

# **Vision Zero: Principles and checklist for effective adoption**

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## **ABSTRACT**

Vision Zero is an approach to road safety characterized by aggressive casualty reduction goals, coordinated and interdisciplinary action, increased priority and resources allocated towards road safety improvement, and a specific ethical policy framework. Vision Zero was launched by Sweden in 1997 and gradually spread to other countries and states. For example, New York City is in the midst of a high-profile, highly funded adoption of Vision Zero, and Minnesota has a toward zero deaths program that in 2013 drew 900 participants to its annual conference. Despite the fact that almost every road safety professional knows about Vision Zero, adoption of the approach has been almost non-existent in Canada. The objective of the paper is to examine the principles for effective adoption of Vision Zero. It documents the kind of funding, partnerships, policy statements, and public engagement required to mobilize Vision Zero adoption, common challenges encountered, and some of the early initiatives that can be implemented in a Vision Zero program. The paper is based on an environmental scan with four leading transport agencies in the United States that have adopted Vision Zero. The paper documents a set of principles an agency can refer to in considering Vision Zero adoption, and a checklist that an agency can use to start putting in place the necessary partnerships, resources, and support. Some oppose extreme implementations of vision zero based on utilitarian principles but the paper shows that all implementations considered were more balanced and focused on cost-effective data-driven treatments.

## **RESUMÉ**

Vision Zéro est une approche à la sécurité routière qui se distingue par l'objectif d'éliminer tous les décès de la route, selon des actions coordonnées et interdisciplinaires, dont l'allocation de ressources pour l'amélioration de la sécurité routière devient prioritaire sous un cadre spécifique de politiques d'éthiques. Vision Zéro fut lancé en Suède en 1997 et s'est répandu progressivement à d'autre pays et régions. Par exemple, la ville de New York est en train d'adopter Vision Zéro, ce dernier étant hautement financée et très présent dans les médias. De plus, le Minnesota a un programme d'élimination de décès qui en 2013 attira neuf cents participants à leur congrès annuel. Même si presque tous les professionnels de la sécurité routière connaissent Vision Zéro, l'adoption de cette approche est presque inexistante au Canada. L'objectif de cet article est d'examiner les principes nécessaires à l'adoption efficace de

Vision Zéro, certains des défis communs et quelques initiatives préliminaires qui peuvent être implémentées pour préparer le programme Vision Zéro. Cet article est basé sur une analyse environnementale de quatre agences de transport éminentes aux États-Unis qui ont adopté Vision Zéro. L'article documente un ensemble de principes qu'une agence peut se référer lors de l'adoption de Vision Zéro et une liste de contrôle lorsqu'elle commence à développer les partenariats, ressources et soutien nécessaires à l'implémentation. Certains s'opposent à une implémentation de vision zéro à cause de principes utilitaires, pourtant cet article démontre que toutes les implémentations étudiées étaient équilibrées et les traitements étaient axés sur les données et la rentabilité.

## **INTRODUCTION**

This paper examines and documents principles for effective adoption of Vision Zero and develops a checklist for agencies to use to start putting in place necessary partnerships, resources and support for Vision Zero adoption. Documented principles include the kind of funding, partnerships, policy statements, and public engagement required to mobilize Vision Zero adoption, common challenges encountered, and some of the early initiatives that can be implemented in a Vision Zero program. The target audience for this paper includes road safety professionals of all disciplines who are interested in potentially bringing Vision Zero to their jurisdiction.

The paper is based on an environmental scan. The jurisdictional component of the environmental scan includes interviews with representatives of four agencies where Vision Zero has been successfully adopted. The interviews are structured around the agency's experience with funding, partnerships, policy statements, public engagements, challenges, and early initiatives in Vision Zero adoption. Interview results are supplemented by review of documents from these agencies. The results are interpreted to present key principles for Vision Zero adoption by Canadian agencies.

## **Background, Need, and Scope**

Vision Zero is an approach to road safety characterized by aggressive casualty reduction goals, coordinated and interdisciplinary action, increased priority and resources allocated towards road safety improvement, and a specific ethical policy framework. The approach has also been called Target Zero and Toward Zero Deaths (TZD). Vision Zero was launched by Sweden in 1997 and gradually spread to other countries and states. For example, New York City is in the midst of a high-profile, highly funded adoption of Vision Zero, and Minnesota has a TZD program that in 2013 drew 900 participants to its annual conference. Despite the fact that almost every road safety professional knows about Vision Zero, adoption of the approach has been essentially non-existent in Canada.

In June 2014, several associations that represent government agencies responsible for highway safety in the United States published Toward Zero Deaths: A National Strategy on Highway Safety (National Strategy) (Towards Zero Deaths Steering Committee, 2014). The document seeks to develop and foster partnerships, and identifies a variety of safety initiatives that can be implemented to work toward reaching the TZD vision. The National Strategy is based on a multidisciplinary road safety approach and emphasizes the importance of encouraging a transportation safety culture, a long-term commitment to TZD, and implementing safety treatments and programs that address road users, road infrastructure, and vehicles. As of April 2015, according to the TRB Toward Zero Deaths subcommittee, over 80% of U.S. states now include some form of Vision Zero goal in their strategic highway safety plan.

