? Does the corridor feature rural cross-section elements such as gravel shoulders and ditches? Is the corridor well illuminated?

5.0 Identifying Mitigation

Following the general five (5)-E's of a traffic safety program, potential mitigation to reduce speeds and implement a Speed Management Plan falls into three categories: Enforcement (Regulatory), Engineering (Geometric) and Education. The specific action plans or options in each of these categories are as follows:

Regulatory Modifications

1. Speed Limit Modification
2. School Zone
3. Community Safety Zone
4. Automated Speed Enforcement (ASE)

Geometric Modifications

5. Cross-Section Modification
6. Traffic Calming
7. Controlled Pedestrian Crossing

Other Modifications

8. Speed Radar Signage
9. Seasonal / Temporary Modifications

Educational Campaigns

10. Education Campaign

Each of these options is described in detail below.

5.1 Regulatory Modifications

5.1.1 Speed Limit Modification

5.1.1.1 Definition

This is defined as any change to the posted speed limit sign of a roadway and applicable by-laws.

5.1.1.2 Application

A change in posted speed limit is applicable in areas where drivers regularly exceed the posted speed limit and safety is a concern.

The authority for Wellington County to set speed limits is granted by the Ministry of Transportation Ontario (MTO) through the Highway Traffic Act (HTA). On May 30, 2017, Bill 65 – Safer School Zones Act 2017 was passed by the Government of Ontario. The new legislation also amended the HTA to allow municipalities to implement new gateway speed limit signage. Municipalities now have the authority,

among other things, to establish speed limits lower than 50 km/h within neighbourhoods using specialized gateway speed limit signage. Under this legislation (Section 128 (2) - *Rate of Speed by By-Law*), the County can set speed limits of up to 100 km/h. The HTA also sets a default speed limit of 50 km/h on roadways within cities, towns, villages or built-up areas and a default speed limit of 80 km/h in rural areas.

The Province is also guided by the Manual of Uniform Traffic Control Devices (MUTCD) and Ontario Traffic Manual (OTM) for assessments and decisions related to posted speed limits.

5.1.1.3 Advantages and Disadvantages

The advantage of a change in posted speed limit is the clear communication of the speed environment on the road to all users. This aids in reducing the speed differential between the higher and lower speed vehicles. Safety problems often occur when fast and slow vehicle speeds mix.

Arbitrarily raising or lowering the posted speed limit has little effect on the operating speed of the road and does not result in statistically significant changes in the frequency or severity of collisions. The physical characteristics of the road highly influence a posted speed limit. The strongest influence on a driver's selection of travel speed is the physical appearance of the road, which can be partly influenced by the design speed selected for that particular road section. For instance, a speed study showing 85th percentile speed > posted speed + 20 km/h would not only indicate there is significant speeding taking place but may also provide a strong indication that the posted speed limit does not reflect the road's design speed as drivers are comfortably travelling well over the posted speed limit. It is strongly recommended that a change in the posted speed limit would need to be accompanied by physical alterations to the roadway (traffic calming) and/or enforcement.

Without physical alterations or increased enforcement, an arbitrarily high or low posted speed limit may be a disadvantage and lead to increased variability in vehicle speeds, creating a less safe environment.

5.1.2 School Zone

5.1.2.1 Definition

A School Zone is defined as a roadway section with a lowered maximum speed zone in effect either on a 24-hour a day basis or during every school day at designated times. School Zones are located in the vicinity (within 150 m) of a school (usually 40 km/h in urban areas, 60 km/h in rural areas). If the School Zone is in effect only during some times of the day or year, then either regulatory signage and/or flashing lights can be introduced to note when the School Zone is in effect.

Fines for speeding are increased by up to 60% in School Zones, and at least 3 demerit points are given to any vehicles travelling 20 km/h or higher than the School Zone Speed Limit.

5.1.2.2 Application

A School Zone shall be implemented only on roads adjacent to a school and at locations within 150 metres.

A School Zone in an urban community usually has a posted speed limit of 40 km/h. On urban roads where schools are present, a '40 km/h when flashing' speed limit should be considered, or supplementary signage introduced to designate the time of day and times of the year where the reduced speed limit is in effect.

In rural areas, a '60 km/h when flashing' speed limit could be considered on rural roads adjacent to or fronting a school.

During periods where the associated flashing lights are inactive, the enforceable posted speed limit would return to the posted speed limit found outside of the School Zone.

5.1.2.3 Advantages and Disadvantages

A School Zone creates a safe place for pedestrians and vulnerable users adjacent to a school. Given the roadway's proximity to vulnerable users, there are no significant disadvantages with the implementation of School Zones. However, they can only be implemented in proximity to a school.

5.1.3 Community Safety Zone

5.1.3.1 Definition

Community Safety Zones (CSZs) are sections of roadways, designated through by-laws where, in the County's Council's view, public safety is of special concern. Monetary traffic fines are doubled within Community Safety Zones, but demerit points associated with the violations are not increased.

The Province of Ontario granted the authority for municipalities to create CSZs through the amendment of the Highway Traffic Act (HTA), specifically Bill 26 – An Act to Promote Public Safety through the Creation of Community Safety Zones, established in 1998. Section 214.1 of the HTA reads:
"The council of a municipality may through a by-law amendment designate a part of a highway under its jurisdiction as a Community Safety Zone if, in the council's opinion, public safety is of special concern on that part of the highway."

