# Traffic Generation Diagrams

September 18, 2025

Presented By:
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DELAWARE DEPARTMENT OF TRANSPORTATION


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# Every Trip.

We strive to make every trip taken in Delaware safe, reliable and convenient for people and commerce.

# Every Mode.

We provide safe choices for travelers in Delaware to access roads, rails, buses, airways, waterways, bike trails and walking paths.

# Every Dollar.

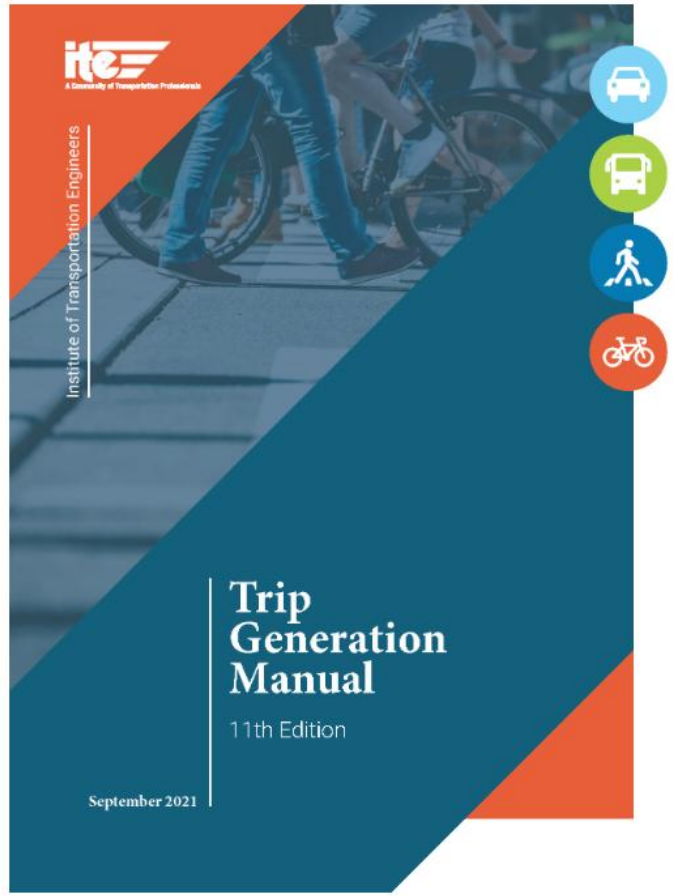
We seek the best value for every dollar spent for the benefit of all.

# Everyone.

We engage our customers and employees with respect and courtesy as we deliver our services.

# Presentation Overview

- Traffic Generation Diagrams (TGDs)
  - Purpose
  - Required Information
- Auxiliary Lane Worksheet
- Trip Generation
  - Rates vs. Equations
  - Pass-By
  - Internal Capture