In Canada, the City of Ottawa has adopted “Toward Zero” as a goal within the Safer Roads Ottawa plan, and the authors know of one other jurisdiction planning to implement Vision Zero in 2016. Most Canadian jurisdictions have expressed road safety strategies, programs, and goals in other ways besides Vision Zero. The key features of Vision Zero examined in this article (collaboration and aggressive targets) are also present to some extent in these other Canadian efforts. It is beyond the scope of this paper to catalogue these other Canadian efforts, compare their effectiveness to that of Vision Zero; or attempt to demonstrate the effectiveness of Vision Zero (these would be useful studies). The paper focuses on summarizing the experience of several jurisdictions that have adopted Vision Zero, drawing lessons about successful implementation for other jurisdictions that are considering it.

From the authors’ perspective, one feature of the original Vision Zero writings that has held back adoption in Canada are that, literally interpreted, the writings contain irrational statements (from an economics viewpoint) about ethics and public decision-making. Public infrastructure managers have a long history of applying benefit cost analysis to investments; this includes investments in road safety. One way to summarize the ethics underlying benefit cost analysis would be to say that public decision-makers should only spend money on policies where the value placed on the benefits of an investment by the members of society exceeds the value placed on the costs of the investment by the members of society. The more radical statements in original Vision Zero writings, however, have suggested that no amount of death or serious injury is acceptable, and that if we have the ability to do something to reduce deaths, we have a corresponding ethical obligation to do it regardless of costs. If these Vision Zero ethical statements are adopted literally, many absurd results could be obtained. The simplest and most extreme of these is illustrated in one known way to eliminate road fatalities completely: the immensely costly option of closing all roads permanently. Another way to interpret these statements from an economics standpoint would be to interpret them as suggesting that: (1) society (its institutions and individual members) should place a much greater (but not infinite) value on reducing road mortality risk than it currently does, and (2) the unacceptability of road deaths should drive new efforts at innovation and collaboration to find feasible solutions to the problem. In some ways, a Vision Zero implementation that does not adhere strictly to a literal and absurd interpretation of Vision Zero ethical principles could be considered an ‘untrue’ implementation of Vision Zero. Some may consider that in such an ‘untrue’ implementation, Vision Zero loses its distinctiveness and is in many ways no different than other road safety strategies, campaigns, or coordinated efforts. In the author’s view, Vision Zero is more distinct when the simplistic but absurd ethical foundations are merged with realities of budget limitations and a need for mobility. The distinctness remains in that a bold desired end state is chosen before the path to that end state is at all clear. The vision calls for innovation, determination, and collaboration between all parties connected to road safety.

## **ENVIRONMENTAL SCAN**

The environmental scan comprised a jurisdictional survey with four U.S. transportation agencies that have successfully adopted Vision Zero, followed by a review of documents prepared by these agencies on their safety programs. Interviews with the agencies were structured around their experience with funding, partnerships, policy statements, public engagements, challenges, and early initiatives in Vision Zero adoption. The following agencies were included in the environmental scan:

- Washington State Department of Transportation (WsDOT)

- Minnesota Department of Transportation (MnDOT)
- Michigan Department of Transportation (MDOT)
- New York City Department of Transportation

## Washington State

Washington State adopted Target Zero in their 2000 Strategic Highway Safety Plan (SHSP) and the vision has remained throughout three SHSP revisions. The driving force behind adopting Target Zero was the desire to form partnerships and take a multidisciplinary approach to road safety that went beyond infrastructure, as well as the desire to see a good return on investment. Having a common vision is critical for forming partnerships, collaboration, and agreeing on how safety funding should be allocated. Just as the National Strategy provides a list of potential treatments that a state can choose to implement, Washington's SHSP provides state-wide treatment options that municipalities can choose to implement. While the National Strategy provides a common vision for the country, Target Zero provides a statewide vision for all counties, cities, and state-level agencies. The Target Zero vision is to have zero serious injuries and fatalities by 2020.

There was some opposition in initially adopting Target Zero by parties that thought it was not realistic or achievable. Having full agreement on a Target Zero vision did not come instantly, but evolved into a shared perception that no amount of fatal and injury collisions are acceptable and the only option is to have a vision for zero. The state held several public consultation efforts to discuss approaches and select safety treatments and strategies. It was important that the community understood what the State was trying to achieve so that they would support the program.

Over 130 partners assisted in developing Washington State's SHSP and are critical to achieving SHSP goals: partner organizations include Washington State government, federal government, tribal nations and organizations, local law enforcement, private and non-private organizations, community, local and regional agencies and organizations. The Washington State Traffic Safety Commission (WTSC) is the State's designated highway safety office. The WTSC Director is the Governor's Highway Safety Representative, which is a designated position that each state must have to qualify for federal funding. The WTSC is made of 22 employees and ten Commissioners chaired by the Washington State Governor. An initial meeting was held to identify priorities for Target Zero: 29 agencies participated and 28 different priorities were identified. The State advocated for the use of performance measures and so priorities became driven by collision data. Three priority levels were set based on collision data analysis, and funding was allocated according to priority levels.

Federal funding from the Highway Safety Improvement Program (HSIP) is the main source of funding for Target Zero initiatives. WsDOT is responsible for administering these funds according to their SHSP. Funding decisions are data driven: collision data analysis identifies trends, focus areas, and helps set interim reduction targets for specific collision types. For example, collision data analysis revealed that run off road collisions were the most frequent type of collision in Washington State, and a target for necessary reduction in run off road collisions in order to contribute to TZD was set. There are some legal challenges associated with data sharing. Although WsDOT has the resources to conduct collision analysis that would benefit other stakeholders (e.g., WsDOT could share speed analysis results with enforcement agencies to assist with their programs), it is sometimes difficult to get clearance. It would also be beneficial to

share data and link collision data with hospital and trauma records, however there are state laws that protect public health records.

