



Appendix A: Multi Modal Level of Service Results



VAUGHAN



DOWNTOWN

vaughan

METROPOLITAN CENTRE



Pedestrian Level of Service – Segments

| Sidewalk Width (m) | Boulevard Width (m) | Motor Vehicle Traffic Volume (AADT) | Presence of On-street Parking | Segment PLOS | | | |
|--------------------|---------------------|-------------------------------------|-------------------------------|------------------------|----------------|----------------|------------------|
| | | | | Operating Speed (km/h) | | | |
| | | | | ≤30 | >30 or 50 | >50 or 60 | >60 ¹ |
| 2.0 or more | > 2 | ≤ 3000 | N/A | A | A | A | B |
| | | > 3000 | Yes | A | B | B | N/A |
| | | | No | A | B | C | D |
| | 0.5 to 2 | ≤ 3000 | N/A | A | A | A | B |
| | | > 3000 | Yes | A | B | C | N/A |
| | | | No | A | C | D | E |
| | 0 | ≤ 3000 | NA | A | B | C | D |
| | | > 3000 | Yes | B | B | D | N/A |
| | | | No | B | C | E | F |
| 1.8 | > 2 | ≤ 3000 | N/A | A | A | A | B |
| | | > 3000 | Yes | A | B | C | N/A |
| | | | No | A | C | D | E |
| | 0.5 to 2 | ≤ 3000 | N/A | A | B | B | D |
| | | > 3000 | Yes | A | C | C | N/A |
| | | | No | B | C | E | E |
| | 0 | ≤ 3000 | N/A | A | B | C | D |
| | | > 3000 | Yes | B | C | D | N/A |
| | | | No | C | D | F | F |
| 1.5 | > 2 | ≤ 3000 | N/A | C | C | C | C |
| | | > 3000 | Yes | C | C | D | N/A |
| | | | No | C | D | E | E |
| | 0.5 to 2 | ≤ 3000 | N/A | C | C | C | D |
| | | > 3000 | Yes | C | C | D | N/A |
| | | | No | D | E | E | E |
| | 0 | N/A | | D | E | F ² | F ² |
| <1.5 | N/A | | F ³ | F ³ | F ³ | F ³ | |
| No sidewalk | N/A | | C ⁴ | F ³ | F ³ | F ³ | |

Source: City of Ottawa’s MMLOS Analysis Guidelines





Pedestrian Level of Service – Intersections

| 5.1 Crossing Distance & Conditions | | |
|------------------------------------|-----------|---------------------|
| Total travel lanes crossed | No median | With Median (>2.4m) |
| 2 | 120 | 120 |
| 3 | 105 | 105 |
| 4 | 88 | 90 |
| 5 | 72 | 75 |
| 6 | 55 | 60 |
| 7 | 39 | 45 |
| 8 | 23 | 30 |
| 9 | 6 | 15 |
| 10 | -10 | 0 |
| Island Refuge | Points | |
| No | -4 | |
| Yes | 0 | |

| 5.3 Corner Radius | |
|-----------------------------------|--------|
| Corner radius | Points |
| Greater than 25m | -9 |
| > 15m to 25m | -8 |
| > 10m to 15m | -6 |
| > 5m to 10m | -5 |
| > 3m to 5m | -4 |
| Less than/equal to 3m | -3 |
| No right turn | 0 |
| Right turn channel with receiving | -3 |
| Right turn "smart channel" | 2 |

| 5.2 Signal Phasing & Timing Features | |
|--------------------------------------|--------|
| Left turn conflict ("Left_turns") | Points |
| Permissive | -8 |
| Protected/permissive | -8 |
| Protected | 0 |
| No left turn/prohibited | 0 |
| Right turn conflict ("Right_turns") | Points |
| Permissive or yield control | -5 |
| Protected/permissive | -5 |
| Protected | 0 |
| No right turn | 0 |
| Right turns on red ("RTOR") | Points |
| RTOR allowed | -3 |
| RTOR prohibited at certain time(s) | -2 |
| RTOR prohibited | 0 |
| Leading ped interval? ("LPI") | Points |
| No | -2 |
| Yes | 0 |

| 5.4 Crosswalk Treatment | |
|-----------------------------------|--------|
| Crosswalk treatment ("Crosswalk") | Points |
| Standard transverse markings | -7 |
| Textured/coloured pavement | -4 |
| Zebra stripe hi-vis markings | -4 |
| Raised crosswalk | 0 |

Source: City of Ottawa's MMLOS Analysis Guidelines



| Pedestrian Exposure to Traffic LOS | |
|------------------------------------|-----|
| Points threshold | LOS |
| ≥90 | A |
| ≥75 | B |
| ≥60 | C |
| ≥45 | D |
| ≥30 | E |
| <30 | F |

