Elgin Street Road Safety Improvements

Submission by:

Ottawa

In association with:

PARSONS

Transportation Association of Canada (TAC)
Road Safety Engineering Award Nomination

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1.0 Introduction

In 2016, the City of Ottawa embarked on a planning and design process for the renewal of one of the city's most prominent and historic downtown streets, twelve city blocks of Elgin Street. The street is a designated Traditional Mainstreet, Arterial Road, Transit Priority Route and Truck Route, while also being a favoured destination for pedestrians and cyclists who frequent the many shops and services. The sewers and watermains were among the oldest in the city, dating back to the late 1800s. The need to replace this aging infrastructure created a unique opportunity to assess the road surface and redesign it to meet the City of Ottawa's Traditional Mainstreet designation in the Official Plan, Complete Streets policy, Accessibility Design Standards and improve safety, especially for the thousands of pedestrians walking along Elgin Street every day. The City consulted with community groups, business owners, residents, and the Urban Design Review Panel on the vision and redesign options.

The City retained a team led by Parsons Inc. to provide planning, engineering, design and construction administration services, and assist with a broad and inclusive stakeholder engagement exercise. The Planning Partnership and J.L. Richards & Associates provided supporting design services, as did various City branches including Ottawa's Transportation Services and Infrastructure Services. Details about the Elgin Street Renewal project can be found on the City's website at: ottawa.ca/elginstreet

City staff and Parsons presented a recommended functional design to the City's Transportation Committee on May 3, 2017, with support from the Elgin Street business and landowner community. City Council subsequently approved the functional design on May 10, 2017. The detailed design was completed in fall 2018, and the project went to construction in January 2019 with an accelerated schedule. By January 2020 the project had reached a 60% completion mark, with underground services constructed, and the street operating for all modes. Substantial completion is targeted for late summer 2020.

Historic image of Elgin Street

Elgin Street prior to reconstruction

The new vision for Elgin Street

2.0 Realized or Anticipated Benefits

2.1 Project Overview – Safety Justification and Magnitude

One of the most important interests to be addressed by this municipal investment was corridor user safety with an emphasis on:

1. Pedestrian Safety;

2. Cyclist Safety, and

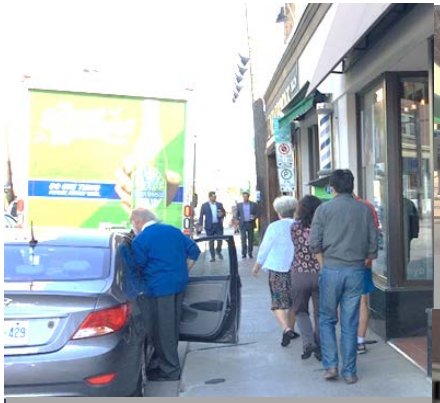
3. Vehicle Behavior.

Safety Issue #1: Pedestrian Safety

The Elgin Street corridor is an intensely used, mixed use mainstreet in the heart of downtown Ottawa. The street has a designated arterial road function and two bus routes serving the corridor. Pedestrian volumes are very high and traffic volumes are as high as 800 per hour per direction. Whereas there is little historical empirical evidence of fatalities or pedestrian accidents reported, stakeholders have described the corridor as follows, "with such narrow sidewalks, Elgin Street is an accident waiting to happen". Certainly, the street's sidewalks did not meet the demand or contemporary requirements for accessibility, with clear sidewalk zones extremely constrained, often by buildings at or close to the property line.

With sidewalks measuring less than 2m wide, and clear zones less than 1.5m in some locations, the following safety issues were observed during the planning and design process (and confirmed with stakeholder anecdotal evidence):

- Pedestrians and wheelchair users unable to pass;
- Pedestrians unable to walk two-abreast;
- Vehicle car doors open into the clear sidewalk zone;
- Through pedestrians unable to pass transit patrons queued at bus stops;
- Pedestrians walking in the roadway to pass other pedestrians or bus patrons;
- Buses and heavy vehicles operating in narrow lanes adjacent to a substandard sidewalk;



Intensely used, busy street with under-performing sidewalks

Cyclist safety on Elgin Street

Unsafe, substandard sidewalk

- Long pedestrian crossing distances, given the previous four-lane cross-section, with high pedestrian exposure to turning vehicles.

