

**MAY 26, 2021**

**REFER TO FILE: 1923 - 5641**

Municipality of Meaford  
21 Trowbridge Street West  
Meaford, ON N4L 1N2

**Attention: Liz Buckton**  
**Manager of Development Services**

**RE: 425 UNION STREET**  
**TRAFFIC OPINION LETTER**  
**MUNICIPALITY OF MEAFORD, COUNTY OF GREY**

Dear Liz,

This letter has been prepared to support the Draft Plan Application for the proposed residential development at 425 Union Street in the Municipality of Meaford ('Meaford'). This letter assesses the expected trip generation of the residential units and reviews the access and safety aspects of the proposed development.

### **1. Existing Conditions**

The site is approximately 5.2 hectares in size and is located to the south of Russet Drive. The site is bound by vacant lands to the north and south, residential dwellings and Union Street to the east, and residential dwellings and Centre Street to the west. Currently the site consists of vacant residential lands with mixed tree and grass cover.

### **2. Development Proposal**

The proposed development consists of 48 single-detached dwelling units and 38 semi-detached dwelling units, totalling 86 dwelling units. Access to the site will be provided by a single east-west urban road "Street A", which will bisect the site and provide access to Union Street and Centre Street. Within the development itself, private roads will connect to "Street A" in crescents on both the north and south sides of "Street A" to provide access to the interior dwelling units. The proposed Draft Plan prepared by Travis and Associates dated May 20<sup>th</sup>, 2021 has been included as **Attachment A**.

### **3. Boundary Road Network**

As noted, the site will provide access to both Centre Street and Union Street. While not posted, the speed limits for both Centre Street and Union Street were identified as 40 km/h on the Grey County GIS. Centre Street and Union Street are north-south local roadways under the jurisdiction of Meaford. The roadways have a rural cross-section and are paved with two lanes; however, neither roadway has pavement markings. Pedestrian and cycling facilities are not provided on either road.

#### 4. Trip Generation

The Institute of Transportation Engineers (ITE) Trip Generation Manual, 10<sup>th</sup> Edition was used to forecast the trips generated by the proposed residential development. Land Use Category (LUC) 210 "Single-Family Detached Housing" and Land Use Category (LUC) 220 "Multifamily Housing (Low-Rise)" were utilized.

**Table 1** outlines the peak hour trips expected to be generated by the proposed development. Relevant excerpts from the ITE Trip Generation Manual, 10<sup>th</sup> Edition have been included as **Attachment B**.

**Table 1: ITE Trip Generation**

Land Use Code	Units	Peak Hour	In	Out	Total
210	48	A.M.	10	29	39
		P.M.	31	19	50
220	38	A.M.	4	15	19
		P.M.	16	9	25
Totals		A.M.	14	44	58
		P.M.	47	28	75

#### 5. Impacts

Based on the location of the development, most employment/commercial areas within Meaford are located to the north of the site. Vehicles travelling into downtown Meaford would likely travel north on Centre Street or Union Street towards Paul Street which provides a connection to Sykes Street (Highway 26).

Outside of Meaford, nearby employment and retail generators include the City of Owen Sound, located west of the development, and the Town of Collingwood and the Town of the Blue Mountains which are located to the east of the development.

Vehicles destined for Owen Sound could utilize the Paul Street and Sykes Street intersection. Alternatively, to by-pass the downtown corridor, vehicles could utilize Miller Street (County Road 12) and 7<sup>th</sup> Line to access Highway 26. Vehicles destined towards the south/east are expected to travel south on Centre Street and Union Street towards Muir Street (Side Road 13) to access Highway 26.

Given the diffusion of traffic through multiple routes within and beyond Meaford, traffic operational issues at any given intersection are not expected.

#### 6. Sight Distance

A sight distance assessment was completed to demonstrate that the proposed accesses provide sufficient stopping and intersection sight distances on Centre Street and Union Street. The minimum stopping sight distance requirements are outlined in Meaford's Engineering Standards, and the minimum intersection sight distance requirements were obtained from the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (GDGCR).

As noted previously, the Grey County GIS indicates that Centre Street and Union Street have speed limits of 40 km/h. Per Meaford's Engineering Standards, urban roadways should have a design speed of 60 km/h. While Centre Street and Union Street have rural cross-sections, they are local roadways

and are within the urban boundary of Meaford, therefore a design speed of 60 km/h is considered appropriate.

**Table 2** outlines the minimum stopping and intersection sight distance requirements per the Engineering Standards and TAC, along with the available sight distance at the accesses. Per the Engineering Standards, urban roadways should have a minimum stopping sight distance of 45 metres. Relevant excerpts from the Engineering Standards have been included in **Attachment C**.

Section 9.9 of the TAC GDGCR provides intersection sight distance for different intersection control types. For these accesses, the applicable cases include "Case B1 – Left turns from the minor road", and "Case B2 – Right turns from the minor road". Comparing these cases, Case B1 has the greatest sight distance requirement of 130 metres for 60 km/h design speed roads. The required intersection sight distance was taken from "Table 9.9.4" as outlined in **Attachment D**.

**Table 2: Sight Distance**

Access	Oncoming Traffic	Stopping Sight Distance		Intersection Sight Distance	
		Minimum Standard	Available Distance	Minimum Standard	Available Distance
Union Street	Northbound	45 m	>200m	130 m	>200m
	Southbound	45 m	>500m	130 m	>500m
Centre Street	Northbound	45 m	>200m	130 m	>200m
	Southbound	45 m	>500m	130 m	>500m

As summarized above, the available sight distance exceeds the minimum sight distance requirements. To the south, there is available sight distance to the t-intersections at Muir Street. To the north, sight distance is available past Russett Drive. Accordingly, the proposed development can be supported from a sight distance perspective.

## 7. Geometric Standards

At this point in the development application process, detailed design of the site including the internal roadways has not been completed. The geometry of the roadways will be confirmed through detailed design. Generally, the key standards outlined in Meaford's Engineering Standards are as follows:

- Urban roads should have a minimum pavement width of 8.5 metres,
- The minimum edge of pavement radius at intersections should be 9.0 metres
- The minimum centerline curve radius of the roadway should be 55 metres
- The minimum daylighting triangles at all intersections should be 5mx5m
- STD DWG No. 1 – Typical Road Cross-Section and Service Locations (20m ROW)

The above standards are included in **Attachment C**

## 8. Conclusions

The proposed development is forecasted to generate 58 and 75 two-way trips in the weekday a.m. and p.m. peak hour. Trips are expected to travel towards downtown Meaford, west to Owen Sound or east towards the Town of Collingwood and Town of the Blue Mountains.