The pedestrian exposure to traffic LOS is assessed calculating the points using Tables 5.1 to 5.4. The pedestrian delay LOS is determined using the equation presented in table below.

| Average Pedestrian Crossing Delay Component | |
|---|-------|
| $\text{Delay} = 0.5 \times \frac{(\text{Cycle Length} - \text{Pedestrian Effective Walk Time})^2}{\text{Cycle Length}}$ | |
| < 10 s per intersection leg | LOS A |
| ≥10 to 20 sec | LOS B |
| >20 to 30 sec | LOS C |
| >30 to 40 sec | LOS D |
| >40 to 60 sec | LOS E |
| > 60 sec | LOS F |

Source: City of Ottawa's MMLOS Analysis Guidelines



Example of Pedestrian and Bicycle LOS at Segment

| Highway 7 Segment | | Edgeley Boulevard and Millway Avenue | |
|-------------------|---|--------------------------------------|-----------------------|
| | | Eastbound | Westbound |
| Pedestrian | Sidewalk Width | ≥ 2 m | ≥ 2 m |
| | Boulevard Width | > 2 m | > 2 m |
| | Avg Daily Curb Lane Traffic Volume | > 3000 | > 3000 |
| | Operating Speed On-Street Parking | > 50 to 60 km/h No | > 50 to 60 km/h No |
| Level of Service | | C | C |
| Bicycle | Type of Cycling Facility | Curbside Bike Lane | Curbside Bike Lane |
| | Number of Travel Lanes | ≥ 3 each direction | ≥ 3 each direction |
| | Operating Speed | >50 to 70 km/h | >50 to 70 km/h |
| | # of Lanes & Operating Speed LOS | D | D |
| | Bike Lane (+ Parking Lane) Width | ≥ 1.8 m | ≥ 1.8 m |
| | Bike Lane Width LOS | A | A |
| | Bike Lane Blockages | Rare | Rare |
| | Blockage LOS | A | A |
| | Median Refuge Width (no median = < 1.8 m) | - | - |
| | No. of Lanes at Unsignalized Crossing | - | - |
| | Sidestreet Operating Speed | - | - |
| | Unsignalized Crossing - Lowest LOS | - | - |
| | Level of Service | D | D |



Example of Pedestrian and Bicycle LOS at Intersection

| Intersection | | Highway 7 and Millway Avenue | | | |
|------------------|------------------------------|------------------------------|-----------------------------|-----------------------------|-----------------------------|
| Crossing Side | | North | South | East | West |
| Pedestrian | Lanes | 5 | 5 | 9 | 9 |
| | Median | No Median - 2.4 m | No Median - 2.4 m | Median > 2.4 m | Median > 2.4 m |
| | Conflicting Left Turns | Protected | Protected | Permissive | Permissive |
| | Conflicting Right Turns | Permissive or yield control | Permissive or yield control | Permissive or yield control | Permissive or yield control |
| | Right Turns on Red (RTOR)? | RTOR allowed | RTOR allowed | RTOR allowed | RTOR allowed |
| | Ped Signal Leading Interval? | No | No | No | No |
| | Right Turn Channel | No Channel | No Channel | No Channel | No Channel |
| | Corner Radius | 5-10m | 5-10m | 5-10m | 5-10m |
| | Crosswalk Type | Textured/coloured pavement | Textured/coloured pavement | Textured/coloured pavement | Textured/coloured pavement |
| | PETSI Score | 49 | 49 | -16 | -16 |
| | Ped. Exposure to Traffic LOS | D | D | F | F |
| | Cycle Length | 169 | 169 | 169 | 169 |
| | Effective Walk Time | 11 | 11 | 11 | 11 |
| | Average Pedestrian Delay | 74 | 74 | 74 | 74 |
| | Pedestrian Delay LOS | F | F | F | F |
| Level of Service | F | F | F | F | |



| Intersection | | Highway 7 and Millway Avenue | | | |
|--------------|---|------------------------------------|-------------------|------------------------------------|------------------------------------|
| Approach | | North | South | East | West |
| Bicycle | Bicycle Lane Arrangement on Approach | Curb Bike Lane, Cycle track or MUP | Mixed Traffic | Curb Bike Lane, Cycle track or MUP | Curb Bike Lane, Cycle track or MUP |
| | If Dedicated Right turn Lane, Then Right Turn Configuration, Else “-“ | Not Applicable | - | Not Applicable | Not Applicable |
| | Dedicated Right Turning Speed | Not Applicable | - | Not Applicable | Not Applicable |
| | Cyclist Through Movement LOS | Not Applicable | - | Not Applicable | Not Applicable |
| | Separated or Mixed Traffic | Separated | Mixed Traffic | Separated | Separated |
| | Left Turn Approach | ≥ 2 lanes crossed | ≥ 2 lanes crossed | 2-stage, LT box | 2-stage, LT box |
| | Operating Speed | ≤ 40 km/h | ≤ 40 km/h | > 50 to < 60 km/h | > 50 to < 60 km/h |
| | Left Turning Cyclist LOS | D | D | A | A |
| | Level of Service | D | D | A | A |
| D | | | | | |