Safety Issue #2: Cyclist Safety

Elgin Street is not a designated Spine Route in the City of Ottawa Cycling Plan and as such, City policy did not call for segregated facilities on this street. Also, given cycling investment decisions for parallel corridors such as the O'Connor Bikeway and Rideau Canal pathway, together with the narrow (18m) right-of-way (ROW), the desire to accommodate high pedestrian volumes, patios and on-street parking, the provision of segregated facilities was not possible. Notwithstanding, the study team identified an opportunity to renew the street with an improved low-speed cycling environment. The pre-existing environment was not ideal for cycling due to these factors and behaviors:

- Four very narrow vehicle travel lanes (approximately 3m) with no cycling facility;
- The curb lanes were operated as off-peak period parking lanes;

- During peak hours, cyclists typically hugged the right side of the very narrow curb lane, with insufficient space for faster-moving vehicles to pass the cyclist;
- During off-peak hours, cyclists were by default required to cycle in the dooring zone between the parking lane and the adjacent single travel lane; and
- Cyclists regularly rode on the sidewalk and in crosswalks.

Safety Issue #3: Vehicle Behaviors

The Elgin Street Corridor is a designated arterial road with traffic volumes exceeding 800 vph per direction in some segments. The street has operated as a four-lane undivided roadway, with speed limit of 50 km/h, for decades. The street accommodates local bus routes and is a designated truck route.

As mentioned previously, the curb lanes had operated as off-peak period parking lanes, with parking permitted up to within 9m of the approach to intersecting side streets. Also, Elgin Street is a two-way local cycling route with close intersection spacing in a very dense, historic downtown neighbourhood. As such there are frequent movements along, to and from the corridor via all modes.

With this arrangement, two traffic conditions and behaviors of concern were observed by the study team. Firstly, given the short block lengths and number of turning movements, motorists had a propensity for weaving through intersections to bypass turning vehicles. This was of particular concern to Elgin Street given the extremely narrow sidewalk widths and the phenomena of pedestrians walking on the travelled surface of the roadway. Sudden braking of turning vehicles coupled with sudden weaving movements amplified the risk of rear-end and sideswipe collisions,

collision with right-turning vehicles from side streets, as well as vehicle-pedestrian and vehicle-cyclist collisions.

The second issue of concern was vehicle travel speed. Although the street was managed as a 50 km/h street (unsigned, as 50 km/h is the default speed for streets in the City of Ottawa), vehicle speeds in excess were possible, especially during periods where all four lanes were operating and there was no on-street parking to act as roadside friction

Summary

Given these three transportation concerns, road safety needs were paramount in every step of the planning, design, construction, operation and maintenance of the Elgin Street corridor. Within this context, the following challenges were addressed by the study team:

- Design the corridor to improve safety for all users, with an emphasis on pedestrians, given the downtown mainstreet context;
- Provide efficient transit service and sufficient traffic capacity, while implementing a road diet; and
- Safely accommodate cyclists without provision of segregated cycling facilities.

There is now an opportunity to share the Elgin Street Renewal experience with the Transportation Association of Canada (TAC) and its membership that has an interest in road safety engineering in an urban, narrow, downtown context.

Multiple users on Elgin Street within a narrow 18m ROW

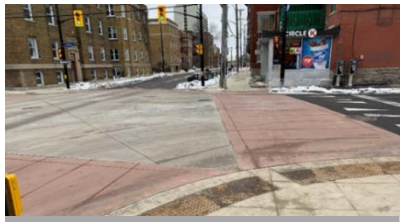
2.2 Elgin Street Design -Anticipated Reliability and Sustainability of Safety Performance Results

As a street of historic importance and commercial vitality, Elgin Street attracts thousands of visitors every day. The street's new general arrangement responds to road safety concern and includes:

- Wider sidewalks on both sides of the street (generally 3m minimum);
- Traffic-calmed 30 km/h posted speed limit corridor;
- Road diet from four travel lanes to one lane per direction;
- Auxiliary turn lanes as required;
- Raised on-street parking;
- Closely set road-edge streetscape elements (streetlights, bollards, trees, benches, bike racks) to further calm traffic;
- Four raised intersections;
- 7.0m narrow curb-to-curb width; and
- Reduction of on-street parking spaces from 120 spaces to 90 spaces.

