TOWN OF
WHITCHURCH–STOUFFVILLE
111 Sandiford Drive, Stouffville, ON L4A 0Z8

Customer Service Centre: 905-640-1900
Toll Free: 1-855-642-TOWN (8696)
Automated: 905-640-1910
Toll Free: 1-855-642-TOWS (8697)
Fax: 905-640-7957
www.townofws.ca

September 30, 2021

Delivered by email
paul.calandra@pc.ola.org

Provincial Parliament
37 Sandiford Drive, Suite 400
Stouffville, ON L4A 3Z2

RE: Report No. PW-014-21 Vision Zero - Traffic Calming Strategy

Please be advised the above-noted matter was placed before Council at its meeting held on September 21, 2021 and the following resolution was passed:

1) That Council endorse in principle the Vision Zero program and associated Traffic Calming Strategy as outlined in this report and Attachment 1; and

2) That Council direct staff to implement a communications strategy for the Vision Zero initiative that will engage, inform and focus residents on Whitchurch-Stouffville's mission and pursuit to achieve zero fatalities or serious injuries on our roadways; and

3) That Council direct staff to continue to seek input from the Road Watch Staff Working Group for the ongoing development and implementation of the Vision Zero program and associated traffic calming initiatives; and

4) That Council direct staff to include a budget of approximately $345,000 in the draft 2022 Capital Budget for Council consideration, to implement traffic calming initiatives, including:

- Roundabout traffic calming initiatives, including signage indicating vehicle right-of-way, pavement marking improvements and raised pedestrian crossings as required.
- Installation of additional traffic delineators in school and park areas, as well as areas of particular speeding concern, as determined in collaboration with York Regional Police and Town residents.
- Purchase and long-term placement of radar speed signs on collector roads.
- Pilot the use of video analytics and accident prediction technology at a high-risk intersection to explore the technology's usefulness in providing the data required to create intersection improvement plans that reduce the risk of injury from traffic accidents at Town intersections.
- Construct sidewalks and/or multi-use paths within existing boulevards based on Master Plan findings to provide for safe active transportation and the benefits of 'Complete Streets'.
- Pilot the use of temporary transverse rumble strips.
- Add shared route bike lanes to narrow roads, slow vehicles and promote active transportation as indicated in the Master Plan.

- Conduct a speed limit review and reduce speed limits as deemed appropriate.
- Complete traffic studies as required to determine the appropriateness of various forms of traffic calming.
- Undertake various education initiatives, including publishing articles in On the Road.

5) That Council direct staff to update the Town's Engineering Standards, Official Plan, and Transportation Master Plan with appropriate Vision Zero, Complete Street, and traffic calming design requirements to ensure that all future developments are designed with a central focus on traffic and pedestrian safety; and

6) That Council direct Staff to inform York Region of Council's desire to implement delineators on Aurora Road at Ballantrae Public School and Ballantrae Community Centre; and

7) That Council direct Staff to come back with memo on potential locations for traffic delineators on Hoover Park between Park Drive and Tenth Line; and

8) That Council direct staff to lobby the Provincial Government to make legislative and regulatory amendments to allow municipalities to administer Automated Speed Enforcement programs through the Administrative Monetary Penalty system, and that this resolution be shared with York Region, the local municipalities within York Region, the Honourable MPP Paul Calandra, the Minister of the Attorney General and the Minister of Transportation Ontario.

Please find attached a copy of Staff Report No. PW-014-21 Vision Zero - Traffic Calming Strategy.

If you have any questions, please contact Brian Kavanagh, Director, Public Works at brian.kavanagh@townofws.ca or 905-640-1910 x2464.

Yours truly,

Kristina Soolepp, Council Coordinator
(905) 642-4130

Attachment

cc. Minister of the Attorney General
Minister of Transportation Ontario
York Region
York Region municipalities

Town of Whitchurch-Stouffville Council Report Item 1

Subject:	**Vision Zero - Traffic Calming Strategy**
Staff Report No.	**PW-014-21**
Department:	**Public Works**
Date:	**September 21, 2021**

Recommendation:

1) **That Council endorse in principle the Vision Zero program and associated Traffic Calming Strategy as outlined in this report and Attachment 1; and**

2) **That Council direct staff to implement a communications strategy for the Vision Zero initiative that will engage, inform and focus residents on Whitchurch-Stouffville's mission and pursuit to achieve zero fatalities or serious injuries on our roadways; and**

3) **That Council direct staff to continue to seek input from the Road Watch Working Group for the ongoing development and implementation of the Vision Zero program and associated traffic calming initiatives; and**

4) **That Council direct staff to include a budget of approximately $345,000 in the draft 2022 Capital Budget for Council consideration, to implement traffic calming initiatives, including:**

    - **Roundabout traffic calming initiatives, including signage indicating vehicle right-of-way, pavement marking improvements and raised pedestrian crossings as required.**
    - **Installation of additional traffic delineators in school and park areas, as well as areas of particular speeding concern, as determined in collaboration with York Regional Police and Town residents.**
    - **Purchase and long-term placement of radar speed signs on collector roads.**
    - **Pilot the use of video analytics and accident prediction technology at a high-risk intersection to explore the technology's usefulness in providing the data required to create intersection improvement plans that reduce the risk of injury from traffic accidents at Town intersections.**
    - **Construct sidewalks and/or multi-use paths within existing boulevards based on Master Plan findings to provide for safe active transportation and the benefits of 'Complete Streets'.**

- **Pilot the use of temporary transverse rumble strips.**
- **Add shared route bike lanes to narrow roads, slow vehicles and promote active transportation as indicated in the Master Plan.**
- **Conduct a speed limit review and reduce speed limits as deemed appropriate.**
- **Complete traffic studies as required to determine the appropriateness of various forms of traffic calming.**
- **Undertake various education initiatives, including publishing articles in On the Road.**

5) **That Council direct staff to update the Town's Engineering Standards, Official Plan, and Transportation Master Plan with appropriate Vision Zero, Complete Street, and traffic calming design requirements to ensure that all future developments are designed with a central focus on traffic and pedestrian safety; and**

6) **That Council direct staff to lobby the Provincial Government to make legislative and regulatory amendments to allow municipalities to administer Automated Speed Enforcement programs through the Administrative Monetary Penalty system, and that this resolution be shared with York Region, the local municipalities within York Region, the Honourable MPP Paul Calandra, the Minister of the Attorney General and the Minister of Transportation Ontario.**

1. Purpose:

The purpose of this report is to seek Council's endorsement of the Vision Zero program and associated Traffic Calming Strategy, and Council's direction to include appropriate funding in the draft 2022 Capital Budget to address various traffic calming initiatives that seek to minimize the risk of traffic collisions and related injuries in Whitchurch-Stouffville.