5.1.3.2 Application

Community Safety Zones are used to modify driver behaviour to be less aggressive and more cautious and aware to achieve enhanced public safety in these particular locations. Driver behaviour is modified by implementing and enforcing increased fines for traffic violations within the Community Safety Zones through a special designation under the Highway Traffic Act.

Each by-law establishing a Community Safety Zone must indicate that the designation is in effect for 24 hours a day to assist the Police with enforcement. Community Safety Zones must always be used in conjunction with other traffic safety and police enforcement measures.

Community Safety Zones should be primarily implemented on roadways that are adjacent to or front community-based facilities such as schools, community centres, parks, retirement areas, and/or roadway sections that see continually high collision rates.

Community Safety Zones are not applicable on County road corridors that feature a higher speed limit (such as 70 km/h or 80 km/h).

Some discretion is required in terms of where a Community Safety Zone would be most effective (i.e., not every park or school area requires it). Areas adjacent to elementary schools might be more vulnerable than the adjacent to high schools. Appropriate locations for the implementation of a Community Safety Zone can be based on elements of risk that may be present along the road section. Risk factors include the posted speed, the daily volume, the nature of the pedestrian environment, vehicle type composition, and the number of access points along the roadway section.

The Region of York has adopted a risk evaluation warrant to determine the appropriateness of the designation of an area as a Community Safety Zone, based on the risk from five different factors. It is also important to note that before using the Risk Component, field observations and/or speed data collection should also verify that there is an unusually high violation and/or collision rate on the specific road section.

The Region of Waterloo approaches Community Safety Zones in a slightly different manner. Rather than establishing a technical threshold for a Community Safety Zone, the Region focuses on context-sensitive design and community education to manage travel behaviour. This approach is well suited to areas with a broad range in roadway role and function (i.e. local/collector/arterial functions in high density urban/semi-urban/rural environments.

As the role/function and hierarchy does not have the range that the Region of Waterloo does, the TAC risk evaluation warrant comparable to that adopted by the Region of York is considered more appropriate for determining where a Community Safety Zone might be implemented. **Table 2** outlines the recommended Community Safety Zone risk evaluation warrant proposed for the County. For a community safety zone to be warranted, the corridor should score at least 18 points, based on risk from 8 different factors.

Table 2: Community Safety Zone - Risk Component

Risk Factor	High (Score 3)	Medium (Score 2)	Low (Score 1)
Posted Speed (km/h)	40	50	60
Average Daily Traffic Volume	>10,000	5,000-10,000	<5,000
Number of Lanes (Both Directions)	>4	3 or 4	2
Presence of Community Facilities	School / Park (with playground)	Retirement Areas / Community Centre / Park (no playground)	None
Presence of Sidewalks	None	On one side	On both sides
Truck Volumes (as %)	>10%	5-10%	<5%
Pedestrians crossing (8 hrs)	>25	10-25	<10
Intersections/Entrances (per km)	>10	4-10	<4

5.1.3.3 Education/Notification

Upon implementation of each Community Safety Zone, Wellington County will need to:

- Distribute notices/information brochures to places of public gathering within or adjacent to the new Community Safety Zone at least one week before its implementation; and
- Conduct a media release regarding the size and location of the new Community Safety Zone and the consequences for violations within the zone.

5.1.3.4 Advantages and Disadvantages

Community Safety Zones are effective deterrents to speeding concerns when combined with enforcement, but should only be established when sufficient enforcement resources exist and located where community-based facilities are present or along corridors that see high violation and/or collision rates continually. As part of the technical review for a Community Safety Zone, the posted speed limit should also be reviewed to ensure it is technically appropriate.

However, establishing Community Safety Zones without appropriate enforcement will reduce the driver behaviour modification effectiveness as no physical alteration of the road is present. The comfortable driving speed will remain unchanged. Their implementation is a low-cost solution.

5.1.4 Automated Speed Enforcement (ASE)

5.1.4.1 Definition

Automated Speed Enforcement (ASE) is an automated system that uses a camera and a speed measurement device to enforce speed limits. An ASE system captures and records images of vehicles speeding within School Zones and/or Community Safety Zones with tickets being issued to the registered owner of the vehicle.

With an ASE, clear signage needs to be posted within each school zone and/or community safety zone where ASE can be implemented. Separate signage is installed before the establishment of the ASE to inform drivers that an ASE will be introduced shortly.

5.1.4.2 Application

In May 2017, an amendment to the Highway Traffic Act (HTA) was made to introduce the use of ASE in municipalities. Under the Highway Traffic Act, ASE is only permitted to be introduced and used in School Zones and/or Community Safety Zones.

Municipalities have the flexibility to introduce ASE at locations within School Zones and/or Community Safety Zones on a temporary or permanent basis. If ASE is introduced temporarily, then the associated signage and devices are relocated to different locations within the County.

5.1.4.3 Advantages and Disadvantages

ASE can help complement traditional enforcement which can allow for police officers to focus on other critical and time-sensitive tasks. ASE can also help to alter driver behaviour and has resulted in better speed compliance, which can reduce the number and severity of collisions.

With an ASE, no demerit points can be awarded, and the only penalty is monetary. Some motorists and members in public may also have an adverse response to the introduction of ASE. There may be some increased levels of vandalism of the camera and speed measurement devices that may trigger the need for enhanced monitoring and maintenance.

