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From: Chris Tam, WSP  
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Subject: Lower Yonge EA – Pre-Regional  
Infrastructure Assessment – “Traffic Impact  
Assessment”

Date: July 21, 2017

Job No.: 16-15113

CC: Jeff Dea, City of Toronto  
Bob Koziol, WSP  
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## 1.0 PURPOSE

This memo builds upon the previous Pre-Regional Infrastructure Assessment completed by MMM in May 2017 which for reference has been attached as Appendix A, with the ultimate goal of identifying a reasonable level of development that can be accommodated prior to the construction of additional regional road infrastructure in and around the Lower Yonge Precinct.

In order to conduct this additional assessment, a “traffic impact” approach was taken to developing the estimated volumes for three land use development scenarios for the Lower Yonge Precinct. This approach involved the use of available existing traffic count data from the City of Toronto, as well as from available studies in the area, and the estimation of future traffic generation, distribution and assignment from trip rates provided by the City, as well as studies submitted for the 1-7 Yonge Street development and the 55 Lake Shore Boulevard development.

## 2.0 BACKGROUND AND ASSUMPTIONS

As with previous studies completed for the Pre-Regional Infrastructure Assessment, the Lower Yonge Precinct Transportation Master Plan (TMP EA) was used as the basis for assumptions with regard to the road network. However, in order to properly identify the need for “Regional” infrastructure, that is, infrastructure outside of the immediate Lower Yonge Precinct area, it was assumed that only a base level of improvements would be in place, and the evaluation focused on how much development this base level of improvements could accommodate before the following recommended improvements from the TMP EA were needed:

- 1) Removal of the Bay Street on-ramp to the eastbound Gardiner Expressway;
- 2) Shortening of the Lower Jarvis Street off-ramp from the eastbound Gardiner Expressway to land west of Yonge Street;
- 3) Elimination of the eastbound "S-curve" on Harbour Street and normalization of the Yonge Street/Harbour Street and Yonge Street/Lake Shore Boulevard intersections;
- 4) Creation of one additional eastbound lane on Lake Shore Boulevard East from Yonge Street to Lower Jarvis Street; and
- 5) Conversion of Harbour Street from York Street to Yonge Street into two-way operation.



It was assumed that these five improvements should proceed together; the elimination of the 'S-curve' and the normalization of Yonge Street/Harbour Street should not be implemented before the Lower Jarvis Street off-ramp is shortened to terminate west of Yonge Street due to geometric design constraints. A two-way Harbour Street cannot be realized until the intersection of Yonge Street/Lake Shore Boulevard is normalized. Furthermore, the addition of an eastbound lane on Lake Shore Boulevard East from Yonge Street to Lower Jarvis is not necessary until the Lower Jarvis off-ramp is shortened.

There is a possibility that the removal of the 'S-curve' can occur before the Lower Jarvis Street off-ramp is shortened to terminate west of Yonge Street. This plan would require the section of Lake Shore Boulevard EB between Yonge Street and Freeland Street to be realigned to intersect with Yonge Street south of the existing Lower Jarvis Street off-ramp structure. However, when the new Yonge Street off-ramp the Lower Jarvis Street off-ramp is shortened, this temporary alignment of Lake Shore Boulevard EB east will have to be modified and moved northerly to align with the new Yonge Street off-ramp. Although feasible, this is not a practical option as it will result in the additional construction cost and traffic disruptions.



## 2.1 LAND USE

For use in the evaluation, three land use scenarios were developed based on information provided by the City. The three land use scenarios correspond to specific horizon years when these levels of development are expected to occur, and thus identify an approximate year at which point the aforementioned regional road infrastructure would be required to support further development. It is important to recognize these land use development scenarios represent ‘test’ scenarios developed exclusively for the purpose of this sensitivity analysis, and that all proposed developments will be subject to the official development approval process. Additionally, as stipulated in the Lower Yonge draft OPA, adopted by City Council on June 7, 2016, the future developments will be subject to Holding bylaw provisions to ensure adequate infrastructure is planned and funded in advance of development proceeding. As a condition of lifting the holding provisions, a cost-sharing arrangement will be required.

It should be also noted that each phase of development includes all of the development from the previous phase. The scenarios are summarized below:

**Table 2-1  
Development Phases and Land Use**

Development	GFA (m2)			# Parking Stalls	# Residents	# Employees
	Residential	Office	Retail			
<b>Phase 1 - 2020</b>						
1-7 Yonge (Tower 1) / Pinnacle	81,541	0	3,354	1974	1,075	70
1-7 Yonge (Tower 2) / Pinnacle	69,588	0	4,671		1,992	20
55 Lake Shore / Menkes (Block 1)	0	49,333	9,057	577	0	1,730
55 Lake Shore / Menkes (Block 2)	123,997	0	5,522	460	3,125	80
<b>Phase 2 – 2021</b>						
1-7 Yonge (Tower 3) / Pinnacle	39,749	0	677	1323	1,726	50
1-7 Yonge / Pinnacle	0	142,925	10,200		0	4,650
55 Lake Shore / Menkes (Block 3)	0	0	3,569	0	0	40
55 Lake Shore / Menkes (Block 4)	234,876	0	19,153	622	6,290	160
<b>Phase 3 – Beyond 2021</b>						
Loblaws	0	48,338	12,000	750	0	1,600
Loblaws	106,500	4,490			2,752	150
<b>Total</b>						
	656,251	245,086	68,203	4,688	16,960	8,550



## 2.2 ROAD NETWORK

The road network was assumed to remain unchanged given the need to evaluate the timing for various proposed improvements. Only two major differences were made to the existing network for this analysis:

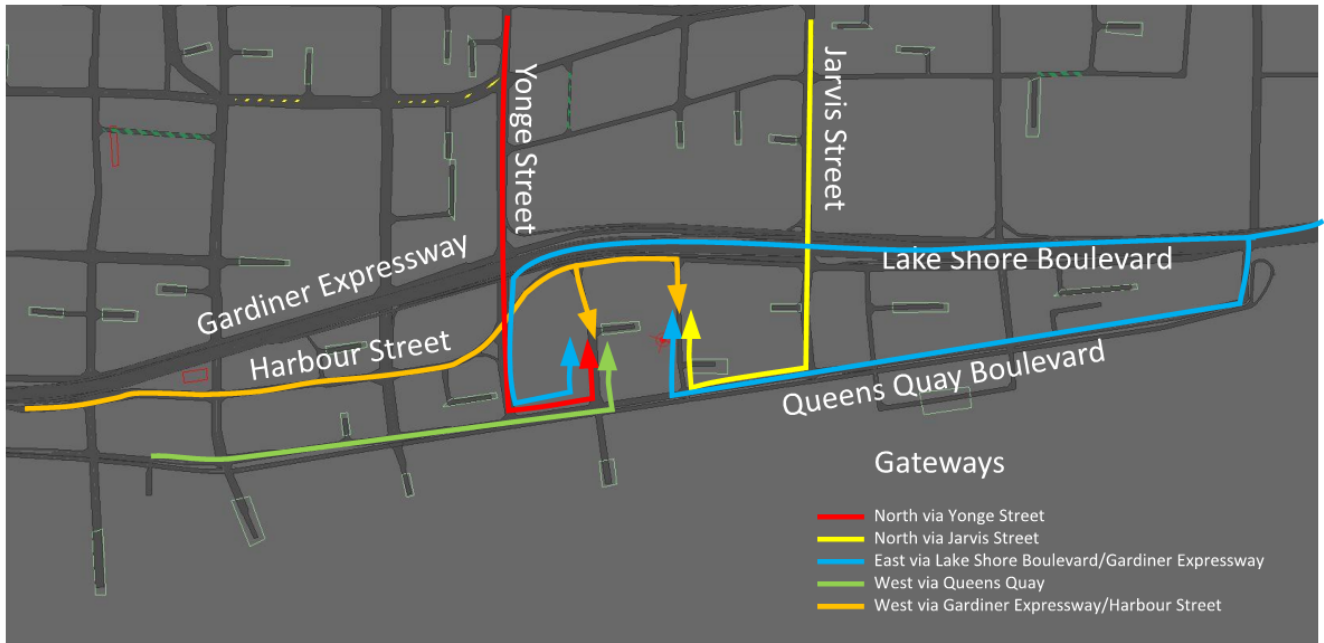
1. Construction of the Simcoe Street Off-Ramp – this change is expected to be in place by January 2018
2. The development of Harbour Street east of Yonge Street is expected to be completed in phases concurrent with development. Harbour Street will be constructed from Yonge Street to Freeland Street, and from Cooper Street to New Street, in Phase 1, from Freeland to Cooper Street in Phase 2, and from New Street to Lower Jarvis Street in Phase 3. With the 'S-curve' in place, the existing lane configurations on Harbour Street on the west side of Yonge Street would be maintained (only the EBR movement allowed), and only the NBR and EBR movements ( a right-in/right-out access) would be allowed to/from the Harbour Street extension.

Currently, the study area road network better serves regional traffic compared to local traffic. For example, while meeting regional traffic needs, the major arterial roads hinder local traffic circulation. The irregular intersections of Harbour Street/Yonge Street, Yonge Street/Lake Shore Boulevard, and Lake Shore Boulevard/Jarvis Street negatively impact the transportation connectivity of the Precinct. This is especially applicable to local traffic travelling to/from the north on Yonge Street and Lower Jarvis Street, and to/from the west on the Gardiner Expressway.

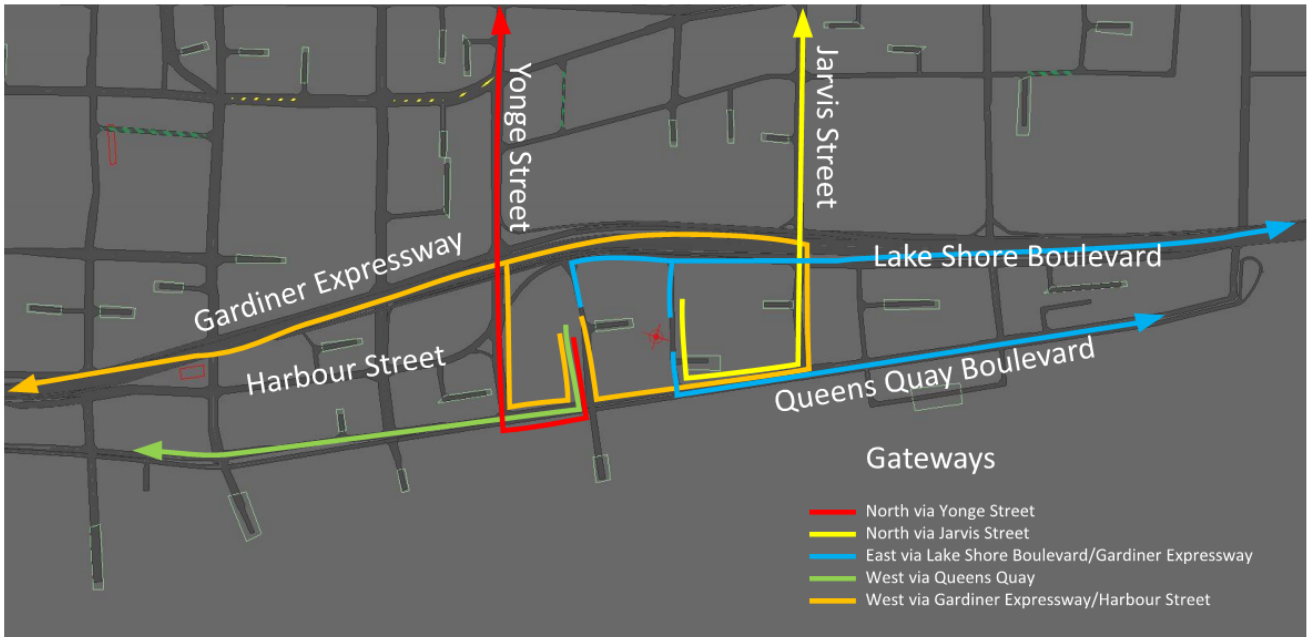
To better illustrate this point, please refer to the local traffic circulation patterns described below and illustrated in **Figures 2-2** and **2-3**. At the Lake Shore Boulevard/Lower Jarvis Street intersection, vehicles on the Gardiner Expressway eastbound off-ramp are not allowed to turn right onto Lower Jarvis Street. While the regional traffic on this off-ramp can utilize the left turn movement to access the downtown, the local traffic heading to the Precinct needs to utilize the York/Bay/Yonge off-ramp. This ramp is currently being relocated to the west to Lower Simcoe Street, which may impact travel times for the Lower Yonge Precinct traffic since it will be required to exit the Gardiner Expressway further west.