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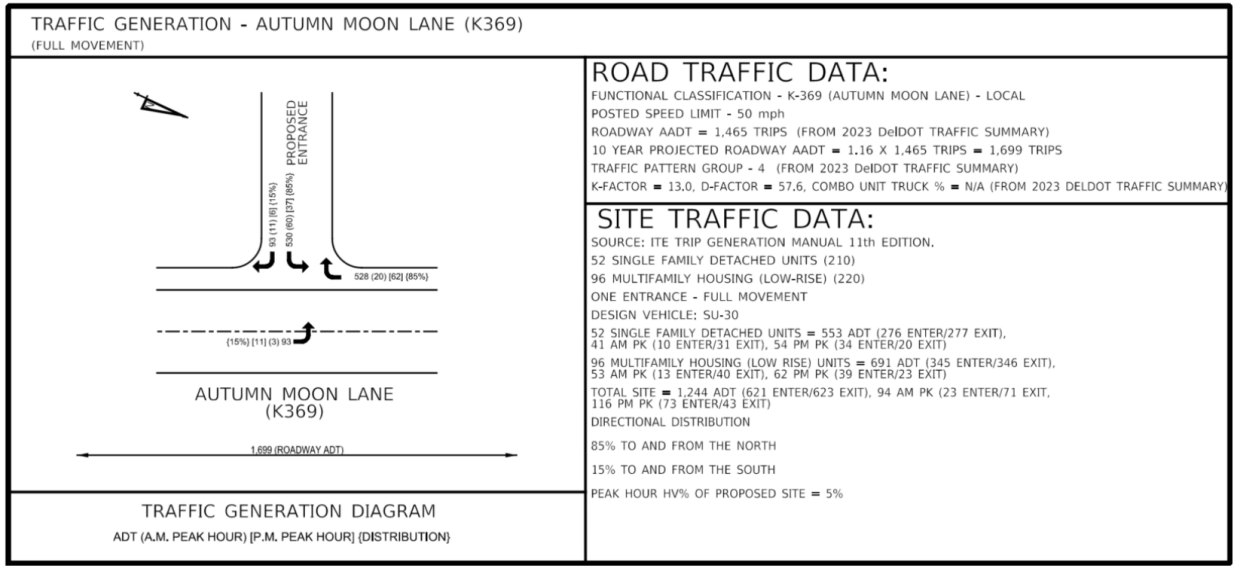
TRAFFIC GENERATION - AUTUMN MOON LANE (K369)
(FULL MOVEMENT)

PROPOSED ENTRANCE

93 (11) [8] (15%)
530 (80) [37] (85%)
528 (20) [62] (85%)
(15%) [11] (3) 93

AUTUMN MOON LANE
(K369)

1,699 (ROADWAY ADT)

TRAFFIC GENERATION DIAGRAM
ADT (A.M. PEAK HOUR) [P.M. PEAK HOUR] {DISTRIBUTION}

ROAD TRAFFIC DATA:
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10 YEAR PROJECTED ROADWAY AADT = 1.16 X 1,465 TRIPS = 1,699 TRIPS
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K-FACTOR = 13.0, D-FACTOR = 57.6, COMBO UNIT TRUCK % = N/A (FROM 2023 DELDOT TRAFFIC SUMMARY)

SITE TRAFFIC DATA:
SOURCE: ITE TRIP GENERATION MANUAL 11th EDITION.
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DIRECTIONAL DISTRIBUTION
85% TO AND FROM THE NORTH
15% TO AND FROM THE SOUTH
PEAK HOUR HV% OF PROPOSED SITE = 5%

- Requirement of Entrance Plan Submissions
  - DCM Section 3.4.2
  - Requirement of Pre-Submittal Meeting
  - Access should be shown onto a 3-digit state-maintained roadway