Given the diffusion of traffic through multiple routes within and beyond Meaford, traffic operational issues at any given intersection are not expected.

The available intersection and stopping sight distance to the north and south on Union Street and Centre Street exceed the minimum requirements outlined in Meaford's Engineering Standards and the TAC GDGCR. Accordingly, the proposed development can be supported from a sight distance perspective.

Based on the above, the proposed development can be supported from a transportation perspective. Any minor changes to the plan will not affect the conclusions in this letter. Should you have any questions or require any further information, please do not hesitate to contact the undersigned.

Yours truly,

**C.F. CROZIER & ASSOCIATES INC.**



Madeleine Ferguson, P.Eng.  
Project Engineer, Transportation

**C.F. CROZIER & ASSOCIATES INC.**



Emma Howlett, EIT  
Engineering Intern, Transportation

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Encl.

**Attachment A:** Draft Plan (May 20th, 2021)

**Attachment B:** ITE Trip Generation Manual Excerpts

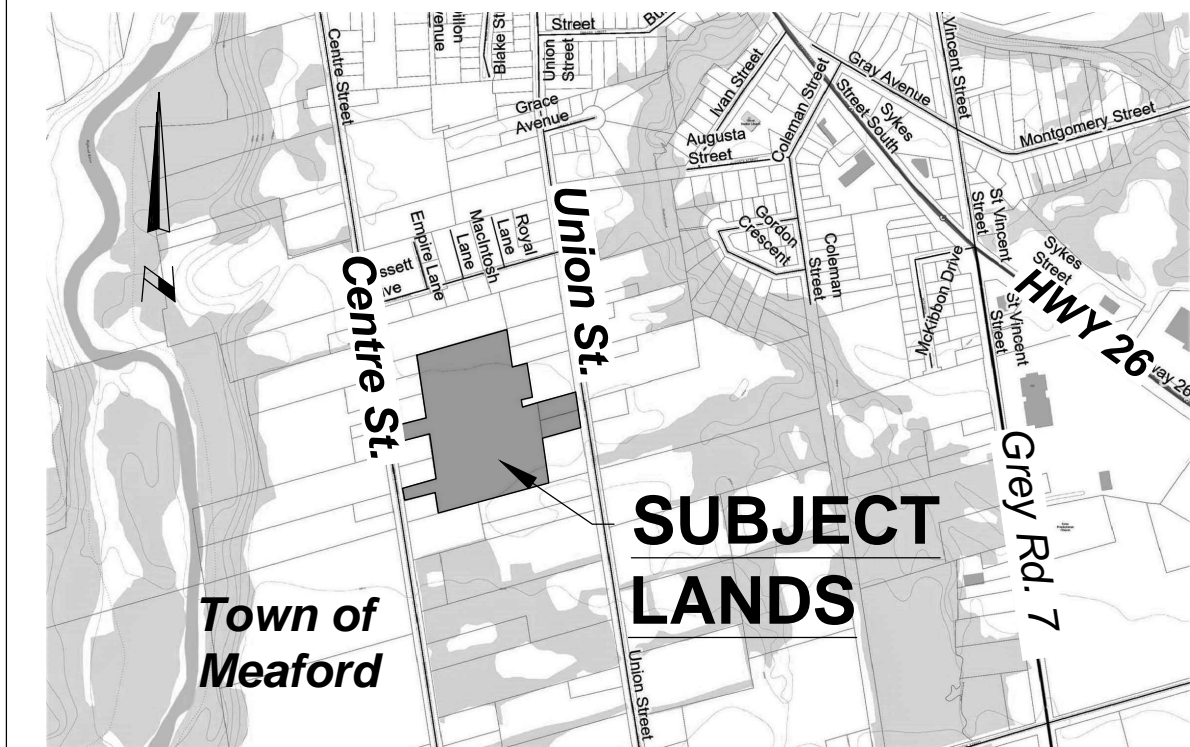
**Attachment C:** Municipality of Meaford's Engineering Standards Excerpts

**Attachment D:** TAC Excerpts

# **Attachment A**

## Draft Plan (May 20th, 2021)





KEY MAP n.t.s.

**DRAFT PLAN OF SUBDIVISION OF  
PART OF LOTS  
421, 422, 423, 424 AND 425  
REGISTERED PLAN 309  
(FORMERLY TOWN OF MEAFORD)  
MUNICIPALITY OF MEAFORD  
COUNTY OF GREY**

SURVEYOR CERTIFICATE:

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AND THEIR RELATION TO THE ADJACENT LANDS ARE ACCURATELY SHOWN ON THIS PLAN.

DATED THE \_\_\_\_DAY OF \_\_\_\_\_, 2021. \_\_\_\_\_  
NAME:  
ONTARIO LAND SURVEYOR

OWNER CERTIFICATE:

AS OF THE DATE ON THIS PLAN THE UNDERSIGNED BEING THE REGISTERED OWNERS OF THE SUBJECT LANDS HEREBY AUTHORIZE \_\_\_\_\_ TO PREPARE AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION AND TO MAKE APPLICATION TO THE GREY COUNTY PLANNING DEPARTMENT FOR APPROVAL THEREOF.

DATED THE \_\_\_\_DAY OF \_\_\_\_\_, 2021. \_\_\_\_\_  
NAME:  
I HAVE THE AUTHORITY TO  
BIND THE CORPORATION

PLANNING ACT, SECTION 51(17)

- (a) As shown on draft plan  
(b) As shown on draft plan  
(c) As shown on draft plan  
(d) See schedule of land use  
(e) As shown on draft plan  
(f) As shown on draft plan  
(g) As shown on draft plan  
(h) Piped municipal treated water  
(i) Clayey sandy silt  
(j) As shown on draft plan  
(k) Municipal sanitary sewer  
(l) None