Existing (2020) Segment PLOS Results for East – West Corridors

| Corridor | Segment | Eastbound PLOS | Westbound PLOS |
|----------------|---|----------------|----------------|
| Portage Pkwy | Applewood Cres and Edgeley Blvd | C | F |
| Portage Pkwy | Edgeley Blvd and Buttermill Ave | C | F |
| Portage Pkwy | Buttermill Ave and Millway Ave | C | F |
| Portage Pkwy | Millway Ave and Jane St | C | C |
| Apple Mill Rd | Applewood Cres and Commerce St | A | A |
| Apple Mill Rd | Commerce St and Edgeley Blvd | A | A |
| Apple Mill Rd | Edgeley Blvd and Transit Square | A | F |
| Apple Mill Rd | Transit Square and Millway Ave | A | A |
| Apple Mill Rd | Millway Ave and Jane St | A | A |
| New Park Pl | Edgeley Blvd and TTC Plaza | A | A |
| New Park Pl | TTC Plaza and Millway Ave | A | A |
| Barnes Court | West of Creditstone Road | F | F |
| McCleary Court | East of Creditstone Road | A | F |
| McCleary Court | West of Creditstone Road | F | F |
| Highway 7 | Colossus Dr and Applewood Cres | C | C |
| Highway 7 | Applewood Cres and Commerce St | C | C |
| Highway 7 | Commerce St and Edgeley Blvd | C | C |
| Highway 7 | Edgeley Blvd and Millway Ave | C | C |
| Highway 7 | Millway Ave and Jane St | C | C |
| Highway 7 | Jane St and Maplecrete Rd | C | C |
| Highway 7 | Maplecrete Rd and Creditstone Rd | C | C |
| Commerce St | Commerce St and Interchange Way (North) | F | F |
| Commerce St | Commerce St and Interchange Way (South) | A | C |
| Doughton Rd | Jane St and Maplecrete Rd | F | F |
| Doughton Rd | Maplecrete Rd and Creditstone Rd | F | F |
| Doughton Rd | East of Creditstone Road | F | C |
| Freshway Dr | East of Creditstone Road | F | B |





| Corridor | Segment | Eastbound PLOS | Westbound PLOS |
|-----------------|----------------------------------|----------------|----------------|
| Interchange Way | Commerce St and Interchange Way | B | F |
| Interchange Way | Interchange Way and Exchange Ave | A | A |
| Interchange Way | Exchange Ave and Jane St | C | A |
| Exchange Ave | West of Peelar Rd | F | F |
| Peelar Rd | Peelar Rd and Maplecrete Rd | F | F |
| Peelar Rd | Maplecrete Rd and Creditstone Rd | F | F |

Existing (2020) Segment PLOS Results for North – South Corridors

| Corridor | Segment | Northbound PLOS | Southbound PLOS |
|-----------------|----------------------------------|-----------------|-----------------|
| Applewood Cres | Portage Pkwy and Apple Mill Rd | A | F |
| Applewood Cres | Apple Mill Rd and Highway 7 | A | F |
| Commerce St | Apple Mill Rd and Highway 7 | A | A |
| Commerce St | Highway 7 and Commerce St | F | F |
| Commerce St | Commerce St and Commerce St | F | F |
| Commerce St | Commerce St and Interchange Way | F | B |
| Edgeley Blvd | Portage Pkwy and Apple Mill Rd | C | C |
| Edgeley Blvd | Apple Mill Rd and New Park Pl | C | C |
| Edgeley Blvd | New Park Pl and Highway 7 | C | D |
| Interchange Way | Highway 7 and Commerce St | A | A |
| Interchange Way | Commerce St and Commerce St | C | C |
| Interchange Way | Commerce St and Interchange Way | C | C |
| Exchange Ave | Interchange Way and Exchange Ave | F | A |
| Millway Ave | Portage Pkwy and Apple Mill Rd | A | A |
| Millway Ave | Apple Mill Rd and New Park Pl | A | A |
| Millway Ave | New Park Pl and Hwy 7 | A | A |
| Jane St | Portage Pkwy and Apple Mill Rd | F | F |