Limited funds are allocated to pedestrian and cyclist initiatives, since these collision types constitute a small proportion of total fatal and serious injury collisions. However, in some counties and cities, pedestrian and cyclist collisions are higher compared with state averages, and so funding can be allocated to pedestrian and cyclist collision countermeasures in these locations. WsDOT monitors the performance of each initiative that is implemented. If a reduction in fatal and serious injury collisions is not realized, WsDOT will change or cancel the program. Although federal funds are available for implementing road safety treatments, there is a lack of funding for road safety research. Research is important for evaluating the effectiveness of treatments.

WsDOT implements systemic and blackspot safety treatments, including rumble strips to address run off road collisions, cable median barriers to address head on collisions, enforcement and a task force to address drink-driving collisions, speed enforcement, pedestrian pavement markings, countdown signals, and high intensity active crosswalk (HAWK) beacons, and school zone safety programs. Prior to adopting Target Zero, WTSC had a series of initiatives joining infrastructure and behavioural aspects. The WTSC facilitates the City/County Corridor Safety Improvement Program, whose goal is to reduce fatal and serious injury collisions in local communities. The program uses a multidisciplinary approach encompassing engineering, enforcement, education, encouragement, and emergency services to implement low-cost, near term solutions to improve road safety. Several partners are involved in the program: citizens, businesses, schools, local leaders, enforcement, the state liquor control board, the department of licencing, health departments, public works departments, and FHWA as funding partner.

## Minnesota

A three-day workshop held in Minnesota in 2001 brought together safety experts from local research and state agencies – as well as presenters from Washington State, Sweden, and Australia – to discuss how to reduce fatal and injury collisions and move toward a goal of zero deaths for Minnesota. TZD in Minnesota developed out of the momentum created during this workshop. The Minnesota Departments of Public Safety, Transportation, and Health revised their road safety strategy and jointly adopted TZD in 2003 as a deliberate, interdisciplinary road safety approach. Having a common vision and adopting a multidisciplinary approach to road safety helped breakdown silos that previously existed between different departments and fields. Minnesota's TZD vision is zero road deaths with 2020 targets of fewer than 300 deaths and fewer than 850 serious injuries.

Minnesota's TZD is co-led by the Director of the Office of Traffic Safety from the Department of Public Safety and the Director of the Office of Traffic, Safety, and Technology from the Department of Transportation (MnDOT). They co-lead a multidisciplinary group that meets once a month with members from a variety of organizations including the Department of Health, University of Minnesota Centre for Transportation Studies, Federal Highway Administration, County Engineers Association, Emergency Medical Services Regulatory Board, National Highway Traffic Safety Administration, and others. Local coordinators were hired to promote TZD efforts at the county level about seven or eight years after adopting TZD. They target counties with limited history of TZD efforts and set up multidisciplinary steering committees with local sheriffs, engineers, education, and emergency service personnel to push the TZD agenda forward. The TZD group

holds an annual TZD conference (inaugural in 2010), stakeholder breakfasts, regional workshops, and monthly webinars called Traffic Topics.

Many road safety partnerships were formed in adopting TZD, including members from the education, engineering, judicial, enforcement, EMS and trauma services sectors (Minnesota TZD, 2014). The value of these partnerships was demonstrated when MnDOT had to address a project soon after adopting TZD, where a legislature proposed raising speed limits. MnDOT was hesitant to approve since raising speed limits seemed counterintuitive to improving safety. Leveraging partnerships formed through adopting TZD, MnDOT took a multidisciplinary approach to addressing and subsequently implementing this proposed legislation. MnDOT conducted engineering studies which demonstrated speed limits could be raised. Implementing the speed limit increase was accompanied by aggressive public education and enforcement campaigns, which aided in speed-compliance and safety management.

Prior to TZD, MnDOT was only concerned with safety on state highways. However, since TZD is data driven and removes funding silos, MnDOT expanded their program to local roads because over half of road fatalities occurred off of the state system. Expanding their program to the local road system required developing close working relationships with local road authorities. Traffic volumes on local roads are low, and so collisions are infrequent, sporadic, and there are less blackspots. MnDOT employs holistic and systemic road safety treatments to mitigate these types of collisions. Instead of only doing a benefit-cost analysis to justify implementing road safety treatments, MnDOT has moved to a proactive and systemic approach for treatment implementation on both local and state roads.

There was no change in federal funding for road safety infrastructure improvements when TZD was adopted in Minnesota. However, in addition to projects that utilize federal funding, MnDOT asks their regions to make an effort to incorporate road safety components into other transport projects that are funded from other sources. MnDOT receives and allocates all federal road infrastructure funding. MnDOT reviews fatal and injury collisions across the state and targets federal funding to regions with more collisions. Once funding is allocated to a region, it is split between state and local roads depending on the proportion of fatal and injury collisions (i.e., if 60 percent of fatal and injury collisions in Region A occur on local roads, 60 percent of Region A's federal funding is targeted toward road safety infrastructure improvements on local roads).