For pedestrian safety and comfort, the specific project features include:

- Generous widening of sidewalks and crosswalks;
- Absolute minimum 1.8m clear zone width;
- Distinctive and contrasting crosswalks;
- Space for bus shelters;
- Audible and advanced pedestrian signals;
- Daytime left-turn prohibitions at all signalized intersections without auxiliary lanes;
- Protected left-turn phases at select locations;
- Tactile Warning Surface Indicators;
- Neckdowns at side streets, shortening the pedestrian crossing distances;
- Accessible design with benches/rest areas;
- Burial of overhead lines and removal of utility poles, thus expanding the clear zone;



Contrasting Crosswalks and Raised Intersections

Wide sidewalks and side level parking

- Tree Plantings using below-grade Silva cells

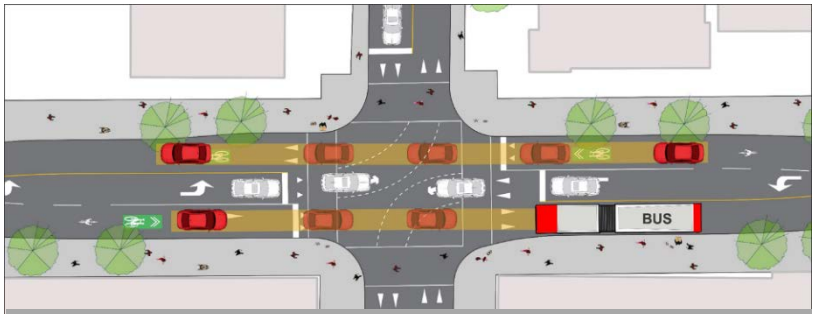
For cyclists, bus safety and efficiency, the project features transit priority and in-line cycling in low-speed, shared travel lanes with “super-sharrows”, new bus shelters, and an abundance of bicycle parking.

With this arrangement, the following road safety and sustainability conditions are being realized:

- Wide, accessible sidewalks with capacity to accommodate pedestrian demand and growth;
- Slower vehicle travel speeds (30 km/h speed limit) which is more conducive to sharing of the road with vehicles, buses and cyclists;
- Less likelihood of cyclists travelling in the dooring zone;
- Slower and more predictable vehicle behaviors at intersections;
- Greening of the urban landscape, with the inclusion of approximately 100 new street trees and 1,600 new shrubs where few existed previously.

In-line cycling on slow 30 kmh street

Transit priority and more predictable motorist behavior



Elimination of weaving at intersections

A sample intersection drawing is provided in **Appendix A**. Images showing the resulting Elgin Street Renewal plan are provided in **Appendix B**, with photos of 2019 preliminary construction progress provided in **Appendix C**. The full street reconstruction demonstration plan is provided as **Appendix D** to this submission and can be found at: https://documents.ottawa.ca/sites/documents/files/DRAFT_Landscape_Rendered%20Roll%20Plan_Full_28%20November%202018.pdf

Road user safety was also a priority during construction. Key aspects of the project's Construction Management Plan included:

- Full road closure to vehicles to enable a one-year rapid construction of underground sewers and watermains;
- Continued pedestrian access to all businesses during construction;
- Detoured transit routes that weaved through the community to maintain transit service; and
- Temporary asphalt sidewalks during winter construction shutdown.