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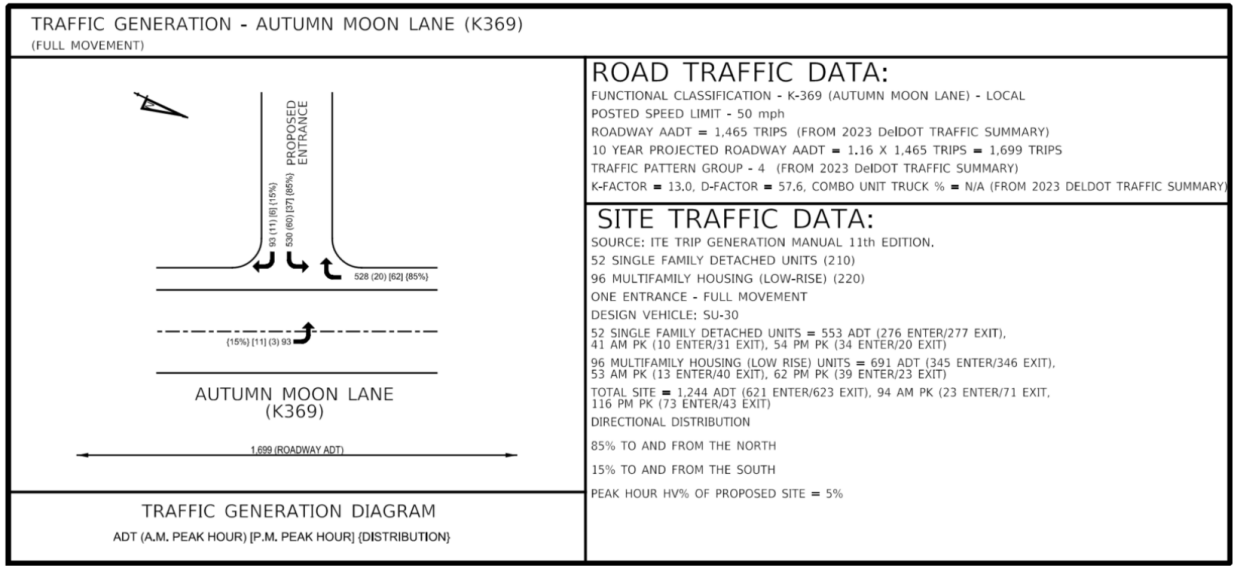
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- Traffic Impact Study (TIS) or Area-Wide Study Fee
  - DCM Section 2.2.2 Traffic Impact Studies – Warrants
    - Net Increase >500 vpd or 50 vph
    - Local Land Use Agency requirements
  - DCM Section 2.2.2.2 Area-Wide Study Fee
    - Net Increase <2,000 vpd and 200 vph
  - Credit for Existing Uses/Previous Approvals

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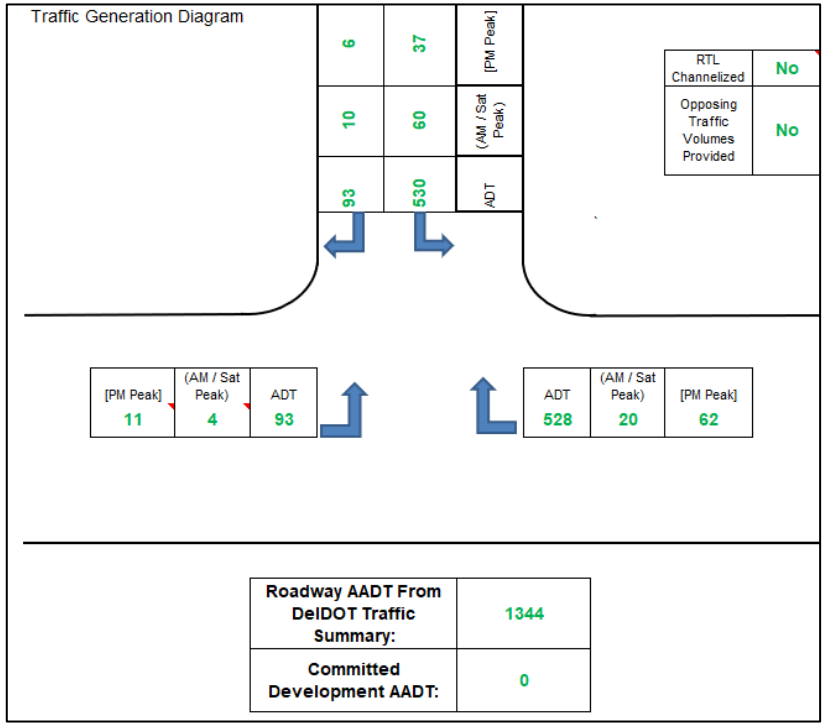
# Traffic Generation Diagrams – Purpose




- Auxiliary Lane Worksheet
  - Inputs Needed:
    - Road Traffic Data
    - Turning Movements
  - DCM Section 5.2.9 – Methodology