2. Executive Summary:

Enhancing roadway safety is critical to the health and well-being of the residents of Whitchurch-Stouffville, as well as to others who travel on our roads. A Road Watch Working Group has been established, serving as a collaborative effort with Town staff, Council representation, York Regional Police and community volunteers to consult on various initiatives to help raise awareness of the Road Watch program and make the Town a safer place to live, work and play with respect to public roads and responsible driving.

This report introduces the concept of Vision Zero and recommends that it be adopted by Council in an effort to eliminate all fatalities and serious injuries caused by motor vehicle crashes in Whitchurch-Stouffville. The Vision Zero program includes the Town's first Traffic Calming Strategy, the purpose of which is to incorporate best practices in traffic calming with local context to provide a more appropriate, efficient, flexible and systematic

framework through which to address traffic safety issues relating to excessive speeding, careless driving, and collision frequency.

The Traffic Calming Strategy includes numerous initiatives planned for implementation or review in 2022 and recommends that traffic calming, complete streets and Vision Zero be made integral to the Town's development process.

3. Background:

The following motion was carried at the June 1, 2021 Council meeting:

> **"WHEREAS** the speed of vehicles in our neighbourhoods continue to be a concern for residents, Council and law enforcement; and
>
> **WHEREAS** a speeding vehicle took the lives of two young children in City of Vaughan on May 16, 2021; and
>
> **WHEREAS** due to the size of our municipality, enforcement resources are limited; and
>
> **WHEREAS** our current grid road network has unintentionally contributed to traffic safety concerns, and traffic calming measures such as mini-roundabouts, automated speed enforcement, radar speed signs, bike lanes, increased signage, bump-outs, traffic delineators, medians, and education are all within the Town's authority to enact.
>
> **NOW THEREFORE BE IT RESOLVED THAT** Council direct staff to develop a Traffic Calming Strategy for the Town of Whitchurch-Stouffville that will include but is not limited to the measures above for "high-incident" roads, as identified by York Regional Police, and develop a budget for implementing those measures for consideration during the 2022 budget deliberations; and
>
> **THAT** Council direct Development Staff to consider traffic calming designs in future subdivision designs."

This report addresses the above resolution with the presentation of a traffic calming strategy, as part of a broader Vision Zero framework, and includes provisions for existing neighbourhoods and future developments.

4. Analysis and Options:

4.1 Road Watch Working Group

Whitchurch-Stouffville's Road Watch Working Group was established through a Council-endorsed Terms of Reference, with the first group meeting held in September 2020.

The Road Watch Working Group serves as one of the Town's primary tools used to engage residents, manage road safety, calm traffic and work proactively with York Regional Police for the betterment of the community. The group's efforts are intended to minimize the risk of traffic collisions and related fatalities in Whitchurch-Stouffville.

The Road Watch Working Group has made significant progress toward this goal. Successes to date include:

- Monthly educational articles published in *On the Road* magazine
- Shared personal impact stories and statistics related to traffic accidents and driving infractions to highlight the importance of traffic safety
- Education campaigns focused around YRP's seasonal focus areas (e.g. back to school, winter driving, pedestrian and bicycle safety, etc.)
- Collaboration with YRP for analysis of safety related data in order to understand trends and locations of concern
- Planning for the implementation of traffic calming initiatives

The mandate of the Road Watch Working Group is very well aligned with the global movement known as Vision Zero. The Vision Zero concept is discussed in the following sections.

4.2 Vision Zero

Vision Zero is a global movement transforming the way we use, interact and travel on our roads. **It has a simple and clear goal: ZERO fatalities or serious injuries on roadways.** Vision Zero is an engaging and open program, which embraces the community and supports local prosperity by striving towards a safe, reliable road network. The underlying foundations of the Vision Zero, as applied to Whitchurch-Stouffville, include the following vision and mission statements:

Vision: Establish a culture of personal responsibility where motor vehicle fatalities and serious injuries are recognized as preventable and not tolerated in Whitchurch-Stouffville.

Mission: Eliminate fatalities and serious injuries caused by motor vehicle crashes in Whitchurch-Stouffville.

Vision Zero encourages active modes of transportation by addressing road safety for vulnerable road users of all ages and abilities – reducing the Town's contribution to climate change and encouraging a healthy lifestyle.

4.2.1 The Five E's of Vision Zero

Vision Zero can be achieved by addressing road safety holistically through five main elements, commonly referred to as the five E's:

- Evaluation
- Engagement
- Education
- Enforcement
- Engineering

These elements need to be implemented in a coordinated and strategic manner to achieve improvements to road safety and to strive towards the goal of zero fatalities and severe injuries on Town roads. The following is a summary of each of the 5 E's.

Evaluation

The evaluation component includes identifying the root causes behind traffic related injuries and fatalities while focusing on methods of collecting, sharing, maintaining, and improving data collection. This evidence-based approach to safety allows for the strategic deployment of effective countermeasures in addressing fatalities and injuries within the transportation network. Enhancing the availability of traffic and collision data is essential to define appropriate programs for use in Engineering, Enforcement, Engagement and Education.

Engagement

The Vision Zero program should inspire residents to become part of the solution on this journey towards zero fatalities and injuries. It should engage residents of all ages and support engineering and enforcement initiatives. Staff will work with Corporate Communications to prepare and implement a communications strategy for the Vision Zero initiative that will engage, inform and focus residents on the Town's mission and pursuit to achieve zero fatalities or serious injuries on our roadways

Education

Vision Zero includes an educational component that will be developed and refreshed annually in collaboration with Town staff, residents, YRP, the Road Watch Working Group, and other stakeholders. Education programs will focus on seasonal issues, trending topics and those issues identified through network screening and enforcement statistics. Education campaigns will continue to re-enforce messages that have been communicated to ensure continued education for residents, however the education plan must also be flexible to undertake campaigns that are unexpected education opportunities and address unexpected challenges in terms of road safety.

Enforcement

Considering that human error is the main cause of collisions, efficient and effective law enforcement is necessary to improve roadway safety. The collaborative, data driven

Vision Zero process, also employed by York Regional Police, results in the efficient allocation of limited law enforcement resources for maximized effectiveness.

While redesigning roadways is one aspect of achieving results, traffic enforcement is also required to reduce inappropriate driving behaviours. Offenses such as distracted driving, speeding, failing to yield to pedestrians, failing to stop on a signal and improper turns all expose vulnerable users to potential catastrophic consequences.

