22 King Street South, Suite 300
Waterloo, ON N2J 1N8
p: 519.896.3163
905.381.2229
f: 1.855.764.7349

www.ptsl.com

September 25, 2017
Project: 170208

Glenn Wellings, MCIP, RPP
Wellings Planning Consultants Inc.
513 Locust Street, Unit B
Burlington ON L7S 1V3

Dear Mr. Wellings:

RE: 2076 – 2086 MEADOWBROOK ROAD, CITY OF BURLINGTON TRANSPORTATION BRIEF

Paradigm Transportation Solutions Limited has been retained by 1053052 Ontario Inc. to prepare a transportation brief for the proposed redevelopment of 2076 and 2086 Meadowbrook Road in Burlington, Ontario. This letter summarizes:

- existing transportation conditions near the subject site;
- area background traffic growth estimates;
- site-generated traffic forecasts;
- roadway capacity assessment;
- sight distance assessment; and
- mitigation recommendations regarding forecast traffic.

Figure 1 illustrates the subject site location.

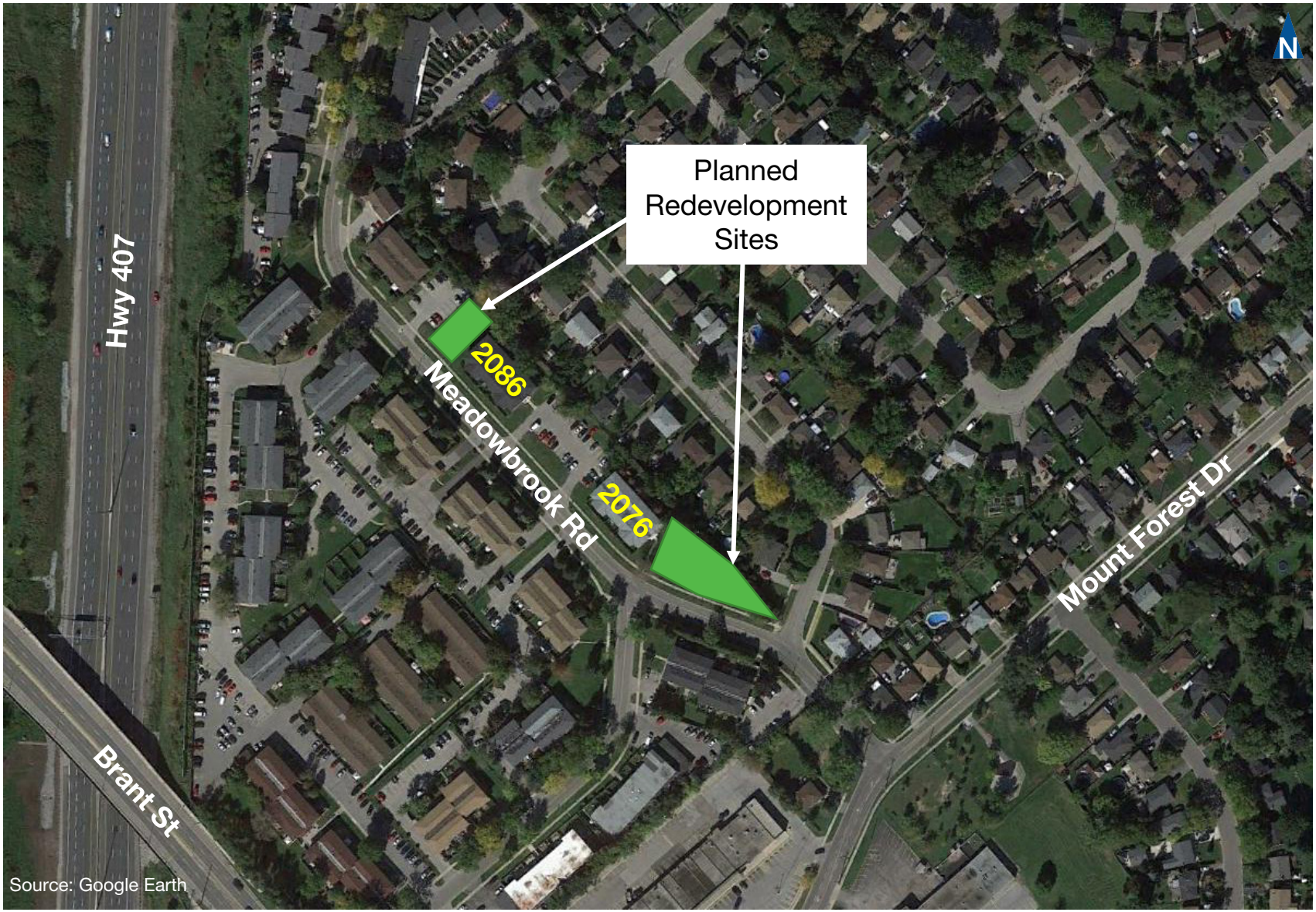
The subject site is anticipated to be fully built and occupied in 2018. This study will assess build-out horizon to determine if Meadowbrook Road has sufficient capacity to accommodate the proposed redevelopment plans.

