

FINAL REPORT

---

ROW OCCUPANCY FEES  
IN THE CITY OF TORONTO

**Cover Image**

William Davis

*A Map of Every Traffic Signal in Toronto*

# Right-of-Way Occupancy Fees in the City of Toronto

## Final Report

Prepared By:  
[The UrbanCore Team](#)

Submitted April 9, 2015  
PLG 620 Advanced Planning Studio I  
[Ryerson University](#)

# TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	1
1.0 INTRODUCTION .....	3
2.0 DESCRIPTION OF CONSTRUCTION STAGING AREAS AND ROW OCCUPANCY .....	7
3.0 REGULATORY CONTEXT.....	14
3.1 TORONTO PARKING AUTHORITY (TPA).....	15
3.2 SNOW REMOVAL .....	17
3.3 OFFICIAL PLAN.....	18
4.0 FIELD RESEARCH & CASE STUDIES .....	19
4.1 SITE VISITS .....	20
4.2 INDUSTRY PROFESSIONAL OUTREACH.....	22
4.3 CONSTRUCTION STAGING AREA RESEARCH .....	23
4.4 CONSTRUCTION STAGING REPORT INVENTORY.....	24
4.5 INFORMATION TECHNOLOGY (IT) STRATEGIES.....	24
4.5.1 BUILDING INFORMATION MODELING (BIM).....	25
4.5.2 BIM IN PRACTICE.....	26
4.6 CASE STUDIES .....	27
4.6.1 SAN FRANCISCO, CALIFORNIA.....	27

4.6.2	ORANGE COUNTY, FLORIDA.....	29
4.6.3	VANCOUVER, BRITISH COLUMBIA.....	30
4.6.4	GERMANY .....	31
<b>5.0</b>	<b>ANALYSIS OF PROPOSED FEE STRUCTURE.....</b>	<b>32</b>
5.1	PER-UNIT COST BREAKDOWN .....	34
5.2	PROPOSED FEE STRUCTURE FLAWS .....	36
<b>6.0</b>	<b>CONCLUSIONS.....</b>	<b>37</b>
<b>7.0</b>	<b>NEW FEE STRUCTURE.....</b>	<b>38</b>
7.1	PEDESTRIAN TRAFFIC.....	41
7.2	STREET CLASSIFICATION .....	41
7.3	BICYCLE LANES .....	41
7.4	REMOVAL OF TPA SPOTS .....	42
7.5	INCENTIVES.....	42
<b>8.0</b>	<b>RECOMMENDATIONS .....</b>	<b>44</b>
8.1	ENFORCEMENT OF BY-LAWS.....	45
8.2	IMPLEMENTATION OF IT STRATEGIES .....	45
8.3	INCREASING ACCESSIBILITY OF INFORMATION .....	46
8.4	CONSTRUCTION RELATED TRAFFIC IMPACT REPORTS .....	48
8.5	INCENTIVES.....	48
<b>9.0</b>	<b>NEXT STEPS.....</b>	<b>50</b>
<b>10.0</b>	<b>APPENDIX .....</b>	<b>51</b>
<b>11.0</b>	<b>REFERENCES.....</b>	<b>60</b>

# EXECUTIVE SUMMARY

Toronto's right-of-way (ROW) occupancy fees are currently under a proposed restructuring. The ROW occupancy fees are a charge placed upon a developer for the temporary occupation of a public sidewalk, laneway or street during construction. The Transportation Services department has proposed an increase on the City of Toronto's ROW fee rates. This increase aims to reduce traffic congestion, shorten construction duration, and compensate for lost revenue to the Toronto Parking Authority (TPA). The research contained in this report will suggest that an increase of that magnitude is not justifiable, or reasonable.

The research findings in this report show that only 44% of ROW occupancy construction staging sites in the City of Toronto, within the last ten years, actually occupied TPA on-street parking spaces. Thus, a fee hike based on TPA parking revenue-loss would be inappropriate. The solution to this fee structuring problem will be reviewed through the examination of relevant literature and data.

The use of case studies in cities such as San Francisco, Orange County, Florida and Vancouver, along with a detailed analysis of regulatory context, Information Technologies, Toronto's Road Classification System and TPA Revenue loss, combined with field research, assisted UrbanCore in creating a new fee structure that charges developers appropriately for the ROW space occupied during construction.

UrbanCore hopes this research and analysis can assist the client and the Building Industry and Land Development Association (BILD) in building a stronger case when expressing the unsuitability behind Transportation Services' proposed fee increase through the recommendations found in the latter portion of this report.

The report will conclude with a detailed explanation of the proposed UrbanCore fee structure for ROW occupancy, and five recommendations. The recommendations intend to mitigate traffic congestion and develop a more positive narrative between developers, the City, and the public. UrbanCore's new fee structure will be supported by the City of Toronto's road classification system and pedestrian volume data found in the City's Open Data Catalogue.

Also, this new fee structure creates two rates based on whether a developer is occupying the sidewalk, the road, or both. Although the findings of this report are that the proposed fee structure is flawed as it assumes that all ROW occupancies take up TPA parking spaces, the new fee structure that this report proposes does account for the revenue loss when they do occupy TPA spaces.

This report hopes to help the client and possibly BILD in supporting their understanding of ROW occupancy fees in the city of Toronto.

# URBA



## 1.0 INTRODUCTION

---

This report was created to fulfill Ryerson Urban and Regional Planning's third year advanced studio project. The team has been working with the client, a private developer in the City of Toronto, and Carlo Bonanni, the faculty advisor. The group has completed a significant amount of research, site visits, and internal discussion and brainstorming to fulfill the deliverables set out in the beginning of the semester. The Terms of Reference can be found in the appendix.





# CORE

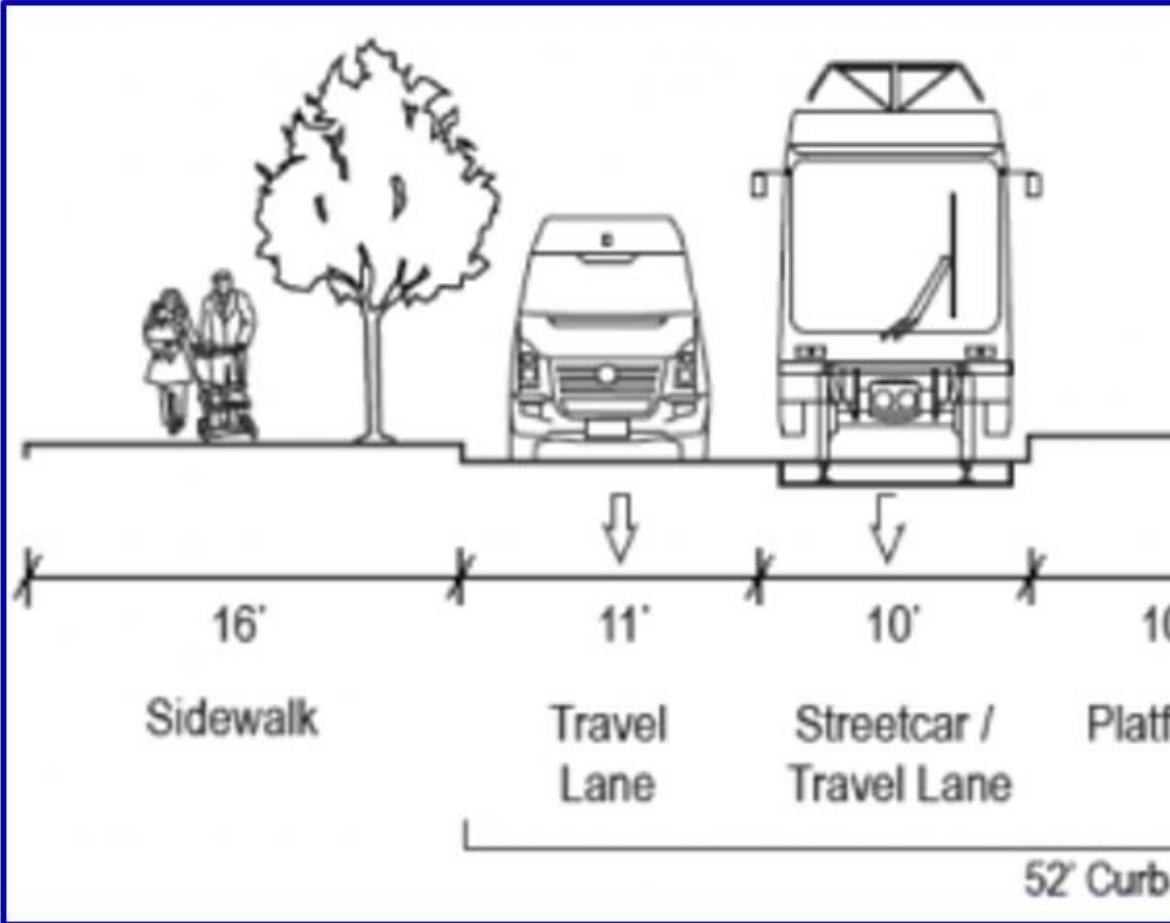
---

The client has retained UrbanCore, a group of eleven Ryerson University Urban Planning students, to assess the proposed restructuring of the right-of-way (ROW) occupancy fees in the City of Toronto. This issue was first brought to Toronto City Council's attention in August 2014 in a motion entitled 'Taking Back Our Streets'. Since then, Mayor John Tory has taken an initiative to solving this problem and has included it in his Six-Point-Plan to battle traffic congestion. The City of Toronto is currently undertaking a comprehensive review of the fee structure that makes this a significant item of timely nature. It is making its way through the Public Works and Infrastructure Committee and will be debated in May 2015.

The ROW is the area in a city where transportation of all kinds happens and contains streets, sidewalks, and bike lanes (Figure 1). ROW fees are charged to developers who require temporary occupation of a portion of the ROW for the purposes of construction operations. In Toronto, many buildings are designed to occupy the entire property on which they are situated, resulting in the need for space adjacent to the construction site for the loading, unloading, and storage of

construction materials; this area is known as the construction staging area. Given the commonality of spatial constraints in the city, the most feasible location for the construction staging area is often in the ROW. However, lane closures are found to aggravate the increasing severity of traffic congestion in the city, which has led stakeholders to seek various mitigation strategies for this problem. The current structure is based per square metre, per month. The proposed increase would change the per square metre, per month fee to a per square metre, per day fee, which in effect is a significant increase. The rationale behind the proposed daily fee structure is lost revenue to the Toronto Parking Authority (TPA). The restructuring of the ROW fee is also a recommended initiative under the City of Toronto's Construction Management Plan 2014-2018.

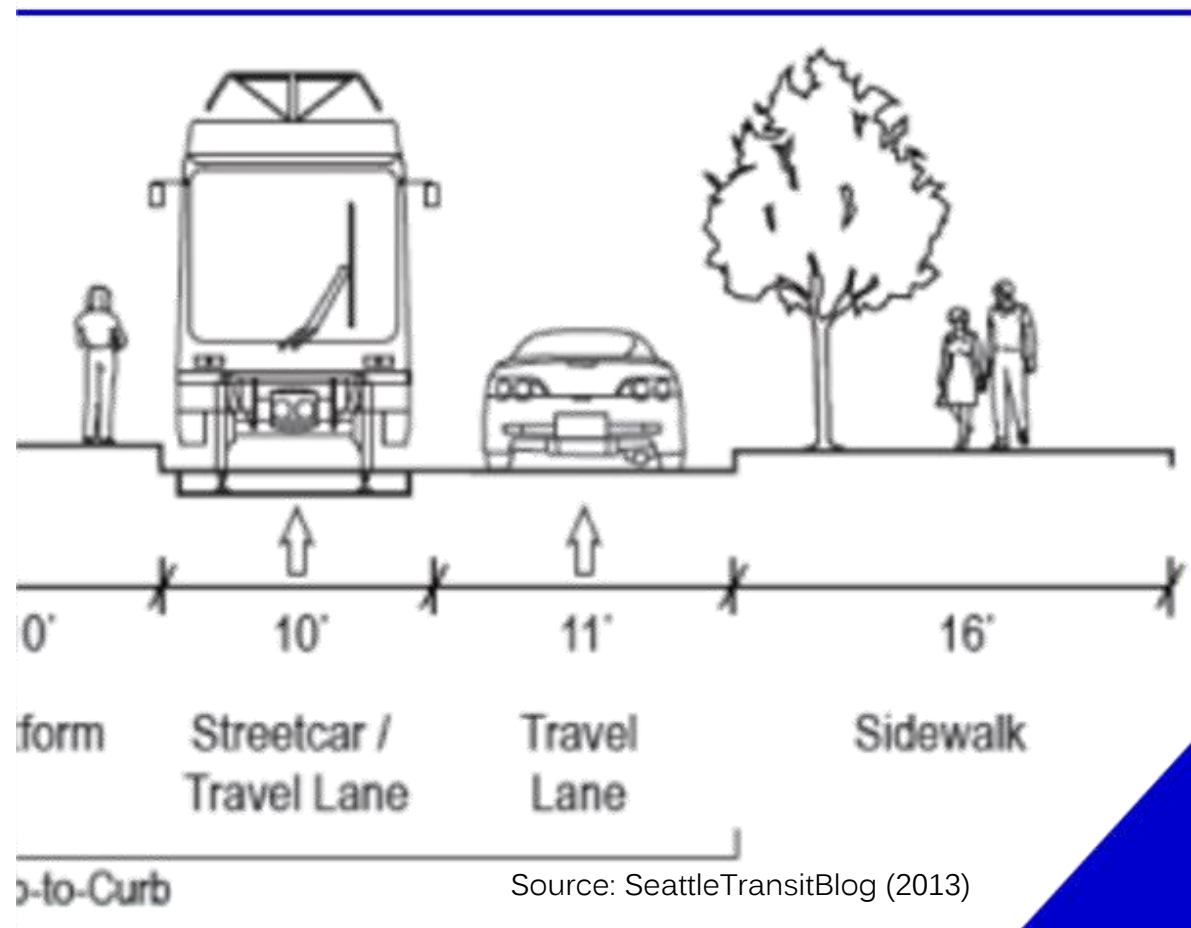
The purpose of this study is to provide an alternative and a more appropriate fee metric upon which the new lane occupancy fees can be based, and to provide mitigation strategies that will reduce the amount of traffic congestion impact from construction staging. UrbanCore has examined potential