The southbound left turn movements are currently not allowed/feasible at the Yonge Street intersections with Lake Shore Boulevard and Harbour Street. Therefore, all local traffic travelling from the north on Yonge Street have to utilize Queens Quay in order to access the Precinct. Furthermore, to access Lake Shore Boulevard WB, all vehicles must currently utilize Queens Quay. Similarly, all local traffic travelling from the north on Lower Jarvis Street have to utilize Queens Quay in order to access the portion of the Precinct west of Cooper Street.

As a result, the street network as currently configured is will not be able to adequately accommodate a number of key movements to and from the Lower Yonge Precinct, which could be alleviated with some of the proposed regional improvements noted in Section 2.0.



**Figure 2-2: Inbound Traffic to Lower Yonge Precinct**



**Figure 2-3: Outbound Traffic from Lower Yonge Precinct**



## 2.3 EXISTING TRAFFIC DATA

Available traffic count data was collected from the following sources as noted in **Table 2-2** below.

**Table 2-2  
Traffic Count Locations and Data Sources**

<b>Intersection</b>	<b>Source Description</b>	<b>Date of TMC or Study</b>
Bay St. & Harbour St.	Gardiner York/Bay/Yonge Off-Ramp EA	2012
York St. & Harbour St.	Gardiner York/Bay/Yonge Off-Ramp EA	2012
Yonge St. & Lake Shore Blvd. W (EB)	City of Toronto Turning Movement Count	2009
Yonge St. & Lake Shore Blvd. (WB)	Gardiner York/Bay/Yonge Off-Ramp EA	2012
Lake Shore Blvd. E & Lower Jarvis St.	East Bayside Transportation Impact Assessment	2016
Queens Quay & Lower Jarvis St.	East Bayside Transportation Impact Assessment	2016
Queens Quay & Yonge St.	City of Toronto Turning Movement Count	2009
Queens Quay & Freeland St.	City of Toronto Turning Movement Count	2017
Yonge St. & Harbour St.	City of Toronto Turning Movement Count	2009
Cooper St. & Lake Shore Blvd. E (EB)	Derived from adjacent intersections (East Bayside Transportation Impact Assessment)	2016
New St. & Lake Shore Blvd. E (EB)	Derived from adjacent intersections (East Bayside Transportation Impact Assessment)	2016
Freeland St. & Lake Shore Blvd. E (EB)	Derived from adjacent intersections (East Bayside Transportation Impact Assessment)	2016
Queens Quay & New St.	Derived from adjacent intersections (City of Toronto TMC)	2016
Queens Quay & Cooper St.	Derived from adjacent intersections (City of Toronto TMC)	2016
Lower Jarvis St. & Harbour St.	Derived from adjacent intersections (East Bayside Transportation Impact Assessment)	2016

It should be noted that, given the Simcoe Street off-ramp is not yet in place, the volumes from the Gardiner York/Bay/Yonge Off-Ramp EA report, for the preferred alternative, were used as a reasonable estimate of traffic volumes once this ramp is in place.

## 2.4 TRIP GENERATION

The trip generation for the Lower Yonge Precinct relies on rates from the TMP EA which were provided by the City of Toronto. These are consistent with the trip rates used by the 1-7 Yonge Street and 55 Lake Shore Boulevard transportation studies. It should be noted these trip rates are lower than the actual trip rates currently observed at similar developments in the downtown area. The developers will need to demonstrate through the development approval process that these trip generation rates are achievable.

A summary of the trip generation by Phase is provided below in **Tables 2-3** and **2-4**.



**Table 2-3  
AM Peak Hour Trip Generation**

Phase	Development	Land Use	Growth Statistics	AM Peak					
				Trip Rate In	Trip Rate Out	Trips In	Trips Out	New Trips In	New Trips Out
1	1-7 Yonge Street	Residential	2186 units	0.02	0.09	44	197	53	198
		Non-Residential	8025 sq. m	0.11	0.01	9	1		
	55 Lake Shore Boulevard	Residential	1794 units	0.02	0.09	36	161	106	168
		Non-Residential	63912 sq. m	0.11	0.01	70	6		
	Loblaws	Residential	0 units	0.02	0.09	0	0	0	0
		Non-Residential	0 sq. m	0.11	0.01	0	0		
2	1-7 Yonge Street	Residential	575 units	0.02	0.09	12	52	181	67
		Non-Residential	153802 sq. m	0.11	0.01	169	15		
	55 Lake Shore Boulevard	Residential	3398 units	0.02	0.09	68	306	93	308
		Non-Residential	22722 sq. m	0.11	0.01	25	2		
	Loblaws	Residential	0 units	0.02	0.09	0	0	0	0
		Non-Residential	0 sq. m	0.11	0.01	0	0		
3	1-7 Yonge Street	Residential	0 units	0.02	0.09	0	0	0	0
		Non-Residential	0 sq. m	0.11	0.01	0	0		
	55 Lake Shore Boulevard	Residential	0 units	0.02	0.09	0	0	0	0
		Non-Residential	0 sq. m	0.11	0.01	0	0		
	Loblaws	Residential	1541 units	0.02	0.09	31	139	102	145
		Non-Residential	64828 sq. m	0.11	0.01	71	6		



**Table 2-4  
PM Peak Hour Trip Generation**

Phase	Development	Land Use	Growth Statistics	PM Peak					
				Trip Rate In	Trip Rate Out	Trips In	Trips Out	New Trips In	New Trips Out
1	1-7 Yonge Street	Residential	2762 units	0.07	0.04	153	87	156	91
		Non-Residential	161827 sq. m	0.04	0.05	3	4		
	55 Lake Shore Boulevard	Residential	1794 units	0.07	0.04	126	72	151	104
		Non-Residential	63912 sq. m	0.04	0.05	26	32		
	Loblaws	Residential	0 units	0.07	0.04	0	0	0	0
		Non-Residential	0 sq. m	0.04	0.05	0	0		
2	1-7 Yonge Street	Residential	0 units	0.07	0.04	40	23	102	100
		Non-Residential	0 sq. m	0.04	0.05	62	77		
	55 Lake Shore Boulevard	Residential	3398 units	0.07	0.04	238	136	247	147
		Non-Residential	22722 sq. m	0.04	0.05	9	11		
	Loblaws	Residential	0 units	0.07	0.04	0	0	0	0
		Non-Residential	0 sq. m	0.04	0.05	0	0		
3	1-7 Yonge Street	Residential	0 units	0.07	0.04	0	0	0	0
		Non-Residential	0 sq. m	0.04	0.05	0	0		
	55 Lake Shore Boulevard	Residential	0 units	0.07	0.04	0	0	0	0
		Non-Residential	0 sq. m	0.04	0.05	0	0		
	Loblaws	Residential	1541 units	0.07	0.04	108	62	134	94
		Non-Residential	64828 sq. m	0.04	0.05	26	32		