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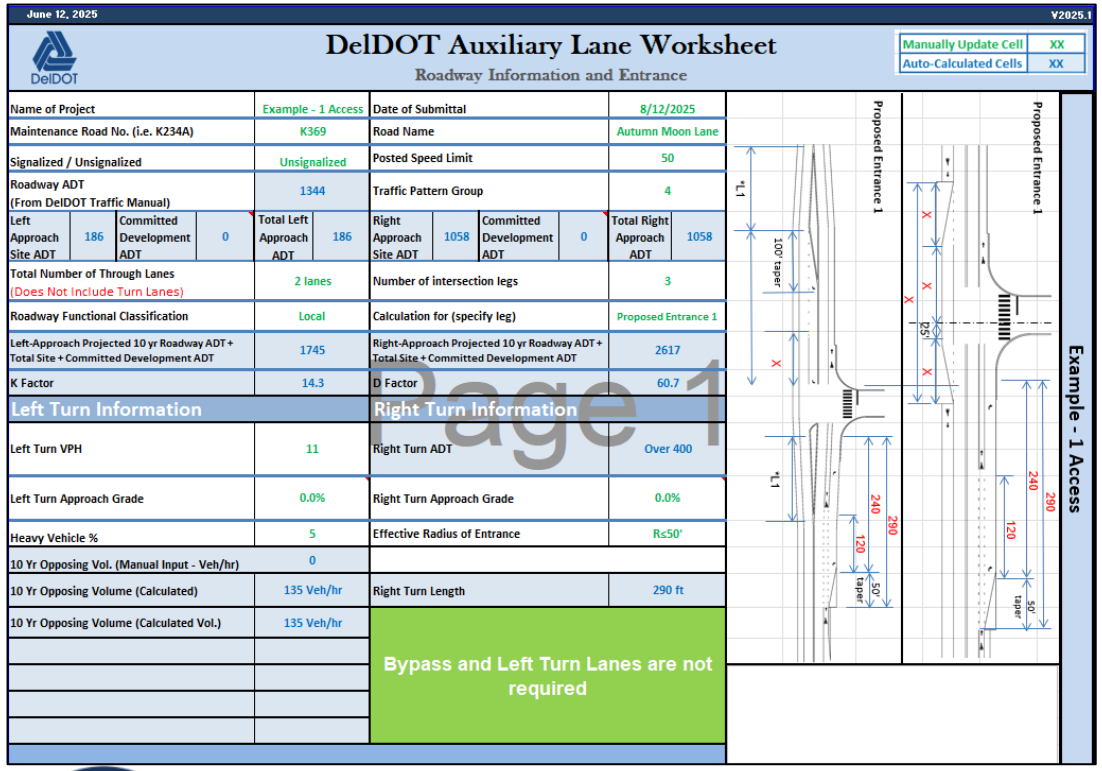

June 12, 2025 V2025.1

**DelDOT Auxiliary Lane Worksheet**

Roadway Information and Entrance

Manually Update Cell XX
Auto-Calculated Cells XX

| | | | |
|---|---|---|---|
| Name of Project | Example - 1 Access | Date of Submittal | 8/12/2025 |
| Maintenance Road No. (i.e. K234A) | K369 | Road Name | Autumn Moon Lane |
| Signalized / Unsignalized | Unsignalized | Posted Speed Limit | 50 |
| Roadway ADT (From DelDOT Traffic Manual) | 1344 | Traffic Pattern Group | 4 |
| Left Approach Site ADT: 186 / Committed Development ADT: 0 | Total Left Approach ADT: 186 | Right Approach Site ADT: 1058 / Committed Development ADT: 0 | Total Right Approach ADT: 1058 |
| Total Number of Through Lanes (Does Not Include Turn Lanes) | 2 lanes | Number of intersection legs | 3 |
| Roadway Functional Classification | Local | Calculation for (specify leg) | Proposed Entrance 1 |
| Left-Approach Projected 10 yr Roadway ADT + Total Site + Committed Development ADT | 1745 | Right-Approach Projected 10 yr Roadway ADT + Total Site + Committed Development ADT | 2617 |
| K Factor | 14.3 | D Factor | 60.7 |
| **Left Turn Information** | | **Right Turn Information** | |
| Left Turn VPH | 11 | Right Turn ADT | Over 400 |
| Left Turn Approach Grade | 0.0% | Right Turn Approach Grade | 0.0% |
| Heavy Vehicle % | 5 | Effective Radius of Entrance | R≤50' |
| 10 Yr Opposing Vol. (Manual Input - Veh/hr) | 0 | | |
| 10 Yr Opposing Volume (Calculated) | 135 Veh/hr | Right Turn Length | 290 ft |
| 10 Yr Opposing Volume (Calculated Vol.) | 135 Veh/hr | Bypass and Left Turn Lanes are not required | |