Before introducing an ASE on either a temporary or permanent basis, several different factors should be considered before introducing an ASE. These include:

- initial capital costs of the signage and equipment;
- operating and maintenance costs, including the cost of damage to the signage or equipment incurred as a result of natural events or vandalism; and
- administrative processes, including approval from Council and/or bylaw amendments.

5.2 Geometric Modifications

5.2.1 Cross-Section Adjustments

5.2.1.1 Definition

A change in cross-section can be defined as widening the street platform or reallocating space within the established platform. Applicable changes may include: an additional bike lane, narrower travel lanes, wider sidewalks, curb and gutter, curb extensions, raised medians, implementation of a parking bay, etc.

5.2.1.2 Application

Changing the cross-section of a roadway can be done to create or increase space dedicated to vulnerable users. It results in a shift in modal priority along a segment or within an area. Changing the cross-section

can also help reduce vehicle speeds from a passive standpoint as it helps make the roadway feel tighter, and as a result, overall speeds would be reduced.

Within the County Road system, careful consideration needs to be applied to the design of a corridor's cross-section in consideration of the intended role and function. County corridors are primarily meant to allow users to travel from community to community. County Roads are also designated as truck routes, in some cases, these corridors were part of the Provincial Highway network before the late 1990s, and also continue to connect to the remaining provincial highway network.

Within Wellington County, any sidewalk, pathway, and/or on-street parking facilities are facilities of the local municipality, even along a County Road. Therefore, any changes to include these items would need to be funded by and/or coordinated with the local municipality. County staff would need to consult with the local municipality to incorporate these items wherever possible.

5.2.1.3 Advantages and Disadvantages

Creating a segregated space for walking and cycling can often alleviate safety concerns on a high or higher speed roadway. Multi-use pathways or pedestrian sidewalks can be moved further from the main flow of traffic. This can be implemented in conjunction with additional controlled pedestrian crossings. This would not be ideal where space is a limiting factor. Also, these measures can positively impact reducing speeds along a corridor as the majority of motorists will travel at a speed suitable to the conditions.

When making modifications to a roadways' cross-section, drainage will need to be specifically considered as curb extensions, curb and gutter, and/or raised medians can all impact the drainage of the roadway.

5.2.2 Traffic Calming

5.2.2.1 Definition

Traffic calming is defined by ITE as physical measures intended to reduce the negative effects of motor vehicle use, alter driver behaviour and improve conditions for non-motorized street users.

TAC and CITE's Canadian Guide to Neighbourhood Traffic Calming notes that the intent of traffic calming is to restore roads to their intended function. These definitions can be more generally simplified to "physical devices aimed at slowing the speed of motorists to the desired speed, given the context of the street".

Features that involve vertical deflection are not appropriate along County roadways. However, some features that may provide horizontal deflection such as curb extensions, raised medians, and or lane narrowing may be appropriate. Care must be made to ensure that adequate lane widths remain given County roads are meant to carry higher traffic volumes and are also truck routes.

5.2.2.2 Application

Traffic calming measures must be implemented in a way that respects the intended role of the street. County roads are intended to have higher operating speeds and traffic volumes and, in some cases, carry higher volumes of trucks and emergency response vehicles and may not be appropriate for all traffic calming measures. The needs of all users must be considered in developing a traffic calming plan.

As Wellington County largely maintains arterial County roads that feature typically higher traffic volumes and permits the usage of heavy trucks, some of these measures found within the *Canadian Guide to Neighbourhood Traffic Calming* would likely not be appropriate for introduction along a County road corridor, both within urban and rural areas.

Horizontal Deflection

- Curb extension
- Chicane
- Mid-block narrowing
- Roundabout
- Raised medians

Routes should not be considered for horizontal traffic calming devices if the right-of-way width or remaining travel lane width cannot safely accommodate the elements.

Vertical Deflection

- Speed hump
- Speed table
- Speed cushion
- Speed kidney
- Raised pedestrian crosswalk
- Rumble strip

Along County road corridors, vertical traffic calming devices should not be introduced due to their roles in the transportation system as well as the impedance to the street drainage. This is because County road corridors carry heavy vehicles such as trucks, and any raised device would result in significant additional noise and vibration.

These features can also be introduced and coordinated with passive measures such as pavement markings and speed limit signs.

When making modifications to a roadways' cross-section, drainage will need to be specifically considered as curb extensions, curb and gutter, and/or raised medians can all impact the drainage of the roadway.

5.2.2.3 Advantages and Disadvantages

There will not be a traffic calming solution to fit every circumstance. A combination of local knowledge, technical expertise, consistency with other nearby implementation and engineering judgement must be relied upon to select an appropriate or combination of traffic calming measures.

If traffic calming remains a potential speed mitigation option, several alternative measures may be applicable. Traffic calming will impact users of all transportation modes, and negative effects must be considered.

Additional information can be found by consulting the Complete Streets Design Handbook and the Canadian Guide to Traffic Calming to determine which measure is appropriate based on those selected for Wellington. The appropriateness of various measures will differ.

Given the County maintains the County road network, all of which are key corridors that serve to connect communities, that are truck routes, and also link directly to the Provincial highway network, any form of vertical traffic calming (speed humps, speed tables, speed cushions, raised intersections etc.) is not recommended along a County Road corridor.