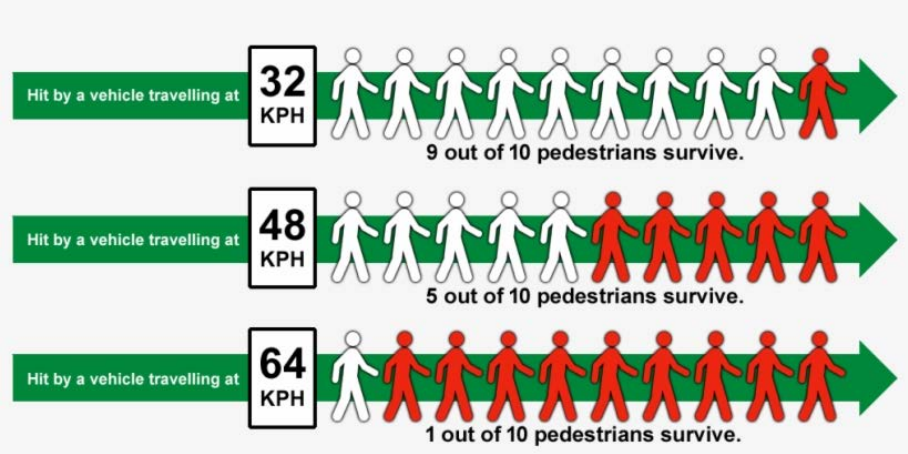
Engineering

The Vision Zero approach to safety is to design and operate roads to minimize the impacts of the mistakes made by road users. Considering the increasing trend in active transportation, proactive design approaches, including a review of speed limits, are required to ensure the safe accommodation of all road users. Consistent monitoring of the road network using safety and traffic data will allow for the incorporation of strategic engineering countermeasures in street design, traffic engineering, transportation planning and land use to prevent collisions involving injuries and fatalities.

4.2.2 Key Themes of Vision Zero

Safe Speeds

Driving at an appropriate speed reduces the likelihood of a collision, reduces the severity of injuries if a collision does occur, and provides a safety buffer by giving motorists enough time to stop in an emergency. The following graphic illustrates the importance of speed in case of an accident:



Safe Vehicles

Safer vehicle designs are outside the responsibility of the municipality, but advances have been implemented by the automotive industry over the last number of decades. Inflatable seat belts, centre air bags, crash avoidance systems, forward-collision warning, traffic sign recognition, adaptive headlights, lane-departure systems, intelligent speed assistance, fatigue-monitoring and pedestrian detection are all examples of new technologies that will increase the safety of vehicles.

Safe Roads

Safe roads play an important role in making Vision Zero successful. The design of a road can help manage a driver's speed, guide a motorist to do the right thing, reduce collisions and allow for human error. Transportation engineers design roads with tools like stop controls, signage and other traffic calming measures to help reduce collisions or other roadway incidents.

Safe Drivers

Driver error is commonly a contributing factor in collisions. Educating drivers and enforcing the rules of the road are critical to reducing injuries and deaths, and achieving the goals of Vision Zero.

4.3 Pedestrian and Cyclist Collision Statistics

The following table outlines the amount of pedestrian and cyclist collisions in each York Region municipality, relative to each municipality's population, over a 10-year period.

Municipality	Pedestrian Collisions	Cyclist Collisions
Aurora	0.6	0.8
East Gwillimbury	1.0	1.5
Georgina	0.8	1.2
King	0.5	1.0
Markham	1.0	1.1
Newmarket	1.4	1.1
Richmond Hill	1.0	0.9
Vaughan	1.1	1.0
Whitchurch-Stouffville	**0.25**	**0.5**

As indicated in the table, Whitchurch-Stouffville has the lowest per capita pedestrian and cyclist collisions in York Region. The 0.25 pedestrian collision statistic for Whitchurch-Stouffville indicates that although the Town represents about 4% of York Region's population, the Town only has about 1% of the Region's pedestrian collisions. Similarly, the Town has about 2% of the cyclist collisions in the Region. This is a good starting point as the Town implements Vision Zero and its first Traffic Calming Strategy.

4.4 The Need for a Traffic Calming Strategy

Traffic calming becomes necessary when the amount of vehicular traffic, speed levels, and/or observed driver behaviour does not correspond with the type of road, the context of the surrounding areas, or the activities of other road users. The purpose of the Town's Traffic Calming Strategy is to incorporate best practices in traffic calming with local context to provide a more appropriate, efficient, flexible and systematic framework through which to address traffic safety issues relating to excessive speeding, traffic infiltration, and collision frequency.

Although introduction of traffic calming measures can mitigate the negative effects of vehicle use, they can also have potentially negative effects on other modes of transportation, operations and maintenance activities conducted by the road authority, and emergency vehicle response times. As such, the Town's traffic calming strategy must be carefully considered and implemented to:

- support the decision-making process from the moment that a traffic related issue is identified to implementation of the selected measure
- inform residents about the different elements composing the traffic calming toolbox and process
- promote a fair allocation of resources through an incremental implementation of required traffic calming measures

The Town's first Traffic Calming Strategy is included as Attachment 1. It outlines the purpose and objectives of the strategy, the Town's key risk groups and the hazards they face, and most importantly, the interventions that can be made and the process to be followed to improve road safety. The Traffic Calming Strategy also includes a detailed description of initiatives that form a 'toolbox' from which various traffic calming improvements can be selected for implementation.

4.5 Traffic Calming Work Completed to Date

Road safety is top of mind for Town residents. As such, numerous traffic calming measures have been implemented over the past few years. These include:

- Installation of traffic delineators
- Implementation and expansion of Community Safety Zones
- Installation of speed humps and speed bumps in Memorial Park
- Installation and rotation of radar speed boards
- Decreased speed limits on various road segments
- Partnering with YRP for targeted speed enforcement
- Formation of a Road Watch Working Group
- Pavement marking improvements such as improved crossings
- Signage additions and improvements
- Signalization of intersections
- Completion of an Active Transportation Servicing Plan, and implementation of select sidewalk and pathway projects

These measures have improved the safety of Town roadways, however it is recognized that there is a need and an opportunity to do more.

4.6 Resident Input

Traffic calming measures have a direct impact on neighbourhoods and the residents living in them. As such, an integral part of the process includes resident communication and feedback. Good community involvement leads to solutions to specific local traffic issues.

Based on input from residents, concerns are widespread. Problem areas include collector roads, such as Millard Street, Hoover Park Drive and Reeves Way Boulevard, and local roads such as Richard Daley Drive, Elm Road and Manitoba Street. Rural roads such as St. John's Sideroad and Bethesda Road are also cited.

Numerous suggestions have been provided by residents, the majority of which have been incorporated into the Traffic Calming Strategy included as Attachment 1. The most commonly requested traffic calming measure is the provision of mid-road traffic delineators. The delineators have proven to be effective in school areas and parks, and there is strong resident interest in expanding their use. Additional suggestions include the following:

- Rumble strips
- Photo radar units, including decoy units
- Electronic speed limit signs
- Pedestrian only roads on weekends
- More bike lanes
- Traffic circles to break-up straightaways
- Use of road pylons
- Community Safety Zones
- Educate drivers on the harm of speeding
- Encourage active transportation and busing to Town events
- Art installations as a form of traffic calming

4.7 2022 Initiatives

Recommendations included in the Traffic Calming Strategy that are planned for implementation in 2022 are summarized as follows.