MnDOT worked with counties to create mini strategic highway safety plans. Many county engineers do not have training or dedicated time to work on road safety issues. Creating these mini strategic highway safety plans was critical because it gave county engineers much needed direction and education on how infrastructure funds can be used to improve safety on local roads. MnDOT reviews funding proposals from county engineers for different road safety works, and approves or denies proposals accordingly. Priority is given to systemic road safety treatments: 70% of federal safety funds allocated to local roads must be for systemic safety treatments. A safety engineer was hired as part of MnDOT's group that works with counties and cities to process their safety projects. County engineers have direct access to this safety engineer, who can answer questions and help them find safety solutions to issues on their roads.

Challenges associated with adopting TZD included educating engineers on how to view road safety pro-actively and systemically rather than focusing on the tradition black spot approach. Sharing federal funds with local road authorities was also challenging, because it meant less safety funding for state roads. Reallocating federal funds was necessary because 50 percent of Minnesota road fatalities were on the local system. Challenges associated with implementing initial TZD programs included identifying priority safety projects on local roads to reduce frequent

collision types, and finding safety champions at the local level to promote systemic and proactive road safety mentalities. It was challenging for these local safety champions to sell systemic safety treatments, like rumble strips and intersection lighting, which were not necessarily popular with the public.

## Michigan

Toward Zero Deaths was adopted as the safety focus of the Michigan Department of Transportation's (MDOT) 2010 Strategic Highway Safety Plan (SHSP), and adopted as the safety vision of the third revision of Michigan's SHSP in 2013 (Leix, 2015; Governor's Traffic Safety Advisory Commission, 2012). The TZD vision in Michigan is an overarching goal of zero traffic fatalities. Four-year and annual interim fatality and serious injury reduction goals are incorporated in the SHSP for state-wide roads and for state-system roads.

The Governor Traffic Safety Advisory Commission (GTSAC) oversees the development and implementation of the SHSP and is therefore the lead agency responsible for coordinating TZD in Michigan. The GTSAC was a pre-existing group that functioned prior to adopting TZD. It is a 4-E body comprised of 11 Commissioners who meet quarterly and represent various government departments. In addition to the Commissioners, 11 Action Teams are part of the GTSAC and are responsible for specific safety initiatives related to a variety of topics, including commercial vehicles, distracted driving, young drivers, pedestrian and bicycle safety, and traffic safety engineering. MDOT is a member of the GTSAC and is responsible for producing most of the TZD resources. MDOT has a history of being safety minded and initially advocated for TZD in Michigan.

Michigan TZD is based on the National Strategy. The National Strategy has influenced research topics and the types of partnerships formed between state-, county-, and city- level transport agencies. Organizations outside of the GTSAC can become "TZD participants" by registering online. TZD participants can use the TZD logo on their website, ads, brochures, posters and for other campaigns and communications. There is also the option to sign-up to receive weekly updates on the number of statewide traffic fatalities and injuries.

MDOT has co-hosted a peer exchange workshop with the Local Technical Assistance Program (LTAP), who are responsible for bridging the gap between research and practice by offering training to State staff. The workshop was attended by state-, federal-, county-, city-, tribe-, and municipal level transport agency staff, and by consultants, and covered case studies, systemic treatments, funding, and safety culture throughout the various organizations.

Safety initiatives implemented by MDOT are data driven and include both black spot and systemic treatments. Local expert knowledge of specific safety issues and solutions are also considered in developing safety initiatives. MDOT follows best practice research in directing and using safety funds and runs initiatives related to seat belt use, impaired driving, distracted driving, younger drivers, older drivers, pedestrians, bicyclists, motorcyclists, systemic installations of cable barriers and rumble strips, road safety audits and in-service reviews. Initial TZD initiatives are focused at improving the safety culture within organizations and the motoring public: a change in culture is needed to complement MDOT's pre-existing rigorous road safety program.

Adopting TZD was not associated with an increased safety budget, however allocation of some federal funds was set for systemic safety treatments (e.g. \$8M USD for statewide rumble strip installation). MDOT allocates 25 percent of federal funds to the Low Cost Safety Improvement Project Program, which sponsors low-cost, system-wide improvements on State Trunkline

Highways without requiring a time-of-return benefit-cost analysis. MDOT regions can apply for funding from this program, for specific and pre-approved treatments, including:

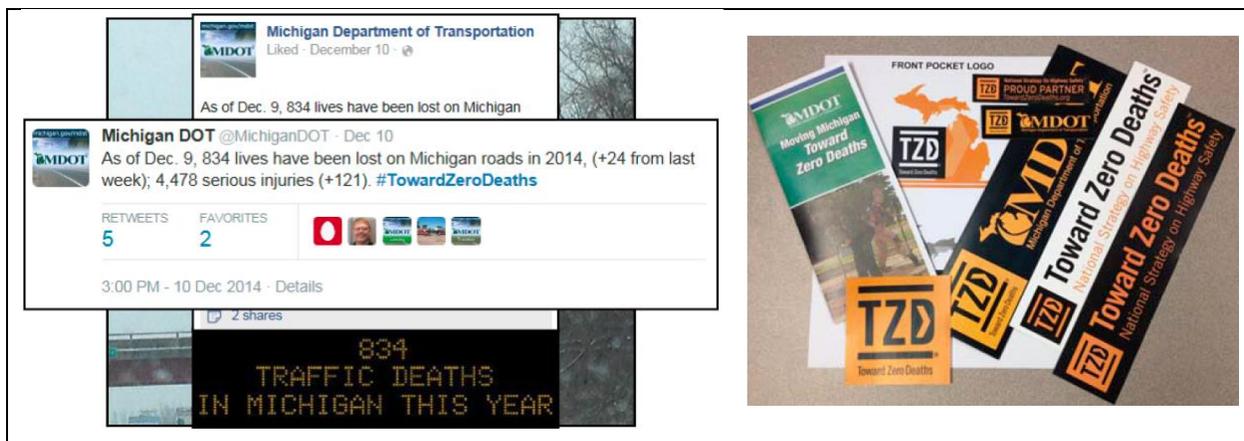
- Attaching guiderail to structure railings
- Re-grading sideslopes to 1:4 or less to eliminate need for guiderail
- Clearzone widening
- Pavement grooving/high-friction surface treatment
- Centreline or shoulder rumble strips
- Constructing right-turn lanes, including offset (Michigan Department of Transportation, n.d.)

MDOT set 2016 safety budget goals which total \$15M USD and are illustrated in Table 1. The largest component of the budget (\$9.5M USD) is allocated toward projects which directly target fatal and injury collisions.

Project Type	Total Program Funds (USD)
Road Safety Audits	\$50,000
Non-motorized facility/pedestrian improvements	\$100,000
High friction surface	\$100,000
Centreline and shoulder rumble strips	\$200,000
Guardrail upgrades and clear zone improvements	\$1,500,000
Projects with scopes that directly correct areas with a concentration of types “A” (fatal) and “K” (serious injury) crashes	\$9,500,000
Safety funds per MDOT region	\$350,000

**Table 1: MDOT 2016 Safety Budget Goals**

Challenges associated with adopting TZD was a lack of a safety culture within organizations and the need to generate awareness of TZD. Road safety campaigns have been a TZD focus to develop the safety culture within organizations and the motoring public. MDOT distributes electronic message boards which electronically display the number of fatalities and injuries, posts these numbers on variable message signs over major roads, uses social media, and developed a promotional video interviewing residents on their perceptions of the magnitude of the road safety problem, their road safety goals for the state and for their families, and if they think TZD is achievable. Figure 1 illustrates some TZD social media content and branding material.



**Figure 1: Michigan TZD Safety Campaigns: (a) Social media; (b) Branding (Leix, 2015)**

Challenges associated with implementing TZD initiatives include a lack of funding to implement treatments, lack of data on roadway attributes (90 percent of roads in Michigan are owned by local agencies and MDOT does not control their safety programs), and differing priorities within the department. Regional priorities are driven by local knowledge and it is difficult to prioritize projects among regions.

## **New York City**

Mayor Bill de Blasio ran for election in 2013 on the platform of adopting and implementing Vision Zero in New York City (NYC). He was elected in the fall of 2013, his term began in January 2014, and NYC's Vision Zero Action Plan was released February 2014. There was a great public desire to adopt Vision Zero in NYC. A progressive transportation community in NYC has become a large force in politics in the past five to ten years. Initially, this community advocated and lobbied for infrastructure improvements such as bike lanes, plazas, park buildings, bike share, and transit expansion, among others, which were implemented. The transportation community has shifted its attention to making this infrastructure safe. It is now widely known among the public that just as many people (or more) die from collisions as they do from homicide. This realization marked a change in perspective, and the public demanded that the police put equal effort into collision prevention as they do homicide prevention.

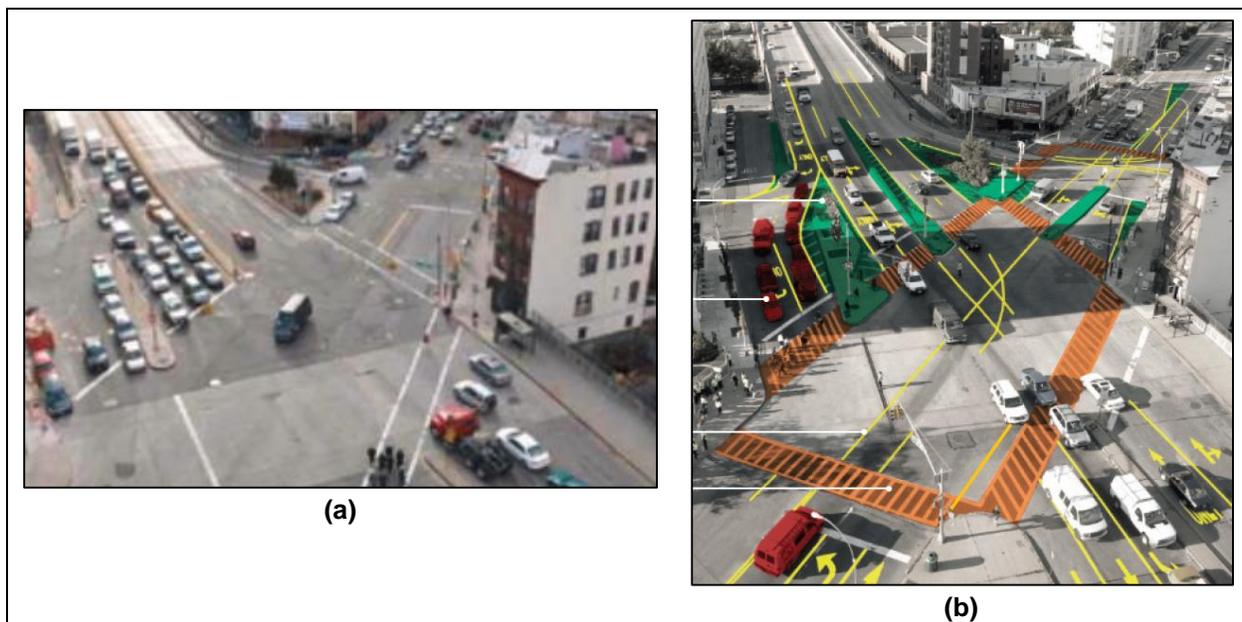
Adopting Vision Zero meant amplifying NYC's existing road safety program and tightening its focus. It was a smooth process as there was widespread political support within all levels and sectors. When Mayor de Blasio was elected, the commissioners that came with him knew that they were mandated to adopt and implement vision zero in their respective sectors. Agencies involved in Vision Zero were doing progressive transportation and safety projects prior to adoption. For these agencies, including the Department of Transportation, a safety culture already existed (in part due to leadership from the previous administration which also focused on road safety without launching vision zero) and there was excitement to have additional resources and funding available to conduct this work. NYC considered setting a target of zero fatalities in 10 years, however, this was dialed back and instead of a timeline and rigorous targets, Vision Zero came to represent a change in mindset to incorporate road safety in all levels and to develop and foster a road safety culture.