5.2.3 Pedestrian Crossovers (PXOs)

5.2.3.1 Definition

Controlled pedestrian crossovers (PXOs) are designated places for pedestrians to safely cross the road, including regulatory control devices such as signage, pavement markings, and flashing lights that can give pedestrians the right-of-way.

OTM Book 15 provides guidance on the necessary type of control for a pedestrian crossover (PXOs) depending on pedestrian demand and volume, the posted speed limit, cross-section of the roadway, and the number of vehicles travelling along the corridor during either a 4-hour or 8-hour period.

In some rare instances, a full pedestrian traffic signal may be warranted. OTM Book 12 guides where a full pedestrian traffic signal should be introduced.

5.2.3.2 Application

Crossovers are often at midblock locations and are applicable in situations where both pedestrian and vehicle volumes are high, and the resulting combination creates delays or safety concerns for pedestrians. OTM Book 12 and OTM Book 15 contain information on the implementation and type of pedestrian crossovers and full pedestrian traffic signals.

5.2.3.3 Advantages and Disadvantages

The advantage of a pedestrian crossover is the safety and priority they provide to vulnerable users crossing the roadway and the shift of focus from vehicle traffic. They can assist with reducing vehicle speeds, improving pedestrian visibility and reducing pedestrian-vehicle conflicts. Where vehicle volumes are high, they can be a disadvantage, by creating a distinct break in traffic flow and increasing vehicle delays.

The Pedestrian Crossover Selection Matrix found in OTM Book 15 notes that PXOs should not be introduced on two-lane corridors that carry more than 17,500 vehicles during an 8-hour period. On any

four-lane corridors, PXOs should not be introduced if there are more than 7,500 vehicles during an 8-hour period. If a County road corridor is busier than these thresholds, then a full pedestrian signal should be investigated. Further, pedestrian crossovers are installed on roadways with a maximum posted speed of 60km/h and a maximum of four lanes of two-way traffic.

As previously noted within Wellington County, any sidewalk, pathway, and/or on-street parking facilities are facilities belonging to the local municipality, even along a County Road. Therefore, any proposal for a pedestrian crossover is typically initiated by the local municipality and if approved by the County, these crossovers are funded by and/or coordinated with the local municipality. County staff would need to consult with the local municipality to incorporate pedestrian crossovers on County roads. As the implementation of the traffic control device can be considered a measure to not only improve pedestrian safety but also better manage prevailing roadway speeds, they can be considered a part of the County's Speed Management Plan. If a PXO is proposed to address a broader corridor speed management issue, the County should consider a cost-sharing arrangement with the local municipality.

5.3 Other Modifications

5.3.1 Speed Display Boards

5.3.1.1 Definition

A speed display (radar-feedback) sign is an electronic sign that measures and displays back the current operating speed to the driver.

These signs can be arranged where they can provide the speed display in different manners such as different colours or flashing when travelling above the posted speed limit, or to only display values at certain times of the day or certain speeds (i.e., the sign may not display a speed that is well over the posted speed limit).

These signs can be powered either via connecting to the hydro grid or can operate under solar power.

5.3.1.2 Application

These signs can be located at locations where the measured operating speed is found to be higher than the posted speed limit. They can often be located within transition points of a corridor (such as a short distance into an urban community), or in advance or along a portion of the road that features significant changes to grade or horizontal alignment (curves).

These signs can be either located at a site permanently or be rotated or introduced to locations temporarily.

5.3.1.3 Advantages and Disadvantages

These signs can provide value to remind drivers of their operating speed and can offer value in terms of speed reduction. However, it has been found that the effectiveness can be reduced in the longer-term, especially if the corridors are travelled by the same drivers on a daily or weekly basis.

Also, it may be necessary to relocate or reallocate these signs regularly, which may have an impact on staffing and/or resourcing depending on how often the signs are shifted/relocated.

Should a speed display sign be recommended as part of a Speed Management Plan, the County should pay for the supply and installation of the device. However, should a local municipality and/or community group request a speed display sign to be installed, and if it is outside of an identified candidate location of Speed Management Plan implementation, the local municipality and/or community group would be responsible for the full cost of the supply and installation of a County-standard speed display sign, subject to County approval.

5.3.2 Seasonal / Temporary Modifications

5.3.2.1 Definition

Seasonal or temporary modifications are defined as physical measures that are installed on a temporary, or seasonal basis.

One strict temporary measure is the vertical centreline treatment (flexible bollards), as they need to be removed seasonally to accommodate winter maintenance vehicles. Other types of temporary measures could include precast concrete or rubber curbing, pavement markings and signage. Some of the well-constructed temporary installations may be able to remain permanently if desired.

5.3.2.2 Application

Seasonal or temporary modifications may be applicable when:

- There is a need to verify (location, configuration, geometry) that the measure will produce the desired effect, before investing in the cost of a permanent solution;
- There are limited or no funds available for a permanent solution;
- The roadway may be reconstructed in the relatively near future;
- There is a need to remove the measures seasonally; and
- There is a desire to gauge community reaction to the temporary measures.

5.3.2.3 Advantages and Disadvantages

There would be the ability to gauge whether the temporary installation would function well if it were made permanent, and it also provides the flexibility to remove the measures seasonally. Typically, the cost for these temporary measures is also lower.