## 2.5 TRIP DISTRIBUTION AND ASSIGNMENT

As noted previously, the trip distribution from the transportation studies prepared for 1-7 Yonge Street and 55 Lake Shore Boulevard was emulated in this study in order to reflect the expected level of development. The trip assignment from these reports were adjusted to reflect the assumptions included in the phasing analysis as follows:

- The site generated assignments from these two developments assumed all improvements were in place, which is not a given in this analysis.
- The assignment assumed that a number of vehicles would travel westbound on Harbour Street at Yonge Street. Since this cannot occur until the Yonge Street /Lake Shore Boulevard intersection is normalized, these vehicles needed to be assigned elsewhere.
- Some of the site assignment was unbalanced between intersections.

As a result, rather than using the exact trip assignment from these reports, the gateway distributions were used and traffic was assigned, in the majority of cases, using a “shortest path” approach. The site traffic volumes, for each block as assigned, are provided in **Appendix B**.





### 3.0 SUMMARY OF RESULTS

While the findings presented the April 2017 memo were based on the Paramics microsimulation results, the Synchro software package was used in this analysis. The Synchro analysis results presented in this section reflect the full build out without the regional improvements in place scenario. A comparative summary of results for each of the intersections studied for both the AM and PM peak hours is provided below in **Tables 3-1** and **3-2**. The comparative summary highlights the changes at key intersections as more development is realized in the Lower Yonge Precinct.

**Table 3-1  
Intersection Capacity Analysis – Comparative Summary AM Peak Hour**

Intersection	Phase 1		Phase 2		Phase 3	
	Overall LOS (Delay) in Seconds	Critical Movement (v/c)	Overall LOS (Delay) in Seconds	Critical Movement (v/c)	Overall LOS (Delay) in Seconds	Critical Movement (v/c)
Bay St. & Harbour St.	F (148)	EB-L (1.28) EB-TR (1.35) SB-L (1.05)	F (230)	EB-L (1.78) EB-TR (1.45) NB-TR (0.87) SB-L (1.52)	F (243)	EB-L (1.78) EB-TR (1.49) NB-TR (0.90) SB-L (1.72)
York St. & Harbour St.	D (51)	EB-TR (1.06) SB-TL (0.97dl)	E (67)	EB-TR (1.11) NB-TR (1.00) SB-TL (1.37dl)	E (74)	EB-TR (1.13) NB-TR (1.04) SB-TL (1.54dl)
Yonge St. & Harbour Street/Lake Shore Blvd. (EB)	D (41)		E (62)		E (62)	
Yonge St. & Lake Shore Blvd. (WB)	F (85)	WB-LTR (1.13) NB-T (0.90)	F (99)	WB-LTR (1.19) NB-T (0.92)	F (106)	WB-LTR (1.22) NB-T (0.92)
Lake Shore Blvd. E & Lower Jarvis St.	D (52)	WB-T (0.90) SB-T (0.88)	E (59)	EB-L (0.92) WB-T (0.94) SB-LTR (0.91)	E (64)	EB-L (0.97) WB-T (0.96) NB-LTR (0.85) SB-LTR (0.92)
Queens Quay & Lower Jarvis St.	B (12)		B (12)		B (14)	
Queens Quay & Yonge St.	B (15)		B (18)		C (20)	
Queens Quay & Freeland St.	A (9)		B (17)		B (16)	



Yonge St. & Harbour St.	EB-R A (9)		WB-R A (9)		WB-R A (9)	
Cooper St. & Lake Shore Blvd. E (EB)	EB-T A (0)		EB-T A (0)		EB-T A (0)	
New Street & Lake Shore Blvd. E (EB)	NB-R A (10)		NB-R B (10)		NB-R B (11)	
Freeland St. & Lake Shore Blvd. E (EB)	NB-R A (10)		NB-R B (10)		NB-R B (11)	
Queens Quay & New Street	SB-LR E (47)	SB-LR (0.64)	SB-LR F (90)	SB-LR (0.81)	SB-LR C (24)	
Queens Quay & Cooper St.	SB-L E (36)	SB-L (0.34)	SB-L E (44)	SB-L (0.39)	SB-L E (39)	SB-L (0.36)

**Table 3-2  
Intersection Capacity Analysis – Comparative Summary PM Peak Hour**

Intersection	Phase 1		Phase 2		Phase 3	
	Overall LOS (Delay) in Seconds	Critical Movement (v/c)	Overall LOS (Delay) in Seconds	Critical Movement (v/c)	Overall LOS (Delay) in Seconds	Critical Movement (v/c)
Bay St. & Harbour St.	F (201)	EB-L (0.90) EB-TR (1.33) NB-TR (1.05) SB-L (3.60)	F (338)	EB-L (1.20) EB-TR (1.44) NB-TR (1.13) SB-L (6.04)	F (363)	EB-L (1.20) EB-TR (1.49) NB-TR (1.17) SB-L (6.40)
York St. & Harbour St.	D (54)	EB-TR (1.03) SB-TL (1.26dl)	E (70)	EB-TR (1.10) SB-TL (1.48dl)	E (77)	EB-TR (1.13) SB-TL (1.57dl)
Yonge St. & Harbour Street/Lake Shore Blvd. (EB)	E (59)		E (61)	EB-TL (0.85)	E (63)	EB-TL (0.89)
Yonge St. & Lake Shore Blvd. (WB)	C (33)	WB-T (0.89) SB-LTR (1.00dr)	D (39)	WB-LTR (0.97) NB-L (0.92) SB-LTR (0.97dr)	D (44)	WB-LTR (1.01) NB-L (0.97) SB-LTR (0.96dr)
Lake Shore Blvd. E & Lower Jarvis St.	E (57)	WB-T (0.98)	E (64)	WB-T (1.04) NB-LTR (0.85)	E (68)	WB-T (1.06) NB-LTR (0.88)
Queens Quay & Lower Jarvis St.	B (12)		B (12)		B (13)	
Queens Quay & Yonge St.	C (21)		C (26)	WB-T (0.91)	C (30)	WB-T (0.94)
Queens Quay & Freeland St.	B (10)		B (20)		C (20)	