outcomes by performing a comparison between the two fee structures. This was done by breaking down cost per unit and using examples from development in the downtown core. The group has conducted research on lane occupancy fee structures of other cities and their construction management strategies. Extensive literature reviews, 'best practices' used by other jurisdictions, and observations from field research has informed the final recommendations and implementation strategies made in this report. These are directed to mitigate lengthy lane occupancies and reduce traffic impacts of construction staging.

This final report contains a description of the City of Toronto's requirements for construction staging and lane occupancy fees, regulatory context, and findings from field research. The following sections detail the analysis, strategy, and proposed implementation of an alternative fee metric and construction management processes. The report ends with final conclusions and recommendations.

Figure 1 - An example of a Right-of-Way (ROW).



# 2.0 DESCRIPTION OF CONSTRUCTION

---

---

# **STAGING AREAS AND ROW OCCUPANCY**

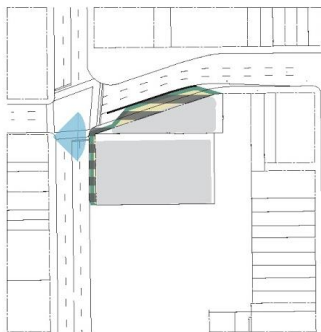
The following section will detail the City of Toronto's existing fee structure, give reasons as to why the City collects ROW occupancy fees, and explain what the fees are used for. It will also briefly discuss existing measures the City undertakes in order to minimize the effects of ROW occupancy on traffic.

In Toronto, construction sites typically occupy the entire lot on which they are situated. As such, spatial constraints during construction are the norm. Therefore, the ROW is usually the most realistic option for the location of the construction staging area. This is where construction materials are loaded, unloaded and stored. Figure 2 outlines each fee's respective use and was taken from the City of Toronto's February 3rd, 2014 Staff Report from Transportation Services directed towards the Planning and Growth Management Committee. The fees themselves can be found in Chapter 441 of the Municipal Code.

Fee Type	Frequency	Cost (+HST)	Purpose	Use of Funds
Site Protection Permit Application Fee	One-time	\$512.47	Funds the review of the site protection application and subsequent inspection and enforcement	Cost-recovery
Hoarding Permit Fee	One-time	\$17.32 per lineal metre for the lifetime of the project	Funds the review of the proposed scaffolding, hoarding, fencing, and walkways, as well as subsequent inspection and enforcement	Cost-recovery
Boulevard Enclosed Fee	Monthly	\$5.77/m <sup>2</sup>	Rental fee for the exclusive use of the public ROW for private construction staging	Rental Fee
Construction Hoarding Sign Permit Fee	One-time	\$6.60 per lineal metre	Funds the review of proposed first party advertising on construction hoarding and subsequent inspection	Cost-recovery




*Figure 2 - Summary Table of The City's Use of Application and Permit Fees*


The highlighted fee \$5.77/m<sup>2</sup> is currently a monthly fee which under the City's proposed increase will become a daily fee. Other fees such as the application fee for a street occupation permit are not proposed to increase. Figures 3 and 4 show the staging area for the development at 117 Peter Street with the various application and permit fees outlined, including site protection, hoarding, and ROW occupancy.



### CONSTRUCTION STAGING AREA DIAGRAM: 117 PETER STREET

Data Source: City of Toronto Website: Street Occupation Application Information

-  Jersey Barrier
-  Site Protection.....\$17.32 per lineal metre for the lifetime of the project
-  Construction Hoarding.....\$6.60 per lineal metre of signage for the lifetime of the project
-  Right-of-Way Occupancy.....\$5.77m<sup>2</sup> per month

 Not to Scale  
Photo Source: UrbanCore

*Figure 3 - Construction Staging Area at 117 Peter Street*



## CONSTRUCTION STAGING AREA DIAGRAM: 117 PETER STREET

Source: City of Toronto Construction Staging Staff Report

- Property Lines
- Painted Lines and Crosswalks
- Jersey Barrier
- Site Protection
- Construction Staging Area
- Building Envelope
- Right-of-Way Occupancy



*Figure 4 - Overhead View of the Construction Staging Area at 117 Peter Street*



Revenues generated by the street occupation fees, which includes the application, the permit, as well as any additional fees including ROW occupancy, are all directed to the City of Toronto's Office of the Chief Financial Officer (CFO). Under the Transportation Services Department these fees are classified as user fees which makes up 8.9% of the department's revenue. It is not clear as to where these user fees are directed after being sent through the Office of the CFO. However based on Figure 2 and BILD's letter to Stephen Buckley, General Manager of Transportation Services, most of it would be directed towards recovery of staffing costs.

Application and permit fees are intended to recover the costs associated with the review of these permits and the City cannot profit from these specific fees, as discussed in more detail in the regulatory context section below. However, the City is permitted to charge whatever it deems necessary as a rental fee for occupying the ROW. The term "rental fee" is ambiguous. This ambiguity has led to one of our recommendations for the City to increase clarity, specific to this rental fee, and to direct revenues collected from ROW occupancy fees toward implementing projects and fulfilling the goals of the Congestion Management Plan.

All of the above permits and applications in Figure 2 fall under the broader category of Site Occupation Permits. As mentioned above, this includes site protection permits and hoarding permits. Site protection permits, under the *Municipal Code* Chapter 743, include the "...scaffolding, hoarding, covered walkways, and enclosures" used for the purpose of providing a construction staging area. The duration of this area and respective ROW occupancy depends on the size and complexity of the development. The impact that these staging areas have on city streets is also dependent on the location. Downtown streets tend to have a narrower ROW than other areas of the city. This fact combined with the increased density and lack of open space results in the sidewalk and roadway generally being the only spaces available for construction staging areas and it is often necessary to close a travel lane. Our site visits included areas outside of the downtown core, however research was focused on areas within the downtown core as the outer areas did not have the same spatial constraints.

# **“FINANCES ASIDE, WORKING WITH DEVELOPERS, I WANT TO REDUCE THE NUMBER OF INSTANCES, IN WHICH WE HAVE LANES CLOSED AT ALL”**

**-JOHN TORY, DECEMBER 4<sup>TH</sup>, 2014**

In order to minimize the impact of ROW occupancies, the City currently works with the developer and construction firm during the review process of street occupation applications and permits. For the General Manager of Transportation Services to approve full or partial closures longer than 30 days, approval from Community Council is required as per the Municipal Code Chapter 937.

The City has recommended that a mandatory traffic impact study be required for every construction staging project. The development community has expressed concern with this requirement. Both the City's recommendation and the development community's rebuttal were taken into consideration and this report will discuss a recommendation that specifically involves expressway ramps and traffic impact studies.

From the City's perspective, occupying the ROW is seen as a last resort and there are several measures that Transportation Services uses to minimize the impact of these staging areas. These include:

- Ensuring staging areas are removed when they are no longer needed.
- Locating staging areas where it will have the least impact on traffic and pedestrians, when possible (especially in scenarios where a construction site fronts onto more than one street).
- Encouraging raised storage or storage above covered walkways to minimize space needed on the ground.
- Re-striping road lane markings to reducing the width of each lane; in order to keep the same number of traffic lanes (If there is adequate width).

The following section of this report will discuss, in detail, the regulatory context that allows the City to pass by-laws and collect fees with regards to ROW occupancy.

# 3.0 REGULATORY CONTEXT

---

The interim report focused primarily on provincial legislation that enables the City of Toronto to pass by-laws setting out the charging of fees for occupying the ROW and sets out the standards for a covered ROW. These included the *Planning Act*, *City of Toronto Act*, and the *Occupational Health and Safety Act*. This final report will focus more so on the municipal by-laws relevant to ROW occupancy. These laws are derived from the Toronto *Municipal Code*.

# 3.1 TORONTO PARKING AUTHORITY (TPA)

The TPA is a major stakeholder in the discussion around the increase of ROW fees. The proposed fee structure is based on TPA lost revenue due to ROW occupancies removing paid parking spots. This is because their parking spaces line the curb lanes of many streets throughout the city. This gives the false impression that their parking is always affected by development and ROW occupancies. Yet, throughout the research and analysis of over 150 development projects, only 44% of the projects occupied TPA pay-and-display parking spaces (Figure 5). This analysis, which included data dating back as far as 2006, verifies the concerns of the development industry with regard to the proposed fee structure based on TPA lost revenue as being flawed. The proposed fee structure is flawed because it applies to all staging areas as though they occupy parking spaces.

The TPA, as a City entity, is given powers and duties by Toronto in Chapter 179 of the *Municipal Code*. All powers, rights, authorities, and privileges given to the City with regard to the construction, maintenance, operation and management of parking facilities within the City of Toronto are subsequently given to the TPA. This includes the power to fix parking rates that do not exceed \$4 per hour, and the power to remove parking spots. There are some conditions to these powers, including that the City Councillor of the ward in which the TPA spots are located in must approve the changes, and where the removal of a TPA spot is in question, the General Manager of Transportation Services must review and agreed to the removal.

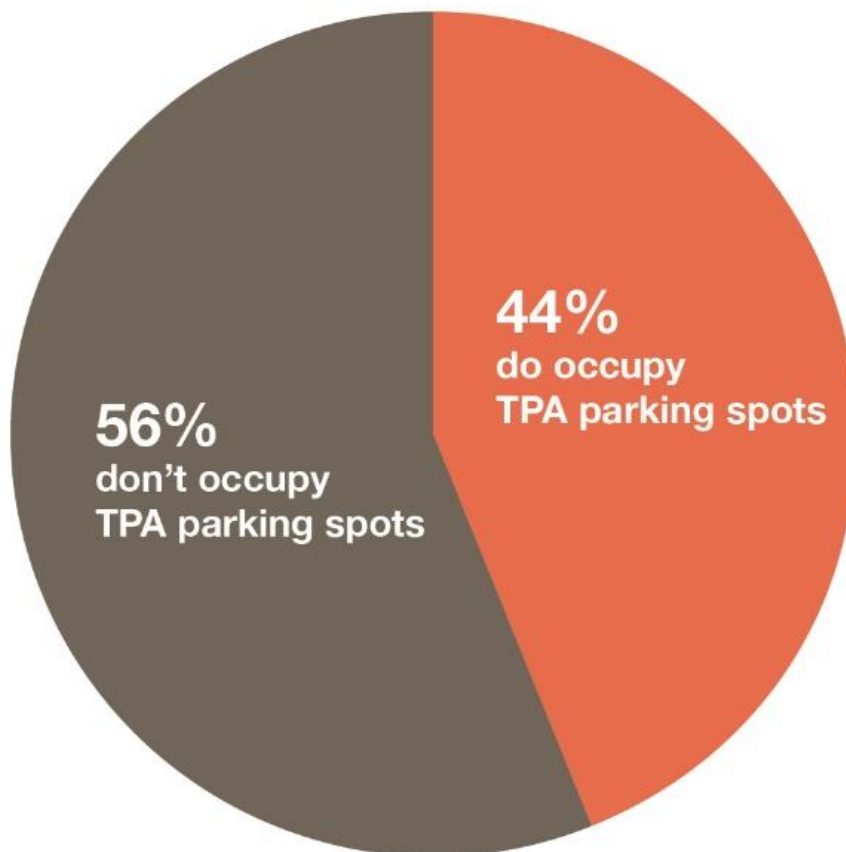
**“NO CLEAR GUIDELINES ON HOW RECOVERY AMOUNTS ARE CALCULATED AND WHO IS RESPONSIBLE FOR DETERMINING SUCH AMOUNTS”**

**-2009 AUDIT OF THE TPA**

In 2009 there was a review of the TPA's revenue and expenditure practices for pay-and-display parking by the Toronto General Auditors Office. The review noted there were no clear guidelines and inconsistent calculations when it came to calculating lost revenue for the occupancy of parking spaces for construction. The TPA policy resolution 2-6 was mentioned as stating that 'contractors will be required to pay an amount of money equal to the day's revenue from each meter'.