However, these temporary measures can also hold low aesthetic values and might be throw-away in the short-term. Also, higher levels of resources are needed to introduce and/or remove the measures in the respective season. Some of these devices may also be routinely struck or damaged especially if directly adjacent to a travel lane (yellow centreline and/or white edge line).

5.4 Educational Campaign / Enforcement

5.4.1 Definition

Education measures include events, programs, or media campaigns to try and raise awareness of road safety issues and modify driver behaviour accordingly.

Enforcement measures would be where the Wellington County OPP would be present to monitor traffic movements and speeds at a specific intersection or corridor. In some situations, OPP officers would stop a vehicle if found violating the Highway Traffic Act (HTA) or local bylaw (regulation). The OPP would then issue a verbal or written warning or could also issue a ticket (issue a fine) that the motorist would be required to pay or appeal in court.

5.4.2 Application

Education campaigns can be a useful component in an overall strategic road safety program and act as a complement to another solution. As such, they are most applicable in combination with another speed mitigation measure.

Wellington County currently is part of the Safe Communities program, which has a vision to "Make Wellington County, the safest and healthiest place in which to live, learn, work and thrive in Canada." Several transportation matters that the Safe Communities program focuses on is distracted driving, and motor vehicle collisions.

Other programs that may be available include lawn signs that display messages such as "Obey the Speed Limit", "Kids Play Here", etc.

Other educational programs could include a "Pace Car" program, in which vehicles would travel along an urban corridor at the posted speed limit and therefore slow down speeding traffic behind the pace car. Pace cars are typically branded or have a sticker so vehicles behind know they are part of an educational program.

Enforcement can be a tool used on certain corridors and at certain intersections where there are notable behaviour concerns from motorists from an intersection or corridor safety perspective, and/or where driver behaviour issues such as speeding or distracted driving are present.

5.4.3 Advantages and Disadvantages

Targeted education campaigns and/or enforcement can be effective in raising awareness of road safety issues along some corridors and/or at certain intersections. They can address multiple types of driver awareness, including speeding and distracted driving.

Results may vary greatly depending on campaign type, scope, outreach levels, etc. It should be noted that outreach programs urging drivers not to speed are unlikely to affect overall vehicle speeds unless also paired with some enforcement or physical measures. A pace car travelling at a speed slower than the average speed and/or 85th percentile speed may also result in increased levels of road rage.

Continued police enforcement at the same location where a sizeable number of fines are given out can result in some motorists thinking that enforcement is present primarily to increase revenue rather than improving safety.

6.0 Evaluating Mitigation

6.1 Screen Out Non-Viable Solutions

The first step would be to consider changes to the **Regulatory** conditions. These are typically lower cost items, including changes to signage or pavement markings such as posted speed limit changes, the introduction of school zones or community safety zones.

The next step would be to consider changes to the **Physical** conditions. These are typically higher cost items, including **Geometric Modifications** such as:

- Cross-Section Modification;
- Traffic Calming; and,
- Controlled Pedestrian Crossovers (PXOs or Pedestrian Signal).

In addition to the geometric modifications, **Other Modifications** such as speed display boards and/or temporary traffic calming as well as **Educational Campaigns / Enforcement Measures** can also be considered in tandem.

The above alternatives have independent evaluation processes (criteria checklist, warrants) that can be reviewed to confirm either that the modifications are appropriate given the surrounding operating environment or that the modification can be successfully implemented.

This exercise will intend to develop a shortlist of options by screening out the solutions that either (a) can't be implemented due to physical or operational constraints, or (b) are not applicable.

6.1.1 Cross-Section Modification

The cross-section of a roadway is the allocation of space within the road right of way to specific functions and users. An urban cross-section often may include lanes for vehicles, boulevards for utilities, trees, etc., and sidewalks, paths, or buffer areas (shoulders) for active users and non-vehicular use. Changing the cross-section of a roadway is a space management exercise, to create or increase space dedicated to non-vehicular use, typically pedestrians, cyclists, and other vulnerable users. It can result in a shift in modal priority within a segment of the road or within a community area. There are no applicable warrant criteria to screen out this solution.

However, suppose a review of the existing operational environment identifies that the existing cross-section does not adequately or appropriately provide for a specific mode (vehicles or non-vehicle) and that the modification of this environment can resolve the identified problem. In that case, modifications to the design should be considered. If the existing design already adequately provides for alternative modes safely, then modifications to the design can be screened from consideration for the final recommended solution set.

6.1.2 Specific Traffic Calming Design Considerations

Specific considerations for implementing appropriate traffic calming measures within an urban or transitional portion of a county road corridor are shown in **Table 3**. These measures are not typically seen on rural corridors.

Table 3: Traffic Calming Considerations

Traffic Calming Measure	Potential Considerations for Implementation
Curb extension, Chicane, Mid-Block narrowing, Raised islands	• Address the introduction of catch basins. Boulevard grading issues may need to be dealt with. Introducing a curb along the cross-fall of a roadway would introduce negative drainage, therefore would have to introduce or relocate catch basins. Maintain minimum width for EMS vehicle access, snow removal vehicles, trucks and transit vehicles.
Vertical treatments (flex posts and bollards)	• Ensure right-of-way conditions are not too constraining on various mobility uses and treatments are removed during winter maintenance months and these measures are usually present from early April to early November
Gateways	• Depending on the gateway type, a combination of the potential solutions discussed would need to be implemented.