Yonge St. & Harbour St.	EB-R A (9)		WB-R A (9)		WB-R A (9)	
Cooper Street & Lake Shore Blvd. E (EB)	EB-T A (0)		EB-T A (0)		EB-T A (0)	
New Street & Lake Shore Blvd. E (EB)	NB-R B (12)		NB-R B (12)		NB-R B (13)	
Freeland Street & Lake Shore Blvd. E (EB)	NB-R A (9)		NB-R B (12)		NB-R B (13)	
Queens Quay & New Street	SB-LR E (35)	SB-LR (0.44)	SB-LR F (62)	SB-LR (0.58)	SB-LR C (21)	
Queens Quay & Cooper St.	SB-L F (53)	SB-L (0.80)	SB-L F (85)	SB-L (0.93)	SB-L F (61)	SB-L (0.86)

The results above indicate that the road network will progressively worsen as additional developments are completed in the Lower Yonge Precinct. The movements which will primarily benefit from the implementation of the four improvements being evaluated will be as described in **Table 3-3** below.

**Table 3-3  
Impacts of Proposed Regional Improvements**

<b>Improvement</b>	<b>Impacts on existing movements</b>
Shortening the Jarvis Off-Ramp to land west of Yonge Street	<ul style="list-style-type: none"> <li>Reduced EB-T flow at York/Harbour, Bay/Harbour and Yonge/Lake Shore EB</li> </ul>
Eliminating the “S-Curve” and providing two-way traffic flow on Harbour Street to York Street	<ul style="list-style-type: none"> <li>Reduced NB-L flow at Yonge/Lake Shore and Lower Jarvis/Lake Shore</li> <li>Reduced SB-LR flow at Freeland/Queens Quay, Cooper/Queens Quay and New/Queens Quay</li> </ul>
Additional EB lane on Lake Shore Boulevard from Yonge Street to Lower Jarvis Street	<ul style="list-style-type: none"> <li>Increased capacity for EB-T and EB-L at Lower Jarvis/Lake Shore</li> </ul>

As a result, in order to determine when these improvements are necessary, the movements which are expected to benefit most upon implementation will be evaluated for each Phase.

### 3.1 EVALUATION OF IMPROVEMENTS

#### Shortening the Jarvis Off-Ramp to land west of Yonge Street

The primary benefit of this improvement is to reduce the expected flow travelling eastbound on Harbour Street from York Street to Yonge Street. As shown in the results, the EB-TR at the Bay Street/Harbour Street intersection already operates well above capacity during both peak hours under Phase 1 conditions. The EB-T movement at the York Street/Harbour Street intersection operates slightly above capacity in Phase 1 in both the AM and PM peak hours, and its operations deteriorate further in Phases 2 and 3. Furthermore, the EB-TL at the Yonge



Street/Harbour Street/Lake Shore Boulevard EB intersection begins to approach capacity beyond Phase 1 in the PM peak hour.

The results suggest that the improvement of shortening the Jarvis off-ramp to land west of Yonge Street does not need to be implemented after Phase 1, but it is required before Phase 2 could proceed. Based on current development construction schedule, this may occur as early as 2021. Furthermore, please note that this would preclude the possibility of providing the other improvements, for the reasons noted in Section 2.0. The elimination of the 'S-curve' and the normalization of Yonge Street/Harbour Street should not be implemented before the Lower Jarvis Street off-ramp is shortened to terminate west of Yonge Street due to geometric design constraints. A two-way Harbour Street cannot be realized until the intersection of Yonge Street/Lake Shore Boulevard is normalized. Furthermore, the addition of an eastbound lane on Lake Shore Boulevard East from Yonge Street to Lower Jarvis is not necessary until the Lower Jarvis off-ramp is shortened. It is important to recognize that the timing of the shortening of the Lower Jarvis off-ramp will need to be considered in light of the Gardiner construction work.

#### Eliminating the "S-Curve" and providing two-way traffic flow on Harbour Street to York Street

The benefit of this pair of improvements will normalize the Yonge Street/Lake Shore Boulevard EB intersection to a typical four-legged intersection with Harbour Street. As a result, Harbour Street can be converted to two-way operation, which will greatly benefit westbound traffic from the Lower Yonge Precinct. Under existing conditions, these westbound vehicles must exit onto Queens Quay and travel to Yonge Street or Lower Jarvis Street, then make a northbound left turn onto Lake Shore Boulevard WB.

While the NB-L movements at both the Yonge Street/Lake Shore Boulevard WB and Lower Jarvis Street/Lake Shore Boulevard intersections operate well, these movements may become more challenging in the future as the number of pedestrians travelling to the Lower Yonge Precinct increases. Furthermore, the SB-LR movements at the Queens Quay/New Street and Queens Quay/Cooper Street intersections are expected to operate at LOS 'F' in the AM and PM peak hours beyond Phase 1. Though the completion of Harbour Street to Lower Jarvis Street alleviates the congestion at the Queens Quay/New Street intersection, the Queens Quay/Cooper Street intersection requires the two-way conversion of Harbour Street after Phase 1 to accommodate the expected exiting vehicles. Acknowledging the results of the capacity analysis above, and that the "S-curve" would need to be eliminated to accommodate a new off-ramp at Yonge Street, we would recommend the elimination of the "S-Curve" and the conversion of Harbour Street to two-way occur concurrently with the construction of the Yonge Street off-ramp.

#### Additional EB Lane on Lake Shore Boulevard from Yonge Street to Lower Jarvis Street

In reviewing the available EB-T and EB-L capacity at the Lower Jarvis Street/Lake Shore Boulevard intersection, even after completion of Phase 3, this movement operates within capacity. As a result, this improvement could be deferred to a later date, or when more definitive traffic data is available from the first Phase of the Lower Yonge Precinct development. However, it is recommended this improvement to concurrently occur with the construction of the Yonge Street off-ramp and removal of the 'S-curve'.