## **CONSTRUCTION STAGING AREAS THAT OCCUPY TORONTO PARKING AUTHORITY PAY-AND-DISPLAY SPACES**

Source: City of Toronto Construction Staging Staff Reports & UrbanCore's database  
Based on 173 Construction Staging Staff Reports



*Figure 5 - Do ROW staging projects occupy TPA parking spots?*



*Figure 6 - The effects of snow at the same staging area.*

## 3.2 SNOW REMOVAL

An observation recorded during field research was that snow was pushed to the margins of the covered ROW, creating even more spatial constraints (Figure 6). Given that ROW occupancies already present spatial constraints and aggravate traffic congestion, the lack of snow removal magnified the issue.

Chapter 719 of the *Municipal Code* explicitly states that the owner or occupant of the property must clear snow and ice from the sidewalk adjacent to the building within 12 hours of the cease of snowfall or rainfall, and the snow cannot be moved onto the sidewalk or the road. Therefore, sites where snow was found pushed onto the road or not removed were in clear violation of this law. This discovery will form the basis of one of the recommendations in this report.

**“THE CITY’S TRANSPORTATION NETWORK WILL BE MAINTAINED AND DEVELOPED TO SUPPORT THE GROWTH MANAGEMENT OBJECTIVES OF THIS PLAN BY PROTECTING AND DEVELOPING THE NETWORK OF RIGHT-OF-WAYS”**

**-TORONTO’S OFFICIAL PLAN SECTION 3.2**

## **3.3 OFFICIAL PLAN**

The Official Plan contains several policies that have guided this work. These include policies for: structuring growth in the city and integrating land use and transportation; supporting the foundations of competitiveness; and policies specific for downtown: the heart of Toronto. Section 2.2 recognizes the importance of protecting Toronto’s network of ROWs; re-striping lanes to maintain the number of lanes, if width permits; and prioritizing maintenance of roads. Section 3.5.1 recognizes the importance of road and ROW networks to the City’s competitiveness, as well as the importance of facilitating development through clear, easily understood rules. Section 2.2.1 recognizes the importance of pedestrian, cyclist, and public transit networks. The direction of the recommendations in this report are consistent with and informed by these policies.

# 4.0 FIELD RESEARCH & CASE STUDIES

---

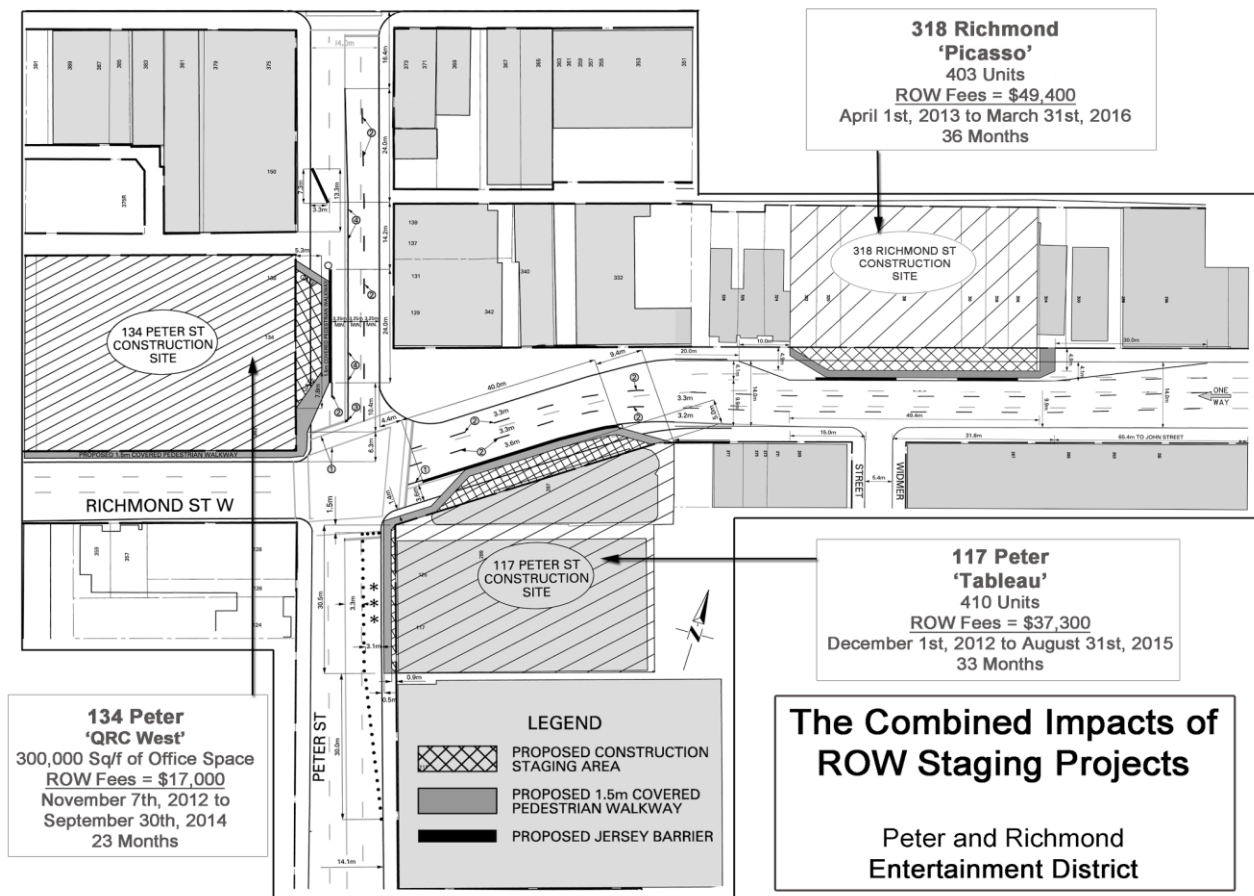
UrbanCore has completed a variety of site visits, external research, and industry outreach. Along with a mix of case studies, this section of the report forms the basis of several recommendations.



# 4.1 SITE VISITS

In order to get an understanding of construction staging areas and ROW occupancy, UrbanCore completed several site visits in various parts of Toronto, including King and Spadina, Union Station, Yonge and Bloor, and areas outside of the downtown core such as North York, and Etobicoke. These were visited at different times of the day, including rush hour between January and March 2015. Three main observations were made: snow accumulation, high concentrations of ROW occupancies within a particular area, and lack of adequate signage to direct motorists and pedestrians contributed to increased traffic congestion. Specifically in the King-Spadina area, pedestrian and vehicular traffic was not so much affected by one staging area in particular, but rather the accumulation and concentration of them. For example, there are three ROW occupancies visible within a few blocks at Richmond and Peter Street (Figure 7). During rush hour,

*Figure 7 - Three staging areas within close proximity to one another.*





*Figure 8 - The occupied lanes can be seen on the right side.*

there was a lot of vehicular and pedestrian congestion in this area. Also, the team noticed that areas near expressway ramps such at Yonge and Sheppard and at Spadina and Queens Quay were also more prone to traffic congestion. This observation has also informed one of the recommendations.

Also, a development project at Shuter Street and Parliament Street occupied two full lanes of the ROW even with the entire adjacent lot being used for their construction staging area (Figure 8).

**“I WILL WORK TO BRING INTO LINE THE OFTEN  
INSENSITIVE AND WRONGHEADED WAY WE APPROACH  
CONSTRUCTION ON OUR CITY STREETS”**

**- JOHN TORY, DECEMBER 4<sup>TH</sup>, 2014**



## 4.2 INDUSTRY PROFESSIONAL OUTREACH

UrbanCore connected with several industry professionals: Giulio Cescato, a senior community planner at the City of Toronto; Ryan Lanyon the Manager of Street Furniture Management at the City of Toronto and the staff lead on the upcoming Public Works and Infrastructure Report; a construction manager at a construction company; Danielle Chin, Senior Planner at (BILD); and a Civil Engineering Student from the University of Waterloo.

Several attempts were made to contact the City of Toronto and it has only been in recent days that the team has been successful. Therefore, at this point in time our correspondence with the City of Toronto has not greatly affected this report.

Danielle Chin from BILD provided data on current Toronto construction staging areas, including lost TPA revenue with and without the proposed fee increase. This information assisted us in creating our own database as mentioned earlier and provided a useful outline for the information gathered.

## **4.3 CONSTRUCTION STAGING AREA RESEARCH**

Upon talking with the construction manager, UrbanCore learned there are developers and construction companies that take up a portion of the ROW because it is easier than coordinating and planning ahead. Also discussed was the possibility of new innovative technologies that could help reduce the amount of ground space needed for the storage of materials and equipment. He said there are ways to increase site efficiency which include scaffolding systems with overhead storage. However, in order to comply with safety and building regulations, a limited amount of weight can be stored in these systems. He also said that even though certain technologies and systems can reduce the amount of space needed for a staging area, they usually cannot hold enough materials to prevent a lane from being closed.

An interview with a Civil Engineering Student from the University of Waterloo, who has gained professional experience on construction sites, uncovered more about the nature of materials stored in construction staging areas and how this changes throughout the lifetime of a development project. This interview has produced valuable knowledge with regard to excavation, phasing, as well as the delivery and movement of materials. UrbanCore learned that staging areas become more constrained after the structural part of the development project is complete, at which point more materials and equipment are needed. Sub-contractors, who are responsible for tasks such as plumbing and drywall installation, also have materials that need to be delivered and stored. Sub-contractors' ability to complete their responsibility on time and on budget is contingent to several factors: other sub-contractors, weather, as well as political and economic events. He mentioned that an innovative way of increasing efficiency in a construction staging area is by employing the Just in Time (JIT)

method to deliver materials to the construction site which includes a highly coordinated and automated system to deliver materials just as they are needed for the specific phase of development, decreasing the space needed for the storage of materials.

## **4.4 CONSTRUCTION STAGING REPORT INVENTORY**

Part of UrbanCore's field research also included taking an inventory of Construction Staging Staff Reports between 2006 and 2014 available on the Toronto Meeting Management Information System (TMMIS). Going through each individual report, the following variables were extracted: City ward, development type, legal address, type of ROW occupancy (road, sidewalk or both), date of staff report, cost of staging (including ROW occupancy), the duration of staging, the number of residential units (where applicable), and the number of occupied TPA parking spots (where applicable). Our research found that only 66 out of 151 projects (44%) actually occupied TPA pay-and-display parking spaces. A sample of this inventory can be found in the Appendix of the report.

## **4.5 INFORMATION TECHNOLOGY (IT) STRATEGIES**

By examining IT strategies that are currently being practiced in North American cities, the construction industry can learn new methods that assist in reducing the duration of projects and ultimately shorten the amount of time a developer spends occupying the ROW. This would be in the best interest of the developers' "bottom line," and in the interests of motorists and pedestrians.

The strategies outlined below have the potential to improve the effectiveness and efficiency of the construction process. The following

recommended solutions can mitigate construction times and costs, aiding in the reduction of negative impacts of ROW occupancy. In order to better understand the intentions and goals of the proposed strategies, one must look at what the City of Toronto has already been working on. Presently, Toronto is facing exponential development growth resulting in increased road construction, utility work, and the construction of high-rise buildings. Private developments within the city create a significant amount of congestion and in order to reduce this negative outcome, techniques that will shorten the duration of the ROW occupancies must be implemented. A project's life span is dependent on efficiency and optimization of the construction staging area. This efficiency and optimization relies heavily on organization and coordination on the part of the developer and construction firm. IT strategies can increase efficiency by coordinating processes such as deliveries, waste pick-up, and can decrease the amount of space needed for the storage of materials.