There are several critical criteria to consider in designing and locating speed management devices on a corridor. These criteria considerations may limit which traffic calming measures can be implemented, and impose considerations for their use, having already been chosen in a way that respects the intended role of the road. Considerations include:

- **Driveway Location**
  - A minimum spacing of 2 metres is required from a driveway to the edge of a traffic calming device to avoid blocking or impacting the driveway location. Also, the impact of devices (such as raised medians) that block or alter access to roadside properties should be carefully considered.
- **Location of Signage**
  - Have to be able to place warning or advisory signage without impacting trees or Active Transportation.
- **Cyclists (longitudinal)**
  - Have to be able to maintain safe passage along a street. Vertical traffic calming measures such as speed humps could obstruct a cyclist's passage if they were not created to be traversable. Cyclists may feel squeezed where insufficient room is present in the right-of-way due to a traffic calming device.
- **Active Transportation Crossings**
  - It is noted that textured surfaces may create stability issues. Additionally, crossings, if not accompanied by right-of-way legislation, may result in a false sense of security.

- **Pinch Points (Curb Extensions)**

  - Pinch points are narrowed sections of road surface curb-to-curb widths. These can be effective for calming traffic but must be wide enough to allow service operations to function. Pinch points facilitate safer pedestrian crossings but can be dangerous for cyclists due to decreased roadway width.
- **Surface Treatments**
  - Surface treatments such as textured crossings, textured surfaces and transverse rumble strips involve the use of contrasting materials or textures to highlight active transportation crossings. They should be skid resistant, particularly on inclines, to promote safety and can create additional noise in the surrounding area. Adjacent land use should be considered.
- **Intersection Radius**
  - Caution should be used when placing urban traffic calming elements on horizontal curves due to limited sight distances. The roadway needs to be able to accommodate the Design Vehicle making a right-hand turn safely. One solution to implementing traffic calming on a horizontal curve would be to use mountable aprons to project the appearance of a reduced radius while still accommodating larger vehicles.
- **Maintenance**
  - Have to be able to maintain the street – sweeping and snow removal. Reduced street widths, horizontal and vertical measures can all impact maintenance equipment. Lane widths of at least 3.3 metres from the edge of the centreline to the edge of the gutter must be maintained as all County roads are truck routes by default.

If an evaluation of the criteria confirms that traffic calming is a feasible option, then it can be carried forward to the evaluation of the next steps. Otherwise, it can be screened from consideration for the final recommended solution set.

6.1.3 Pedestrian Crossover Warrant

The warrant criteria for a controlled pedestrian crossing are provided on page 28 of OTM Book 15 *(June 2016 edition)*. All requirements of Warrant 1 must be met to warrant the implementation of a crossover. As well, the appropriate flow condition should be selected and must be met for Warrant 2. Controlled pedestrian crossings may be installed at appropriate pedestrian crossing locations. OTM Book 12 and OTM Book 15 contain additional information on the implementation of controlled pedestrian crossings. If the warrants are not met, then the implementation of a pedestrian crossover is not considered a feasible option.

In Wellington County, requests for the installation of PXOs in urban areas on County roads come from the local municipality. They are to review the proposed location to be completed by an engineering consultant and provide the County documentation that warrants have been met as outlined in OTM Book 15 and/or OTM Book 12. If warrants have been met, the local municipality will be required to design and install the PXO as outlined by the requirements provided in OTM Book 15 and be responsible for any associated costs for review, design and installation. Once the PXO has been installed the County will assume ownership and long-term maintenance of the facility. Should a PXO be proposed to be implemented as part of a Speed Management Plan, the County should consider a cost-sharing

arrangement in the implementation of the PXO, as it can be considered as a combined pedestrian and speed management measure.

6.2 Develop Final Solution

Those options that are not disqualified can be considered on the shortlist of options and evaluated, taking into account the characteristics of the street and the root source of the speeding issue, to arrive at a final solution set.

7.0 Engagement

Developing and implementing effective education and communication strategies that inform and influence the stakeholders concerning the need and importance of speed management initiatives are critical components in the success of a Speed Management plan.

Education is particularly important for developing an understanding of the nature and scope of speed as a traffic safety and transportation efficiency issue. Communicating clear and effective messages to municipal partners and private/public stakeholders will support new and existing sustained enforcement efforts.

7.1 Establish Project Stakeholders

Project stakeholders can be considered in two forms: Internal-Public (Agencies) and External-Private (Private groups or individual members of the community).

Internal-Public stakeholders are municipal and other agency partners who have a role in the management of community planning and provision of services. The role of these partners is to provide review and inputs related to planning and strategy development (developing the foundations of the plan), developing plan concepts (determining how best to reach target audiences), and support the enforcement of the initiatives (how best to support enforcement efforts, align with other safety measures).

External-Private stakeholders are individual members or groups of the business or residential community who have a vested interest in their community and the surrounding environment. They may live or work in the area and will have specific concerns related to local issues. They perceive their physical environment based on daily activity and recurring issues and also may have very strong opinions on mitigation potentials. Public support for traffic safety initiatives can be enhanced through a more thorough understanding of the risks associated with speeding. While many people acknowledge that speeding is dangerous, there is often a lack of personal responsibility and accountability when individuals evaluate their own driving behaviours. Creating an understanding of the risks of speeding will be critical to a successful communication effort.