## 4.0 RECOMMENDATIONS

In summary, the recommended improvement phasing plan is largely consistent with the findings of the April 2017 memo, which recommended that Phase 1 of the Lower Yonge Precinct proceed prior to construction of regional infrastructure, but further phases would require construction of these improvements. This assessment has allowed for a more refined review of the timing for improvements, which is as follows:

- Construct the Yonge Street off-ramp prior to Phase 2 of the Lower Yonge Precinct (currently estimated for 2021) or that arrangements, to the satisfaction of the City, be otherwise made to secure construction of the off-ramp;
- Reconstruct the Yonge Street/Harbour Street intersection, and eliminate the “S-Curve”, concurrent with the construction of the Yonge Street off-ramp; and
- Reconstruct Yonge Street between Queens Quay East and Front Street.

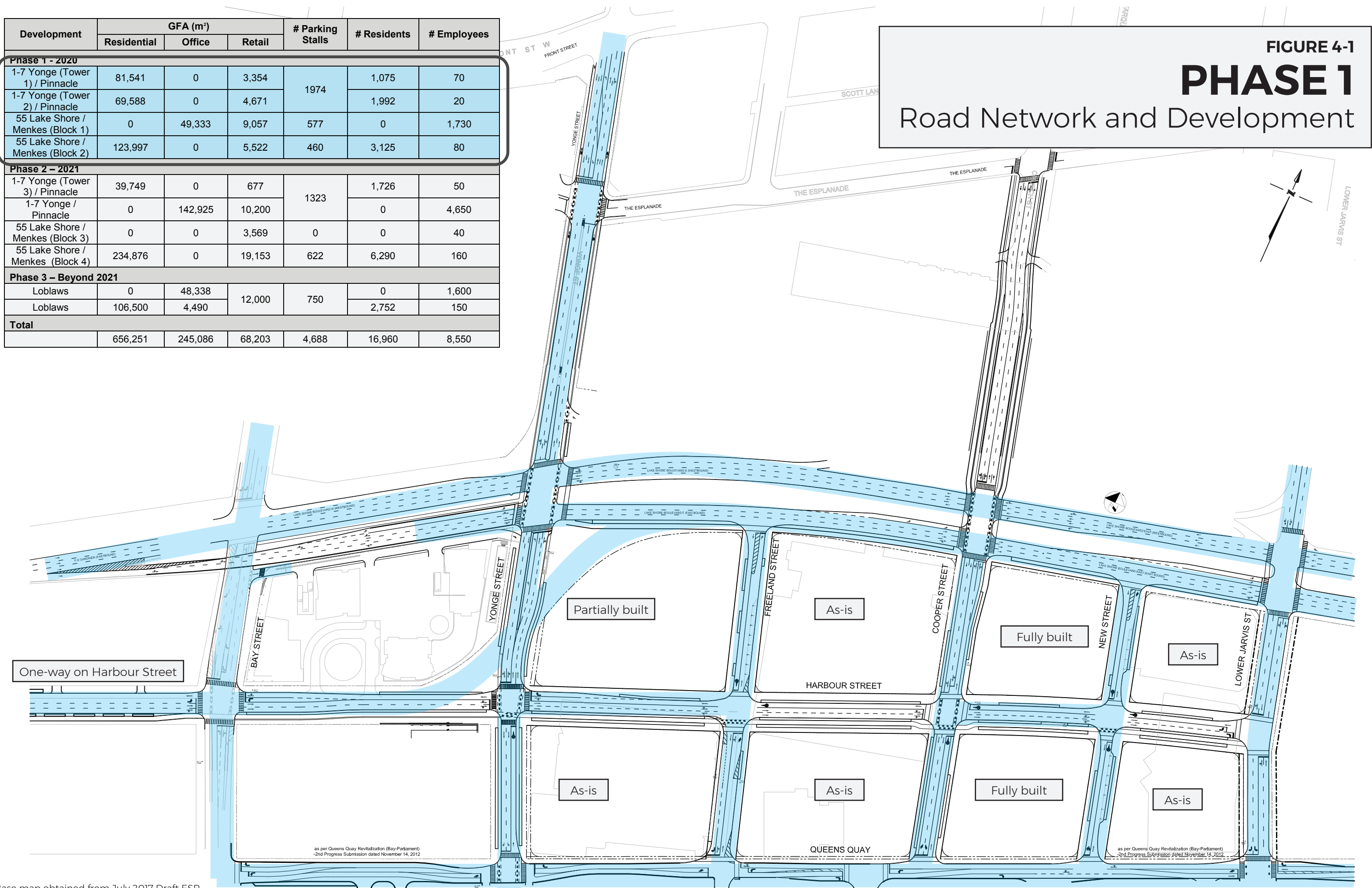
The recommended road network improvements and development phasing plans are illustrated in **Figure 4-1** through **Figure 4-4**.

The recommended improvement phasing plan is premised on the assumptions as noted in both this memo and the April 2017 memo. It is important to recognize these assumptions represent ‘test’ scenarios developed exclusively for the purpose of this sensitivity analysis, and that all proposed developments will be subject to Holding bylaw provisions to ensure adequate infrastructure is planned and funded in advance of development proceeding.

As noted in Section 2.4, the trip rates estimated for the development assume a very aggressive non-auto modal split, which must be realized for the above analysis to be valid. The developers will need to demonstrate through the development approval process that trip generation rates assumed for the Lower Yonge Precinct are achievable. Should the trip rates as evaluated in this memo not materialize, or should the demand flows clearly exceed the capacity of a majority of the study area intersections, then further analysis should be conducted to reevaluate the timing and need for improvements.

Development	GFA (m <sup>2</sup> )			# Parking Stalls	# Residents	# Employees
	Residential	Office	Retail			
<b>Phase 1 - 2020</b>						
1-7 Yonge (Tower 1) / Pinnacle	81,541	0	3,354	1974	1,075	70
1-7 Yonge (Tower 2) / Pinnacle	69,588	0	4,671		1,992	20
55 Lake Shore / Menkes (Block 1)	0	49,333	9,057	577	0	1,730
55 Lake Shore / Menkes (Block 2)	123,997	0	5,522	460	3,125	80
<b>Phase 2 - 2021</b>						
1-7 Yonge (Tower 3) / Pinnacle	39,749	0	677	1323	1,726	50
1-7 Yonge / Pinnacle	0	142,925	10,200		0	4,650
55 Lake Shore / Menkes (Block 3)	0	0	3,569	0	0	40
55 Lake Shore / Menkes (Block 4)	234,876	0	19,153	622	6,290	160
<b>Phase 3 - Beyond 2021</b>						
Loblaws	0	48,338	12,000	750	0	1,600
Loblaws	106,500	4,490			2,752	150
<b>Total</b>	<b>656,251</b>	<b>245,086</b>	<b>68,203</b>	<b>4,688</b>	<b>16,960</b>	<b>8,550</b>