Roundabout Improvements

Staff recommendations include the provision of signage that clearly indicates that vehicles have the right-of-way at roundabouts. Additional recommendations include:

- Refresh the yield line pavement markings and extend the centre and edge line markings to the entries at all existing roundabouts.
- Install one-way signage on the centre island of the Creekland Avenue / West Lawn Crescent roundabout to prevent vehicles from mounting the centre median (to be completed in 2021 to address a safety concern).
- Install a raised crosswalk at the south leg entry at the Reeves Way Boulevard & Richard Underhill Avenue roundabout.
- Widening of select splitter islands and/or installation of entry curb extensions, pending speed reduction results of pavement marking improvements

Crosswalk Pavement Markings

Add ladder-style pavement markings to high risk pedestrian crossings.

Accident Prediction Technology

Staff recommend that a pilot project be implemented using video analytics and accident prediction technology at a high-risk intersection to explore the technology's usefulness in providing the data required to create intersection improvement plans that reduce the risk of injury from traffic accidents at Town intersections.

Complete Street Improvements

Staff recommend that the Town's Engineering Standards, Official Plan and Transportation Master Plan be updated with appropriate complete street, Vision Zero and traffic calming design considerations to ensure that future developments are designed with a central focus on road safety.

For existing neighbourhoods, staff will continue to address the addition of sidewalks and multi-use paths, as guided by the Town's Active Transportation Servicing Plan.

Automated Speed Enforcement

Effective use of Automated Speed Enforcement is limited by legislation that mandates the application of the Provincial Offence Act as opposed to an administrative monetary penalty system. Staff will lobby the Provincial Government to make legislative and regulatory amendments to allow municipalities to administer Automated Speed Enforcement programs through the Administrative Monetary Penalty system.

York Region has begun a two-year automated speed enforcement pilot project to determine the capacity of provincial courts to process the infractions, as well as a trial for the technology being used. Town staff will report to Council when results of the pilot are available.

Rumble Strips

Staff recommend that a pilot project be implemented to test the effectiveness of temporary transverse rumble strips.

Annual Speed Limit Review

Staff recommend that annual reviews of speed limits be conducted, and speed limits be reduced where appropriate.

Traffic Delineators

A traffic delineator policy was implemented in 2019 that specified their use in school zones and park areas. Based on their effectiveness and community acceptance, requests for the installation of additional traffic delineators have increased and benefits are seen beyond school zones and park areas. Staff recommend that the policy be broadened to include additional areas beyond schools and parks, as determined by staff in collaboration with York Regional Police and Town residents.

Radar Speed Signs

Staff recommend that additional radar speed signs be purchased for long term installation on rural roads, and collector roads such as Reeves Way Boulevard, Millard Street, Tenth Line and Baker Hill Boulevard.

Shared route bike lanes

Add shared route bike lanes, including on Stouffer Street south of Main Street.

Traffic Studies

Complete various stop sign warrant reviews, and speed and volume studies as needed to support traffic safety reviews.

Education Initiatives

Undertake various education and resident engagement initiatives, including articles published in On the Road.

5. Financial Implications:

Implementing a Vision Zero program and the associated traffic calming strategy is a significant undertaking. It will take time, resources, commitment and funding. The following table outlines the recommended initiatives and their respective approximate costing recommended to be included as part of the 2022 draft capital budget for Council consideration.

Initiative	2022 Capital Budget
Roundabout improvements	$295,000
Accident prediction technology	$12,500
Rumble strip pilot	$7,500
Traffic delineators	$10,000
Radar speed signs	$15,000
Education initiatives	$5,000
Shared route bike treatment	*
Sidewalk and multi-use path construction	*
Traffic studies	*
TOTAL	**$345,000**

* to be funded from annual Public Works accounts

6. Alignment with Strategic Plan:

1. Asset Planning, Maintenance and Development
   Successful stewardship of the infrastructure and facilities required to support a growing community and vibrant economy.

    - Address / plan for maintenance of existing assets & infrastructure; Create new infrastructure

7. Attachments:

1. Traffic Calming Strategy

8. Related Reports:

None

Author: Brian Kavanagh, Director, Public Works
For further information on this report, please contact the Department Head: Brian Kavanagh, Director, Public Works, at 905-640-1910 or 1-855-642-8697 ext. 2464 or via email at brian.kavanagh@townofws.ca

Whitchurch-Stouffville
Traffic Calming Strategy

1. Traffic Calming Defined

Traffic calming involves implementing safety measures or programs to reduce speed and encourage safe driving behaviour for the benefit of all road users.

A successful traffic calming program is one which will alter the street in such a way that motorists will drive slower, exercise caution, and bring the street back closer to its intended use while limiting the negative effects on emergency response agencies and operational costs.

2. Purpose of the Traffic Calming Strategy

The purpose of the Town's Traffic Calming Strategy is to incorporate best practices in traffic calming with local context to provide a more appropriate, efficient, flexible and systematic framework through which to address traffic safety issues relating to excessive speeding, traffic infiltration, and collision frequency and severity.

3. Objectives of the Traffic Calming Strategy

Traffic calming refers to measures aimed at improving safety for all road users by reducing speed and encourage safe driving. Main objectives of traffic calming measures are to:

- Reduce the speed of traffic
- Reduce collision severity and frequency
- Improve safety for drivers
- Enhance safety of pedestrians and cyclists
- Increase the quality of rural and urban life

4. Key Risk Groups

The Town's Traffic Calming Strategy relies on an understanding of local conditions and key risk groups. The following key risk groups have been identified based on emerging trends, research and analysis:

Whitchurch-Stouffville
Traffic Calming Strategy

Risk Group	Definition
Young/Novice Drivers	Drivers who are under the age of 25 or have less than 2 years driving experience.
Medically at Risk Drivers	Drivers with physical or cognitive impairments which affect a person's ability to operate vehicles safely.
Vulnerable Road Users	Pedestrians, motorcyclists, cyclists and persons in personal mobilized devices (e.g., motorized wheelchairs and scooters).
Commercial Drivers	Drivers of heavy commercial vehicles (e.g., vehicles over 4,586 kg or passenger transportation).
High Risk Drivers	Repeat offenders with a pattern of illegal driving behaviours (e.g., recurring incidences of alcohol/drug impaired driving, traffic violations, collision involvement, or suspended/prohibited drivers).
General Population	Road users who benefit from strategies, interventions, regulations, and legislation introduced to make roads, vehicles and road users safer.