Project stakeholders would include but not be necessarily limited to:

Agencies

- Wellington County
  - Roads Division
  - Representative County Councillor
  - Roads Committee
- EMS
  - Fire
  - Ontario Provincial Police (OPP)

  - Ambulance
- Local Municipality
  - Public Works
  - Planning
  - Representative Municipal Councillor

Other

- Schools / District School Boards
- Resident Groups
- Local Businesses (BIA)

To develop a co-ordinated approach from an Engineering and Enforcement standpoint, quarterly meetings with representatives from both the Wellington County OPP and Wellington County Roads staff could occur. This Speed Management Team could be led by Wellington County Staff and members of the Wellington County OPP staff. Other stakeholders could be involved on an as-needed basis. During these discussions, the following matters could be considered:

- A review of the current Speed Management Guidelines;
- A review of any potential posted speed limit adjustments being considered;
- A review of data that was recently collected;
- A discussion about the following corridors that have been approved for further speed mitigation;
- A discussion of the types of improvements that could be implemented on the corridors approved for speed mitigation;
- A discussion of the local context and factors impacting the surrounding road environment, including but not limted to:
  - Traffic volumes (hourly and daily);
  - Percentage of truck/tractor-trailer and bus traffic;
  - Other road users (e.g. agricultural equipment, horse and buggy, etc.); and
  - Driveway access type and use;
- Preparation of a summary report of current speed management locations under reviewto be tabled at the Roads Committee. This review will keep the committee informed on the status of the various ongoing Speed Management corridor reviews.

7.2 Stakeholder Engagement

The stakeholder engagement process is illustrated in **Table 4**.

Table 4: Stakeholder Engagement Process

Stakeholder Engagement Points of Contact	Stakeholders Involved	Method of Contact
Screening Process		
1. The County receives a speed mitigation request from the stakeholder.	The resident who is raising concerns	County or Wellington County OPP website (fillable form), email, mail, telephone or through County Councillor
2. The County communicates with the stakeholder to inform whether or not this area has been assessed within the last three years.	The resident who is raising concerns	Email and/or mail
Assessing Speed Profile of Street		
3. If no subsequent investigation will be considered, the County shall contact the party to inform them of the initial assessment findings. If a Speed Mitigation Plan will be prepared, the resident should be informed.	The party and other residents	Mail drop and/or email
Developing a Speed Mitigation Plan		
4. After a suitable list of solutions has been identified and non-viable solutions are screened out, the final solution can be chosen by taking into account the characteristics of the County road and the root source of the speeding issue. After a draft plan strategy has been developed, the final solution can be brought to stakeholders for review and discussion.	All stakeholders will be contacted directly	Notices will be posted on various social media platforms as well as on the County's website. Residents of the area will receive a mailed letter.

The Screening Process (**Figure 1**) incorporates the above Stakeholder Engagement Process with four points of contact as indicated on the combined Screening and Stakeholder Engagement Process (**Figure 2**). Following meetings of the County Roads and OPP Speed Management Team, a summary report will be submitted regualry to the Roads Committee identifying ongoing Speed Management locations under review.