**FIGURE 4-1**  
**PHASE 1**  
Road Network and Development

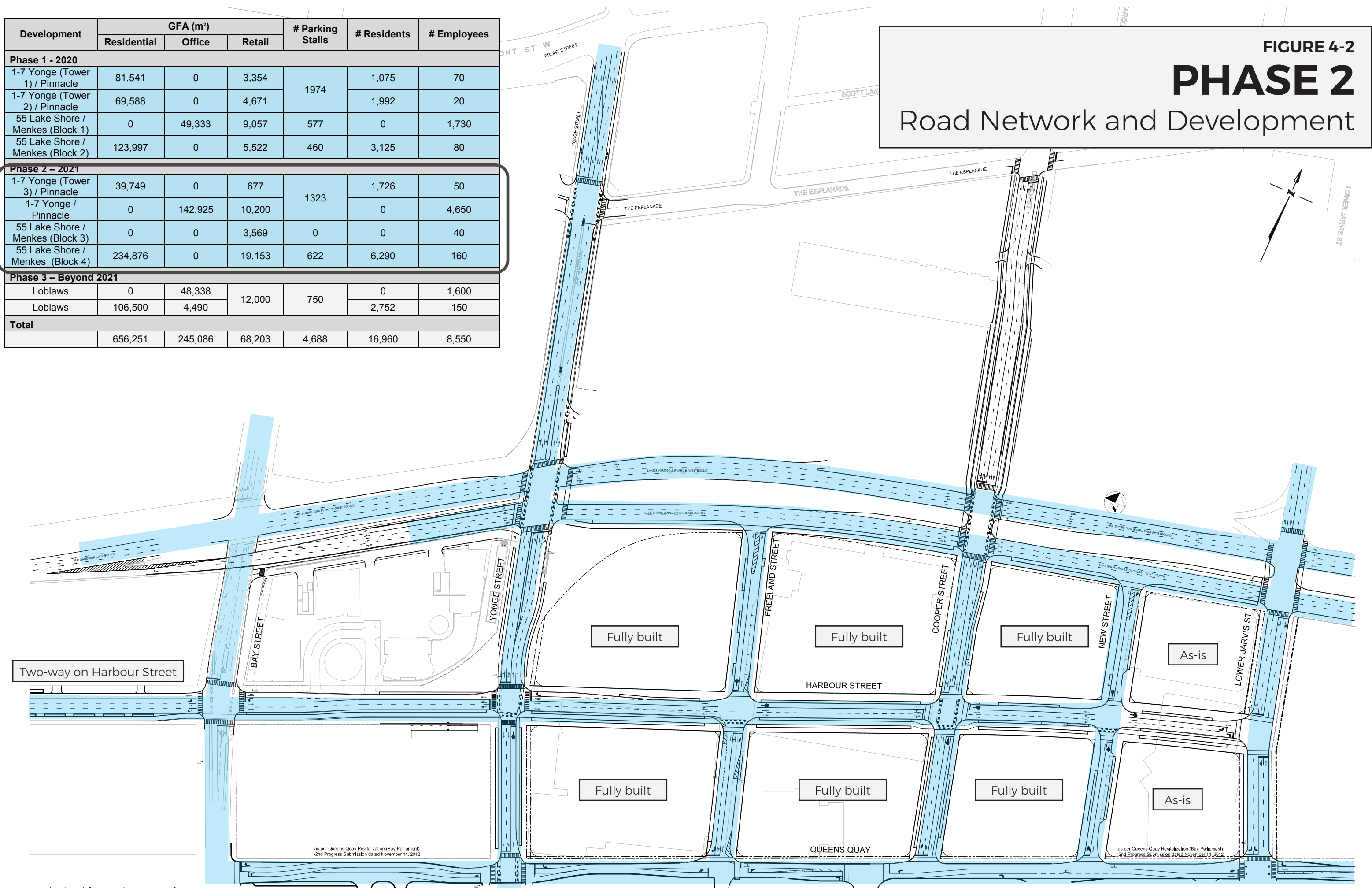


as per Queens Quay Revitalization (Bay-Parliament)  
-2nd Progress Submission dated November 14, 2012

as per Queens Quay Revitalization (Bay-Parliament)  
-2nd Progress Submission dated November 14, 2012

Development	GFA (m <sup>2</sup> )			# Parking Stalls	# Residents	# Employees
	Residential	Office	Retail			
<b>Phase 1 - 2020</b>						
1-7 Yonge (Tower 1) / Pinnacle	81,541	0	3,354	1974	1,075	70
1-7 Yonge (Tower 2) / Pinnacle	69,588	0	4,671		1,992	20
55 Lake Shore / Menkes (Block 1)	0	49,333	9,057	577	0	1,730
55 Lake Shore / Menkes (Block 2)	123,997	0	5,522	460	3,125	80
<b>Phase 2 - 2021</b>						
1-7 Yonge (Tower 3) / Pinnacle	39,749	0	677	1323	1,726	50
1-7 Yonge / Pinnacle	0	142,925	10,200		0	4,650
55 Lake Shore / Menkes (Block 3)	0	0	3,569	0	0	40
55 Lake Shore / Menkes (Block 4)	234,876	0	19,153	622	6,290	160
<b>Phase 3 - Beyond 2021</b>						
Loblaws	0	48,338	12,000	750	0	1,600
Loblaws	106,500	4,490			2,752	150
<b>Total</b>	<b>656,251</b>	<b>245,086</b>	<b>68,203</b>	<b>4,688</b>	<b>16,960</b>	<b>8,550</b>