The safety budget was increased when Vision Zero was adopted. The Mayor allocated Vision Zero funding (in the millions of USD) to various departments. This funding was used to hire additional staff (e.g., 10 staff were added to a section of the DOT responsible for research, implementation and safety; the crew responsible for speed bump installation doubled; there were additional hires for traffic signal construction; and new hires for the police department's bureau of transportation). Funding was not allocated to capital construction budgets when Vision Zero was adopted, however NYC is currently pursuing federal funding (in the 100s of millions USD) for capital construction projects associated with Vision Zero.

The Mayor's Office of Operations is responsible for managing the Vision Zero website and publishing periodic update reports that track progress of all efforts. The Mayor's Office of Operations also convenes and coordinates a permanent Vision Zero Task Force comprised of representatives from key agencies: City Hall, DOT, Police Department, Department of Health and Mental Hygiene, Metropolitan Transportation Authority, Taxi and Limousine Commission, and Department of Citywide Administrative Services who deal with fleet management and City drivers services. This Task Force is a critical component of Vision Zero. Like many jurisdictions, NYC has a complex government bureaucracy with many interacting duties between agencies. The set Task

Force means that on a regular basis all of these agencies responsible for implementing Vision Zero sit together at the same table to report progress and plan future initiatives.

The NYC Vision Zero Action Plan identified 63 initiatives to be undertaken by Task Force member agencies. The initiatives were identified by each respective agency, and were a mix of new and existing programs; existing programs were expanded or had a shift in focus to include more safety elements. DOT initiatives included engineering improvements at 50 intersections, installation of 20 new speed cameras in school zones, and installation of new arterial slow zones. The 50 intersections selected for engineering improvements were existing works that were coined Vision Zero projects by refocusing the improvements on safety elements and selecting intersections with high pedestrian collisions. Figure 2 illustrates an engineering improvement project at one intersection in NYC that included eliminating vehicular movements, extending medians, delaying turning, improving lane designation, and improving crosswalks. Arterial slow zones was a concept developed within the DOT that involved lowering speed limits to 25 mph on more than 25 corridors, coordinating enforcement with police, and incorporating signal timing plans to slow down signal progressions and encourage people to reduce speeds.



**Figure 2: Vision Zero engineering improvement project at intersection: (a) before; (b) after**

Most of the 63 initiatives are carried out by single agencies who report progress back to the Task Force, however there is inter-agency collaboration on some initiatives. For example, the DOT and NYPD worked together on arterial slow zones, borough-specific pedestrian safety plans, and street team efforts, in which both agencies did public outreach and handed out safety flyers, and NYPD followed up at those locations with enforcement a week later.

There were some understandable setbacks associated with implementing all of the 63 initiatives in the first year of Vision Zero. For example, the DOT wasn't able to meet its target for implementing neighbourhood slow zones due to weather and staffing issues. The DOT was also competing for resources to install speed humps, as these were going in as part of different projects all over NYC. Reporting and transparency is very important for acquiring and retaining public and agency support for Vision Zero initiatives. The Mayor's office is cognisant of this importance,

maintains the Vision Zero website with transparent information on collision data and the status of different Vision Zero initiatives. An initiative set for additional street reconstruction was not completed because Vision Zero funds were not allocated to it. There were sometimes discrepancies between funding requests and allocations. Enforcement setbacks late in the year occurred as a result of a high profile killing of an NYC citizen by a police officer, who was not indicted. Public protests and other factors led to a police strike, which resulted in reduced enforcement.