Existing Transportation Conditions

Roadways

Meadowbrook Road is the roadway that will be most impacted by the application. This roadway is classified as a local roadway as per the City's Official Plan (OP)[1]. Meadowbrook Road has a two-lane

[1] Official Plan of the Burlington Planning Area, City of Burlington, July 2015



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Location of Subject Sites

urban cross-section. Sidewalks are provided on both sides of the roadway. Cycling facilities (bike lanes, multi-use path) are not provided. Parking is prohibited on both sides of the roadway. The speed limit is not posted; therefore, it is assumed to be 50 kilometres per hour. The immediately surrounding land use is residential in nature.

Transit Service

Transit service is not provided on Meadowbrook Road; however, **Route 12 Upper Middle** operates on Mount Forest Drive at the southerly terminus of Meadowbrook Road. Route 12 provides service between the Burlington GO station and the area of Dundas Street and Appleby Line. As of September 3, 2017, service will be provided seven days per week as follows:

- Monday to Friday service operates from about 6:00 AM to 10:30 PM on 30-minute headways during peak periods and 60-minute headways during the midday and evening periods.
- Saturday service operates from about 7:30 AM to 10:30 PM on 60-minute headways; and
- Sunday service operates from about 8:30 AM to 6:30 PM on 60-minute headways.

The closest eastbound and westbound stops are located on Mount Forest Drive at Tyrrell Road approximately 350 metres from the subject site.

Figure 2 illustrates the existing Burlington Transit service in the study area.

Traffic Volumes

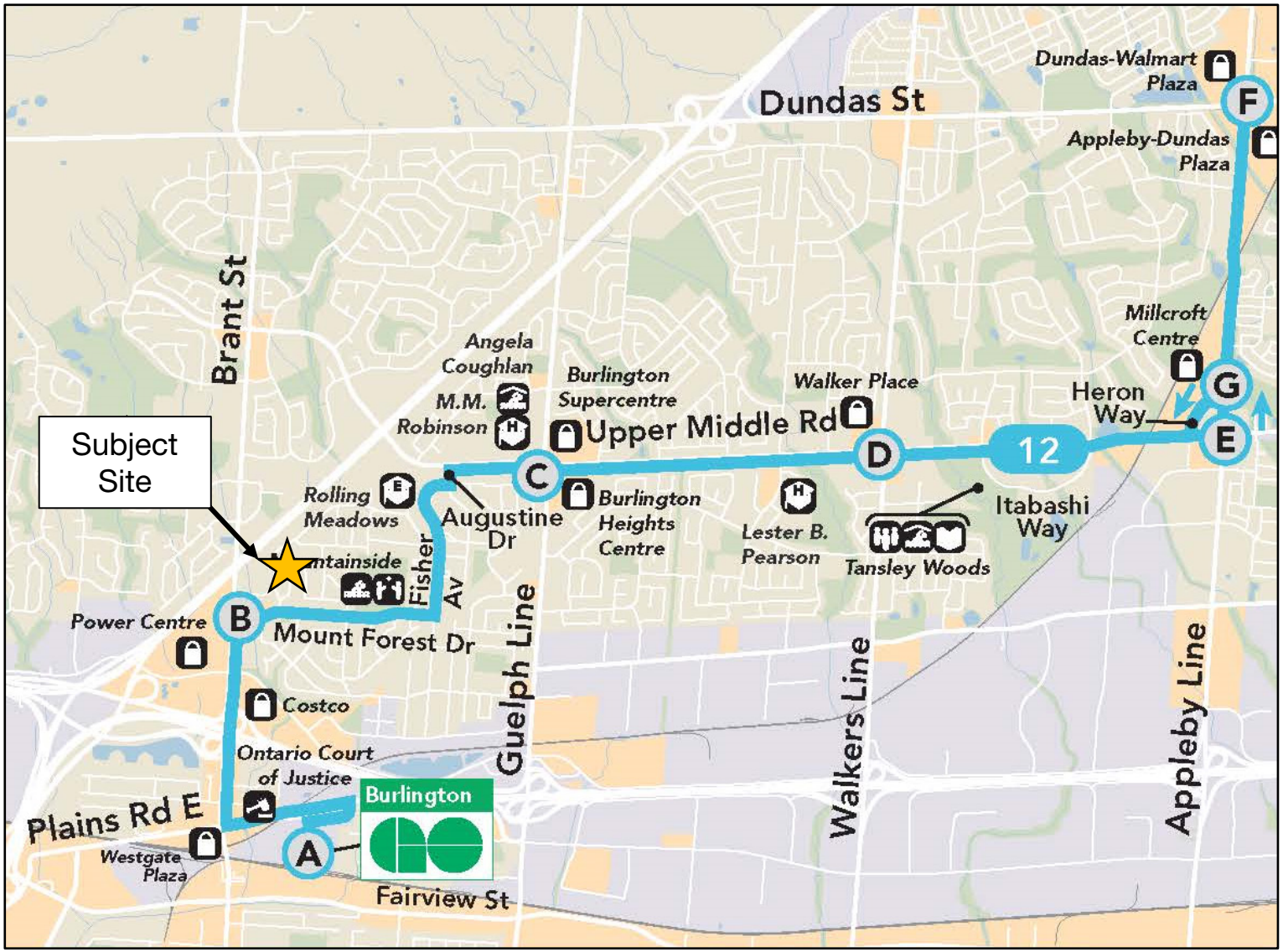
Paradigm conducted AM and PM peak period turning movement counts on Meadowbrook Road across the frontage of the site to establish baseline conditions to be used in the analyses. These counts were conducted on Thursday, August 17, 2017. **Figure 3** summarizes the existing AM and PM peak hour traffic volumes.