Page 1

Proposed Entrance 1 — Proposed Entrance 1 — Example - 1 Access

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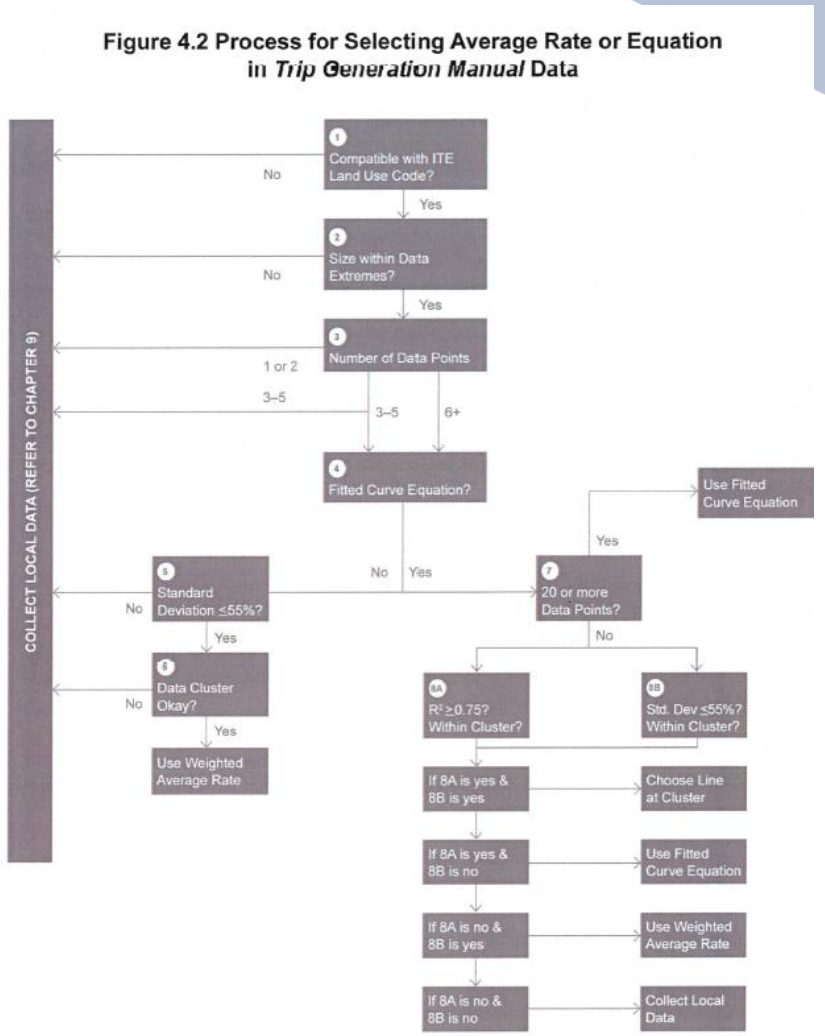
# Rates vs. Fitted Curve Equations

- Per ITE Trip Generation Manual Handbook 3rd Edition (Figure 4.2)
  - 20 or more data points, Fitted Curve Equation
  - Five or less data points, collect local data
- Additional data with every new edition of ITE Trip Generation
  - Previously accepted practices could be revisited