Whitchurch-Stouffville
Traffic Calming Strategy

5. Key Contributing Factors

To protect the key risk groups, an understanding of the factors that contribute to collisions is required. The key contributing factors are defined as follows:

Contributing Factor	Definition
Distracted Driving	Distracted driving occurs when a driver's attention is diverted from the driving task by secondary activities (e.g., eating, talking to passengers, talking or texting on electronic communication devices (ECDs) such as cell phones and smart phones).
Alcohol Impaired Driving	Physical or cognitive impairment of a road user which is caused by the consumption of alcohol.
Drug Impaired Driving	Physical or cognitive impairment of a road user which is caused by the consumption of psychotropic drugs (e.g., cannabis, prescription drugs, narcotics, etc.).
Fatigue Impaired Drivers	Fatigue is a general state caused by lack of sleep, time of day, time on task, or task monotony which diminishes the ability to drive by altering alertness and vigilance.
Speed and Aggressive Drivers	Includes driving at speeds beyond posted legal limits or driving too fast for road conditions and driver behaviours which are deemed illegal or outside socially acceptable norms which put other road users at risk (e.g., tailgating, improper passing, failure to signal, etc.).
Unrestrained Occupants	Includes factors pertaining to proper restraint use by all road users (e.g., seat belts, child safety seats, booster seats).
Environmental Factors	Includes factors that may affect the likelihood or severity of crash occurrence (e.g. weather conditions, wildlife on road).
Road Infrastructure	Includes factors that may affect the likelihood or severity of crash occurrence (e.g., roadway configuration, road construction, road surface condition, road and roadside design, lighting and signage).
Vehicle Factors	Includes factors related to vehicle design (e.g., crash avoidance, crashworthiness), maintenance, recalls, aftermarket vehicle equipment, commercial vehicles, unusual vehicles, automated vehicles, new and emerging vehicle technologies.

Whitchurch-Stouffville
Traffic Calming Strategy

6. Road Safety Interventions

For each risk group and contributing factor, there may be more than one intervention for promoting safer road users, safer infrastructure and safer vehicles. A combination of interventions could result in even greater improvements to safety. Traffic calming interventions are categorized as follows:

Intervention Type	Definition
Policy/Legislation/ Regulation	Includes evidence-based jurisdictional policies, laws, and regulations intended to improve road user behaviour and the safety of the road infrastructure and vehicles.
Education/ Training	Includes activities that provide knowledge and/or test the capacity of a person to demonstrate appropriate behaviour with respect to road safety (e.g., proactive and remedial education, driver training, child restraint training).
Communication/ Awareness	Includes any activities that contribute to increased awareness and knowledge of key road safety issues by the general public or target audience that may lead to safer road user behaviour. (e.g., ad campaigns, social media, etc.).
Enforcement	Includes activities carried out by enforcement agencies in order to apprehend offenders and to raise the perceived likelihood of being apprehended (e.g., enhanced Check Stops, Selective Traffic Enforcement Programs (STEP), intelligence-based enforcement, automated enforcement, commercial vehicle inspections).
Information/Data/ Research	Includes capturing and compiling complete, uniform and timely data (e.g., crash, trauma, exposure) to expedite the identification of emerging trends/issues for the further development of evidence-based road safety interventions. This also includes the evaluation of road safety measures and the monitoring of road safety indicators over time.
Technology	Includes using technology and innovation to improve the safety of the driver (e.g., installment of alcohol ignition interlock, speed and red light cameras); vehicle (e.g., electronic stability control, side curtains and airbags) and infrastructure. (e.g., Intelligent Transportation Systems, roundabouts).

7. Traffic Calming Process

7.1 Initiation of Review Process

The traffic calming review process will typically be initiated by resident request or proactively by Town staff. Residents with traffic related concerns will be asked to submit

details of their concern using a standard form that will be developed by staff, made available on the Town web-site, and communicated to residents as part of a detailed communication plan. Appropriate information will be gathered through this process in order to proceed with detailed analysis, including a review against several screening criteria.

7.2 Site specific Screening Criteria

Staff will review the location to determine if the roadway meets the criteria for implementing traffic calming measures.

The screening process sets requirements that should be met for a location to be eligible for traffic calming measures such as horizontal deflection, vertical deflection, roadway narrowing, pavement markings, traffic delineators, or enforcement. The screening criteria will also help identify whether a more complex issue exists that may need to be addressed using a different approach. Screening criteria include:

Grade: if the grade of the roadway is equal to or greater than the maximum threshold of 8%, safety considerations dictate that the location will not be considered for implementation of traffic calming measures.

Block Length: if the distance between consecutive controlled intersections along the requested route is shorter than 100 meters, the location will not be considered a high priority for implementation of traffic calming measures.

Speed: if the 85th percentile speed is 15km/h over the posted speed limit, the location will be considered a high priority for implementation of traffic calming measures. 85th Percentile is the speed that 85% of vehicles are observed to travel below that speed.

Daily Traffic Volume: if the average daily traffic (ADT) along the roadway section is less than 750 ADT for local roads, and 1500 ADT for collector roads the location will not be considered a high priority for implementation of traffic calming measures.

Collision Data: Staff will review available collision data to be provided by YRP and consider this information in a context of relativity to similar roads throughout Town. Above-average collision history will form part of the data used to prioritize traffic calming projects.

7.3 Traffic Study

As part of the review, Town staff will determine if a traffic study is required in order to determine the appropriateness of various forms of traffic calming. Traffic studies will typically include a volume and speed study to determine 85th percentile speed, daily volumes, and peak hour volumes present at the location under review. This data can be used to determine the nature and severity of the speeding concern.

Whitchurch-Stouffville
Traffic Calming Strategy

7.4 Implementation and Monitoring

Based on the information gathered and analysis completed as part of the previous steps, staff will select appropriate measure(s) from the Traffic Calming Toolbox detailed in Section 8 of this report.

Once the traffic calming plan has been warranted and prioritized against other opportunities, the project will be put forward in priority sequence to proceed with implementation. Larger projects will be added to draft capital and/or operating budgets for Council consideration.

Following implementation of the traffic calming measures, staff will monitor their effectiveness, refine the installation if required, and remove measures no longer serving their intended purpose.

8. Traffic Calming Toolbox

The Traffic Calming Toolbox has been developed based on industry best practices, lessons learned in Whitchurch-Stouffville, and the content and recommendations of TAC's Canadian Guide to Traffic Calming. The toolbox has been customized to address the Town's context-sensitive approach to traffic calming.

Town Staff will continue to obtain the input of the Road Watch Working Group, Fire and Emergency Services and Public Works Operations when evaluating the need for traffic calming and use sound engineering judgment when selecting a traffic calming measure.

8.1 Pedestrian Crossover

Pedestrian crossovers are a relatively new way for pedestrians to easily and safely cross the road. By law, drivers and cyclists must stop and yield to pedestrians intending to cross the road while waiting for them to completely reach the other side before driving ahead. An example of a pedestrian crossover, similar to that which is planned to be installed at the intersection of Ninth Line and Elm Road in 2022, is pictured below.