Appendix A contains the detailed count data.

Meadowbrook Road Existing Functional Classification

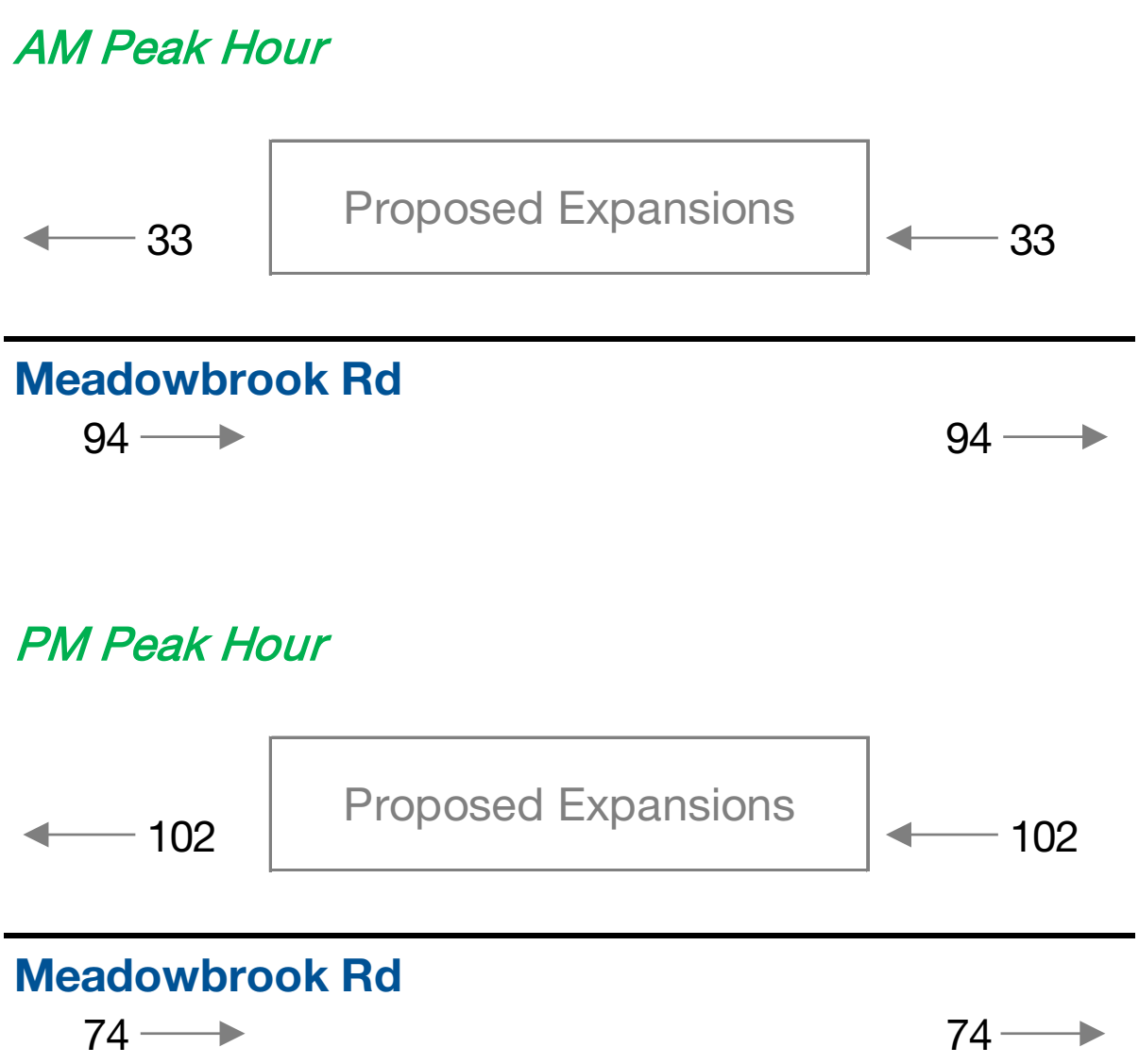
As outlined above, Meadowbrook Road is classified as a local roadway. As per the City's OP, local roads have a daily maximum traffic volume of up to 3,000 vehicles per day (vpd). Meadowbrook Road currently accommodates about 1,760 vpd which is within the daily volume range of a local road.