2.3 Methodology to Estimate Benefits

During the planning and design process, there was some hesitancy by the Elgin Area Business Association to entertain a loss of on-street parking, or for vehicle lane reductions. At the same time, some stakeholders felt that the City was not going far enough to improve cycling conditions, or to provide for street greening. The City also held a public design workshop and posted an online questionnaire to determine where people's priorities lay. To address these divergent views, the study team developed a ***Complete Street Scorecard*** for the project (See **Appendix E**) and attempted to quantify the various losses and gains associated the recommended design. That scorecard proved extremely useful to the "balancing act" discussion and can be built upon for future projects in Ottawa or any community in Canada.

2.4 City of Ottawa Commitment to Implementation, Enforcement and Monitoring

A decision to notably change the arrangement and operation of this twelve-block long arterial road and downtown mainstreet was difficult for the City to make, considering the wide range of external stakeholders involved and their many competing interests. The decision was no less difficult to balance amongst internal municipal branches. Ultimately, there was agreement amongst City branches responsible for transportation planning, traffic operations, road safety, forestry, urban design, emergency services and surface operations. Of note, the City made an exception to its 30 km/h streets policy to enable this arterial road to be embraced within that policy (the 30 km/h tool is otherwise reserved for local roads). Whereas the City has reached high in terms of physical traffic calming measures, the municipality's enforcement team is also committed to playing its part to ensure project success.

3.0 Degree of Innovation

3.1 Innovative Study and Stakeholder Engagement Process

As one of the prominent mainstreets in the Nation's Capital, the Elgin Street Renewal project was of extremely high interest to adjacent landowners, businesses, institutions, community associations, special interest groups, and individuals. The street also forms a route for commuters entering and exiting downtown Ottawa. Accordingly, the interest of elected officials was extremely high.

A mechanism to engage stakeholders and demonstrate transparency and willingness to listen was critical to the project success. To meet this requirement, the idea of a special ***Elgin Street Design Working Group*** consisting of key partners / stakeholders was conceived. This group had representation from the residential and private sector business community, elected officials and City staff, and assisted in identifying challenges and bring solutions toward the development of a functional design. Prior to the design development, the Working Group and study team identified a vision for the future of Elgin Street. The shared vision concluded that Elgin Street should not simply be a corridor to travel safely through

Elgin Street Stakeholder Engagement

but be a *place* for all people. This included the following considerations, with respect to Elgin Street as:

- *a home:* a place to live;
- *a destination:* a place to visit and linger;
- *a workplace:* a place to work and shop; and
- *a growth corridor:* a place to invest.

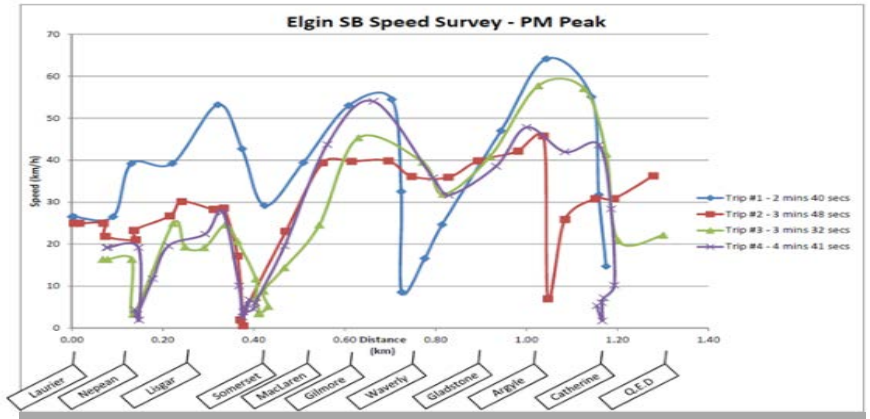
These considerations helped inform priorities and core needs of the street, informing subsequent design decisions pertaining to road safety. In addition to the Working Group, the project benefitted from a public design workshop, online questionnaire, technical advisory group, four (4) public open houses, a landowner drop-in session and a robust web site.