## **PRINCIPLES FOR EFFECTIVE ADOPTION OF VISION ZERO**

### **Funding**

Road safety improvements cost money and navigating budget constraints and coordination among multiple actors can be a challenge. Jurisdictions with successful implementation of vision zero have the following funding characteristics in common: (1) data-driven treatments emphasize obtaining value for money; (2) ownership-based silos that may prevent efficient funding allocation are removed (e.g. a state may pay for municipal improvement if better ROI is expected, or regional fund transfers are facilitated); (3) sustainable funding channels are built through defined programs which are likely to get renewed annual budget allocations as long as they continue to be effective (e.g. systemic rumble strip program; systemic pedestrian improvement program); and (4) other barriers to funding are removed when they make sense (e.g. requirements for a cumbersome business case submission are waived for a predefined set of low-cost treatments known to be highly effective). New or expanded funding was only a dominant implementation feature in New York City (Minnesota funded new hires ten years in). More common than new funding was reallocating, refocusing, and removing barriers to funding. Task forces do have administration and facilitation costs but the bulk of membership is drawn from the existing staff of various departments. Some critics of Vision Zero believe that it inefficiently will allocate indeterminate amounts of money to do whatever it takes to end all road deaths. While an unlimited resource approach to vision zero could be logically deduced from some of the ethical and philosophical statements of early vision zero proponents, the approach is clearly not the case in Vision Zero implementation jurisdictions that work towards zero within practical realities of budget constraints and constantly seek the most effective ways to spend road safety funds with data-driven and collaborative programs.

### **Partnerships**

Anyone can start Vision Zero but no one can finish it: partnerships are essential. A department of transportation, politician, citizen group, or other department may provide the initial push. However, in all jurisdictions with successful vision zero implementations, the initial actor placed a high priority on building a wide range of partnerships with other stakeholder organizations.

Partnerships are often structured via committees and task forces, where the committee is composed of representatives from multiple organizations and reports directly to a senior political level. Typically, vision zero does not exist within an individual agency. Individual agencies retain ownership in what they are experts at but they increase collaboration due to participation in partnership-based committees. In some jurisdictions such as Michigan, businesses can also join an official partnership program that helps in promoting a safety culture.

The following stakeholders are usually brought into the partnership: politicians and staff; health agencies (public health, injury prevention, emergency rooms, first responders) enforcement agencies, justice officials, transportation or public works departments, educational agencies, insurance agencies, businesses, and community organizations such as MADD (Mothers Against Drunk Driving)).

In several jurisdictions, the formation of local committees was an important partnership step in bridging the gap between state or provincial level agencies and smaller municipal organizations. In Minnesota, local coordinators were hired to facilitate this process.

## **Policy Statements**

Policy statements about Vision Zero are an effective means of providing a mandate to task forces, and their member organizations. They can help align efforts and encourage commitment of time, resources, and collaborative approaches. Policy statements about Vision Zero are helpful in marking the “adoption” time of Vision Zero. For example, Minnesota started committee and stakeholder meetings on Vision Zero in 2001, but then *adopted* it with policy statements in its road safety strategy in 2003. Washington and Michigan State also include their adoption policy statements within their road safety strategy. In New York, the policy was a core election platform element for the mayor; after the mayor was elected the policy statements were solidified a month later inside a document called the NYC Vision Zero Action Plan. It is important for policy statements to have political support and approval, to be embedded in a larger strategy document and to come after a period of initial consensus building with stakeholders to agree on adopting Vision Zero and to develop initial elements of the plan.

## **Public Engagement**

Public engagement is an important component of Vision Zero adoption in all implementing jurisdictions. Public engagement can be used to build support for adopting zero, and when it is adopted, for achieving road safety culture change and developing community-based plans. In New York, a mayoral candidate engaged the public by making Vision Zero a core election campaign platform component. In Michigan, a business partners program allows businesses to access promotional and educational materials and to use the Vision Zero website. In Washington State, public consultations workshops were held to overcome initial opposition to Vision Zero. New York uses a twitter feed to engage with the public on Vision Zero progress; tweets are regularly sent out about crashes as they occur or initiatives that have been implemented, opening up a discussion with large participation geared at changing safety culture. All agencies have marketing and promotional material associated with their Vision Zero initiative.

## **Training and Access to Expertise**

Minnesota hired local coordinators and a state level safety engineer dedicated to vision zero initiatives and to be a resource to counties and smaller municipal agencies which may not in house road safety expertise. Washington and Michigan both ran defined road safety training programs for Vision Zero participants and Minnesota’s annual vision zero conference (900 people last year) are opportunities for participants to obtain training in workshops and sessions.

## Challenges Encountered

No strong themes emerged regarding common challenges faced by implementing jurisdictions, however, some of the anecdotal challenges are summarized here. In Washington, some were hesitant to adopt vision zero because of a perspective that it is a policy that does not promote efficient allocation of resources. However, many jurisdictions emphasize that their programs are data driven based on cost effective measures to counterbalance this perspective. In Minnesota, it was two years between the initial exploratory meetings and official policy adoption of Vision Zero, indicating that it takes significant time and effort to build consensus around the initiative. New York faced some setbacks when trying to plan coordinated efforts because of special circumstances with some of the partners. In each case, the implementing agencies persevered and found ways to overcome the challenges.

## VISON ZERO ADOPTION CHECKLIST

The vision zero adoption checklist represents a process that someone can initiate to move towards successful implementation in their jurisdiction. To the authors' knowledge, no Canadian jurisdiction yet has adopted Vision Zero – perhaps this checklist will help the first to do so. It is separated into three phases: (1) Vision Zero Pre-Adoption; (2) Vision Zero Adoption; and (3) Vision Zero Implementation. The checklist is presented at the end of this paper and is available from the authors as a standalone word document for a reader to use, modify and customize.