**FIGURE 4-2**  
**PHASE 2**  
Road Network and Development

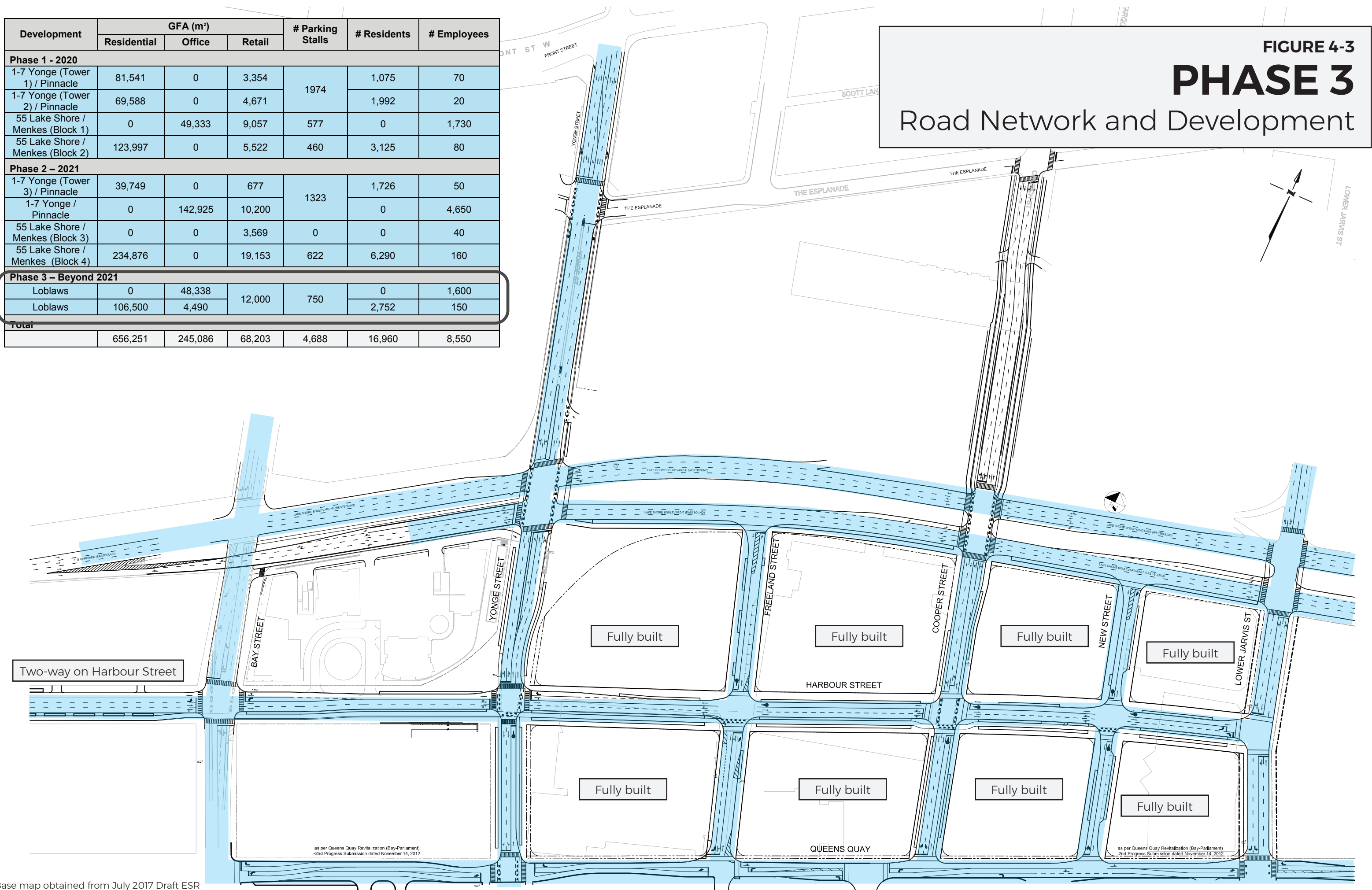


as per Queens Quay Revitalization (Bay-Parliament)  
-2nd Progress Submission dated November 14, 2012

as per Queens Quay Revitalization (Bay-Parliament)  
-2nd Progress Submission dated November 14, 2012

Development	GFA (m <sup>2</sup> )			# Parking Stalls	# Residents	# Employees
	Residential	Office	Retail			
<b>Phase 1 - 2020</b>						
1-7 Yonge (Tower 1) / Pinnacle	81,541	0	3,354	1974	1,075	70
1-7 Yonge (Tower 2) / Pinnacle	69,588	0	4,671		1,992	20
55 Lake Shore / Menkes (Block 1)	0	49,333	9,057	577	0	1,730
55 Lake Shore / Menkes (Block 2)	123,997	0	5,522	460	3,125	80
<b>Phase 2 - 2021</b>						
1-7 Yonge (Tower 3) / Pinnacle	39,749	0	677	1323	1,726	50
1-7 Yonge / Pinnacle	0	142,925	10,200		0	4,650
55 Lake Shore / Menkes (Block 3)	0	0	3,569	0	0	40
55 Lake Shore / Menkes (Block 4)	234,876	0	19,153	622	6,290	160
<b>Phase 3 - Beyond 2021</b>						
Loblaws	0	48,338	12,000	750	0	1,600
Loblaws	106,500	4,490			2,752	150
<b>Total</b>	<b>656,251</b>	<b>245,086</b>	<b>68,203</b>	<b>4,688</b>	<b>16,960</b>	<b>8,550</b>

**FIGURE 4-3**  
**PHASE 3**  
 Road Network and Development





Development	GFA (m <sup>2</sup> )			# Parking Stalls	# Residents	# Employees
	Residential	Office	Retail			
<b>Phase 1 - 2020</b>						
1-7 Yonge (Tower 1) / Pinnacle	81,541	0	3,354	1974	1,075	70
1-7 Yonge (Tower 2) / Pinnacle	69,588	0	4,671		1,992	20
55 Lake Shore / Menkes (Block 1)	0	49,333	9,057	577	0	1,730
55 Lake Shore / Menkes (Block 2)	123,997	0	5,522	460	3,125	80
<b>Phase 2 - 2021</b>						
1-7 Yonge (Tower 3) / Pinnacle	39,749	0	677	1323	1,726	50
1-7 Yonge / Pinnacle	0	142,925	10,200		0	4,650
55 Lake Shore / Menkes (Block 3)	0	0	3,569	0	0	40
55 Lake Shore / Menkes (Block 4)	234,876	0	19,153	622	6,290	160
<b>Phase 3 - Beyond 2021</b>						
Loblaws	0	48,338	12,000	750	0	1,600
Loblaws	106,500	4,490			2,752	150
<b>Total</b>	<b>656,251</b>	<b>245,086</b>	<b>68,203</b>	<b>4,688</b>	<b>16,960</b>	<b>8,550</b>

**FIGURE 4-4**  
**FINAL PHASE**  
 Road Network and Development