The stakeholder engagement carried on through construction, and included the following initiatives that were either delivered or supported by the municipality:

- A full-time construction liaison officer;
- Regular "block captain" meetings;
- A regular construction newsletter; and
- A fun-spirited business development campaign spearheaded by local private sector business representatives, coined ***I Dig Elgin***. http://idigelgin.squarespace.com/

Supportive community initiatives

The study also employed innovation in the engineering analyses. An example of innovation in engineering analysis was the use of a smartphone app, *Cyclemeter*. This app was used by the project team to evaluate trip times and vehicle travel speeds along the Elgin Street corridor. This baseline data analysis will be replicated post-construction, so that before-and-after analyses of both vehicle travel speed peak and total corridor travel time can be made. https://play.google.com/store/apps/details?id=com.abvio.meter.cycle&hl=en_US



Speed Survey for Elgin Street

4.0 Transferability to Other Canadian Communities and Organizations

4.1 Relationship to the National Road Safety Vision and Vision Zero

Considerations for road safety were addressed at all stages of the project implementation, ranging from the early functional design, through the preliminary and detailed design phase, and during the construction process. The decision to notably change the arrangement and functionality of the Elgin Street Corridor was informed by the resulting polices and activities of the ***TAC Road Safety Standing Committee*** and other organizations promoting a Vision Zero approach, including the pursuit of, "making Canada's roads the safest in the world" (Canada's Road Safety Strategy 2025, CCMTA). The province of Ontario has a long history of pursuing road safety on all roads and promoting road safety research.

The Elgin Street Renewal project illustrates a very urban, multi-modal approach to road safety, and can bolster the understanding of best practices in safety-oriented designs, as opposed to being auto-focused. This type of urban street best practice can be showcased in national and provincial safety plans and strategies, given that the relative health and safety of downtown streets can be a barometer for the wider provincial context.

The design result is also consistent with the priorities of National Association of City Transportation Officials (NACTO), the Complete Streets Coalition, and the Toronto Centre for Active Transportation (TCAT).

4.2 Relationship to City of Ottawa Road Safety Initiatives

The vision of Ottawa's recently updated Road Safety Action Plan is *"A comprehensive and proactive strategy for making Ottawa roads safe for all users", with* a goal of significantly reducing the occurrence of major injury and fatal collisions, especially for vulnerable road users such as pedestrians. The Elgin Street Renewal project was guided by these principles, as well as a range of related City of Ottawa plans and programs, including:

- Safer Roads Ottawa Program;
- Transportation Master Plan;
- Pedestrian and Cycling Plans;
- Regional Road Corridor Design Guidelines;
- Collector Road Planning and Design Guidelines;
- Traffic Calming Design Guidelines;
- 30km/h Speed Limit Policy;
- Complete Streets Implementation Framework;
- Multi-Modal Level of Service Guidelines; and
- Downtown Moves.

These documents are all found on the City of Ottawa's website, and demonstrate the City's longstanding commitment to road safety and excellence in urban street design.

4.3 Transferability to Other Canadian Municipalities

The Elgin Street Renewal experience is highly relevant to all Canadian municipalities that are pursuing transportation safety in urban, downtown districts that have these defining characteristics:

- Aging infrastructure that will soon need renewal;
- Renaissance in downtown real estate development;
- Higher rates of residential development downtown;
- Greater focus on pedestrian, cycling, and transit modes;
- Increased rates of walking and cycling;
- More seniors and vulnerable street users;
- Informed, active and focused stakeholder groups; and
- Economic benefits of active transportation and public realm improvements.

The primary areas of transferable knowledge towards design decision-making include:

- Engage diverse range of stakeholders in combined "Working Group" meetings as opposed to separate public and technical stakeholder meetings;
- Balance road safety requirements vis-à-vis business and other competing interests;
- Combine learned experiences and empirical analyses including the "scorecard" approach; and
- Demonstrate commitment to safety throughout planning, design and construction phases.

5.0 Conclusion

The City of Ottawa and Parsons are extremely proud to submit the Elgin Street Renewal project as an exemplary transportation project that showcases user safety for all modes in an urban, downtown context. An attention to corridor safety was a priority during the planning, design, and construction implementation phases. The project demonstrates that a combination of empirical engineering analyses and extensive and meaningful stakeholder involvement can result in a road design that can be embraced by all.