## **4.5.1 BUILDING INFORMATION MODELING (BIM)**

BIM is the process and practice of virtual design and construction throughout a construction project's lifecycle. It is a platform to share knowledge and communicate between project participants. In other words, BIM is the process of developing a three dimensional computer generated image of each site.

BIM involves the generation and management of digital representations of physical and functional characteristics of development projects. Due to the gradual decrease in the construction industry's labour productivity since the early 1960's, BIM is a solution that can potentially bolster the current state of productivity in the industry. This process is relevant because it makes the communication of electronic data among owners, clients, contractors, and suppliers very efficient. Throughout a project's life span the use of BIM can aid in the improvement of work speed and quality, it can integrate processes, manage supply chains, sequence workflows, improve data accuracy and reduce time spent on data entry, while also lessening time on finding solutions to design and

engineering-related conflicts. Similar to other IT strategies, BIM will require monetary investment. BIM costs are estimated between 0.1% - 0.5% of the construction value of the project. Therefore, using an IT like BIM isn't overwhelmingly expensive and will potentially pay off in the future.

## **4.5.2 BIM IN PRACTICE**

The following are examples of how BIM software can be used in construction and the positive effects it has on process optimization and efficiency. Chicago-based construction and development firm Clayco has recently learned of the benefits of using BIM and now integrates it into its design-build process. Chicago is a good city to compare with Toronto as they have similar climates, geography, populations, and both have dense urban cores.

Clayco approached Autodesk, the creator of BIM, with the goals of increasing speed, accuracy, and quantity of the data captured on each construction site. Their goals were accomplished by using BIM software that put real-time information into the hands of managers and supervisors working on the construction sites. Clayco outfitted site staff with tablets running the BIM software, and this resulted in each worker gaining access to vital information and allowed for greater visibility into issues and tasks on the site. Clayco calculated that 1.7 hours a week per user was the time saved because of BIM and on average Clayco has seen an 80% decrease in issue creation and distribution.

In order to obtain the optimal benefits of using an IT strategy like BIM, it must be supplemented with other innovative practices. Prefabrication, preassembly & modular construction are three techniques that can be used at the construction staging site level to improve efficiency and reduce the impacts that spatial constraints and high population densities have on construction sites. These techniques involve developing building systems and other components off-site and then shipping them to the site where they are installed. This method has proven to increase labor productivity by an average of 30% when lighter materials were used. Furthermore, prefabrication and other related techniques allow for more controlled conditions, fewer job-site environmental impacts,

compressed project schedules, fewer conflicts in work crew scheduling, reduced requirements for on-site materials storage, and increased worker safety.

Through the implementation of IT strategies such as BIM, the overall duration of construction projects can be reduced. A construction project's duration is vital because it directly relates back to the cost of ROW occupancies. The above strategies and techniques provide the developer with insight into ways to shorten the amount of time and money spent on occupying lanes by optimizing their work. This information has helped develop the new fee structure and recommendations, which includes providing developers with incentives for using such technologies while not penalizing firms that do not.

## **4.6 CASE STUDIES**

Examples from San Francisco, Orange County, and Vancouver have been looked at for learning innovative ways of managing construction staging areas and how some alternative fee structures offer more insight and increased efficiency in the development process. Looking beyond the scope of Toronto, new solutions to problems that face all growing cities will be uncovered. These examples were chosen because they offered examples of what Toronto could be doing right in the practice of ROW occupancy and congestion mitigation strategies.

### **4.6.1 SAN FRANCISCO, CALIFORNIA**

San Francisco is a large North-American city facing similar issues in growth management as Toronto. Despite differences in climate, they both have traffic congestion problems. Also, they employ desirable techniques in order to increase honesty and accessibility for developers and the public. San Francisco's breakdown of development charges, the ease and accessibility of information as



well as their use of a “streets of major importance” map are key takeaways from this case study.

As the second densest city in the United States, a Bureau of Street Use and Mapping was created to aid Public Works, the Planning Department, and Muni, the local Transit Authority, in the coordination of street use and land occupancy. They aim to keep the city congestion free and maximize cooperation between capital project teams to ensure efficiency. Street occupancy permits are obtained through Public Works and enforced through the Public Works Code and the “Blue Book” created by planning authorities. Strict requirements accompany ROW occupancy permits and are enforced through inspection by officers and fines for non-compliance regarding the pedestrian realm. For example, a width of four ft. must be maintained at all time for pedestrians and there must be adequate signage for no parking. Violations of these conditions can cost developers upwards of \$1000 per day. In addition, the construction staging and equipment in the ROW may not occupy more than a third of the street width and half of the sidewalk without an additional permit.

Integrated Project Delivery is an initiative by the Bureau of Street Use and Mapping to provide incentives for developers who finish ahead of schedule and free of claims and litigation which aims to simplify the planning and development processes. According to San Francisco’s Public Works Code, fees are charged on a monthly basis, even if the developer takes less than a month. San Francisco’s Public Works Department continuously stresses the importance of coordination to minimize the effects on traffic, the environment and residents.

The San Francisco Department of Building Inspection’s website also has easy-to-read maps that demarcate the zones in which additional fees are added to the sum of street occupation fees for a development. The worksheets provided by the San Francisco Department of Public Works help to reduce developers’ uncertainty while creating a reasonable and agreed-upon street occupation fee. In addition to this, streets are classified in official policy documents by their “Major Traffic Importance”. They are listed and described in the Blue Book. This guide was published by the San Francisco Municipal Transportation Agency (SFMTA) to aid in the coordination and proper management of construction on roadways and traffic mitigation. One key fee which Toronto should take note of is the SFMTA Parking Meter Occupation Fee, charged per linear foot of staging that obstructs public parking spaces. Note that this fee is not applied universally but is tailored

to each individual project depending on the type of parking spaces, the duration of the project, as well as the number of occupied parking spaces. Following San Francisco's example, and further elaborated further in the report, Toronto would benefit from a fee which accounts for major streets and intersections.

## **4.6.2**      **ORANGE COUNTY, FLORIDA**

Likewise, Orange County, Florida has broken their development charge, into separate categories. These separate categories include Fire Impact Fees, Law Enforcement Impact Fees, Parks and Recreation Impact Fees, and Transportation Impact Fees. Florida Counties have explicitly stated what each fee will be used for and how. The development charge is essentially a development fee, which includes ROW occupancy permits where applicable. Although Florida and Ontario differ in climate and economic conditions, their actions towards a more transparent public process is what this research focused on. Florida has a history of opposition to raised fees, and especially to tax increases. For this reason, the breakdown is essential for developers and residents to know what certain sums of their money are being spent on. In Toronto, this same breakdown of fees is made clear for development charges, but not street occupation fees. As found within a City of Toronto Staff Report and as discussed above, the purpose and use of funds are stated but are unclear. Clear and open dialogue is key to cooperation between the City and the development community, and a more detailed fee breakdown for street occupation fees could be a step forward for Toronto. In 2011 in Orange County, "Measure M" was put in action to increase the sales tax for twenty years in order to fund transit needed to accommodate the projected population increase of 30% by 2035. This came after years of opposition, proving the effectiveness of public awareness and a transparent system.

Another lesson to be taken from Florida is their use of online applications for development charges. The Orange County website features an app into which the proponent of a project will enter the number of units and type of development

they are proposing, and receive an estimate of their payable fees, and to which public department they will be allocated. The disclaimer warns that many factors can change these numbers, and they do not account for credits, exemptions, and other fee-changing circumstances. Toronto could benefit from this by creating an application which accounts for street addresses and parking space data. When the fees are broken down ahead of time, there is no surprise for a developer and it could eliminate the length of approvals based on ROW occupancy fees and appeals processes.

Finally, Florida recognizes the importance of incentivising development and offers “offsets” or “credits” to developers for improvements, including land, which developers or builders may build or provide in lieu of paying fees. Essentially, every project is subjectively evaluated by the County for the space used to determine credits for ROW occupancy. From this example, it is evident that there are benefits to providing developers with incentives or credits.

## **4.6.3 VANCOUVER, BRITISH COLUMBIA**

Vancouver is a good Canadian example in construction management and efficiency. Similar to Toronto, development fees throughout districts in the city have seen increases since 2014. Some practices that Vancouver use and could be applied to Toronto include:

- Stressing the importance of leaving pedestrian and bicycle lanes open.
- Limiting developers to the use of one lane for staging, which in most cases is costlier and demands innovative staging techniques.
- Only allowing full lane closures if they are done on the weekends, to mitigate the effects of traffic.
- Offering a warning upon inspection of an infraction of the building permit and lane restriction conditions - and upon the second infraction, issuing a fine to the developer upwards of \$3,000.
- Requiring a Construction Traffic Mitigation Plan as part of the Building Permit application process. The City then attaches conditions relating to traffic onto the Building Permit.

- Stressing the importance of notifying both residents and visitors in advance of lane closures due to construction.
- Restricting truck traffic and material delivery during peak times.
- Similar to San Francisco, the traffic mitigation strategies for ROW occupancy is discussed in a publicly accessible “Traffic Control Manual”.

## 4.6.4 GERMANY

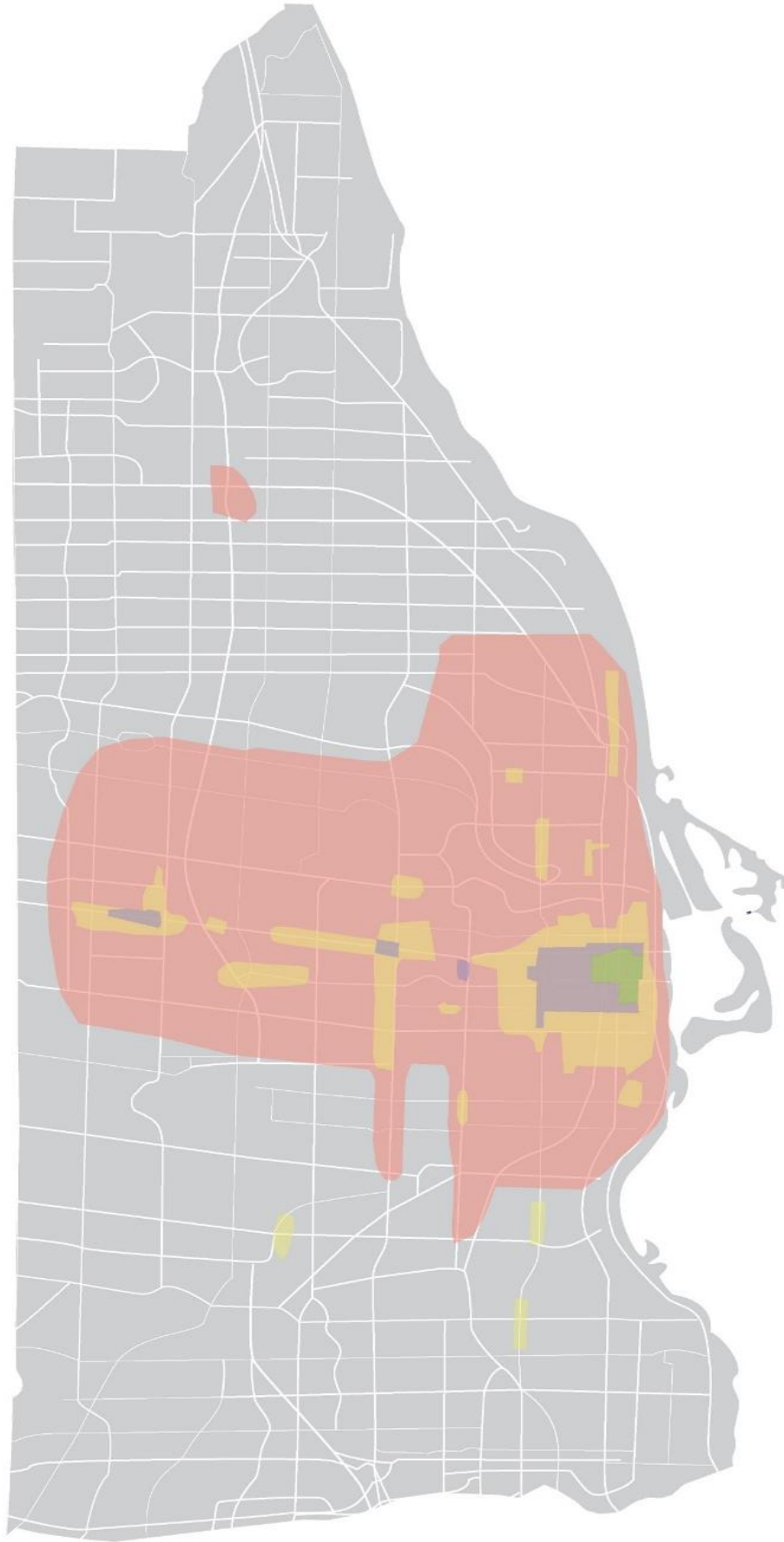
One final lesson for Toronto comes from a study of German construction practices and analysis of traffic congestion caused by construction staging areas. While Germany is out of the North-American context, it is key to note that staging areas cause congestion all over the world. A minimal invasive staging is implementable anywhere around the world because it is not a matter of funding; rather, it focuses on coordination, optimized delivery, delivery appointments, material requests between workers, the reduction of on-site stock, and other on-site logistics. These practices and their outcomes are similar to what was discussed about IT strategies such as BIM. This strategy becomes most efficient when implemented through IT strategies which allow instant communication across the construction site. Both our case studies and research of IT strategies have helped us develop our recommendations and incentives, which will be described in more detail in the recommendations section.