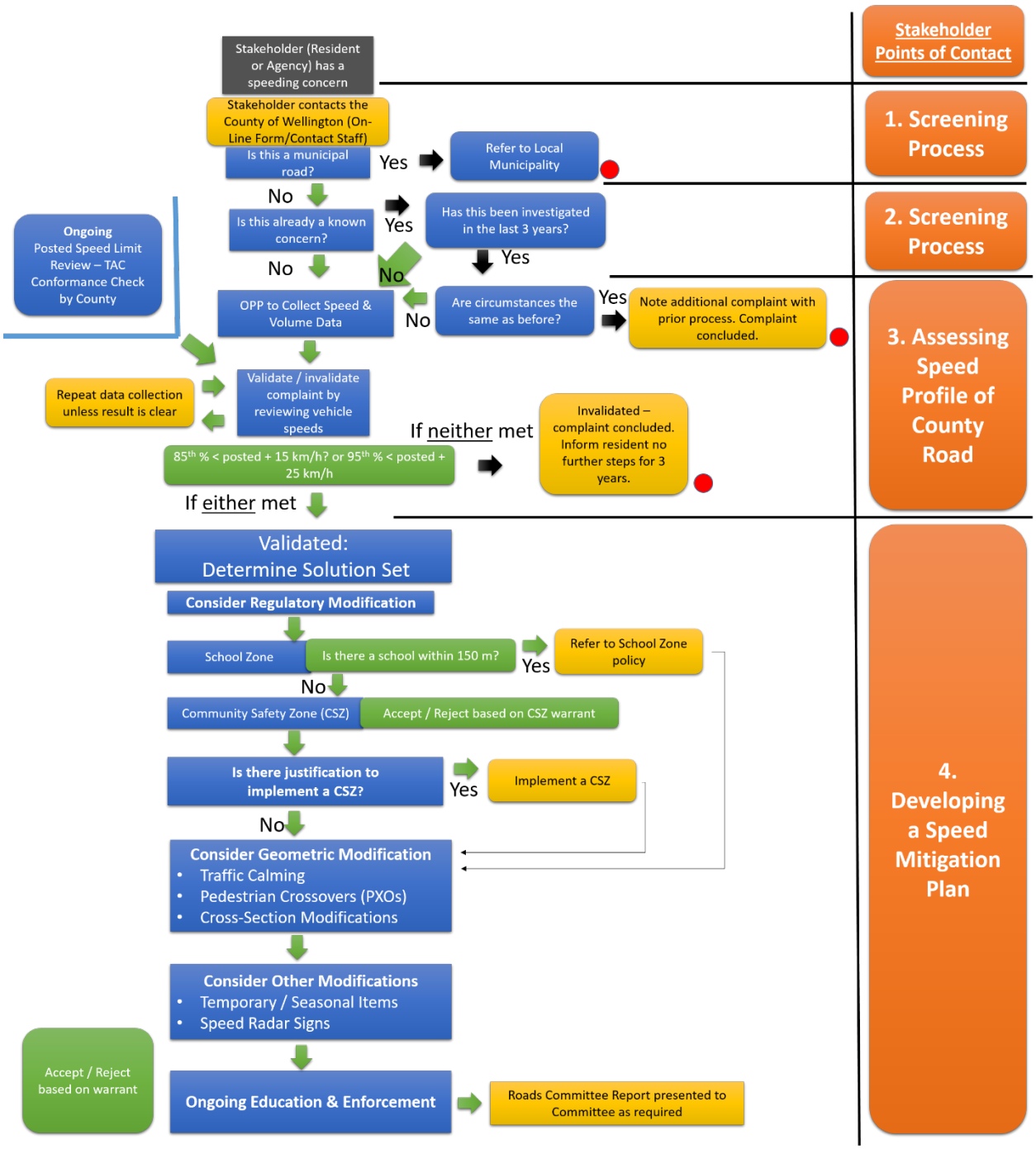

Figure 2: Speed Management & Stakeholder Engagement Process

8.0 Approvals & Implementation

8.1 County Approvals Process

County staff will forward the final solution and recommendation as well as any comments received from the public to the County Roads Committee and Council for its deliberations on an appropriate course of action if required, including approving the project for construction.

Some of the lower-cost improvements such as the introduction of pavement markings, signage and/or speed display boards may be able to be implemented at a Speed Management Team and/or Roads staff level, while any regulatory improvements such as posted speed limit changes, the introduction of community safety zones and school zones would need to be approved via a By-law Amendment at County Council. The same would be applicable for any geometric improvements which would include the need for a contract and tender to be awarded for the design and construction of any corridor improvements or physical traffic calming (such as medians, curb extensions, etc.).

8.2 Next Steps

Once target locations and mitigation solution sets are approved, the next steps in the process should be as follows:

- Design project(s) and allocate appropriate funding sources and/or pursue grants or private funding;
- Develop implementation schedule, assign tasks, and incorporate costs into operational capital budgets;
- Finalize safety targets or other goals;
- Identify measures of effectiveness and develop an evaluation plan;
- Implement and complete evaluation; and
- Communicate results to stakeholders, internal and external.

Appendix A

Speed Mitigation & Community Safety Zone (CSV) Warrants

Table A.1: Speed Profile Assessment

Street Information	Result
County Road Number	Wellington Road _____
County Road Name	_____
Segment (from where to where)	from _____ to _____
Local Municipality	_____
Daily Number of Vehicles	_____ VPD
Heavy Vehicle %	_____ % Heavy Vehicles
Peak Hour Traffic Volume (both directions)	_____ VPH
Posted Speed	_____ km/h
School Zone	YES / NO, if so, _____ km/h
Posted + 15 km/h (abundance) Threshold	_____ km/h
Posted + 25 km/h (dangerous) Thresholder	_____ km/h

Metrics	Data Collection	Prepare Speed Mitigation Plan?
Task Description	Insert collected speed	Was the data benchmark met? 85^{th} > posted + 15, 95^{th} > posted + 25
85^{th} percentile speed	_____ km/h	*YES / NO*
95^{th} percentile speed	_____ km/h	*YES / NO*
Outcome	*YES NO*	*If one or both YES – Begin Developing a Speed Mitigation Plan* *If both NO - no Speed Mitigation Plan necessary and process ended*

Table A.2: Community Safety Zone (CSV) Assessment

Street Information	Result
County Road Number	Wellington Road _____
County Road Name	_____
Segment (from where to where)	from _____ to _____
Local Municipality	_____

Risk Factors (circle one)	High (Score 3)	Medium (Score 2)	Low (Score 1)	Score
Posted Speed (km/h)	40	50	60	_____
Average Daily Traffic Volume	>10,000	5,000-10,000	<5,000	_____
Number of Lanes (Both Directions)	>4	3 or 4	2	_____
Presence of Community Facilities	School / Park (with playground)	Retirement Areas / Community Centre / Park (no playground)	None	_____
Presence of Sidewalks	None	On one side	On both sides	_____
Truck Volumes (as % of daily traffic)	>10%	5-10%	<5%	_____
Pedestrians crossing (8 hrs)	>25	10-25	<10	_____
Intersections/Entrances (per km)	>10	4-10	<4	_____

TOTAL SCORE (Sum up scores from the 8 risk factors) _____

MINIMUM POINTS REQUIRED
18

OUTCOME? (Circle One) **YES**
NO