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Study Area Transit Service



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Existing Peak Hour Traffic Volumes

Proposed Development Description

The development proposal includes redevelopment of both 2076 and 2086 Meadowbrook Road in the City of Burlington. The redevelopments are planned as follows:

2076 Meadowbrook Road

- Four townhouse units on the eastern portion of the existing development with each townhouse having a direct driveway connection to Meadowbrook Road.

2086 Meadowbrook Road

- Three townhouse units on the western portion of the existing development with each townhouse having a direct driveway connection to Meadowbrook Road.

The anticipated build-out year is 2018.

Figure 4 and **Figure 5** illustrate the proposed site plans.

Development Trip Generation

The vehicle trips generated by the proposed redevelopments were estimated for the AM and PM peak hours using the ITE Trip Generation[2]. The average trip generation rates for Land Use Code (LUC) 230 Condominium/Townhouse were used to calculate the site-generated trips for each parcel. The average rates were utilized due to the small number of units proposed. **Table 1** shows the resulting trip generation estimates which indicate that the redevelopments are estimated to generate a total of 3 trips in the AM peak hour and 4 trips in the PM peak hour.

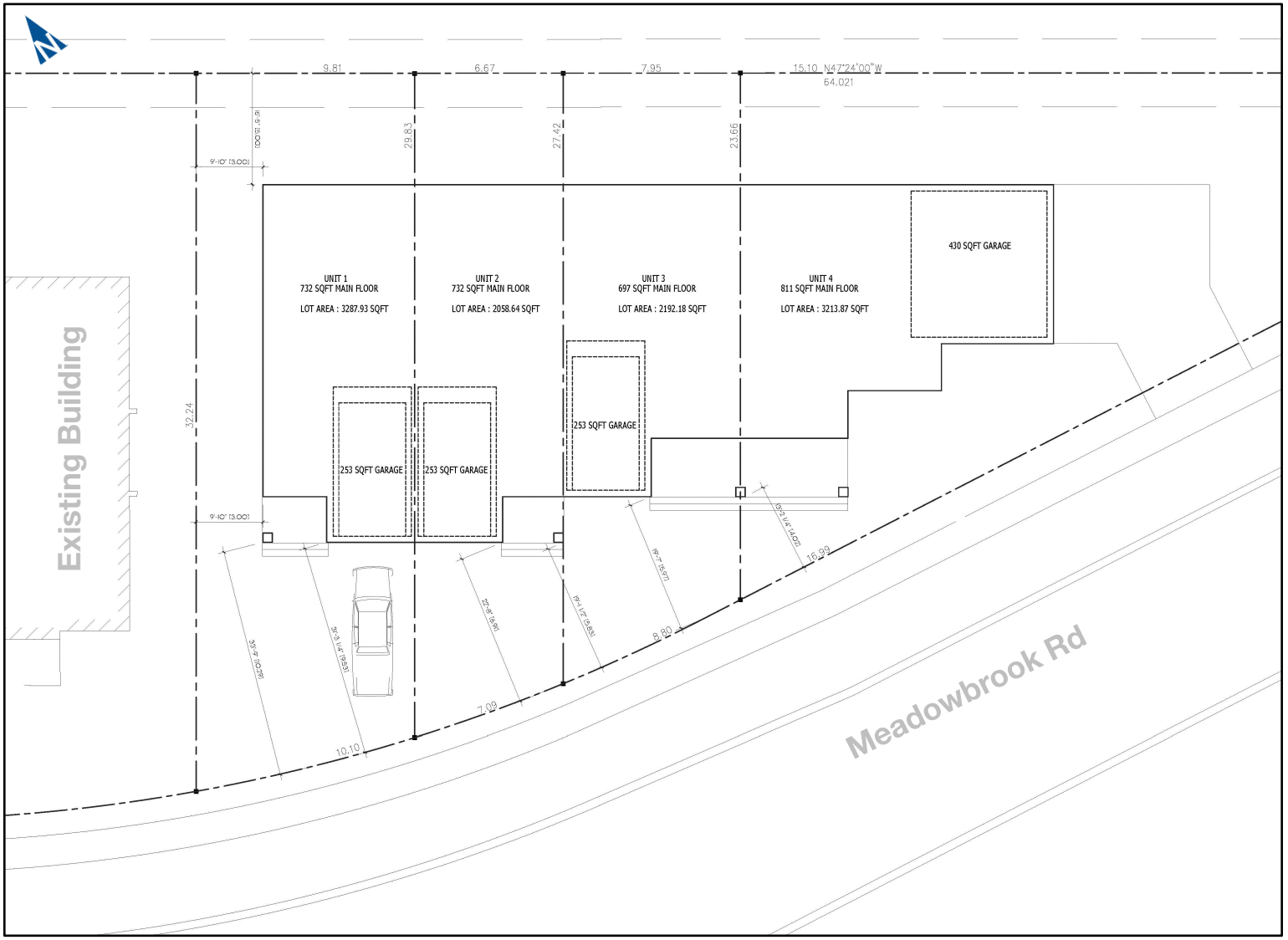
TABLE 1: ESTIMATED TRIP GENERATION

Land Use Code	Independent Variable		AM Peak Hour				PM Peak Hour			
			Rate	In	Out	Total	Rate	In	Out	Total
LUC 230 Condo/Townhouse (west)	3	Units	0.44	0	1	1	0.52	1	1	2
LUC 230 Condo/Townhouse (east)	4	Units	0.44	0	2	2	0.52	1	1	2
TOTAL						**3**				**4**

Note that trip assignment was not conducted since each unit will have a separate driveway connection to Meadowbrook Road. As well, the intent of this brief is to assess the mainline volumes on Meadowbrook Road, not intersection level of service.

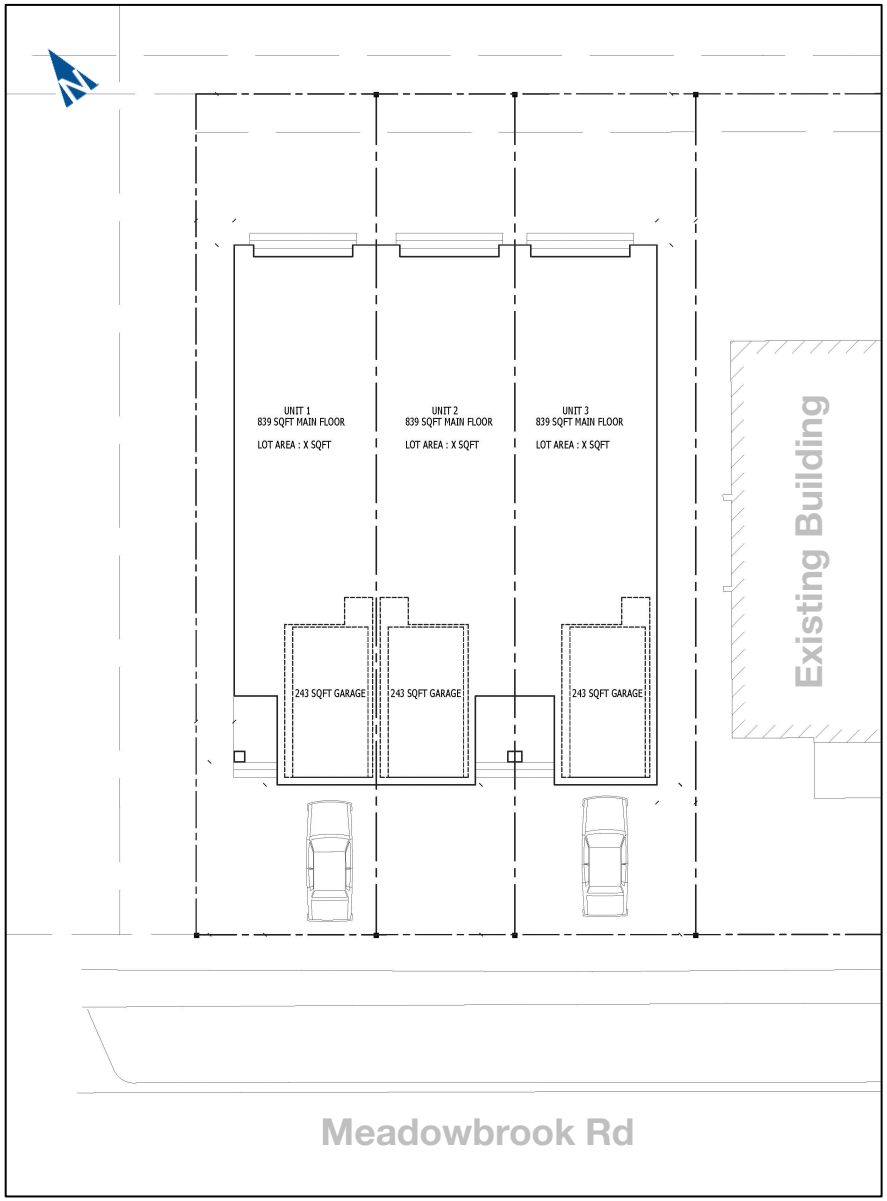
[2] Trip Generation 9th Edition, Institute of Transportation Engineers, Washington, D.C., 2012





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Site Plan – 2076 Meadowbrook Road



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Site Plan – 2086 Meadowbrook Road

2018 Background Traffic Volumes

To derive the 2018 background traffic volumes, a growth rate of 1% per annum was applied to the existing traffic volumes. This rate of growth was confirmed by City of Burlington staff during the pre-study consultation undertaken prior to commencing this report. The daily volume is estimated to be increased by approximately 18 vpd to 1,786 vpd at the 2018 horizon which is within the daily volume range of a local road.