# 5.0 ANALYSIS OF PROPOSED FEE STRUCTURE

---

The new fee structure proposed by Transportation Services uses a market based structure. Under the new structure, fees would change from being charged on a per month basis to being charged per day. The fees would also be determined by what TPA on-street parking zone the staging area was located in. The more demand there is for parking, the more it costs to park in the area on a per hour basis. The on-street parking zones and their respective rates can be seen in Figure 9. If a developer is looking to occupy a lane in the blue area, they will pay more than a developer occupying a lane in the yellow area. The exact rates being proposed are shown in Figure 10 and are charged per day and per square meter.

Figure 9 - TPA On-Street Parking Zones



### TORONTO PARKING AUTHORITY ON-STREET PARKING ZONES

Source: Toronto Parking Authority On-Street Parking Map

- AA: \$4.00/hour
- A: \$3.00/hour
- B: \$2.25/hour
- C: \$1.50/hour
- All other areas: \$1.00/hour

Not to Scale  
Locations are Approximate

The rationale behind using this method is that when a developer occupies part of the street, the TPA cannot collect revenue from the on-street parking. The method of determining lost TPA revenues, as used by Transportation Services is a numeric formula. For an area in a \$4 zone, it is assumed that one parking spot, or an area of 9.54 square metres is generating \$4 per hour. They have calculated this to be the equivalent of \$0.41 per square metre per hour. This is then multiplied by 14 which is assumed to be the amount of hours the parking spot will be generating revenue for. This gives a final amount of \$5.74 per m<sup>2</sup> and this formula is repeated for each zone to get the market based rate structure (Figure 10). The proposed structure for ROW occupancy merges the two-tiered structure into a 1-tiered structure, with the boulevard enclosure fee and lost parking revenue being merged into one cost. It is important to note that the proposed fee structure generalizes the area of construction staging and there is no fee differentiation between the area of sidewalk being occupied and road being occupied.

Area	Fee Amount Per Day
AA	\$5.74
A	\$4.27
B	\$3.20
C	\$2.85
OTHER	\$1.42

*Figure 10 - Proposed Fee Structure*

*(Price is based on per square metre per day of space occupied)*

## 5.1 PER-UNIT COST BREAKDOWN

For developers, per-unit costs are important to assess the feasibility of a project. Certain servicing and development costs are passed onto the user and are broken down on a per-unit basis. If per-unit costs rise, owners bear those costs in the purchase price. An analysis was conducted using data from resources including City staff reports that included staging costs for projects, and rezoning applications that included the number of units. BILD provided UrbanCore with per-unit costs for a number of projects which were used to verify the method of calculation. Shown in Figure 11, five projects in downtown Toronto

were analyzed. These developments were QRC West, Picasso, and Tableau in the Entertainment District, a recent development at 64-70 Shuter St, and 5 St Joseph. The TPA on-street parking zone each development is in is shown in the chart. Using the data on the actual costs paid by developers, the current fee structure was reversed to figure out how much space each staging project was being charged for. This number was then applied to the new rate in order to determine the costs, should the proposed changes be implemented. The costs can simply be divided among the number of units to produce a per-unit cost.

Development	Time (months)	TPA Zone	Current Cost Per Unit (\$)	Proposed Cost Per Unit (\$)	Increase (%)
117 Peter - Tableau	33	AA	91	2811	3090
134 Peter - QRC West	23	AA	56	1754	3100
318 Richmond - Picasso	36	AA	123	3790	3092
64-70 Shuter - Core	31	B	84	1454	1730
5 St Joseph	48	A	402	6363	1582

*Figure 11 - Summary of Five Development Project's Current and Proposed Per-Unit Costs*

As shown in the Table above, projects that fall under the TPA's on-street parking zone AA had a more significant increase that those in other zones. Per-unit costs in all projects rise to thousands of dollars per unit which would have an impact on the affordability of these developments.



## 5.2 PROPOSED FEE STRUCTURE FLAWS

Several weaknesses were identified in the proposed fee structure set out by Transportation Services. To begin with, the fact that the fee would be based on TPA lost parking revenue is flawed. By analyzing an inventory of over 151 construction staging areas in the past 10 years throughout the City of Toronto, it was determined that only 44% of staging projects actually occupy TPA parking spots. Therefore, basing an entire fee structure off of this metric is not reasonable. The proposed fee structure is also being imposed on the entire ROW which is not sensible because the TPA does not lose parking revenue when a sidewalk is being occupied. Several occasions were identified when a sidewalk was occupied and but parking operations continued (Figure 12).



*Figure 12 - ROW Occupancy with maintained TPA parking.*

Also, the fee structure rates are based off a 14-hour 100% occupancy rate, when in fact a majority of TPA parking spaces use less than a 14 hour rate structure and rarely have 100% occupancy. This is offsetting as the current method of calculating lost parking revenue uses the correct formula, accounting for site specific variables such as occupancy, hours, and hourly rate.

# 6.0 CONCLUSIONS

---

Throughout the research and analysis of the current and proposed ROW occupancy fees, UrbanCore has been able to identify important factors that affect traffic congestion as well as possible solutions to decreasing the duration of construction projects. This research and analysis has also resulted in the creation of a new fee structure that has taken into account several variables. These include: the enforcement of conditions attached to construction staging plans; creating a fee based on a typology of traffic volumes, pedestrian volumes and transit ridership; creating a fee differential between the occupation of a sidewalk and a road; creating incentives for developers; and increasing the open dialog between the City, the development community, and the public.

# 7.0 NEW FEE STRUCTURE

---

“WE'RE GONNA GET MUCH TOUGHER ABOUT THIS WITH A VIEW TO MAKING THE CITY OVERALL MORE **LIVEABLE** FOR EVERYBODY, AND THAT INCLUDES PEOPLE WHO WALK AND BICYCLE, BUT ALSO FOR DRIVERS TOO.

-**JOHN TORY**, APRIL 1ST, 2015

As per the Terms of Reference provided by the client, this section proposes a new fee structure for ROW occupancy fees in the City of Toronto. The main rationale behind this new fee structure is ensuring different fees for the sidewalk and road, or curb lane as used by the City. Under this new structure the rate applied to the curb lane area would be based on the City of Toronto's Road Classification System. On the other hand, the rate applied to the sidewalk area would be based on pedestrian volumes separated into 3 categories (Figure 13).

As mentioned earlier, the rationale behind the fee structure proposed by the City of Toronto's Transportation Services is inappropriate and unjust. An increase is necessary in order to account for lost TPA revenue, but the increase should be based on justified reasons. UrbanCore's fee structure is a hybrid between a more bureaucratic and subjective site-specific fee and a blanket fee.

The rate applied to the curb lane, or road, area is based off the City of Toronto Road Classification system which classifies roads based on their vehicular traffic volume and Toronto Transit Commission (TTC) surface route ridership levels. Using this classification system, the fee would increase or decrease based on the number of affected vehicles and transit-riders.

If occupying only the sidewalk, the base rate is directly correlated to the pedestrian volume as obtained from the City of Toronto's Open Data catalogue. Additional charges could then be added to this base fee depending on whether or not a bike lane is present and whether or not TPA parking spots are occupied. If taking up both the sidewalk and road, both base rates and additional fees for occupying a bike lane will be applied. The developer will endure a higher ROW occupancy fee if planning on occupying a lane of traffic in addition to the sidewalk. The following section will break-down the importance of each section of our new fee structure. A detailed example of the fee structure being applied to a current ROW occupancy can be found in the Appendix of the report.

# Right-of-Way Occupancy Fees

<b>1 Pedestrian Traffic</b>		
Source: City of Toronto Pedestrian Volume Data		
	High	\$___/ m <sup>2</sup> of street per month
	Medium	\$___/ m <sup>2</sup> of street per month
	Low	\$___/ m <sup>2</sup> of street per month
<b>1 Total for Section 1</b>		<b>\$___/m<sup>2</sup> per month</b>

<b>2 Road Classification</b>		
Source: Toronto Road Classification Map		
	Laneway	\$___/ m <sup>2</sup> of street per month
	Local Road	\$___/ m <sup>2</sup> of street per month
	Collector Road	\$___/ m <sup>2</sup> of street per month
	Minor Arterial	\$___/ m <sup>2</sup> of street per month
	Major Arterial	\$___/ m <sup>2</sup> of street per month
	Expressway	\$___/ m <sup>2</sup> of street per month
<b>2 Total for Section 2</b>		<b>\$___/m<sup>2</sup> per month</b>

<b>3 Bike Lanes</b>		
	Yes	
	Temporary Removal	\$___/m <sup>2</sup> per month
	Temporary Replacement	\$___/m <sup>2</sup> per month
	No \$0	
<b>3 Total for Section 3</b>		<b>\$___/m<sup>2</sup> per month</b>

<b>4 Removal of Toronto Parking Authority Parking Spots</b>		
	Permanent Removal	Fair Market Value / sq. m
	Temporary Removal	# of Spots*Hourly Rate* # of Days* # of Occupied Hours*Occupancy Rate
<b>4 Total for Section 4</b>		<b>\$_____</b>

<b>5 Incentives</b>		
	Use of Information Technologies	___% Bonus
	Implementation of Public Relations Campaign	___% Bonus
<b>5 Total for Section 5</b>		<b>___% Bonus</b>

<b>Total ROW Occupancy Fee</b>		<b>\$_____</b>
--------------------------------	--	----------------

Figure 13 - UrbanCore's New Fee Structure

## **7.1 PEDESTRIAN TRAFFIC**

Pedestrian traffic was sub-categorized into three levels; high, medium, and low. Each level will be charged per m<sup>2</sup> of sidewalk per month. This variable was aggregated due to the fact that streets typically vary in volume of pedestrians. If there is a higher volume of people, the cost will be higher than that of a low density area. The recorded pedestrian volumes taken from the City of Toronto's open data catalogue were taken over a 24-hour period and the time at which each value was measured varies in season as well as the day of the week. This data set could be improved upon by recording pedestrian volume both on the weekends and weekdays, during different seasons, and more often. More intersections and their pedestrian volume counts should also be added in order to increase reliability.

## **7.2 STREET CLASSIFICATION**

Based on the Toronto Road Classification System, there are six street types that will determine the fee rate for the area of occupied curb lane. The categories include: Laneway, Local Road, Collector Road, Minor Arterial, Major Arterial, and Expressway. Each of these fees will be charged per m<sup>2</sup> of street per month basis. The total for this fee will be the first component of the formula that determines the grand total for the ROW occupancy fee. A standard base fee should not be the same for all roads being occupied. Some roads, if occupied, will cause more congestion than others, thus posing a bigger risk of delay and potential gridlock.

## **7.3 BICYCLE LANES**

Bicycle lanes were sub-categorized into two types; temporary removal and temporary replacement. This variable was aggregated due to the need of either setting up a detour bike lane or removing it as a whole temporarily and putting in shared bicycle/car lanes. This decision is up to the developer but by increasing the fee for temporary removal developers are encouraged to maintain the bike lane during construction. This fee will be charged on a per m<sup>2</sup> per month basis.

## **7.4 REMOVAL OF TPA SPOTS**

As stated above, UrbanCore recognizes the importance of the TPA making up for lost revenue due to ROW occupancies and this section of the fee structure takes this into account. In the rare case a developer is permanently removing TPA pay-and-display parking spots after construction is complete, the developer must follow the procedure as defined by the TPA which is to pay market value. This value is to be assessed by the TPA at the time of inquiry. The fees charged for temporarily removing TPA parking spots for the duration of construction are based on the number of spots being taken away, the hourly rate for the spots being taken away, the number of days of the occupancy, the number of hours for which parking is charged for the spots being taken away, and the average occupancy of those spots. Therefore, this is a very site specific calculation and developers will pay a fair fee that represents the actual lost revenue. For example, for the temporary removal of parking spots on Bond St, just outside the School of Urban and Regional Planning, the following variables would complete the equation: 365 day ROW occupancy, 5 spots being taken away, an hourly charge of \$3.00, 13 hours of occupancy from Monday to Saturday, and 8 hours on Sundays for an average of 12.3 hours per day, and assumed 75% occupancy. By multiplying these the amount of lost revenue can be determined. This fee, separate from the per m<sup>2</sup> per month rate, will be a one-time fee paid to the TPA.