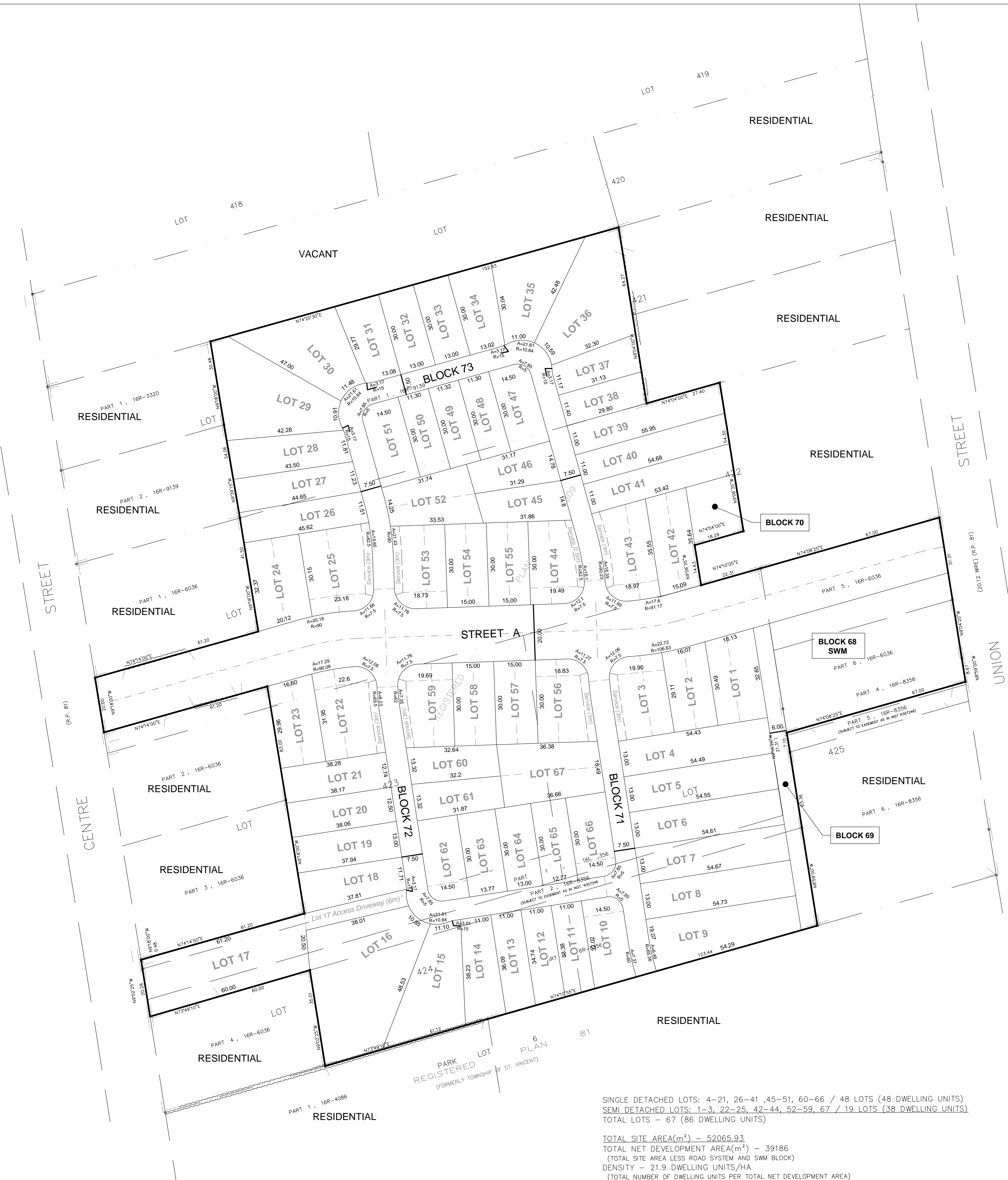
Revision#. Date D/M/Y	Description / Notes
1. 27/04/2021	DRAFT PLAN FOR SUBMISSION
2. 20/05/2021	REVISED DRAFT PLAN FOR SUBMISSION

SCALE / METRIC  
0 5 10 20 30 50 m  
1:750

ZUBEK, EMO  
**PATTEN  
&  
THOMSEN**  
LIMITED  
ONTARIO LAND SURVEYORS  
200 MOUNTAIN ROAD  
UNIT 4  
COLLINGWOOD, ONTARIO L9Y 4V5  
PHONE: (705) 445-4910

**travis**  
travis & associates  
planning consultants 7 - 275 first street collingwood  
approvals facilitators ontario canada L9Y 1A8  
development managers v 705 446 9917 f 446 9918  
travisinc.ca

File/CAD: TA-MEAFORD-DRAFT.dwg  
Date: 20-05-2021  
Drafted by: D.C.  
Checked by: C.T.  
**D-1**



SINGLE DETACHED LOTS: 4-21, 26-41, 45-51, 60-66 / 48 LOTS (48 DWELLING UNITS)  
SEMI-DETACHED LOTS: 1-3, 22-25, 42-44, 52-59, 67 / 19 LOTS (38 DWELLING UNITS)  
TOTAL LOTS - 67 (86 DWELLING UNITS)

TOTAL SITE AREA(m<sup>2</sup>) - 52065.93  
TOTAL NET DEVELOPMENT AREA(m<sup>2</sup>) - 39186  
(TOTAL SITE AREA LESS ROAD SYSTEM AND SWM BLOCK)  
DENSITY - 21.9 DWELLING UNITS/HA  
(TOTAL NUMBER OF DWELLING UNITS PER TOTAL NET DEVELOPMENT AREA)

SCHEDULE OF LAND USE  
LOTS - USE - AREA(m<sup>2</sup>)

LOT 1-LOT 3 - SEMI-DETACHED LOTS - 1626.29  
LOT 4-LOT 9 - SINGLE DETACHED LOTS - 4411.67  
LOT 10-LOT 21 - SINGLE DETACHED LOTS - 7967.05  
LOT 22-LOT 23 - SEMI-DETACHED LOTS - 1212.44  
LOT 24-LOT 25 - SEMI-DETACHED LOTS - 1359.4  
LOT 26-LOT 41 - SINGLE DETACHED LOTS - 9492.61  
LOT 42-LOT 43 - SEMI-DETACHED LOTS - 1177.15  
LOT 45-LOT 51 - SINGLE DETACHED LOTS - 2678.84  
LOT 52-LOT 55, LOT 44 - SEMI-DETACHED LOTS - 2582.31  
LOT 56-LOT 59, LOT 67 - SEMI-DETACHED LOTS - 2795.95  
LOT 60-LOT 66 - SINGLE DETACHED LOTS - 2840.03  
LOTS 1-67 TOTAL AREA(m<sup>2</sup>) - 38143.74

OPEN SPACE BLOCKS  
BLOCK 68 - STORM WATER MANAGEMENT (SWM) - 2649.02  
BLOCK 69 - OPEN SPACE-WALKWAY SERVICE CONNECTION - 663.24  
BLOCK 70 - FUTURE DEVELOPMENT - 379.58  
OPEN SPACE TOTAL AREA(m<sup>2</sup>) - 3691.84

ROAD SYSTEM  
STREET A - 6562.2  
BLOCK 71 - CONDOMINIUM ROAD - 854.88  
BLOCK 72 - CONDOMINIUM ROAD - 1123.34  
BLOCK 73 - CONDOMINIUM ROAD - 1689.94  
ROAD SYSTEM TOTAL AREA(m<sup>2</sup>) - 10230.36

# **Attachment B**

## ITE Trip Generation Manual, 10<sup>th</sup> Edition Excerpts



# Land Use: 210

## Single-Family Detached Housing

### Description

Single-family detached housing includes all single-family detached homes on individual lots. A typical site surveyed is a suburban subdivision.