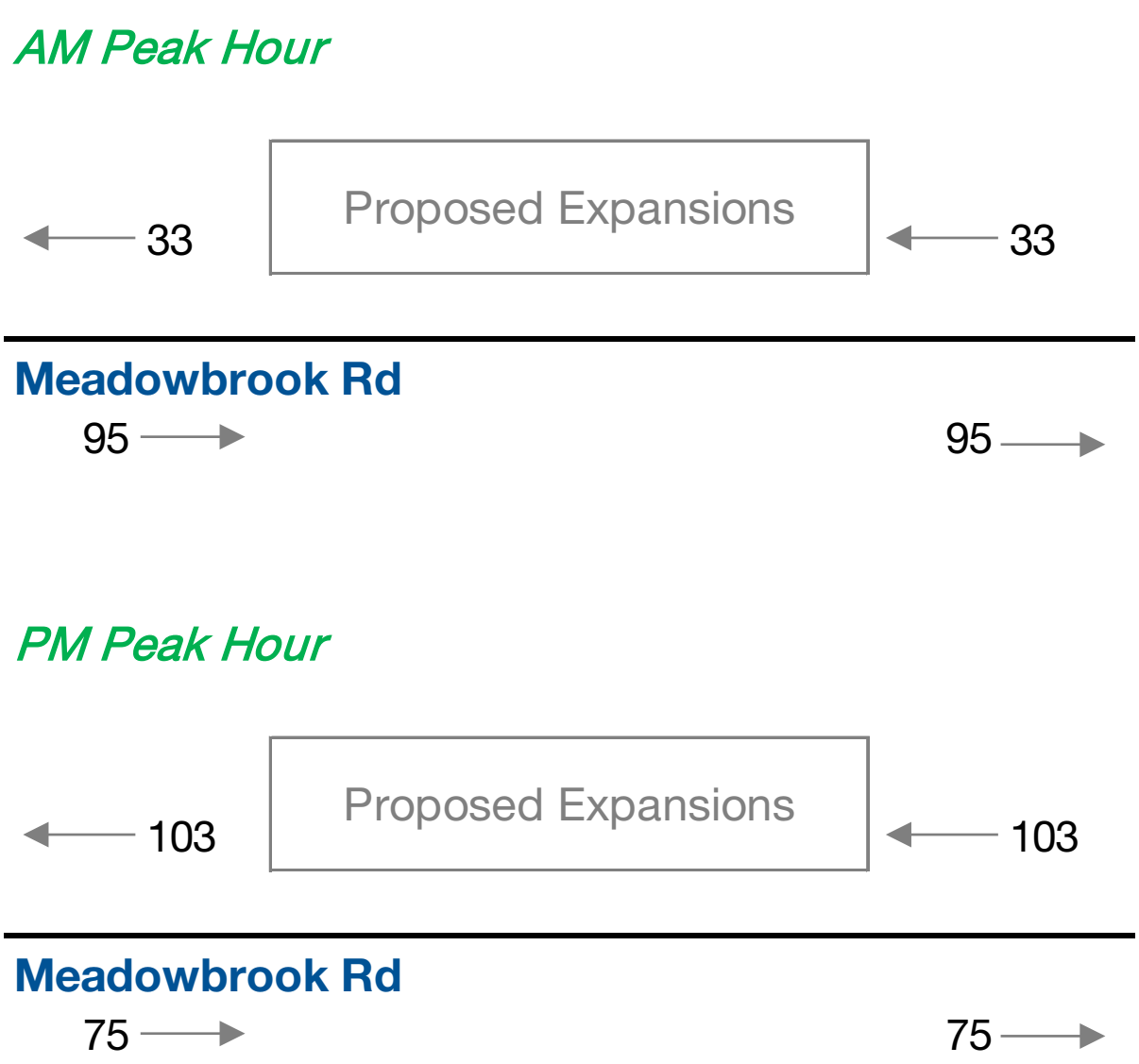
Figure 6 shows the resulting AM and PM peak hour 2018 background traffic volumes.