## **7.5 INCENTIVES**

All of the above sections are in addition to the base rate. An incentives section provides developers with an opportunity to reduce their ROW occupancy fee and this section outlines two main incentives. The first one is incentivising the use of Information Technologies (IT) during the construction process. As discussed in detail above, BIM is one of many technologies and systems available that help developers reduce a project's duration. Another incentive is to encourage the implementation of a public relations campaign. This incentive supports what the City is already encouraging developers to do. A public relations campaign includes having a designated point person or media relations staff member who provides timely updates to both the City and the public. A dollar

amount or percentage would be attached to each of these incentives that would be subtracted from the rate per m<sup>2</sup> per month that the developer would have to pay.

Consequently, the new fee structure allows the developer to be charged exactly for what congestion they are causing from being able to clearly see the full breakdown of recurring congestion variables. At the same time, this keeps the developer from being charged for types of congestion they are not causing.

**“BY ATTACHING A REAL PRICE TO CLOSING DOWN LANES OF TRAFFIC, I BELIEVE WE WILL SIGNIFICANTLY REDUCE THE NUMBER OF LANES OF TRAFFIC THAT WE HAVE TO CLOSE AND THE LENGTH OF TIME THOSE LANES ARE CLOSED IF IN FACT THEY ARE AT ALL.”**

**-JOHN TORY, DECEMBER 4<sup>TH</sup>, 2014**



# 8.0 RECOMMENDATIONS

---

Based on the background research, site visits, interviews, research, construction-staging report analysis, and case studies, UrbanCore have formed the following recommendations to provide a comprehensive approach in managing congestion. Apart from the new fee structure, these recommendations will further aid in mitigating traffic congestion and improving the relationship and transparency between the City, developers and the public. The following recommendations include:

1. Stricter enforcement of by-laws and conditions for construction staging areas
2. Incentivising the use of Information technologies
3. Increasing accessibility of information that provides clear and easily understood rules.
4. Incorporating incentives into the fee structure
5. Requiring a mandatory Traffic Impact Report for all Construction Staging Areas within a certain distance of an expressway or highway ramp.

## **8.1 ENFORCEMENT OF BY-LAWS**

The first recommendation is the stricter enforcement of by-laws and conditions on construction staging areas. From the group's initial site visit in February, the observation was made that snow had a major impact on the construction staging areas. Due to unenforced snow removal, this affected the traffic flow for cars, pedestrians and cyclists, provoking risk and congestion. The Municipal Code states that snow removal on the sidewalk adjacent from the building or property is the owner or occupant's responsibility. However, this by-law was poorly enforced. From the second site visit in March, the same construction staging areas were observed without snow on the sidewalks and roads. It was noticeable that there are positive benefits of enforcing snow removal at construction staging areas. These benefits include facilitating improved traffic flow for all modes of transportation and ensuring the safety of the public.

It has been established that there are ROW Management Units that do exist within Transportation Services. These units already employ Transportation Standards Officers who enforce by-laws related to ROW occupancies. They also ensure that preconditions, such as required traffic management plans, hoarding requirements and signage, all abide by the conditions of the permit. As these by-laws and conditions are enforced by complaint-based inspections, construction sites now need to provide a 24-hour construction hotline that the public can use to report any construction staging areas that are not abiding by the by-laws or hindering the safety of pedestrians, vehicles or cyclists. It is recommended that this enforcement be done on a more proactive basis rather than a by complaint basis to ensure public safety.

## **8.2 IMPLEMENTATION OF IT STRATEGIES**

The second recommendation is the implementation of incorporating IT strategies as part of the construction process. This recommendation is to aid in mitigating construction costs and the duration of ROW occupancies, which in turn will alleviate congestion. The City of Toronto's Congestion Management Plan has

already recommended the operation and strengthening of Intelligent Transportation Systems, separate from Information Technologies. They have stated recommended initiatives to help manage traffic congestion, which will improve monitoring and response times to unexpected traffic incidents, improve coordination of traffic signals with traffic flows, and increase the quality of traffic information produced along with the efficiency of communication between the City's networks. This report supports the City's recommendation of improving already existing Intelligent Transportation Systems.

From the research and case studies of comparable cities, Building Information Modeling (BIM) was used as an example of an innovative IT strategy that developers can adopt to their construction management practices. As mentioned, this software can help reduce the duration of construction projects, which will eventually benefit the developers as this reduces the length of time of their ROW occupancies.

Due to the incurred costs of IT strategies to developers, it is proposed that incentives should be given to developers that are incorporating these innovative practices. These incentives will encourage developers to invest as they will be able to use this IT software for future developments. The details of these incentives will be further explained below in the Incentives section. Overall, the impact of reducing the duration of construction projects and ROW occupancies is beneficial to the City, developers and the public as it mitigates traffic congestion.

## **8.3 INCREASING ACCESSIBILITY OF INFORMATION**

The third recommendation is to increase the accessibility of information that provides clear and easily understood rules. From the regulatory context, these ROW occupancy fees were found to be charged to developers as a type of "rent" for occupying City property. However, with extensive research, it was not determined where these revenues are being allocated.

By increasing the accessibility of information and providing a fee allocation breakdown, communication between the City, developers, and the public is

improved. This is consistent with the City of Toronto's Official Plan section 3.5.1 where it encourages the facilitation of development through clear and easily understood rules. It is suggested that the revenues incurred from ROW fees be directed toward the implementation of the strategies in the Congestion Management Plan, and for this be communicated to the general public and development community.

It is recommended that the City create an online calculator, tool or map where a developer can input information on their construction staging areas and receive an estimation on their fees (Figure 14). Another approach can simply be a booklet outlining all fees, worksheets, and regulations relating to ROW occupancy similar to what San Francisco and Vancouver have.

*Figure 14 - Example on an online calculator.*

The screenshot shows the City of Toronto's online calculator for Street Occupation. The page is titled "Construction Permit Information" and "Street Occupation". It features a navigation bar with "Living In Toronto", "Doing Business", "Visiting Toronto", and "Accessing City Hall". The main content area is divided into "Input" and "Output" sections. The "Input" section includes a map and a search bar for an address. The "Output" section includes checkboxes for Road Classification (Expressway, Major Arterial, Minor Arterial, Collector Road, Local Road), Pedestrian Volume (High, Medium, Low), Bike Lane (Yes, No), and Toronto Parking Authority On-Street Parking Occupation (Yes, Zone: \_\_\_\_\_, No). A "Price Estimate" field is highlighted in orange. The page also includes a sidebar with various transportation-related links and a footer with contact information and copyright notice.

## **8.4 CONSTRUCTION RELATED TRAFFIC IMPACT REPORTS**

As part of a complete application for a rezoning, a traffic impact study is required. This recommendation would include, as part of that study, an additional construction-related traffic management plan that would be mandatory at the site-plan approval stage for all development projects within a certain distance of an expressway or highway ramp. By the site planning stage, the developer is aware of any ROW occupancies they may need and appropriate timelines. Expressway ramps and the area surrounding them are more susceptible to traffic congestion, as evident in the site visits. This recommendation derives from the research on the actions and recommendations the City of Toronto has already made with regards to ROW occupancy and traffic mitigation. The City recommended that traffic impact reports be mandatory for all construction staging plans, for which the development community expressed concerns over. This recommendation takes both sides into consideration. This distance would need to be agreed upon between the City and the development community.

## **8.5 INCENTIVES**

The fifth recommendation is the implementation of an incentive system for developers. As seen in this report, there are many ways that the construction process could be more efficient. An incentive system would aim to reward developers that take appropriate actions in order to ensure an efficient process that reduces the duration of lane occupancy and congestion in Toronto. The incentive system is in no way meant to penalize developers, but rather provide an opportunity to reduce ROW occupancy fees. This would benefit the city, developers as well as motorists, pedestrians and cyclists.

As was previously mentioned, IT strategies have the potential to create a significant impact during the construction process. In the example of BIM, explained above, these strategies have the potential to reduce issues and overall

time of the general construction period. This is significant to the ROW issue as it is an indisputable opportunity to reduce the period of lane occupancies, thus reducing fees and congestion. These strategies cost between 0.1% and 0.5% of construction costs, therefore incentives in the form of a reduction in charges would cover these initial costs while promoting efficient construction practices. A reduction in fees could also be granted if a developer provides sufficient and effective notice of the traffic impacts of construction. This could be done by submitting traffic impact statements that focus on the effect on traffic during construction rather than after completion. Developers often do this upon completion, however providing an incentive could encourage completion of these reports prior to construction. Having a designated spokesperson updating the city and public with changes and impacts of a development as it progresses could also be incentivized. This would keep track of developments and creates awareness of congested areas as a result of lane occupancy.

Incentives would be given prior to construction as a discount to ROW occupancy fees. No extra charges would be incurred, however if a developer is found not to have followed through, they would be issued a fine equal to the value of the incentive. These incentives would be optional and those developers that choose to implement these strategies would be rewarded for increasing efficiency and creating a safer and more pleasant environment for the city.

# 9.0 NEXT STEPS

---

This report will be provided to the client to be used at their discretion. The client has already expressed their interest in sharing these findings and recommendations with BILD. In addition to the proposed fee structure, the findings and recommendations in this report will aim to support the construction industry's position in formulating a strong case as to why the proposed TPA metric is inappropriate. This report provides a planning-perspective on this topic as it is free of bias. This information attempts to provide insight to all parties in this discussion, especially during upcoming Public Works and Infrastructure meetings with regards to the agenda items pertaining to ROW occupancy fees.

# 10.0 APPENDIX

**ROW Occupancy Fees**

**WINTER 2015**

**TERMS OF REFERENCE**

Client: Diamond Corp.

## GOAL

The goal of this study is to provide an alternative and more appropriate fee metric upon which the new lane occupancy fees can be based and to provide mitigation strategies that will reduce the amount of impact from construction staging should also be provided.

Alternatives for space-efficient construction staging and alternative ROW occupancy fee structures should be strategized using precedents and examples from other cities. The project should culminate in a strategy that will minimize the impacts on traffic congestion, as well as appeal to developers as an affordable method of providing a safe construction environment.

## STUDY BACKGROUND

In December 2014, Mayor John Tory released a six-point plan to reduce traffic congestion in Toronto. The report provides strategies to mitigate traffic on the City's main arterial roads. Tory's six-point plan recommends revisiting the fees for development construction staging and lane occupancy permits to better reflect the cost of incurred disruption (e.g. loss of parking, traffic delays).

	Details	Application Fee	Permit Fee	Additional Fee
Site Protection	<ul style="list-style-type: none"> <li>- Covered walkway</li> <li>- Hoarding</li> <li>- Hoarding w/covered walkway</li> <li>- Hoarding w/scaffolding</li> <li>- Scaffolding</li> <li>- Street closure</li> </ul>	\$501.19 + HST	\$16.94 per lineal metre or the lifetime of the project (+ HST on total LM)	\$5.64 per m per month for enclosed portion of the public right of way (+ HST on total m )

Source *Street Occupation Application Information, Construction Permit Information, City of Toronto Website*

The current fees are standard throughout the entire City of Toronto. However, City of Toronto Transportation Services is proposing to increase the monthly fee of \$5.64/m<sup>2</sup> per month to **\$5.74/m<sup>2</sup> per day** – a 3000% increase. The proposed occupancy fee structure is based on the market value of parking rates in the area. As parking rates are higher in the downtown core, fees will also be higher. In addition, the proposed fee structure will now include the area of the boulevard upon which construction staging is encroaching. The rationale behind the proposed fee structure is to offset the Toronto Parking Authority revenue losses in addition to reducing traffic congestion.

BILD, on behalf of the development industry, has taken the position that the TPA metric is inappropriate. In an effort to support BILD and the industry's position, we are looking for research and recommendations on a more appropriate fee metric and strategies to mitigate lengthy lane occupancy.

The full proposal for changes to the Lane Occupancy Fees is tentatively scheduled to be released at the Public Works and Infrastructure in February 2015.