### Additional Data

The number of vehicles and residents had a high correlation with average weekday vehicle trip ends. The use of these variables was limited, however, because the number of vehicles and residents was often difficult to obtain or predict. The number of dwelling units was generally used as the independent variable of choice because it was usually readily available, easy to project, and had a high correlation with average weekday vehicle trip ends.

This land use included data from a wide variety of units with different sizes, price ranges, locations, and ages. Consequently, there was a wide variation in trips generated within this category. Other factors, such as geographic location and type of adjacent and nearby development, may also have had an effect on the site trip generation.

Single-family detached units had the highest trip generation rate per dwelling unit of all residential uses because they were the largest units in size and had more residents and more vehicles per unit than other residential land uses; they were generally located farther away from shopping centers, employment areas, and other trip attractors than other residential land uses; and they generally had fewer alternative modes of transportation available because they were typically not as concentrated as other residential land uses.

Time-of-day distribution data for this land use are presented in Appendix A. For the six general urban/suburban sites with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:15 and 8:15 a.m. and 4:00 and 5:00 p.m., respectively. For the two sites with Saturday data, the overall highest vehicle volume was counted between 3:00 and 4:00 p.m. For the one site with Sunday data, the overall highest vehicle volume was counted between 10:15 and 11:15 a.m.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in California, Connecticut, Delaware, Illinois, Indiana, Maryland, Minnesota, Montana, New Jersey, North Carolina, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Vermont, and Virginia.

### Source Numbers

100, 105, 114, 126, 157, 167, 177, 197, 207, 211, 217, 267, 275, 293, 300, 319, 320, 356, 357, 367, 384, 387, 407, 435, 522, 550, 552, 579, 598, 601, 603, 614, 637, 711, 716, 720, 728, 735, 868, 903, 925, 936



# Single-Family Detached Housing (210)

**Vehicle Trip Ends vs: Dwelling Units**

**On a: Weekday,  
Peak Hour of Adjacent Street Traffic,  
One Hour Between 7 and 9 a.m.**

**Setting/Location: General Urban/Suburban**

Number of Studies: 173

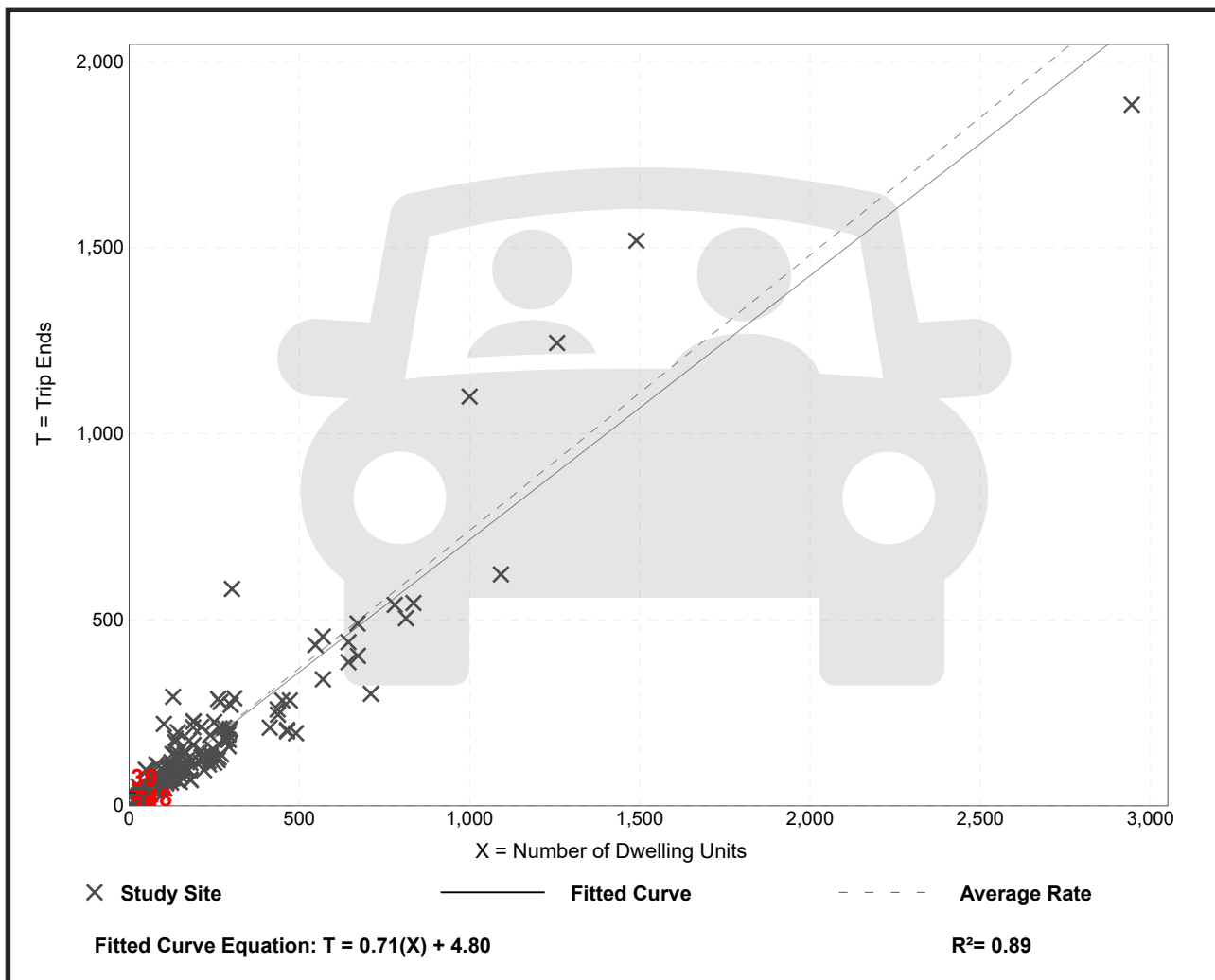
Avg. Num. of Dwelling Units: 219

Directional Distribution: 25% entering, 75% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.74	0.33 - 2.27	0.27