Pedestrian crossovers have special ladder-style stripes that mark the crosswalk and marked yield bars showing where drivers must stop. Some crossovers have flashing lights that are activated by pedestrian push buttons. Signs are also present telling drivers to stop for pedestrians.

If there is a push button, pedestrians push the button and cross when all vehicles (including cyclists) have come to a complete stop. If a push button is not present, pedestrians are advised to make eye contact with motorists before stepping into the crossover. Motorists must come to a complete stop when signals are flashing or when pedestrians are within the crossover. Drivers must not proceed until the signals have stopped flashing or until pedestrians are no longer in the crossover.

8.2 Crosswalk Pavement Markings

Crosswalk pavement markings serve to highlight pedestrian crossing conditions and vulnerable users at priority locations. Crosswalk treatments should consider all types of pedestrians' and pedestrian abilities. Knowledge about neighbourhood characteristics (i.e. traffic volume and speeds, pedestrian volume, pedestrian age and ability, school zone, commercial district etc.) as well as pedestrian-vehicle crash data would likely influence the type of treatments introduced to make crosswalk locations safer.

The road or street locations and widths being considered for crosswalk treatments (e.g. mid-block, local streets or intersection of primary/secondary arterials, dual or multilane) and the types of crashes to be mitigated also influence the type of treatments introduced.

A common example is the ladder stripe crosswalk which has lines painted within the pedestrian crosswalk parallel to the driver's direction of travel. The white bands are typically 60 cm wide and spaced 60 cm apart. Ladder stripe crosswalks increase drivers' visibility of crosswalks during daylight and at night.

There have been several studies related to the effectiveness of ladder stripe crosswalks in the improvement of crosswalk visibility. Based on this, the Town will use ladder stripe crosswalks as a means to improve pedestrian safety. An example of crosswalk pavement markings is pictured below.

8.3 Innovation and Technology

Decommissioned decoy police vehicles

York Regional Police use decommissioned police vehicles with no one inside, parked at various places in the municipality, as decoys to slow drivers down. Motorists will typically slow down when they see a cruiser as they will assume there is an officer inside doing speed enforcement.

The Town has an opportunity to partner with York Regional Police in the selection of locations for the decommissioned cruisers.

Video Analytics

The use of network screening is a process for reviewing a transportation road network to identify and rank sites from the most likely to the least likely to benefit from a safety improvement. High-crash locations relating to speed and aggressive driving can be identified in order to introduce infrastructure and/or enforcement strategies where needed.

Targeted intersection improvements may be achieved by means of countermeasures that focus on access management, advanced technology, improved lighting, intersection geometry modifications, intersection traffic control, speed management, and signs.

Staff recommend that a pilot project be implemented for the use of video analytics, risk assessment and accident prediction technology at a high-risk intersection to explore the technology's usefulness in providing the data required to create intersection improvement plans that reduce the risk of injury from traffic accidents at Town intersections.

8.4 Roundabout improvements

A roundabout is the safest type of intersection for motorists. According to the insurance Institute for Highway Safety (IIHS) in the United States, when an intersection controlled by stop signs or traffic signals is replaced by a roundabout, on average the total number of collisions is reduced by 35%, and the number of injury collisions is reduced by 76%. This is the primary reason why municipalities and provincial agencies such as the Ministry of Transportation Ontario (MTO) are now constructing roundabouts.

The safety of a roundabout comes from low traffic speeds, fewer conflict points, and the elimination of high-speed T-bone and head-on collisions. Roundabouts have other advantages as well:

- Higher traffic capacities and shorter delays for same number of lanes (or, fewer lanes to achieve similar capacity)
- Shorter vehicle queues, which can lessen the potential to block nearby driveways and intersections
- Efficient operation during power failures

Whitchurch-Stouffville
Traffic Calming Strategy

- Gateway or transition between high-speed rural and low-speed urban areas
- Streetscaping opportunities
- Lower motor vehicle noise, fuel consumption and emissions through more uniform speeds with less starting and stopping and less idling
- Generally lower life cycle costs

Staff reported to Council on July 20, 2021 with recommendations to improve the safety of Town roundabouts. Council raised concerns regarding a recommendation to provide right-of-way to pedestrians, and the report was subsequently deferred for inclusion as part of the Traffic Calming Strategy.

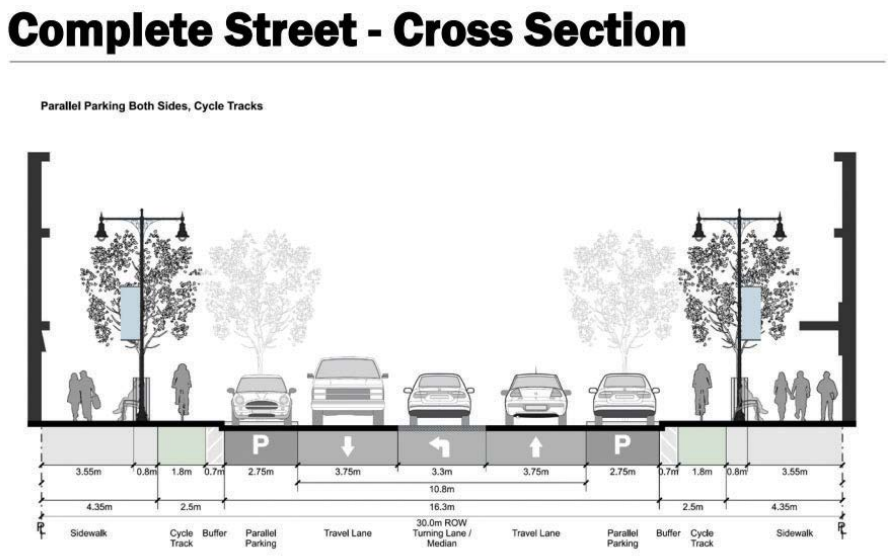
Staff have revised the recommendations to include the provision of signage that clearly indicates that vehicles have the right-of-way at roundabouts. The remaining recommendations remain unchanged and focus on reducing vehicle entry speeds:

- Refresh the yield line pavement markings and extend the centre and edge line markings to the entries at all existing roundabouts.
- Install one-way signage on the centre island of the Creekland Avenue / West Lawn Crescent roundabout to prevent vehicles from mounting the centre median
- Install a raised crosswalk at the south leg entry at the Reeves Way Boulevard & Richard Underhill Avenue roundabout.
- Widening of select splitter islands and/or installation of entry curb extensions, pending speed reduction results of pavement marking improvements

The following photograph shows recommended improvements to roundabout pavement markings.