## OBJECTIVES

1. Provide an overview of the current fee structure and the proposed changes
2. Provide a comparison between the two fee structures, breaking down costs per unit. Use examples from developments in the downtown core
3. Using traffic studies that examine the most congested locations in Toronto, determine whether or not the proposed location-based fee structure is reasonable
4. Examine the potential outcomes if the fee structure is implemented (e.g. reduced development, expedited construction periods, etc.)
5. Suggest strategies that will mitigate lengthy lane occupancy (e.g. re-visiting construction hours, quicker permit process, etc.)



6. Provide suggestions for more efficient (in cost, space, and time) staging that can be used in downtown Toronto
7. Look to other cities for lane occupancy fee structures and mitigation strategies
8. Propose and justify a new metric upon which a new fee proposal can be based

#### DELIVERABLES

1. Work Plan/Critical Path
2. Preliminary Report:
  - a. Background research of the City of Toronto's current lane occupancy fee structure, breaking down the costs on a per unit basis
  - b. Calculate revenues produced compared to revenues lost
  - c. Possible presentation of preliminary findings to Diamond Corp team (TBD – Feb 26<sup>th</sup>?)
  - d. One to two page summary of key findings that can be distributed to the Diamond Corp team
3. Final Report
  - a. Analysis of the proposed ROW occupancy fee structure, breaking down the costs on a per unit basis
  - b. Provide a comparison between the current and proposed fee structures, breaking down the costs on a per unit basis
  - c. Provide strategies that will mitigate lengthy lane occupancy
  - d. Provide alternatives for more efficient fee structures and staging options
  - e. Choose one of the alternative ROW occupancy fee structure and create a strategy for implementation that takes into account costs incurred to developers and lost parking revenues to the City of Toronto – the studio group is encouraged to combine this strategy with suggestions from 3(c)
4. Final Presentation
  - a. Present to the Diamond Corp team at the completion of the semester (in addition to the Ryerson Studio Presentation)

#### REQUIREMENTS

1. Monitor and report back to the clients on scheduled committee meetings, workshops, consultations, open houses, etc. at City Hall re: lane occupancy fee policy updates or reform motions – provided to the client **as they happen**

#### SUGGESTED RESOURCES

1. Congestion Management Plan 2014-2018 – released October 2013
2. John Tory's Six Point Traffic Plan
3. Past and current agenda items re: traffic congestion brought forward to City Council or Public Works
4. Street Occupation Application Information (City website)
5. Deputy Mayor's Roundtable on Gridlock & Traffic Congestion (Feb 28 2014)
6. Toronto Meeting Management Information System (TMMIS) – upcoming meeting schedules and staff reports

#### CLIENT CONTACTS

**Kate Hatoum**  
 Development Manager  
 Diamond Corp  
 22 St Clair Ave E, Suite 1010  
 khatoum@diamondcorp.ca

**Christine Chea**  
 Assistant Development Planner  
 Diamond Corp  
 22 St Clair Ave E, Suite 1010  
 cchea@diamondcorp.ca

# Fee Structure Development Sample

(all numbers are not exact)

## Project Facts

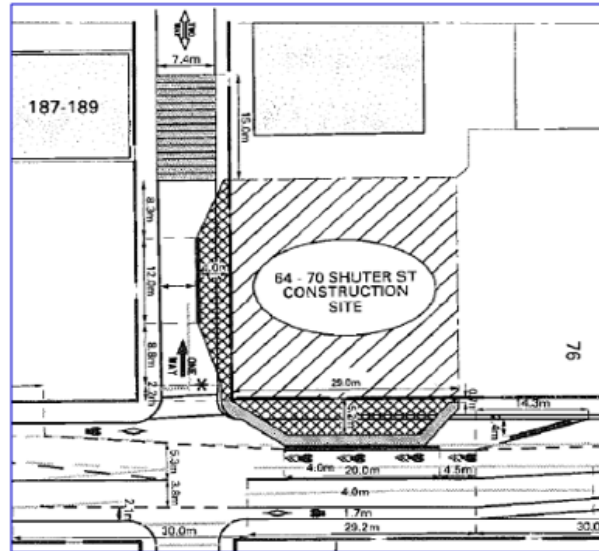
Core Condos | Shuter and Dalhousie | 24

Storeys | 220 Units | 2017 Occupancy

ROW Staging Approved for 32 Months

14 TPA Spaces Removed

Developer Charged \$18,500 + Cost of Lost  
Revenue to TPA



## TPA Parking Revenue

14 Spots | 973 Days of Lost Revenue | \$3 Hourly Parking Rate

12.3 Hours Average Paid Hours | Assumed 60% Occupancy

= \$301,591 One Time Payment

## Current Fee Structure

= \$18,500 + \$301,591 = **\$320,091**

## Proposed Transportation Services Fee Structure

Zone A ROW Occupancy = \$4.27 per m<sup>2</sup> per day.

366 m<sup>2</sup> of ROW Occupancy

366 m<sup>2</sup>\*\$4.27\*973 Days = **\$1,520,624**

## UrbanCore Model

Blue = 55m<sup>2</sup> of Low Pedestrian Sidewalk

\$25 per sq. /m per month

= \$44,000

Red = 90 m<sup>2</sup> of Medium Pedestrian Sidewalk

\$50 per sq. /m per month

= \$144,000

Baby Blue = 43 m<sup>2</sup> of Local Road

\$40 per sq. /m per month

= \$55,040

Orange = 178 m<sup>2</sup> of Minor Arterial

\$100 per sq. /m per month

= \$569,600

Yellow = 77m<sup>2</sup> of Bicycle Lane

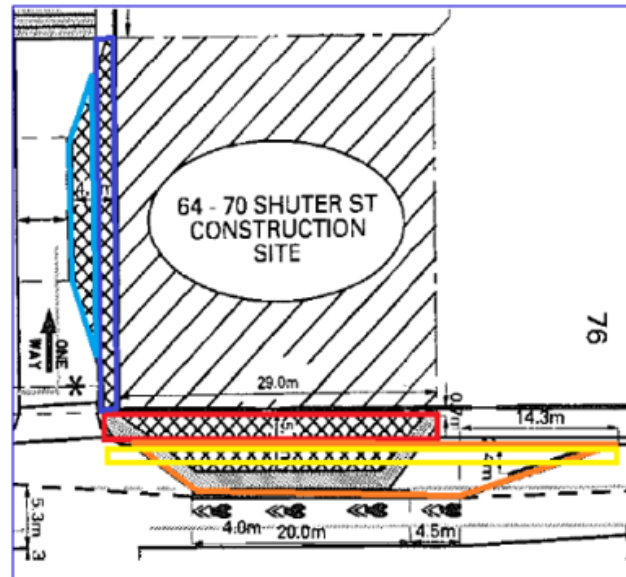
\$10 per sq. /m per month

= \$24,640

$\$44,000 + \$144,000 + \$55,040 + \$569,600 + \$24,640 = \$837,280$

$\$837,280 + \$301,591 \text{ (onetime payment to TPA)} = \$1,138,371$

Developer has agreed to Public Relations Campaign = 10% discount = **\$1,024,534**



## Recap

Current = \$320,091

Proposed Transportation Services = \$1,520,624 (475% increase)



UrbanCore = \$1,024,534 (320% increase)

# TPA Space Occupancy by Developments





**Zone B Developments**

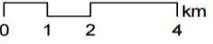
- Legend**
-  zoneB\_NO\_tpa
  -  zoneB\_tpa\_occupy

- Road Class**
-  Highway
  -  Major Roads
  -  Local Roads
  -  Ramp

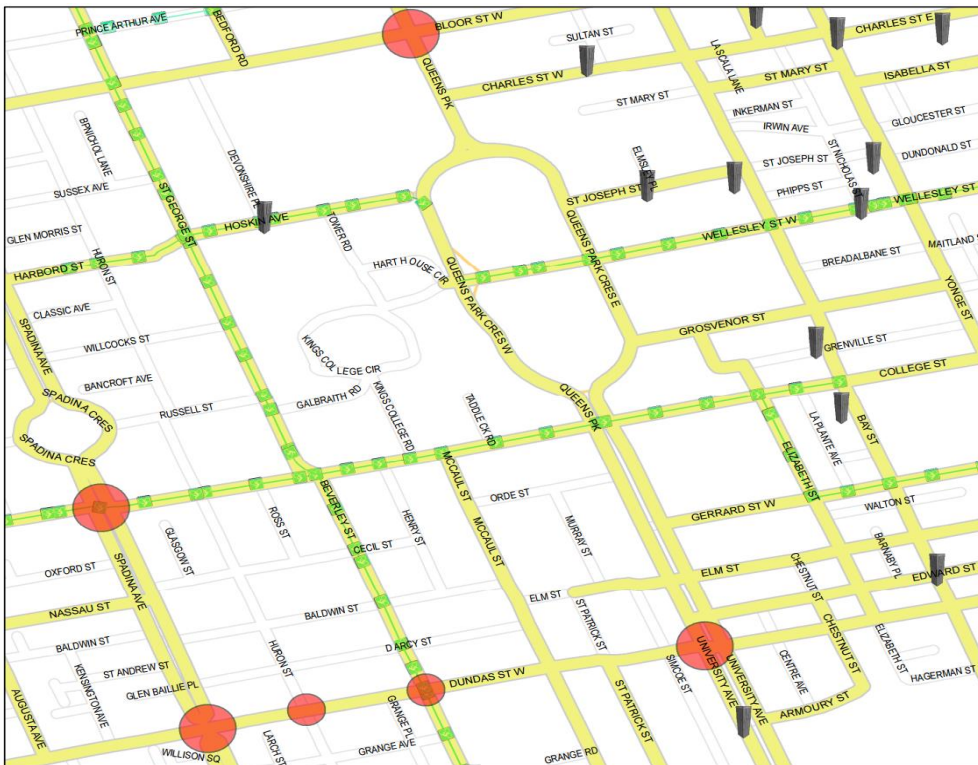
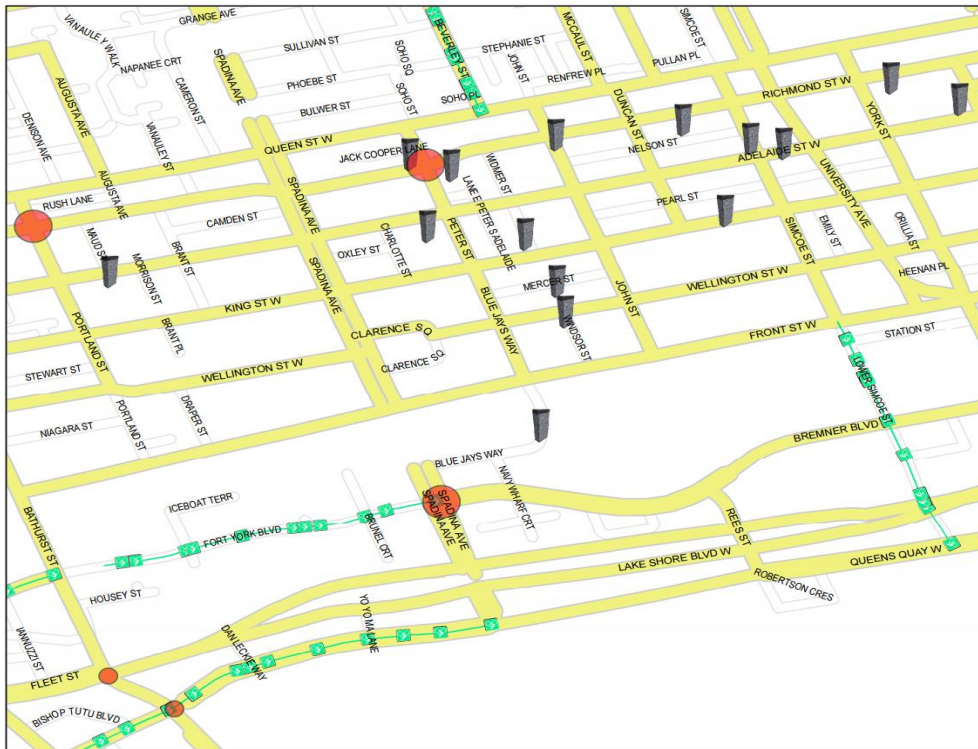