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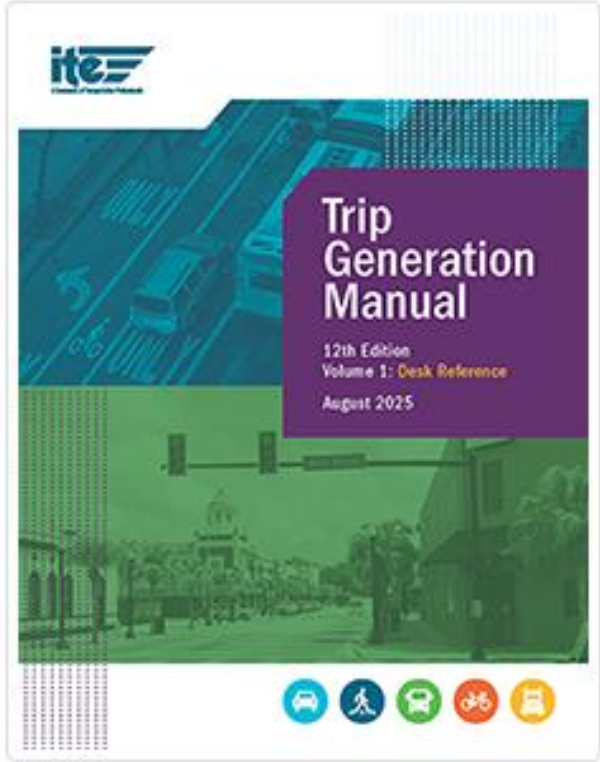
# ITE 12th Edition

- Released August 18, 2025
- Over 550 new study sites added across the land uses
- Removed all pre-1990 data
- New land use codes, including travel centers and high-volume fast-food restaurants
- Revised land use definitions and updated independent variables

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# Traffic Generation Diagram
## Road Traffic Data

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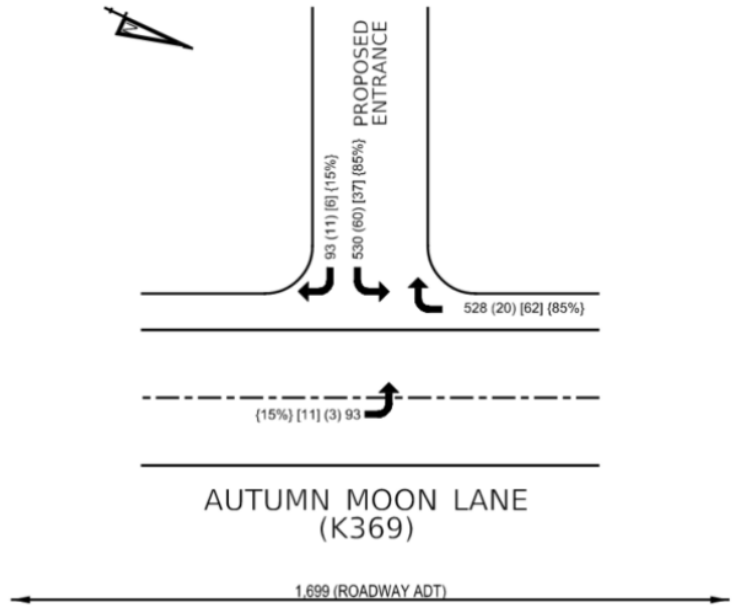


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Use Latest DelDOT Traffic Summary!!!