8.5 Complete Streets

The National Complete Streets Coalition defines a complete street as “a street that works for motorists, bus riders, cyclists and pedestrians, including those with disabilities.” A complete street is one that takes into account each mode of transport and uses a variety of policies, bylaws and infrastructure to make a street fully multi-modal. The following diagram displays a sample section of a complete street.



By adopting complete streets policies, municipalities stand to gain many benefits. Viewing the road network holistically enables communities to reduce infrastructure costs by designing a transportation network that suits all users at the outset, rather than retrofitting to include pedestrian, cycling or transit amenities later. There are also safety and social benefits realized by lowering traffic speeds, expanding mobility options, improving air quality, increasing opportunities for physical fitness, and designing more attractive communities.

Ideally, Complete Streets are achieved proactively through the development process. It is important to incorporate speed control as a design objective in road design guidelines for new developments. Wide and straight roadways tend to encourage speeding. The design within the right-of-way such as landscaping, active transportation facilities, accessibility treatments, and horizontal and vertical deflections are elements that can be considered and included. The goals are to use these designs as passive speed control devices and to set the expectation for safety from the beginning. Speed control measures should be described as part of the development application.

Staff recommend that the Town’s Engineering Standards, Official Plan and Transportation Master Plan be updated with appropriate complete street, Vision Zero and traffic calming

design considerations to ensure that future developments are designed with a central focus on road safety.

Existing roads that don't meet Complete Street standards can be modified over time to achieve certain benefits. Staff will continue to address the addition of sidewalks and multi-use paths in existing neighbourhoods, as guided by the Town's Active Transportation Servicing Plan.

8.6 Automated Speed Enforcement

Speeding is the most common traffic concern raised by community members. Automated speed enforcement is a technology-based safety tool to address speeding that supplements traditional speed enforcement. Changing driver behaviour to slow down and comply with speed limits has a positive effect on community health and well-being. The industry reports that Automated Speed Enforcement can reduce the number and severity of collisions.

If a vehicle exceeds the posted speed limit in an automated speed enforcement area, the automated speed enforcement system captures an image which is reviewed by a provincial offences officer. An image of the offence, license plate and ticket with an associated fine will be mailed within the next 30 days. As per the Safer School Zone Act, Automated Speed Enforcement can only be utilized in School Zones and Community Safety Zones. The following pictures depict standard signage and camera equipment utilized for automated speed enforcement.

York Region has begun a two-year automated speed enforcement pilot project to determine the capacity of provincial courts to process the infractions, as well as a trial for the technology being used. The goal of the pilot is to increase safety in school areas while also changing driver behaviour. One mobile automated speed enforcement unit is being rotated between 12 community safety zones spread through all nine local municipalities.

Whitchurch-Stouffville
Traffic Calming Strategy

In Whitchurch-Stouffville, the automated speed enforcement unit will be placed on Bloomington Road in the vicinity of Whitchurch-Highlands Public School.

Should local municipalities choose to use automated speed enforcement in the future, independent programs from the Region will need to be setup as agreements need to be executed with the jurisdictional ownership. Local municipalities do not have a mechanism to recover any costs at this time as all fees/revenue are collected by courts, including with the Region's program. This may change in the future if infraction notices are administered through Administrative Municipal Penalty (local municipal staff) versus Provincial Offence Act (courts). Staff recommend that the Town of Whitchurch-Stouffville lobby the Provincial Government to make legislative and regulatory amendments to allow municipalities to administer Automated Speed Enforcement programs through the Administrative Monetary Penalty system.

8.7 Red Light Cameras

The goal of red light camera enforcement programs is to improve driver and pedestrian safety by reducing the number of right angle collisions at intersections. The red light camera programs are expected to change driver behaviour and reduce the number and severity of these collisions. The following picture depicts standard red light camera signage and equipment.

Similar to Automated Speed Enforcement, red light camera infractions are administered through the Provincial Offence Courts, as opposed to an administrative penalty system.

8.8 Rumble Strips

Transvers rumble strips are particularly suitable for rural intersections controlled by stop signs, where noise and vibration concerns can be minimized. Rumble Strips can be installed along the travel lanes of a higher speed roadway that contains an isolated all-

way stop controlled intersection. A motorist may grow accustomed to traveling at a certain speed and otherwise may not expect to stop; the purpose of the rumble strip is to alert the driver.

In semi-urban or urban areas, where development may be present adjacent to intersections, rumble strips may generate excessive noise that negatively impacts local residents. At such urban locations, a decision to install rumble strips should be based on careful assessment of site-specific conditions (i.e., an adequate buffer zone between buildings and the intersection). Typically, transverse rumble strips are not installed within 300 meters of a residence to avoid noise concerns.

Transportation noise has been associated with health effects such as sleep disturbance, annoyance, cardiovascular effects and hypertension. Thus, it is important to avoid unwanted sound and particularly to reduce the noise exposure from road traffic. About half of urban noise is generated by transportation.

An example of temporary transverse rumble strips is depicted below. Staff recommend that the use of temporary transverse rumble strips be piloted to determine their effectiveness.

8.9 Speed Limit Reduction

Higher speeds contribute to higher risk of serious injuries and fatalities by reducing driver reaction time, increasing the vehicle stopping distance, and inflicting more severe blunt force trauma on victims upon impact.

Speed limit reduction is considered a shorter-term initiative that can be implemented quickly, effectively and inexpensively. Signage is put in place to alert drivers to the new speed limit, as shown in the photograph below.

Whitchurch-Stouffville
Traffic Calming Strategy

Over the past several years, the Town has reduced speed limits in targeted areas in an effort to curb speeding and minimize traffic-related fatalities on Town roads. For example, speed limit reductions have been implemented on Ninth Line, on segments under both the Town's and Region's jurisdiction. Recently, staff reported to Council with recommended speed reductions for Aurora Road, which will be considered by York Region.

As part of the Town's Traffic Calming Strategy, staff will review speed limits annually, and report to Council with recommended changes.

8.10 Targeted Police Enforcement

Targeted police enforcement will make drivers more aware of the speed limit and force them to reduce their speed and comply with speed limits. In some instances, physical traffic calming initiatives may not be suitable, and Town staff will collaborate with York Regional Police to establish an enforcement presence.

8.11 On-Street Parking

Roads within residential areas are built wide enough to allow on street parking on at least one side of the road. The presence of parked cars on one or both sides of a road serves to narrow the road and decrease vehicular speeds. There have been studies done in North America which have shown the introduction of a No Parking zone increased the speed of traffic by 20%.

8.12 Speed Bumps and Speed Humps

Speed humps and speed bumps are vertical obstacles placed on traveled surfaces as traffic calming tools. The height of speed humps and speed bumps is similar; however, speed bumps are much narrower and thus have a shorter travel distance compared to

speed humps. This results in speed bumps causing a more significant disruption to drivers, resulting in much lower speeds. The following photographs depict a speed hump (left) and speed bump (right).