2018 Future Total Traffic Volumes

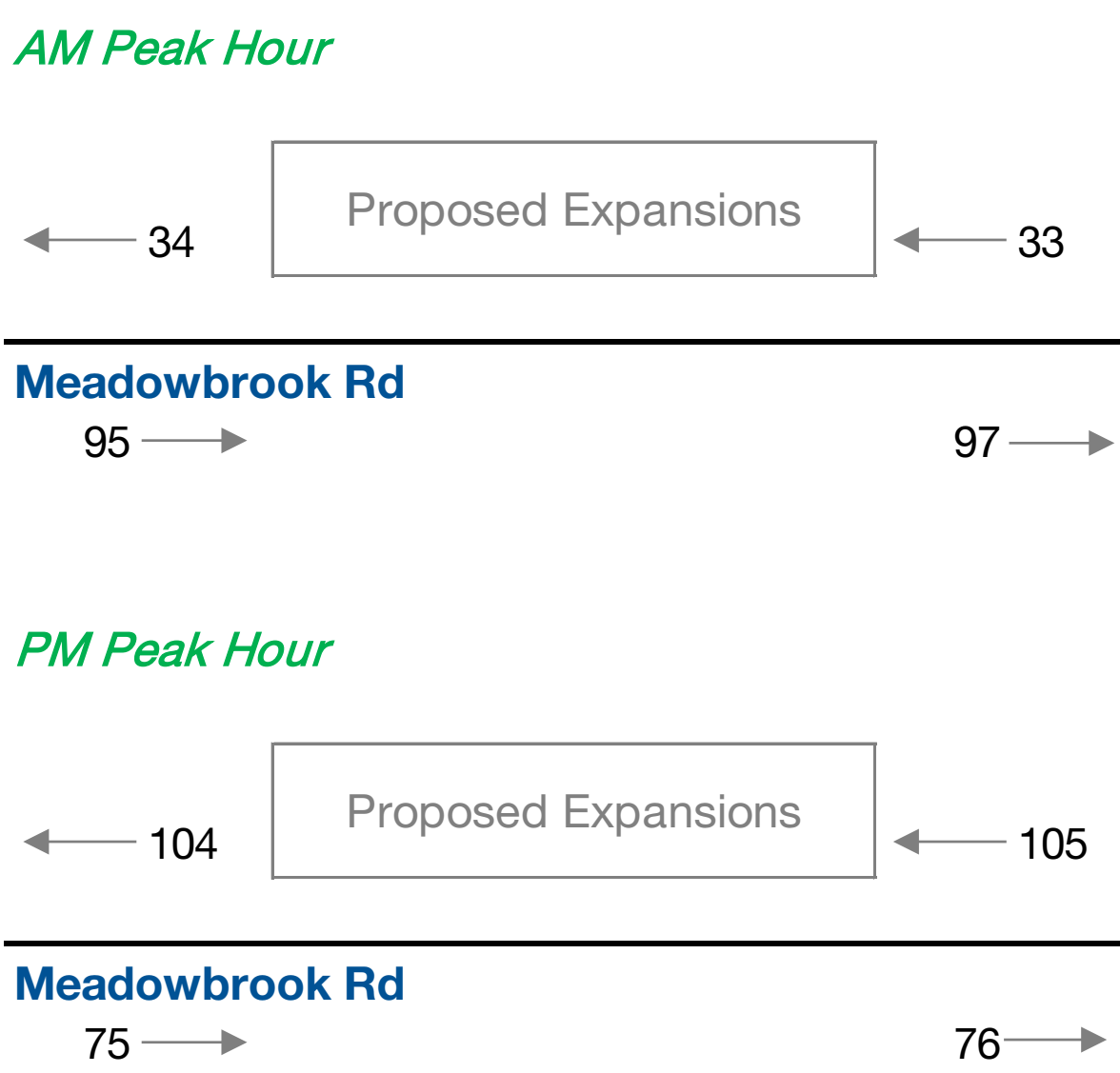
The estimated site-generated trips (**Table 1**) were added to the 2018 background traffic (**Figure 6**) to produce the 2018 future total traffic volumes shown in **Figure 7**. With inclusion of the site-generated traffic, the daily volume on Meadowbrook Road increases by 28 vpd to 1,806 vpd which is within the daily volume range of a local road.

Overall, Meadowbrook Road will be able to accommodate the minor increase in traffic due the proposed redevelopments without the need for remedial measures.





2018 Background Peak Hour Traffic Volumes



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2018 Future Total Peak Hour Traffic Volumes

Sight Distance Assessment

The driveway serving the most easterly townhouse (at 2076 Meadowbrook Road) was assessed to determine if sufficient sight distance is available.

The Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads[3] Chapter 2.5 (Sight Distance), Section 2.5.1 (Introduction)[4] states:

"Depending on the specific circumstances, the designer may use different measurements of sight distance, including: stopping sight distance, passing sight distance, and decision sight distance".

"In many applications, one of these types of sight distance will govern, and the designer need satisfy only one requirement".

Sight distance measurements were taken at the proposed driveway connection to Meadowbrook Road. The main measurements were taken from a point five metres from the centerline of the driveway (the rear of a vehicle turning into the driveway) with a target object height of 0.60 metres (as per TAC) along a line of sight to the furthest point in the respective direction at 1.08 metres above the pavement (the height of a driver's eye).