## CONCLUSIONS

Vision Zero is an approach to road safety characterized by aggressive casualty reduction goals, coordinated and interdisciplinary action, increased priority and resources allocated towards road safety improvement, and a specific ethical policy framework. Vision Zero started in Europe and spread to the United States. To our knowledge, no Canadian jurisdiction has yet adopted Vision Zero, although many have active road safety programs and strategies.

Vision Zero's main contributions are that it can be a unifying vision for encouraging collaboration action, changing safety culture, removing obstacles to safety investment, re-defining what is and isn't acceptable, and encouraging systemic, data-driven improvements in road safety.

Among the many jurisdictions that have implemented Vision Zero, this paper presents a jurisdictional scan of four that are known to have successful implementations. The scan revealed common Vision Zero implementation trends related to funding, partnerships, policy statements, public engagement, training and access to expertise, and challenges encountered. A Vision Zero implementation checklist was developed that a person or group from any agency who wants to begin exploring implementing Vision Zero can use as a starting point for planning their efforts.

**Table 1: Vision Zero Implementation Checklist**

<b>1. VISION ZERO PRE-ADOPTION</b>		
1.1. <i>Initiator</i> <sup>1</sup> obtains director approval to begin exploratory meetings with representatives at <i>stakeholder</i> <sup>2</sup> organizations and with political level.	2 weeks	<input type="checkbox"/>
1.2. <i>Initiator</i> <sup>1</sup> meets with representatives to assess willingness to work on a <i>Vision Zero Strategy Proposal</i> <sup>3</sup> ; representatives obtain director approvals.	4-8 weeks	<input type="checkbox"/>
1.3. Political meetings take place early to obtain formal or informal mandate for developing a <i>Vision Zero Strategy Proposal</i> <sup>3</sup> .	4-8 weeks	<input type="checkbox"/>
1.4. All <i>stakeholder</i> <sup>2</sup> organizations decide on time and financial commitments for <i>Vision Zero Strategy Proposal</i> development. This allows workshops and peer exchange visits to be adequately scoped.	12-16 weeks	<input type="checkbox"/>
1.5. Representatives from <i>stakeholders</i> <sup>2</sup> form <i>ad hoc vision zero committee</i> <sup>5</sup> . Committee engages in workshops, peer exchanges and consultations to develop <i>Vision Zero Strategy Proposal</i> <sup>3</sup> .	6-18 months	<input type="checkbox"/>
1.6. <i>Ad hoc vision zero committee</i> <sup>5</sup> obtains director approval of <i>Vision Zero Strategy Proposal</i> <sup>3</sup> from each <i>stakeholder</i> <sup>2</sup> organization.	0-3 months	<input type="checkbox"/>
1.7. <i>Stakeholder</i> <sup>2</sup> organization directors submit <i>Vision Zero Strategy Proposal</i> <sup>3</sup> to political level for approval and adoption decision.	0-3 months	<input type="checkbox"/>
<b>2. VISION ZERO ADOPTION</b>		
2.1. Political level approves the <i>Vision Zero Strategy Proposal</i> <sup>3</sup> . Vision zero is considered adopted.	0-6 months	<input type="checkbox"/>
2.2. The proposal is jointly published and publicized by the <i>Vision Zero Task Force</i> <sup>6</sup> as the <i>Vision Zero Strategy</i> <sup>4</sup> . Appropriate public relations and marketing assets are developed and used.	2 months	<input type="checkbox"/>
2.3. <i>Vision Zero Task Force</i> <sup>6</sup> and local or topical sub-committees are established including membership, reporting relationship, funding arrangements, meeting schedule, and mandate. Membership is largely transitioned and expanded from <i>ad hoc vision zero committee</i> <sup>5</sup> .	1-3 months	<input type="checkbox"/>
<b>3. VISION ZERO IMPLEMENTATION</b>		
3.1. Activate initial program elements focusing on training, safety culture development, and defined quick-win programs.	3 months	<input type="checkbox"/>
3.2. Activate monitoring, evaluation, and reporting framework. Publicize notable achievements such as completion of systemic treatments.	Quarterly (minimum)	<input type="checkbox"/>
3.3. Annually update, fund and implement <i>Vision Zero Strategy</i> <sup>4</sup> and Associated Plans, Programs, and Activities.	Annually	<input type="checkbox"/>
3.4. Plan and hold annual Vision Zero Stakeholder's Conference to build safety culture, offer training, and develop collaboration opportunities.	Annually	<input type="checkbox"/>

*Definitional Notes for Implementation Checklist*

1. *Initiator*: a person or group from any agency who wants to begin exploring implementing Vision Zero.
2. *Stakeholder*: organizations with an interest in or mandate related to road safety.
3. *Vision Zero Strategy Proposal*: vision zero strategy prior to director and political approval.
4. *Vision Zero Strategy*: document outlining vision zero policy, goals, initiatives, programs, participants, funding signals, collaboration structure, reporting lines, implementation responsibility, and framework for monitoring, evaluation, and reporting.
5. *Ad Hoc Vision Zero Committee*: stakeholder representatives responsible for vision zero strategy development.
6. *Vision Zero Task Force*: group responsible for implementing the Vision Zero Strategy reporting directly to political level.