Although the two measures are related, and have many of the same benefits, they are not interchangeable solutions: they're appropriate in different applications.

Speed bumps are more aggressive traffic calming options than speed humps, and so are useful in locations with low speeds where pedestrians and cars share space closely. As such, speed bumps were selected for implementation along the Leisure Centre driveway in 2019.

Speed bumps are not appropriate for public roads because they require vehicles to come to a near stop to pass over them, and can do damage to cars moving at regular speeds. Speed bumps placed on a traveled roadway with a 40 km/hr speed limit have also been found to increase the occurrence of rear-end vehicle collisions due to abrupt changes in speed.

Speed humps are typically placed on local streets where traffic needs to flow smoothly but excessive speed will endanger pedestrians. A road passing through a park is an appropriate application; as such, speed humps were installed along Burkholder Street, east of the Leisure Centre driveway in 2019.

Speed humps and speed bumps, by the nature of their intended purpose, have a negative impact on fire and emergency services response times. Each one can have an impact of about 30 additional seconds, which is significant when lives are at stake and is magnified when there are multiple units in place. An additional negative impact is the common occurrence of vehicle damage when a large emergency vehicle passes over a speed bump or hump, even at a relatively low speed. Injuries to drivers are also a significant consideration, and commonly occurring.

Based on these factors, consideration of the installation of speed humps and speed bumps is based largely on a trade-off between pedestrian safety and emergency services response time.

8.13 Community Safety Zones

Community Safety Zone signs inform drivers they are entering a zone that the community has designated as an area where the safety of its children/citizens is paramount. Traffic related offences committed within the zone are subject to increased fines (many set fines are doubled such as speeding and traffic signal related offences) through a special designation under the Highway Traffic Act. Standard Community Safety Zone signage is depicted below.

School children are generally viewed as representing the youngest and most vulnerable road user group. In 2018, Council endorsed the implementation of Community Safety Zones on major Town roads adjacent to public schools. This focused application avoids overuse of the Community Safety Zone designation, which could otherwise become counter-productive to the goal of increased traffic and pedestrian safety.

The Town will continue to add Community Safety Zones on major Town roads as new public schools become operational.

8.14 Stop Signs

It is important to note that stop signs are not to be used for speed control. In accordance with the Ministry of Ontario (MTO) Traffic Manual Book 5 (Regulatory Signs) unwarranted stop signs increase vehicular speeds between stop signs and encourage rolling stops (stop signs only affect speeds within approximately 40 metres of the stop sign). An excessive number of stop signs, particularly those that are not warranted, encourage disrespect for stop control signs and other traffic control devices.

When implementation of all-way stop control is being considered, staff will complete a traffic study to determine whether or not all-way stop control is warranted.

8.15 Traffic Delineators

Traffic delineators are flexible in-road traffic calming signs that are installed in the centre of the road, between opposing traffic lanes and designed to withstand impacts from, and avert damage to, vehicles if struck by collapsing and rebounding. The signs can have a narrowing effect on the lane or roadway which can give drivers the perception of the need to slow down.

The Town implemented a traffic delineator pilot project in 2019, consisting of the installation of delineators in four school zone locations. Staff monitoring of the traffic delineators indicated lower vehicular speeds in their vicinity. Resident feedback obtained through a survey indicated 85% of respondents felt the delineators had a positive effect on reducing traffic speed, and 74% of respondents were in favour of their continued use.

A traffic delineator policy was implemented later in 2019 to manage their use. The traffic delineator policy specifies their use in school zones and park areas. Based on their effectiveness and community acceptance, demand for the installation of additional traffic delineators has increased and benefits are seen beyond school zones and park areas. Staff recommend that the policy be broadened to include additional areas beyond schools and parks, as determined by staff in collaboration with York Regional Police and Town residents.

8.16 Radar Speed Signs

Radar speed display signs are portable or permanent radar activated signs that instantaneously display approaching speeds for individual vehicles. They can also be programmed to flash when motorists are exceeding the speed assigned within the sign.

The signs can be solar powered to reduce environmental impact. These devices create a sense of being monitored to the driver and provide an instant notification when the speed limit is being exceeded. A sample radar speed sign is depicted below.

Staff recommend that additional radar speed signs be purchased for long term installation on rural roads, and collector roads such as Reeves Way Boulevard, Millard Street, Tenth Line and Baker Hill Boulevard.

8.17 Lane Narrowing Through Pavement Markings

This measure narrows the travel lanes to a minimum width of 3.0 metres through the use of pavement markings (centreline and edge lines). Reduced lane widths provide a feeling of constraint and should cause drivers to reduce their travel speed. Any remaining road width would be designated as shoulder. The photograph below shows a road narrowed by edge line placement, which also increases the width of the paved shoulder.

8.18 Curb Extension

Also known as ‘bumpouts’, curb extensions are horizontal extensions of a curb into a road, resulting in a narrower road section. These may be used to provide high visibility of pedestrians, shorter walking distances to cross the road, and to slow motorists down.

Curb extensions must be utilized carefully to avoid drainage problems, the interruption of bike lanes and loss of on-street parking.

Staff will incorporate curb extensions mainly during design and construction of new subdivisions, as well as during road reconstruction, including downtown Main Street. The following photo illustrates the use of curb extensions to facilitate a pedestrian crossing.

8.19 Forgiving Roadsides

Collisions between vehicles leaving the road and unforgiving roadside objects such as trees, poles, road signs, and street furniture contribute significantly to the severity of traffic accidents. The concept of a 'forgiving roadside' was established and countermeasures were identified to help errant vehicles avoid crashes with potential hazards on the roadside, as well as minimise crash consequences when they occur.

Treatments that render roads more forgiving and reduce the severity of run-off-road collisions may include clear zone areas adjacent to the roadway, breakaway devices (i.e. breakaway utility poles, and barrier treatments.

Clear zone widening involves clearing an area adjacent to the roadway of hazards (such as trees) to allow space for errant vehicles to either manoeuvre back onto the roadway or lessen the likelihood or severity of a collision. The common criteria used for determining the dimensions of clear zones include the posted speed limit, side slope, curve radius, and traffic volume.

Guardrail barriers with energy absorbing end treatments absorb much of the force of a crash and can reduce the severity of crashes. Slotted rail terminals, sliding extruder terminals, buried end terminals, and attenuated end terminals are common treatments

that meet safety criteria for barriers. The following photo illustrates a guardrail barrier with end treatment, installed along a sloped roadside.

A recent example of the implementation of guardrail barriers with end treatments is the installation on the north side of Lakeshore Road, completed as part of the shoreline stabilization project. Staff will continue to consider clear zones and guardrail barriers as part of future road reconstruction, shoreline stabilization, new development, and other opportunities as appropriate.