The TAC Guide Chapter 2.5 (Sight Distance), Section 2.5.3 (Stopping Sight Distance)[5] states that the *"Stopping sight distance is the sum of the distance travelled during the perception and reaction time and the braking distance"* where the brake reaction time is 2.5 seconds. Based on a design speed of 60 kilometres per hour (10 kilometres per hour over the assumed speed limit), the minimum stopping sight distance for design is 65 metres.

A sight distance measurement was taken toward the west at the proposed easterly townhouse driveway connection to Meadowbrook Road and was determined to be approximately 95 metres which exceeds the minimum stopping sight distance criteria.

Conclusions

Based on the analyses contained in the report, it is concluded that:

- **Existing Functional Classification:** Meadowbrook Road is currently classified as a local roadway under the City's Official Plan. Under this classification, daily two-way traffic should not exceed 3,000 vehicles.
- **Existing Traffic:** Meadowbrook Road currently accommodates about 1,760 vehicles per day which is within the daily volume range of a local road.
- **Development Generated Traffic:** The subject site is forecast to generate three trips during the weekday AM peak hour and four trips during the weekday PM peak hour.

[3] Geometric Design Guide for Canadian Roads, Transportation Association of Canada, June 2017
[4] TAC Guide, page 35
[5] TAC Guide, page 38

- **2018 Background Traffic:** The daily volume is estimated to be increased by approximately 18 vpd to 1,786 vpd at the 2018 horizon which is within the daily volume range of a local road.
- **2018 Future Total Traffic:** With inclusion of the site-generated traffic, the daily volume on Meadowbrook Road increases by 28 vpd to 1,806 vpd which is well within the daily volume range of a local road.
- **Remedial Measures:** No remedial measures will be required to accommodate the increase in traffic due to the proposed redevelopments.
- **Sight Distance:** Minimum stopping sight distance criteria are exceeded toward the west at the easterly townhouse driveway connection to Meadowbrook Road.

Recommendations

Based on the findings of this study, it is recommended that:

- The City recognize the conclusions drawn above; and
- The proposed redevelopments proceed as planned.

Yours very truly,

PARADIGM TRANSPORTATION SOLUTIONS LIMITED



Stew Elkins
BES, MITE
Vice-President

Appendix A

Detailed Traffic Counts



Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 jjuhlke@ptsl.com

Count Name: 2076 - 2086 Meadowbrook Road
Site Code:
Start Date: 08/17/2017

Direction (Westbound)

Start Time	Lights	Mediums	Articulated Trucks	Total
7:00 AM	2	0	0	2
7:15 AM	8	0	0	8
7:30 AM	10	0	0	10
7:45 AM	10	0	0	10
8:00 AM	7	0	0	7
8:15 AM	5	1	0	6
8:30 AM	5	0	1	6
8:45 AM	14	0	0	14
3:00 PM	9	0	0	9
3:15 PM	19	1	0	20
3:30 PM	16	0	0	16
3:45 PM	16	0	0	16
4:00 PM	24	0	0	24
4:15 PM	17	0	0	17
4:30 PM	15	0	0	15
4:45 PM	18	0	0	18
5:00 PM	31	0	0	31
5:15 PM	25	0	0	25
5:30 PM	25	0	0	25
5:45 PM	21	0	0	21
Total	297	2	1	300
Total %	99.0	0.7	0.3	100.0
AM Times	8:00 AM	7:30 AM	7:45 AM	8:00 AM
AM Peaks	31	1	1	33
PM Times	5:00 PM	3:00 PM	3:00 PM	5:00 PM
PM Peaks	102	1	0	102

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Count Name: 2076 - 2086 Meadowbrook Road
Site Code:
Start Date: 08/17/2017

Direction (Eastbound)

Start Time	Lights	Mediums	Articulated Trucks	Total
7:00 AM	6	0	0	6
7:15 AM	19	0	0	19
7:30 AM	9	1	0	10
7:45 AM	25	0	0	25
8:00 AM	20	0	0	20
8:15 AM	24	0	0	24
8:30 AM	27	0	0	27
8:45 AM	22	1	0	23
3:00 PM	10	0	0	10
3:15 PM	14	0	0	14
3:30 PM	13	0	0	13
3:45 PM	9	1	0	10
4:00 PM	8	0	0	8
4:15 PM	13	0	0	13
4:30 PM	17	1	0	18
4:45 PM	11	0	0	11
5:00 PM	20	0	0	20
5:15 PM	20	0	0	20
5:30 PM	15	0	0	15
5:45 PM	19	0	0	19
Total	321	4	0	325
Total %	98.8	1.2	0.0	100.0
AM Times	8:00 AM	7:30 AM	7:45 AM	8:00 AM
AM Peaks	93	1	0	94
PM Times	5:00 PM	3:00 PM	3:00 PM	5:00 PM
PM Peaks	74	1	0	74

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