## Data Plot and Equation



# Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,  
Peak Hour of Adjacent Street Traffic,  
One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 190

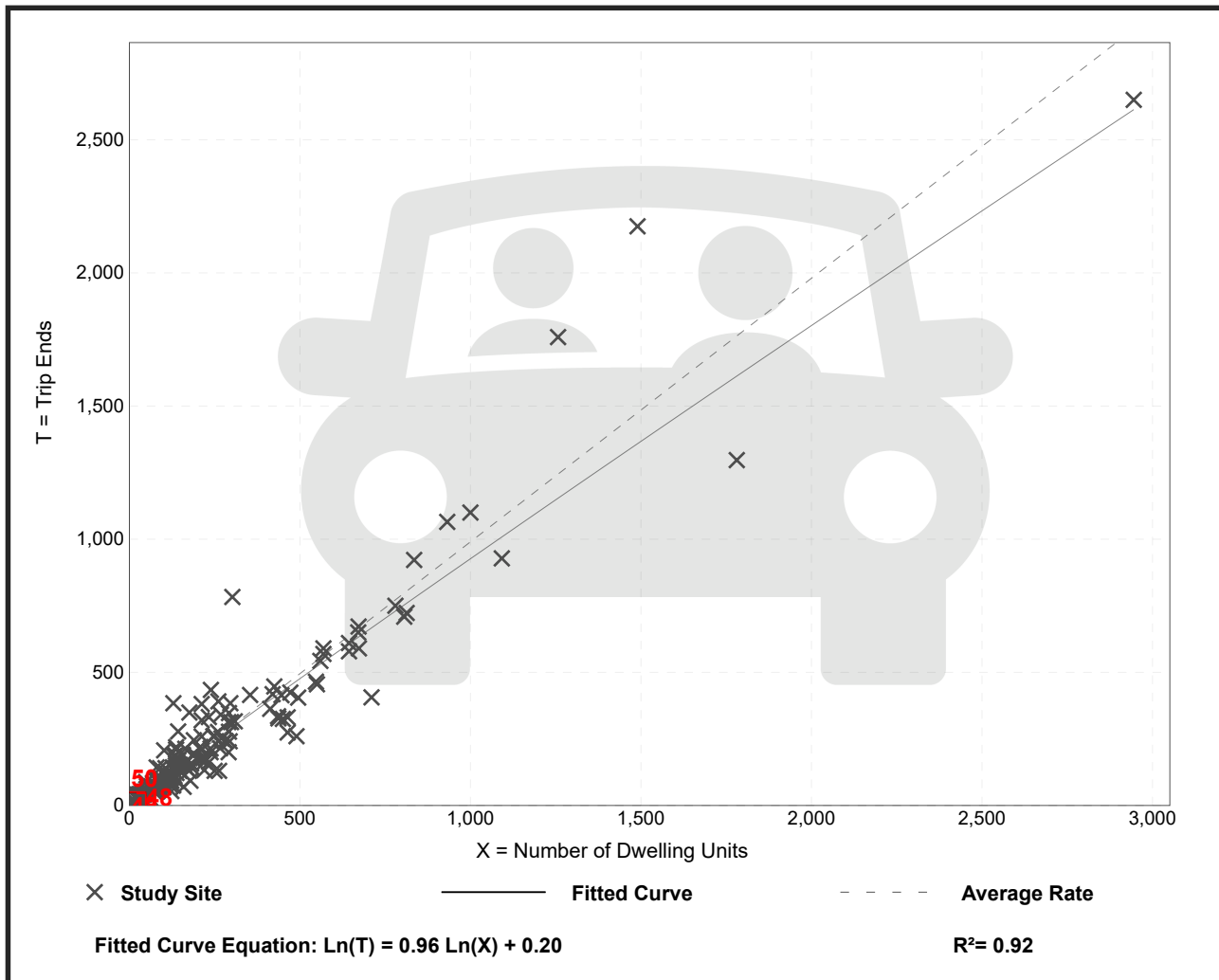
Avg. Num. of Dwelling Units: 242

Directional Distribution: 63% entering, 37% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.99	0.44 - 2.98	0.31

## Data Plot and Equation



# Land Use: 220

## Multifamily Housing (Low-Rise)

### Description

Low-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have one or two levels (floors). Multifamily housing (mid-rise) (Land Use 221), multifamily housing (high-rise) (Land Use 222), and off-campus student apartment (Land Use 225) are related land uses.

### Additional Data

In prior editions of *Trip Generation Manual*, the low-rise multifamily housing sites were further divided into rental and condominium categories. An investigation of vehicle trip data found no clear differences in trip making patterns between the rental and condominium sites within the ITE database. As more data are compiled for future editions, this land use classification can be reinvestigated.

For the three sites for which both the number of residents and the number of occupied dwelling units were available, there were an average of 2.72 residents per occupied dwelling unit.

For the two sites for which the numbers of both total dwelling units and occupied dwelling units were available, an average of 96.2 percent of the total dwelling units were occupied.

This land use included data from a wide variety of units with different sizes, price ranges, locations, and ages. Consequently, there was a wide variation in trips generated within this category. Other factors, such as geographic location and type of adjacent and nearby development, may also have had an effect on the site trip generation.

Time-of-day distribution data for this land use are presented in Appendix A. For the 10 general urban/suburban sites with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:15 and 8:15 a.m. and 4:45 and 5:45 p.m., respectively. For the one site with Saturday data, the overall highest vehicle volume was counted between 9:45 and 10:45 a.m. For the one site with Sunday data, the overall highest vehicle volume was counted between 11:45 a.m. and 12:45 p.m.

For the one dense multi-use urban site with 24-hour count data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:00 and 8:00 a.m. and 6:15 and 7:15 p.m., respectively.

For the three sites for which data were provided for both occupied dwelling units and residents, there was an average of 2.72 residents per occupied dwelling unit.

The average numbers of person trips per vehicle trip at the five general urban/suburban sites at which both person trip and vehicle trip data were collected were as follows:

- 1.13 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 7 and 9 a.m.
- 1.21 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 4 and 6 p.m.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in British Columbia (CAN), California, District of Columbia, Florida, Georgia, Illinois, Indiana, Maine, Maryland, Minnesota, New Jersey, New York, Ontario, Oregon, Pennsylvania, South Dakota, Tennessee, Texas, Utah, Virginia, and Washington.

