



STAFF REPORT ACTION REQUIRED

The Effectiveness of Extended Construction Working Hours and Improved Public Awareness on Managing Traffic Disruption

Date:	April 26, 2016
To:	Public Works and Infrastructure Committee
From:	Executive Director, Engineering & Construction Services
Wards:	ALL
Reference Number:	P:\2016\Cluster B\TEC\PW16001 (AFS#22265)

SUMMARY

The purpose of this report is to report back on (1) the outcome of various measures to mitigate traffic disruption that were used by the Engineering & Construction Services division (ECS) for 2015 City-led construction projects; and, (2) the integrated public awareness and education campaign to inform the public about ways in which they can learn about the location and timing of construction in the road right-of-way and options they can take to minimize the effects of the disruption on their travel.

Based on the information obtained during the 2015 construction season, ECS will continue to apply mitigation measures on City-led construction projects where appropriate and after consultation with the local councillor(s) as a means of alleviating traffic disruption due to City-led road construction projects. As with all other ECS projects, notice of construction activities, including mitigation measures, will continue to be communicated to the local councillor(s) and local communities prior to the start of construction.

RECOMMENDATIONS

The Executive Director, Engineering & Construction Services recommends that:

1. Public Works and Infrastructure Committee receive this report for information.

Financial Impact

There is no financial impact associated with this report.

City-led construction projects that are future candidates for application of traffic disruption mitigation measures will continue to be evaluated individually to determine which traffic mitigation approach will be most effective.

The financial impacts will be reviewed, prior to issuing tenders, to confirm budget funding availability. All costs associated with measures to mitigate traffic disruption on City-led construction projects will be accommodated within the Council Approved 2016 Capital Budget and 2017 – 2025 Capital Plan for Toronto Water and Transportation Services.

The Deputy City Manager and Chief Financial Officer has reviewed this report and agrees with the financial impact information

DECISION HISTORY

At its meeting on February 10 and 11, 2015, and in consideration of the staff report titled Managing Traffic Disruption on City-Led Construction Projects, City Council approved (a) the use of extended construction work schedules, including 24/7, overnight, and extended daily work hours, for City-led construction projects within the road right-of-way during the 2015 construction season, where appropriate and after consultation with the local councillor(s); and, (b) the development and implementation of an integrated public awareness and education program to inform the public about ways to learn about the location and timing of construction and options available to the public to minimize the effects of traffic disruption. City Council directed the Executive Director, Engineering & Construction Services to report back to the Public Works and Infrastructure Committee on the outcome of the various measures to mitigate traffic disruption implemented on 2015 construction projects; and on a detailed communication strategy. The Council Decision can be found at:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2015.PW1.3>

ISSUE BACKGROUND

The City is making great strides in addressing its sewer, water and road infrastructure renewal backlog, with a forecasted growth in capital construction over the next 10 years. This growth will, however, raise the number and duration of lane restrictions due to construction on city roads resulting in increased traffic congestion.

Traffic congestion is a major concern for road users and public officials responsible for managing the City's transportation road network because it reduces the quality of life, has environmental impacts, negatively impacts productivity due to longer travel or commute

times, and negatively affects the local economy, particularly when motorists, pedestrians, and cyclists actively avoid areas of high congestion.

Traditional construction daily work hours on City-led projects are 7:00 am to 7:00 pm from Monday to Friday. By extending working hours on City-led construction projects, construction schedules and the corresponding impacts on traffic (mainly as a result of construction-related lane restrictions) are expected to be reduced.