| Corridor | Segment | Northbound PLOS | Southbound PLOS |
|----------------|---|-----------------|-----------------|
| Jane St | Apple Mill Rd and Highway 7 | F | F |
| Jane St | Highway 7 and Doughton Rd | F | F |
| Jane St | Doughton Rd and Interchange Way | E | D |
| Jane St | Interchange Way and Hwy 407 WB Off-Ramp | E | D |
| Jane St | Hwy 407 WB and EB Off-Ramps | E | E |
| Peelar Rd | Interchange Way and Peelar Rd | F | F |
| Maplecrete Rd | North of Highway 7 | A | F |
| Maplecrete Rd | Highway 7 and Doughton Rd | F | F |
| Maplecrete Rd | Doughton Rd and Peelar Rd | F | F |
| Creditstone Rd | North of Barnes Ct | C | D |
| Creditstone Rd | Barnes Ct and McCleary Ct | C | D |
| Creditstone Rd | McCleary Ct and Highway 7 | C | D |
| Creditstone Rd | Highway 7 and Doughton Rd | F | F |
| Creditstone Rd | Doughton Rd and Freshway Dr | F | F |
| Creditstone Rd | Freshway Dr and Peelar Rd | F | F |
| Creditstone Rd | South of Peelar Road | F | F |

Existing (2020) Intersection PLOS Results

| Intersection | Approach | Pedestrian Exposure to Traffic LOS | Pedestrian Delay LOS |
|--|----------|------------------------------------|----------------------|
| Portage Parkway and Applewood Crescent | North | B | B |
| | South | E | B |
| | East | D | B |
| | West | E | B |
| Portage Parkway and Edgeley Blvd | North | D | B |
| | South | D | B |
| | East | C | B |
| | West | E | B |





| Intersection | Approach | Pedestrian Exposure to Traffic LOS | Pedestrian Delay LOS |
|--|----------|------------------------------------|----------------------|
| Portage Parkway and Millway Avenue | North | B | C |
| | South | E | C |
| | East | B | D |
| | West | B | D |
| Portage Parkway and Jane Street | North | F | E |
| | South | F | E |
| | East | D | E |
| | West | D | E |
| Apple Mill Road and Applewood Crescent | North | D | C |
| | South | D | C |
| | East | D | C |
| Apple Mill Road and Commerce Street | South | C | B |
| | East | C | B |
| | West | C | B |
| Apple Mill Road and Edgeley Boulevard | North | D | B |
| | South | D | B |
| | East | D | B |
| | West | D | B |
| Apple Mill Road and Millway Avenue | North | E | E |
| | South | E | E |
| | East | D | D |
| | West | D | D |
| Apple Mill Road and Jane Street | North | C | F |
| | South | D | F |
| | West | D | F |
| Creditstone Road and McCleary Court | North | D | B |
| | South | D | B |
| | East | B | B |
| | West | B | B |
| Highway 7 and Colossus Drive | North | B | E |
| | West | C | E |
| Highway 7 and Applewood Crescent | North | F | E |
| | East | F | E |





| Intersection | Approach | Pedestrian Exposure to Traffic LOS | Pedestrian Delay LOS |
|-------------------------------------|----------|------------------------------------|----------------------|
| Highway 7 and Commerce Street | North | D | E |
| | South | B | E |
| | East | F | E |
| | West | F | E |
| Highway 7 and Edgeley Blvd | North | D | F |
| | South | D | F |
| | East | F | F |
| | West | F | F |
| Highway 7 and Millway Ave | North | D | F |
| | South | D | F |
| | East | F | F |
| | West | F | F |
| Highway 7 and Jane Street | North | E | F |
| | South | E | F |
| | East | F | F |
| | West | F | F |
| Highway 7 and Maplecrete Road | North | B | F |
| | South | B | F |
| | East | F | F |
| | West | F | F |
| Highway 7 and Creditstone Road | North | D | F |
| | South | B | F |
| | East | F | F |
| | West | F | F |
| Interchange Way and Interchange Way | North | C | D |
| | East | B | D |
| | West | B | D |
| Jane Street and Doughton Road | North | D | F |
| | East | C | F |
| Jane Street and Interchange Way | North | F | F |
| | South | F | F |
| | East | B | F |
| | West | D | F |





| Intersection | Approach | Pedestrian Exposure to Traffic LOS | Pedestrian Delay LOS |
|---|----------|------------------------------------|----------------------|
| Jane Street and Highway 407 WB Off-Ramp | North | F | E |
| | West | B | E |
| Jane Street and Highway 407 EB Off-Ramp | South | D | E |
| | West | B | E |