***It is expected that the number of bedrooms and number of residents are likely correlated to the number of trips generated by a residential site. Many of the studies included in this land use did not indicate the total number of bedrooms. To assist in the future analysis of this land use, it is important that this information be collected and included in trip generation data submissions.***

### **Source Numbers**

168, 187, 188, 204, 211, 300, 305, 306, 319, 320, 321, 357, 390, 412, 418, 525, 530, 571, 579, 583, 864, 868, 869, 870, 896, 903, 918, 946, 947, 948, 951

# Multifamily Housing (Low-Rise) (220)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,  
Peak Hour of Adjacent Street Traffic,  
One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 42

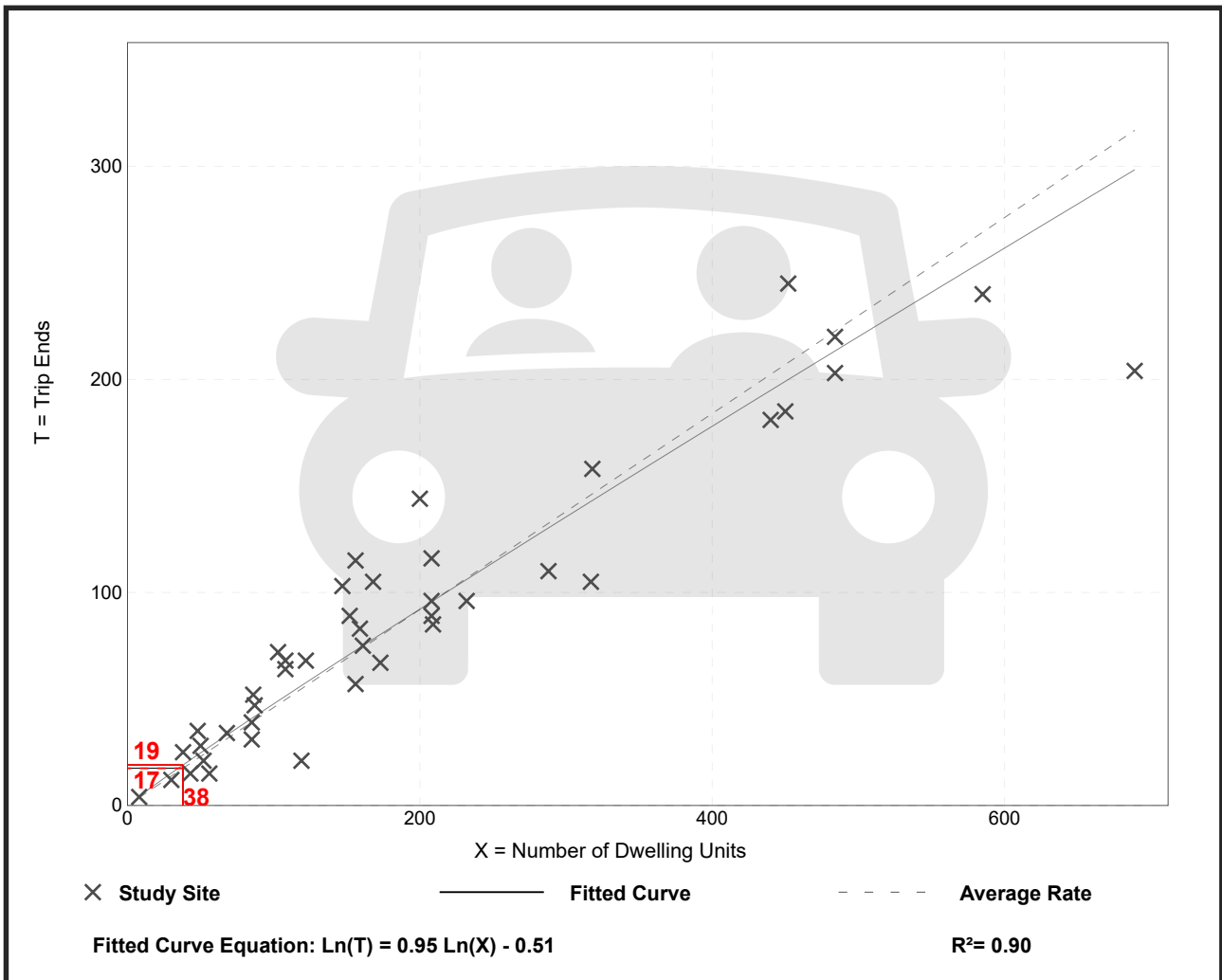
Avg. Num. of Dwelling Units: 199

Directional Distribution: 23% entering, 77% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.46	0.18 - 0.74	0.12

## Data Plot and Equation





# Multifamily Housing (Low-Rise) (220)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,  
Peak Hour of Adjacent Street Traffic,  
One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 50