The City has some, albeit limited, experience using non-traditional construction work hours. For example, the construction schedule for the West Deck replacement (Exhibition Place to Grand Magazine Street) of the F.G. Gardiner Expressway was accelerated. To do this, the contractor used additional labour, equipment and materials and extended construction work hours during weekdays and undertook work on Saturdays. This resulted in reducing the elapsed time during which lane restrictions (which are needed to provide the construction work zone for the crews and equipment) were in place; it also reduced the overall traffic impact associated with the project. There was a capital cost premium to accelerate the West Deck project. However, it was significantly less than the economic losses that could have resulted from reduced traffic flow on the Expressway. Based on computer simulation modelling using an average road user cost of \$20 per hour, the cost to Toronto's economy of reducing the Gardiner Expressway by one lane in each direction was estimated to be in the order of \$1,000,000 per day in lost productivity.

Given the potential economic, social, and environmental benefits of reducing construction-related traffic disruption, in February 2015, City Council approved the pilot testing of three different types of extended work schedules, outlined below, on City-led construction projects in the road right-of-way during the 2015 construction season:

1) 24 hours per day - 7 days per week

Under a 24/7 project, work is undertaken around the clock every day of the week for the duration of the project. Ideal projects for a 24/7 schedule include intersections, expressways and major roads where the project would otherwise significantly disruptive to the commuting public and TTC streetcar service. This type of schedule imposes the greatest amount of traffic disruption in a concentrated period of time, but can also result in the most drastic reduction in overall construction duration.

Provisions may have to be made to accommodate noise restrictions set out in the City's Noise By-Law or in response to residents' concerns.

2) Overnight work (7:00 pm to 6:00 am), up to six days per week

Under an overnight work schedule, work begins at 7:00 pm at night and ends at 6:00 am in the morning. Projects using this type of schedule are planned so that lanes are closed only when construction activities are taking place at night, and the lanes are opened to traffic each morning, so that there are no lane closures outside the overnight working hours. As such, contractors are required to mobilize and demobilize their operation, equipment and materials at the end of each overnight work period. This type of schedule allows the road to remain open without lane

restrictions during the day, disrupting traffic only during overnight hours. This type of schedule is best suited to major roads where the work is not in close proximity to residential neighbourhoods, such as industrial or largely commercial areas, thereby limiting the impact of the noise generated by the work in the overnight hours.

3) Extended daily work hours (14- to 17-hour days)

Under an extended daily work hour schedule, the workday is increased from 12 hours per day to 14 or 17 hours per day on local and major roads, respectively. This type of schedule is best suited for the acceleration of projects, where overnight construction work hours would not be suitable (e.g., in proximity to residential areas). The work schedules are as follows:

- a) Major Roads: 17 hours per day, from 6:00 a.m. to 11:00 p.m., Monday to Saturday; and,
- b) Local Roads: 14 hours per day on local roads from 7:00 a.m. to 9:00 p.m., Monday to Friday.

COMMENTS

(1) Outcome of Various Measures to Mitigate Traffic Disruption

In 2015, eleven (11) City-led construction projects were used to pilot test the different types of extended work schedules, which included three projects with two or more phases, each relying on a different type of extended work schedule, for a total of 14 pilot tests:

- 24 hours per day - 7 days per week: 2 pilot tests
- Overnight work (7:00 pm to 6:00 am), up to six days per week: 3 pilot tests
- Extended daily work hours (14- to 17-hour days): 9 pilot tests

The above-noted projects were chosen in consultation with Transportation Services and the local Councillor(s) in whose ward(s) the projects were located. The project locations are shown in the Attachment to this report.

The projects were evaluated on the basis of:

- a) Net reduction in overall construction schedule;
- b) Capital cost impacts;
- c) Operational issues; and,
- d) Impact to traffic.

Table 1 presents a summary of the pilot test findings.