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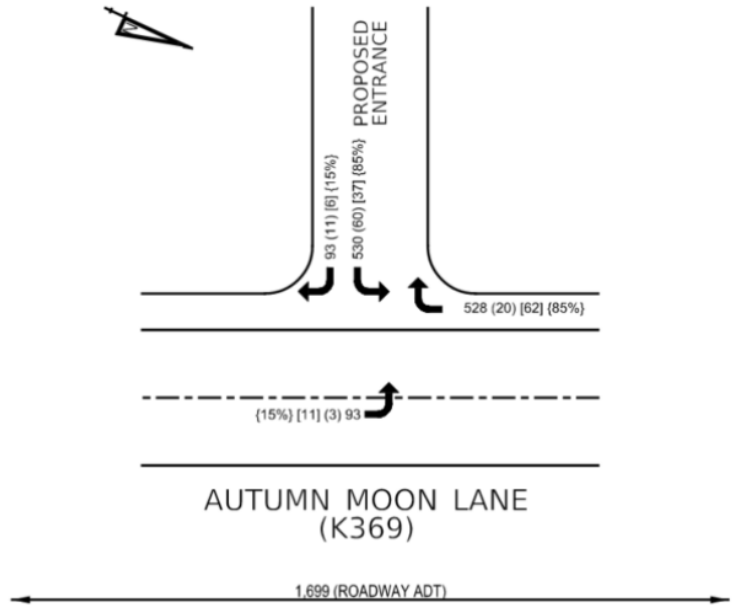


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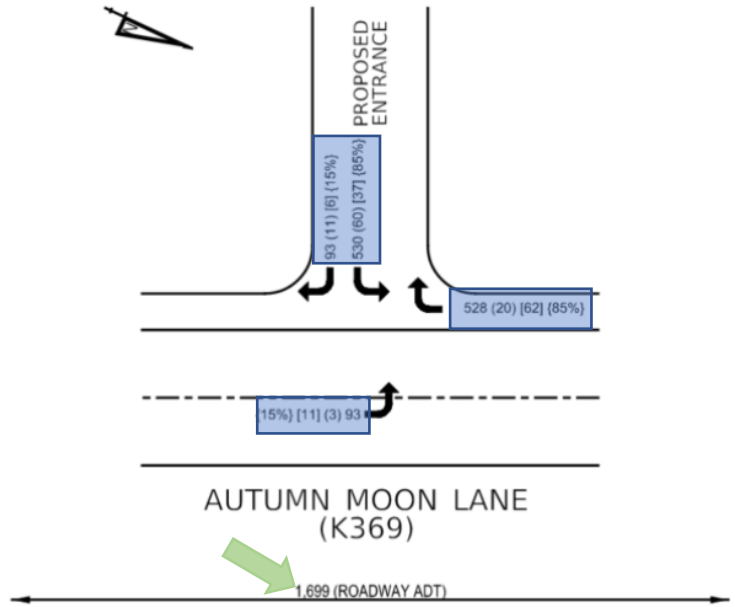


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# Traffic Generation Diagram – Items to Remember

- List unique characteristics
  - Size of use (SF, number of units, number of students, etc.)
  - Number of vehicle fueling positions (if applicable)
  - Distance to nearby train (if applicable)
- Unique Land Uses
  - Obtain trip generation count data from other similar existing uses (at least 3 separate locations)
- Internal capture and pass-by
- Interconnection

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# Trip Generation – Internal Capture

- Internal Capture
  - For mixed-use developments, important to consider internal trips from one use to another
    - Included in shopping center land use code
  - Trip Generation Handbook, 3rd Edition
  - ITE provides a spreadsheet for calculating
  - Can apply to peak hour and daily volumes

| NCHRP 684 Internal Trip Capture Estimation Tool | | | |
|---|---|---|---|
| Project Name: | | Organization: | |
| Project Location: | | Performed By: | |
| Scenario Description: | | Date: | |
| Analysis Year: | 2025 | Checked By: | |
| Analysis Period: | AM Street Peak Hour | Date: | |

**Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)**

| Land Use | Development Data (*For Information Only*) | | | Estimated Vehicle-Trips[3] | | |
|---|---|---|---|---|---|---|
| | ITE LUCs[1] | Quantity | Units | Total | Entering | Exiting |
| Office | | | | 0 | | |
| Retail | | | | 0 | | |
| Restaurant | | | | 0 | | |
| Cinema/Entertainment | | | | 0 | | |
| Residential | | | | 0 | | |
| Hotel | | | | 0 | | |
| All Other Land Uses[2] | | | | 0 | | |
| | | | | 0 | 0 | 0 |