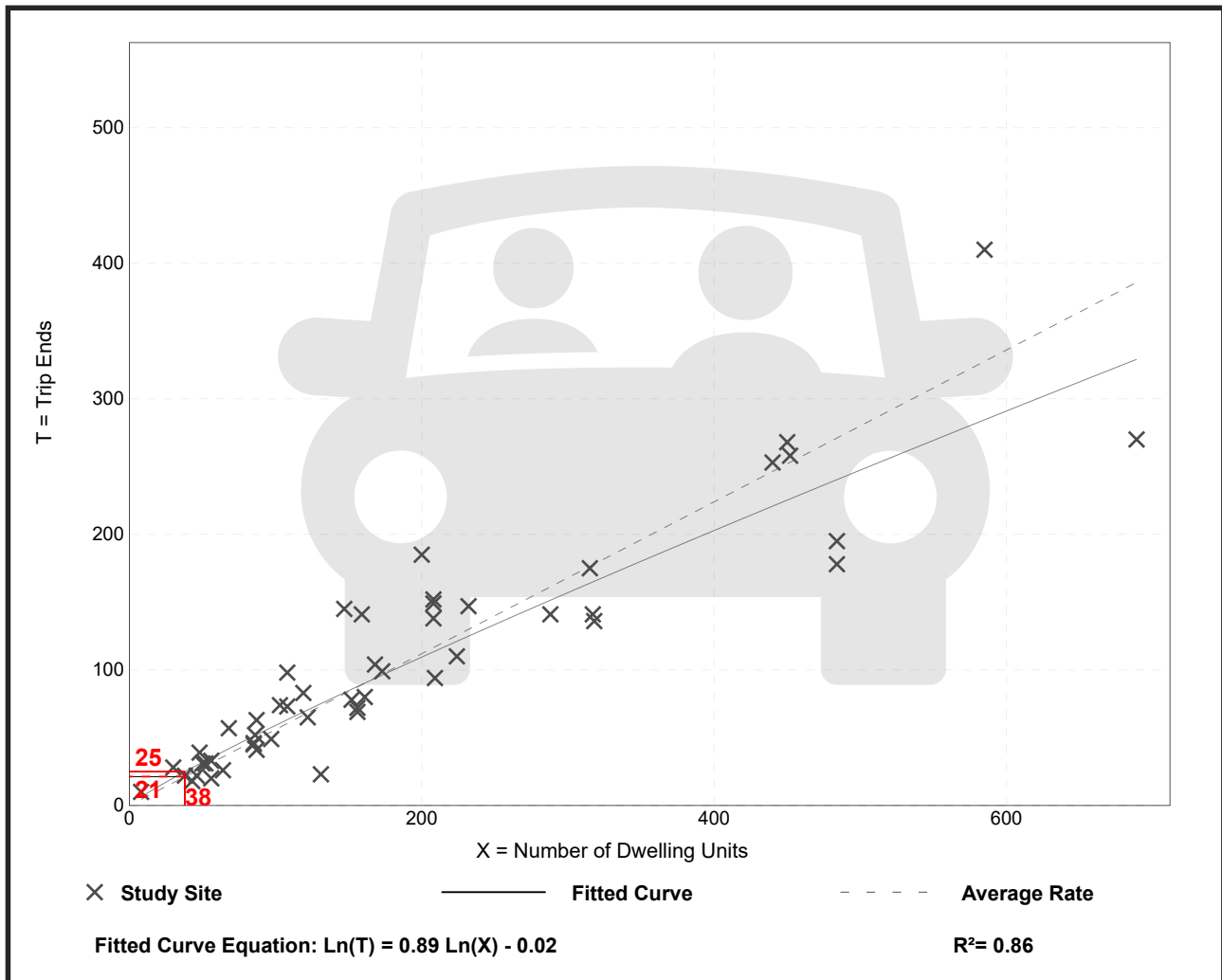
Avg. Num. of Dwelling Units: 187

Directional Distribution: 63% entering, 37% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.56	0.18 - 1.25	0.16

## Data Plot and Equation



# **Attachment C**

## Municipality of Meaford's Engineering Standards Excerpts



## ENGINEERING STANDARDS

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The Developer will be responsible for clearing all mud tracked onto municipal property and/or adjacent properties to the satisfaction of the Municipality.

The Erosion & Sediment Control Plan (ref. Section 1.2) shall include the minimum control measures required to address erosion and sediment control resulting from mud tracking onto municipal streets, windblown dust and waterborne sediments.

The following are general requirements for the design of urban roads and rights-of-way:

- Design speed, 60 km/hr min; /urban/ 90km/hr min; /rural/
- Minimum centerline curve radius, 55 m;
- Horizontal and vertical stopping sight distance, 45 m min. (urban) and 85 m min. (rural);
- Street allowance 20 m min;
- Pavement width (not including gutters) – 8.5 m (urban), 6.5 m (rural);
- The use of cul-de-sac is discouraged, however, where necessary cul-de-sac street allowance, 22.8 m R. min;
- Edge of pavement in cul-de-sac, 16.0 m R. min;
- Edge of pavement at intersection, 9.0 m R min;
- Road grades, 0.3% min., 6.0% max. and 8% max. with curb and gutter;
- Daylighting at all intersections and changes in alignment where the deflection angle is greater than 45° shall be a minimum of 5 m x 5 m;
- Roads shall be classified in accordance with the Municipal Official Plan; and
- Provisions shall be included in the road design for communal mailboxes. The Developer shall be responsible for providing parking areas, structural concrete foundations, etc. all as required by the Municipality and/or Canada Post for communal mailboxes in locations designated by the Municipality and/or Canada Post.

### 3.3 Clearing and Grubbing

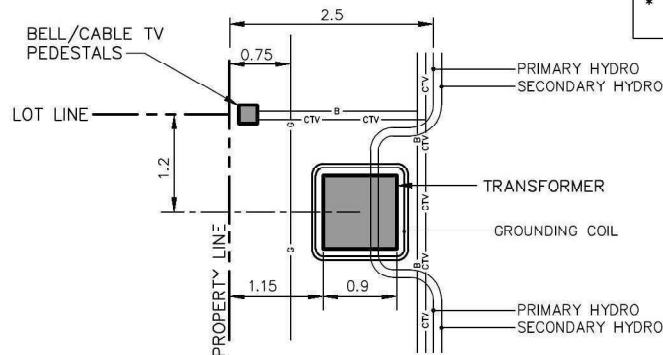
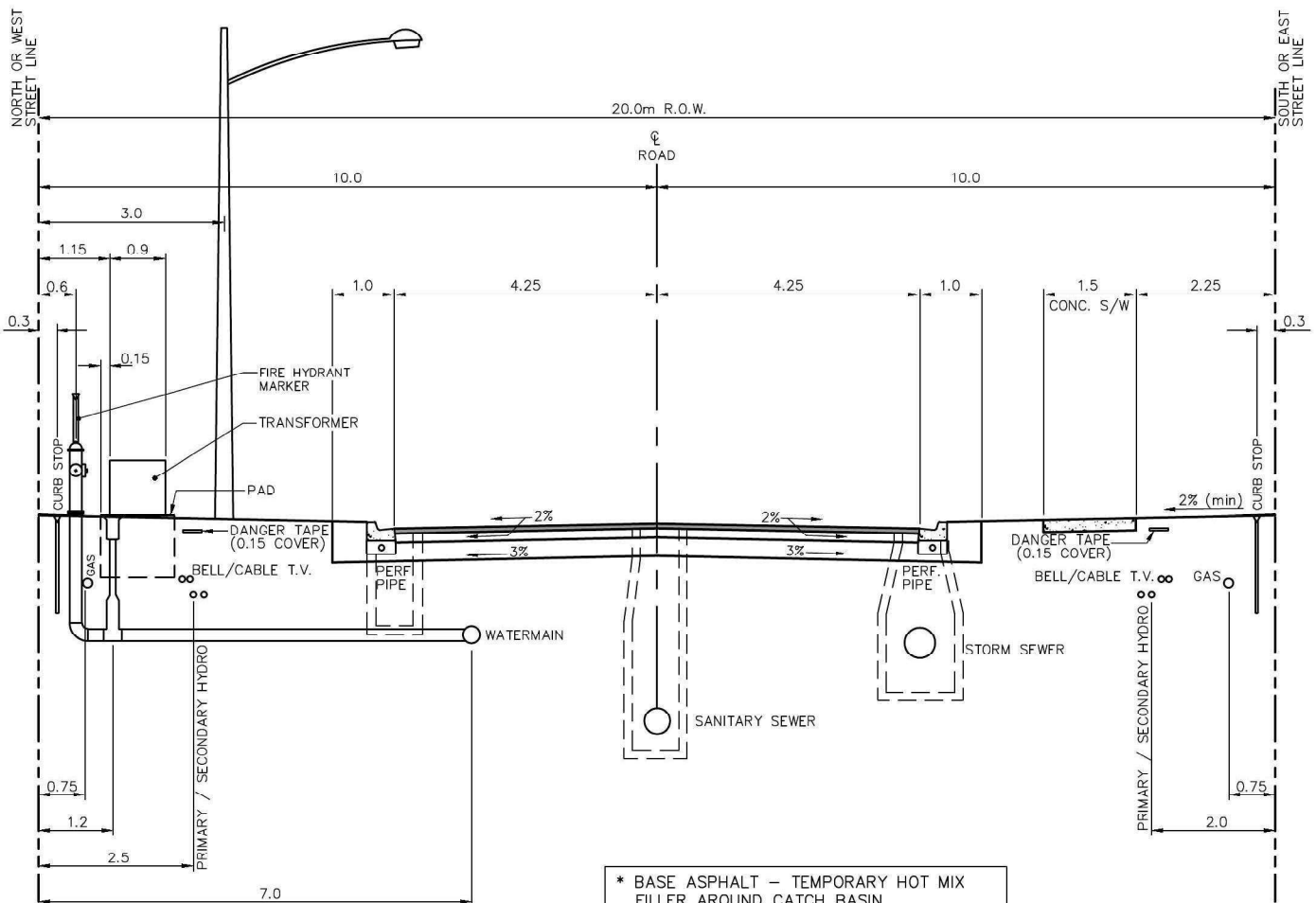
Trees shall be removed so that the specifications for sight distances, grading, ditching, etc. may be met. All stumps, logs, brush, boulders, debris, etc. shall be removed from the entire street allowance and deposited off the site of the subdivision to a disposal area approved by the Developer's Engineer.