Table 1. Summary of Overall Impacts Associated with Extended Hour Construction Projects

Net Reduction in Overall Construction Schedule*	Capital Cost Impact**	Operational Issues	Traffic Impact
<i>24 hours per day – 7 days per week</i>			
General reduction in schedule by 50%	Experienced a 10% to 20% decrease, related to less demobilization and mobilization costs and the increased productivity.	When noisy concrete removal activities were underway, this work ceased at 11:00 pm, to minimize noise complaints from area residents. Maintaining continuity in construction inspections oversight was challenging.	While this type of schedule represents a significant impact during construction, the shorter construction duration means the overall impact to traffic is significantly reduced.
<i>Overnight work (7:00 pm to 6:00 am, up to six days per week)</i>			
Construction schedules were generally similar, if not longer, in comparison to similar types of work undertaken under the traditional daytime work period of 7am to 7pm due to the need to re-open lanes every morning, requiring daily mobilization and demobilization of construction equipment.	Experienced a 5% to 15% increase, related to the need for extra work associated with daily mobilization and demobilization of equipment, and placement of traffic controls.	Low light conditions, even when portable/auxiliary lights were used during night time operations, made visual inspections of grading and observations of potential depressions in pavement challenging to see.	Given that the work generally took place between 7:00 pm and 6:00 am, when traffic volumes were generally lower than during the day, the daily impact on traffic was significantly less.
<i>Extended daily work hours (14- to 17-hour days)</i>			
Construction schedules were reduced by 20 to 40%, however, contractors did not fully utilize the additional work hours. Rather, they deployed extra crews to complete the work within the contract schedule. Based on personal communication with contractors, this was preferred over paying overtime, and/or asking their crews to work extra hours during summer months (when the crews would rather work 10 hours per day). An extended hour work day from 6:00 am to 11:00 pm represents a 17 hour work day, which is not long enough to fully utilize a second shift.	Experienced a 15% to 20% increase due mainly to the additional labour costs associated with assigning extra crews or paying for crews to work overtime.	Providing inspection staff resources during extended daily work hour operations represented an additional scheduling challenge for City staff, and could represent additional costs in paid overtime, to provide the necessary oversight.	Daily traffic impacts – during peak traffic volumes – would be the same as conventional hours. However, given the reduction in the overall construction schedule, the overall traffic impacts would be reduced.

*Reductions in construction schedule are referenced against a conventional Monday to Friday: 7am to 7pm schedule

**Direct capital cost impacts only; does not include additional city costs (e.g., inspection) or account for economic impacts.

A qualitative summary of the impacts associated with extended hour construction projects, in comparison to projects using conventional construction work schedules, is presented in Table 2.

Table 2. Qualitative Summary of the Overall Impacts Associated with Extended Hour Construction Projects

Traffic Disruption Mitigation Measure	Construction Duration	Capital Costs	Overall Traffic Impacts
24 hours per day – 7 days per week	↓	↓	↓
Overnight work (7:00 pm to 6:00 am, up to six days per week)	≈	↑	↓
Extended daily work hours (14- to 17-hour days)	↓	↑	↓

Legend: ↑ - increase; ↓ - decrease; ≈ - similar

As summarized in Tables 1 and 2, it can be concluded that while capital costs are generally higher for extended hour projects, where the premium can be between 5% and 20% in comparison to traditional work hour projects, the construction duration is typically decreased by 20% to 40%, resulting in a corresponding reduction in traffic impacts.

Overnight projects were substantially less disruptive to the commuting public as all lanes were reopened and returned to service during the daytime hours. However, there was no appreciable reduction in the overall construction schedule. Overnight schedules are most effective on highly-trafficked major roads since all lanes can be reopened in the daytime to avoid significant traffic disruptions. Working in the evening hours, close to residential areas, can be an issue due to noise from the construction activities.

For projects where the daily work hours were extended from the traditional 12 hour day to 14 or 17 hour days, contractors opted to meet the project completion dates by assigning additional crews to a conventional 10 hour work shift, rather than fully utilizing the extended hours.

For the 2016 construction season, ECS plans to continue pilot testing the different types of extended work schedules. Candidate projects, particularly those on major roads with high traffic volumes, will be evaluated individually to determine which traffic mitigation approach will be most effective, in consultation with the local Councillor(s), and the financial impact will be identified with the asset owner(s).