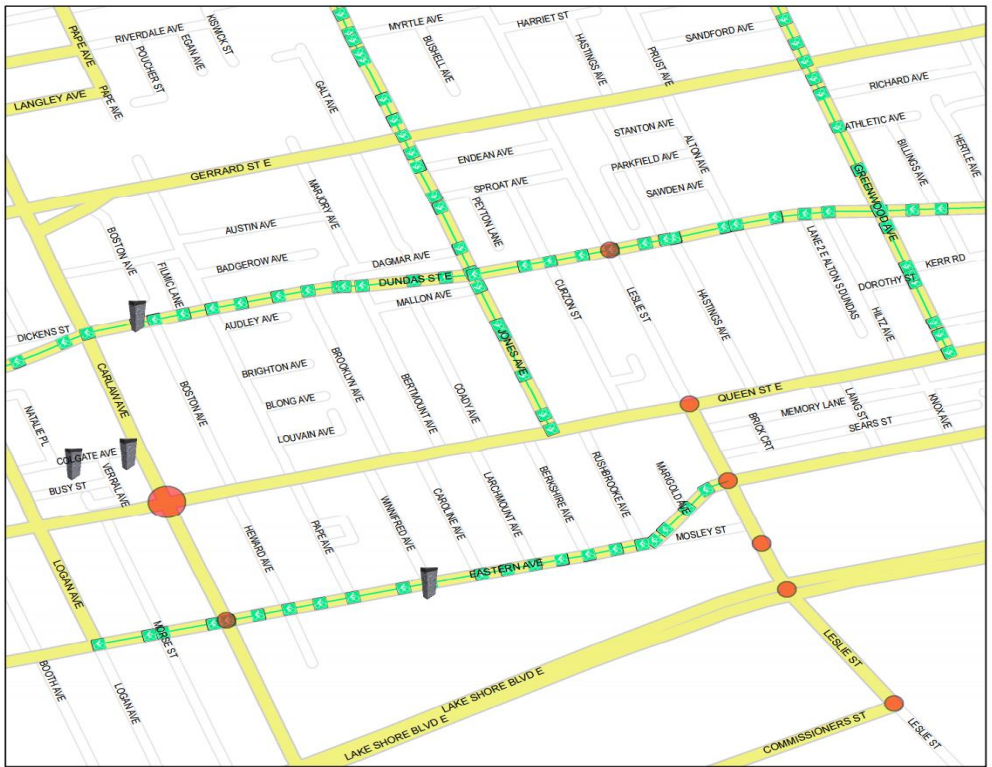
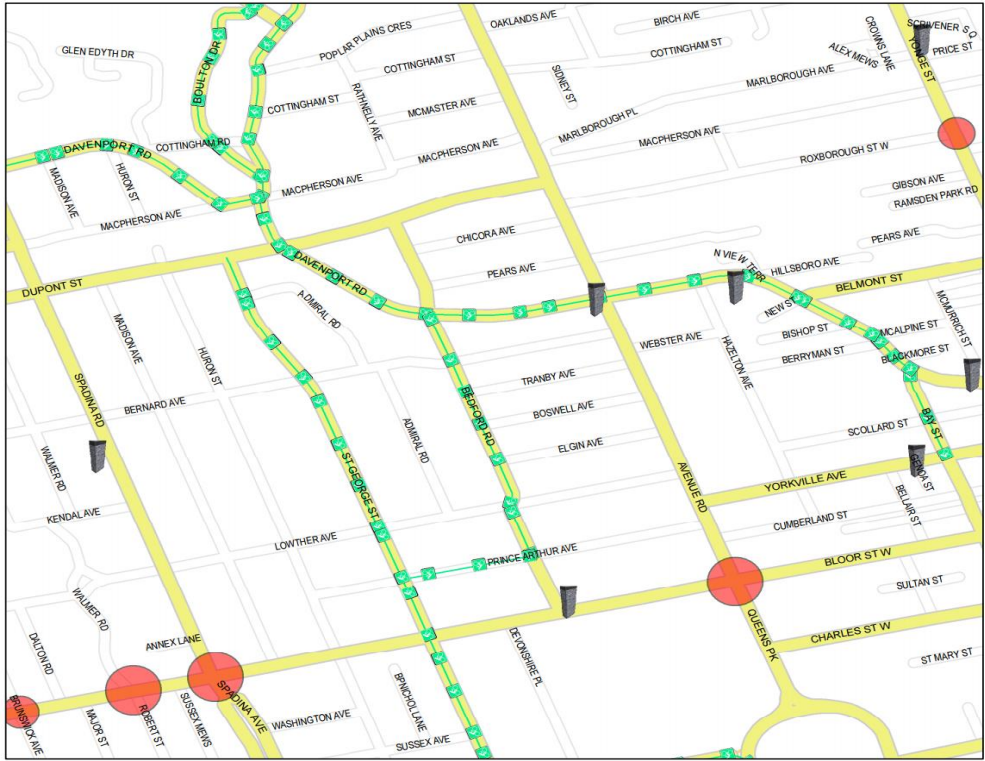
**Zone C Developments**

- Legend**
-  Not Occupying TPA
  -  Occupying TPA
  -  Highway
  -  Major Roads



# Pedestrian Volume, Bike Lane, and Road Class Maps





## Construction Staging Inventory Sample

ZONE	WARD	DEVELOPMENT TYPE	PROJECT DEVELOPER/CONSTRUCTOR	LEGAL ADDRESS OF PROJECT	SIDEWALK/ROAD/ BOTH	DURATION OF STAGING	DATE OF STAFF REPORT	COST OF STAGING	TPA PARKING SPOTS #	DOES THE TTC RUN HERE
A	27	Repair/Restoration	Alliance Restoration Ltd.	2 Bloor St. East	Road	6	August 15, 2011	\$ 5,000	0	No
A	27	32 Storey Condo	Crestford Developments	1000 Bay Street	Both	18	July 17, 2014	\$ 7,000	7	Yes
A	27	45/55 Storey Condo	Pemberton Group	50 St. Joseph Street	Both	6	May 15, 2012	\$ 10,000	8	Yes
A	27	7 Storey Condo	Alterra	36 Hazelton Avenue	Both	12	December 3, 2012	\$ 10,600	Yes (not specified)	No
A	27	23 Storey Research Tower	Elis Don Corporation	674 & 686 Bay Street	Both	13	August 22, 2011	\$ 12,800	0	No
A	27	24 Storey Condo	Centre Court Developments	64-70 Spadina Street	Both	31	January 27, 2015	\$ 18,500	14	No
A	27	32 Storey Condo	Crestford Developments	1000 Bay Street	Both	18	July 17, 2014	\$ 25,500	0	No
A	27	42 Storey Building Renovations	Lanterna Developments	955 Bay Street	Both	30	January 26, 2015	\$ 28,100	0	No
A	27	23 Storey Condo	Park Property Management	66 Isabelle Street	Both	16	July 18, 2014	\$ 29,200	2	No
A	27	Renovation	Turner Fleischer Architects Inc	438 Church Street	Both	8	March 31, 2011	\$ 33,000	0	Yes
A	27	50 Storey Condo	Lifetime Developments	9-21 Grenville Street	Both	35	September 12, 2012	\$ 36,000	4	No
A	27	70 Storey Condo	Great Gulf Homes	1 Bloor Street East	Both	24	March 22, 2012	\$ 41,000	0	Yes
A	20	32 Storey Condo	Lamb Development Corp.	11 Charlotte Street	Sidewalk	24	August 14, 2012	\$ 51,000	5	No
A	27	56 Storey Condo	Crestford Developments	42 Charles Street East	Both	20	May 16, 2014	\$ 52,900	2	No
A	27	31, 39 & 10 Storey Mixed Use	Camrosst-Fecorp	21 Avenue Road	Both	26	September 14, 2012	\$ 55,900	0	Yes
A	20	10 Storey Condo	Empire Communities	15 Beverley Street	Both	25	November 28, 2012	\$ 56,600	8	No
A	27	35 Storey Condo	Urban Capital Property Group	75 St. Nicholas Street	Both	30	October 6, 2011	\$ 63,000	0	No
A	28	58 Storey Condo	Concert Properties	40 Scott Street	Both	21	January 30, 2014	\$ 64,900	8	Yes
A	28	58 Storey Condo	Concert Properties	40 Scott Street	Both	46	January 30, 2014	\$ 65,900	0	No
A	20 & 27	31, 39 & 10 Storey Mixed Use	Camrosst-Fecorp	21 Avenue Road	Both	26	September 14, 2012	\$ 72,500	0	Yes
A	27	39 Storey Condo	Ederstrow Homes	45 Charles St. East	Both	36	December 12, 2011	\$ 89,200	2	No
A	20	25 Storey Condo	Diamond Corp	210 Simcoe Street	Both	33	March 26, 2014	\$ 95,000	Yes (not specified)	No
A	22	17 Storey Condo	Andrin Cherry Ltd.	54-74 Berwick Avenue	Both	19	September 17, 2012	\$ 127,800	5	No
A	20	Sports Centre	Elis Don Corporation	100 Devonshire Place	Both	27	May 24, 2012	\$ 130,000	Yes (not specified)	No
A	27	45 Storey Condo	Five St. Joseph Developments Ltd.	5 St. Joseph Street	Both	48	March 30, 2011	\$ 216,000	10	No
A	27	70 Storey Condo	Great Gulf Homes	1 Bloor Street East	Both	54	October 14, 2011	\$ 282,200	2	No
AA	28	Hotel - Fairmont	Linen Group Construction Ltd.	100 Front Street West	Both	6.5	August 17, 2011	\$ 5,700	?	No
AA	27	4 Storey Tower	Turner & Townsend CMZR	178 Victoria Street	Both	6	February 4, 2014	\$ 5,800	3	No
AA	20	17 Storey Office Building	Allied Properties REIT	134 Peter Street	Both	23	October 5, 2012	\$ 17,000	0	No
AA	28	Hotel Renovations	King Edward Realty Inc.	37 King Street East	Both	13	September 14, 2011	\$ 19,500	0	No
AA	27	9 Storey Building	ElisDon Corporation	341 Yonge Street	Both	19	August 21, 2012	\$ 28,400	0	No
AA	20	44 Storey Condo	Pinnacle International	295 Adelaide Street West	Both	24	December 15, 2011	\$ 31,500	?	Yes
AA	20	40 Storey Building	Lifetime Developments	290 Adelaide Street West	Both	36	October 10, 2012	\$ 33,000	5	Yes
AA	20	31 Storey Condo	Aspen Ridge Ltd.	199 Richmond Street West	Both	36	December 13, 2012	\$ 37,000	2	No
AA	27	36 Storey Building	Urban Capital Property Group	117 Peter Street	Both	33	October 10, 2012	\$ 37,300	?	Yes
AA	27	9 Storey Building	ElisDon Corporation	341 Yonge Street	Both	19	August 21, 2012	\$ 45,500	0	Yes
AA	20	39 Storey Condo	Monarch Group	318 Richmond Street West	Both	36	January 21, 2013	\$ 49,400	6	Yes
AA	28	54 Storey Condo	Lifetime Developments	70 Temperance Street	Both	45	December 3, 2012	\$ 50,000	0	No
AA	28	42 Storey Office Tower	Oxford Properties	100 Adelaide Street West	Both	46	May 29, 2013	\$ 56,000	0	Yes
AA	20	44 Storey Condo	Pinnacle International	295 Adelaide Street West	Both	24	December 15, 2011	\$ 62,000	0	No
AA	28	47 Storey Office Tower	Brookfield Office Properties	40 Adelaide Street West	Both	31	January 28, 2013	\$ 67,650	15	No
AA	27	39 Storey Apartment	HNR Properties Ltd.	252 Victoria Street	Both	40	August 21, 2012	\$ 78,400	?	No
AA	28	47 Storey Office Tower	Brookfield Office Properties	40 Adelaide Street West	Both	30	January 28, 2013	\$ 90,000	0	Yes
AA	20	31 Storey Condo	Aspen Ridge Homes	199 Richmond Street West	Both	24	October 9, 2012	\$ 93,700	0	No
AA	20	41 Storey Mixed-Use Building	Lifetime Developments	56 Blue Jays Way	Both	48	August 21, 2012	\$ 95,000	?	No



# 11.0 REFERENCES

---

The following resources were consulted throughout the creation of the report:

- The City of Toronto Congestion Management Plan 2014-2018
- Construction Staging Area Staff Reports
- Measures to Mitigate Construction-Related Traffic Congestion Staff Report
- City of Toronto Official Plan
- City of Toronto Open Data Catalogue
- City of Toronto Road Classification System
- John Tory Six-Point-Plan
- Toronto Municipal Code
- The Planning Act
- Occupational Health and Safety Act
- Autodesk – Building Information Modelling
- SFGov – San Francisco Municipal Website
- OCGov – Orange County Website
- City of Vancouver Municipal Website
- Hamid Mohebzada, Civil and Environmental Engineering Student, University of Waterloo
- Lane Occupancy Fee Review Industry Consultation Presentation Slides
- BILD Lane Occupancy Fee Review Letter to Stephen Buckley
- Toronto Parking Authority Website