Unless noted otherwise, all healthy trees behind the back slope of ditches and not obstructing visibility or installation of services shall be preserved. The Municipality may give special permission to leave trees on the street allowance.

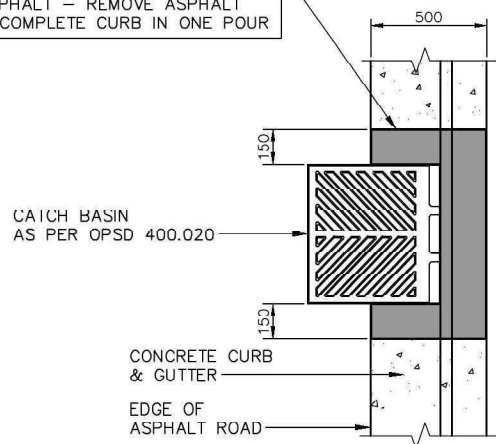
The Developer is responsible to coordinate the delineation of tree clearing to the satisfaction of the Municipality prior to mobilization, including legal survey of the property to ensure that tree clearing does not encroach onto neighboring properties or into adjacent vegetated buffers.

### 3.4 Grading

The boulevard area behind the curb shall be graded at 2% towards the curb.



**PLAN**  
(AT PAD MOUNT TRANSFORMER)



**PLAN**  
(AT CURB WITH CATCH BASIN)

**NOTES:**

1. TOPSOIL TO BE REMOVED TO ITS FULL DEPTH ALONG ENTIRE WIDTH OF RIGHT-OF-WAY
2. ORGANIC MATERIAL WITHIN 1.2m OF TOP OF PAVEMENT TO BE REMOVED.
3. BOULEVARDS TO BE FULLY SODDED AS SPECIFIED (100mm TOPSOIL AND SOD).
4. ROAD BASE:
  - 40mm HL3 ASPHALT SURFACE COURSE
  - 50mm HL4 ASPHALT BASE COURSE
  - 150mm GRANULAR 'A'
  - 300mm GRANULAR 'B'
5. CONCRETE CURB AND GUTTER PER OPSD 600.040 AND 600.070 IN NEW DEVELOPMENT
6. CONCRETE SIDEWALK PER OPSD 310.010
7. MINIMUM DEPTH OF COVER :
  - SANITARY SEWER - 2.75m
  - STORM SEWER - 1.5m
  - WATERMAIN - 1.7m
  - HYDRO - 1.2m
  - CABLE - 0.9m
  - BELL - 0.9m
  - GAS - 0.6m
  - GAS AT CROSSING ROAD - 1.0m

**MUNICIPALITY OF MEAFORD**

**TYPICAL  
ROAD CROSS-SECTION  
AND SERVICE LOCATIONS**

DRAWN: J.M.M.	SCALE: N.T.S.	
DESIGN: P.M.K.	PLOT: 1=1	
CHECKED: R.C.J.	DATE: NOV. 2015	STD.DWG.No.1



# Attachment D

## TAC Excerpts

**Table 9.9.4: Design Intersection Sight Distance – Case B1, Left Turn From Stop**

Design Speed (km/h)	Stopping Sight Distance (m)	Intersection Sight Distance for Passenger Cars	
		Calculated (m)	Design (m)
20	20	41.7	45
30	35	62.6	65
40	50	83.4	85
50	65	104.3	105
60	85	125.1	130
70	105	146.0	150
80	130	166.8	170
90	160	187.7	190
100	185	208.5	210
110	220	229.4	230
120	250	250.2	255
130	285	271.1	275

Note: Intersection sight distance shown is for a stopped passenger car to turn left onto a two-lane highway with no median and grades 3% or less. For other conditions, the time gap should be adjusted and the sight distance recalculated.

Sight distance design for left turns at divided-highway intersections should consider multiple design vehicles and median width. If the design vehicle used to determine sight distance for a divided-highway intersection is larger than a passenger car, then sight distance for left turns will need to be checked for that selected design vehicle and for smaller design vehicles as well. If the divided-highway median is wide enough to store the design vehicle with a clearance to the through lanes of approximately 1 m at both ends of the vehicle, no separate analysis for the departure sight triangle for left turns is needed on the minor-road approach for the near roadway to the left. In most cases, the departure sight triangle for right turns (case B2) will provide sufficient sight distance for a passenger car to cross the near roadway to reach the median. Possible exceptions are addressed in the discussion of case B3.