(2) Integrated Public Awareness and Education Campaign

In parallel with the pilot testing, the City undertook a public awareness campaign beginning in the spring of 2015. Staff commissioned public attitude research to gain information about the public's knowledge and understanding of construction projects in the city, and to learn about what information the public wants and how best to communicate with them.

The survey revealed that:

- Half of Torontonians (52%) believe it is becoming somewhat harder to get around the City.
- The majority agree that construction (66%) and road congestion (56%) are to blame.
- While Torontonians understand why construction is needed, few residents believe they have enough detailed information on how construction will impact travel.
- A majority of residents (60%) indicated that they would show more patience regarding delays if they were more aware of construction start and end dates.
- Residents and motorists indicated a preference to receive information about construction projects by television, radio, and signage at the actual construction site.

Following the survey, the City issued a media release to highlight its findings and the story was published in various media outlets.

In addition to providing a baseline of statistical information, the survey also formed the basis for creating a multi-media public education campaign using enhanced media relations, advertising and other tactics. The advertising campaign, which took place from mid-September to mid-October 2015, ran on most of Toronto's radio stations as a 30-second ad or an announcer-read 10-second tag following a traffic report, in order to reach the key driving audience. The campaign also featured digital and television banner ads. The advertisements promoted the City's new webpage, www.toronto.ca/roadrestrictions, which provides real time updates on road conditions so that the public can plan their trips around the city.

At the same time, stories were pitched to media about the City's efforts to co-ordinate road construction activities. The result was that 40 media stories were generated including 25 in online publications and 13 on radio stations. The City continued to issue news releases about road closures, including for special events, which were used by traditional media, online media and traffic reporters. These, combined with a significant increase in Twitter updates, helped to provide the public with up-to-date information.

As part of our messaging efforts in 2015, written communications and interviews with spokespeople informed residents that they should take advantage of various traffic apps available to help them plan their trips and they should also consider alternative methods of travel including public transit and cycling when making their transportation choices. The City also produced enhanced Pre-Construction and Construction Notices with more details and information to better assist communities affected by construction. Improved project road signs were used by the City's contractors to provide information about the type of work, its impact and the timeline for project completion at these locations.

The communications campaign also included activities such as an annual media event to highlight major road construction projects for the year. Written articles were provided to community newspapers and for Councillors' newsletters and websites, including articles for City Updates.

Public education efforts will continue in 2016, and will include updating the public on the types of City-led construction projects that are in progress and their benefits, building confidence in the City's efforts while distinguishing between City and private-sector projects, encouraging alternate routes and transit, and directing people to the City's websites, including www.toronto.ca/roadrestrictions to help residents and visitors plan their travel as well as www.toronto.ca/inview where they can access information about the city's planned capital construction.

Additional activities planned for 2016 include:

- Improved signage at construction sites;
- Creating and posting construction site walk-about videos on-line;
- Continuing to approach different media outlets to encourage writing stories about such topics as "Don't be that guy; bad habits around construction sites", "Debunking construction myths", and "Toronto beneath your feet: 100 years of city-building down below";
- Appointing ambassador-spokespeople who can take media on tours of a major construction project; and,
- Investigating speaking opportunities with major stakeholders such as BIAs.

Raising public awareness and promoting public education are long-term efforts as it is not simple to change public opinion overnight. It will take time to build credibility and confidence in the City's efforts to minimize traffic impacts as a result of construction work. In addition, it is anticipated that there will be a greater number of City-led construction projects in 2016 and 2017 in comparison to 2015, in some cases, this is due to projects that were deferred to accommodate the Pan Am and Parapan Am Games. Consequently, in the short term, it will be difficult to ascertain if an improvement in communications will be able to overcome what may be viewed as an increase in construction-related disruption.

This report was prepared in consultation with Transportation Services, Toronto Water and Strategic Communications.

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SIGNATURE

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ATTACHMENT

Attachment 1. Locations of 2015 Construction Projects With Extended Hours

Attachment 1 Locations of 2015 Construction Projects With Extended Hours