**Table 2-A: Mode Split and Vehicle Occupancy Estimates**

| Land Use | Entering Trips | | | Exiting Trips | | |
|---|---|---|---|---|---|---|
| | Veh. Occ.[4] | % Transit | % Non-Motorized | Veh. Occ.[4] | % Transit | % Non-Motorized |
| Office | | | | | | |
| Retail | | | | | | |
| Restaurant | | | | | | |
| Cinema/Entertainment | | | | | | |
| Residential | | | | | | |

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# Trip Generation – Pass-By

- Pass-by Trips
  - Trips already on roadway which will visit site while "passing-by"
  - Refer to pass-by rates included in 11th Edition ITE Manual Appendix
  - Percentage applied only to peak hour volumes

**Vehicle Pass-By Rates by Land Use**

Source: ITE *Trip Generation Manual*, 11th Edition

| | |
|---|---|
| Land Use Code | 932 |
| Land Use | High-Turnover (Sit-Down) Restaurant |
| Setting | General Urban/Suburban |
| Time Period | Weekday PM Peak Period |
| # Data Sites | 12 |
| Average Pass-By Rate | 43% |

Pass-By Characteristics for Individual Sites

| GFA (000) | State or Province | Survey Year | # Interviews | Pass-By Trip (%) | Non-Pass-By Trips | | | Adj Street Peak Hour Volume | Source |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Primary (%) | Diverted (%) | Total (%) | | |
| 2.9 | Kentucky | 1993 | 41 | 37 | 27 | 36 | 63 | 3935 | 2 |
| 3.1 | Kentucky | 1993 | 21 | 38 | 29 | 33 | 62 | 2580 | 2 |
| 4.6 | Florida | 1992 | 276 | 63 | — | — | 37 | — | 30 |
| 5 | Florida | 1992 | 65 | 58 | — | — | 42 | — | 30 |
| 5.3 | Kentucky | 1993 | 24 | 50 | 37 | 13 | 50 | 1615 | 2 |
| 5.7 | Florida | 1994 | 308 | 57 | — | — | 43 | — | 30 |
| 5.8 | Florida | 1992 | 150 | 32 | — | — | 68 | — | 30 |
| 6.2 | Florida | 1995 | 521 | 46 | 43 | 11 | 54 | — | 30 |
| 7.1 | Indiana | 1993 | — | 23 | 23 | 54 | 77 | 1565 | 2 |
| 8 | Florida | 1995 | 664 | 40 | 39 | 21 | 60 | — | 30 |
| 11 | Florida | 1996 | 267 | 38 | 43 | 19 | 62 | — | 30 |
| 12 | Florida | 1996 | 317 | 29 | 51 | 20 | 71 | — | 30 |

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# Traffic Generation Diagram With Existing Entrances

- Provide traffic volumes at existing entrance
- Trip Generation
  - Existing
  - Proposed (entire development)
  - Difference
- Turning movements on diagram should show all traffic utilizing entrance
  - Include adjacent uses (interconnection)


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# Useful Links

- DCM Manual: https://deldot.gov/Business/subdivisions/index.shtml?dc=changes

- Auxiliary Lane Worksheet: https://deldot.gov/Business/subdivisions/#formstab

- TGD Example: https://deldot.gov/Business/subdivisions/pdfs/Traffic_Generation_Example_June_2024.pdf?cache=1723557594597

- NCHRP Internal Capture Spreadsheet: https://www.ite.org/technical-resources/topics/trip-and-parking-generation/other-resources/

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# Useful Links

- ITE Website: https://itetripgen.org
- DelDOT Traffic Summary: https://deldot.gov/Publications/manuals/traffic_counts/index.shtml
- Gateway: https://gateway.deldot.delaware.gov/

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QUESTIONS &
COMMENTS

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# THANK YOU!

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