

LATR Transportation Study Outline

Draft Version 1.3

Last Updated: 1/3/2024 by Richard Brockmyer, Montgomery County Planning Department

1. Executive Summary

- a. Brief summary of the proposed project
 - i. Units/Square Footages Proposed
 - ii. Net new person trips table

Example Table of Net New Person Trips

Existing Conditions Trip Generation (if applicable)

Land Use	Land Use Code	Units/Sqft.	AM Peak Hour Total Person Trips	PM Peak Hour Total Person Trips	AM Peak Hour Vehicle Trips	PM Peak Hour Vehicle Trips
Strip Retail Plaza (<40k)	822	30,000	97	233	70	168

Proposed Development Trip Generation

Land Use	Land Use Code	Units/Sqft.	AM Peak Hour Total Person Trips	PM Peak Hour Total Person Trips	AM Peak Hour Vehicle Trips	PM Peak Hour Vehicle Trips
Multifamily Housing (Mid-Rise)	221	300	186	182	116	113
General Office Building	710	40,000	100	103	74	76

Net Trip Generation

AM Peak Hour Total Person Trips	PM Peak Hour Total Person Trips	AM Peak Hour Vehicle Trips	PM Peak Hour Vehicle Trips
+189	+51	+121	+22

- b. Very brief description of the scope of the Study (tier for each modal adequacy test)
- c. Brief summary of each modal test findings
- d. Identify Proportionality Guide amount (if applicable)
- e. Table and map of **deficiencies proposed to be addressed after applying the proportionality guide**

- i. Note if proposing a mitigation payment and justify how that mitigation payment conforms to guidance in the Growth and Infrastructure Policy.

Example Table of Proposed Mitigations

ID	Location	Deficiency Type (ADA, PLOC, Transit, etc.)	Deficiency Description	Recommended Mitigation	Linear Feet (if applicable)	Cost Estimate
A1	Northeast curb ramp of intersection A and B	ADA	Broken curb ramp with no DWS	Reconstruct the curb ramp and add DWS	N/A	\$ X,XXX
P2	North side of Street A between Street B and Street C	PLOC	No street buffer between the sidewalk and roadway	Add a 6-foot-wide street buffer and relocate sidewalk	300	\$ X,XXX
S1	South side of Street A between driveway and study area boundary	Streetlighting	Deficient streetlight spacing	Add 1 streetlight	N/A	\$ X,XXX
B1	East side of Street B between Street A and Street D	BLTS	Segment has a high speed limit with an on-street striped bike lane	Construct a two-way separated bike lane with transitions at both ends to the existing bike lane.	350	\$ X,XXX
T1	North side mid-block of Street D	Transit	Flag bus stop with no pad, shelter or other amenities	Construct a bus shelter and bus pad	N/A	\$ X,XXX

2. Adequacy determination

- a. Units/Square Footages Proposed
- b. Net new person trips table

Example Table of Net New Person Trips

Existing Conditions Trip Generation (if applicable)

Land Use	Land Use Code	Units/Sqft.	AM Peak Hour Total Person Trips	PM Peak Hour Total Person Trips	AM Peak Hour Vehicle Trips	PM Peak Hour Vehicle Trips
Strip Retail Plaza (<40k)	822	30,000	97	233	70	168

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Net Trip Generation

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- c. Policy Area and summary of modal adequacy tests required
- d. Brief description of proposed access for the Site
 - i. Roadway frontages
 - ii. Point(s) of access
 - iii. Roadway ownership
- e. Maps of project site including:
 - i. Project Site (not a point, a boundary)
 - ii. Study Area for each modal test
 - iii. Pipeline CIP projects (if applicable)
 - iv. Identified Deficiencies with a numeric identifier (for each mode studied)
- f. Table and corresponding map of **all deficiencies before factoring in proportionality**

Example Table of All Deficiencies

ID	Location	Deficiency Type (ADA, PLOC, Transit, etc.)	Deficiency	Recommended Mitigation	Linear Feet (if applicable)	Feasible to Construct (Y or N)	Notes on Feasibility (ROW with Plat #, etc)	Cost Estimate
A1	Northeast curb ramp of intersection of Street A and Street B	ADA	Broken curb ramp with no DWS	Reconstruct the curb ramp and add DWS	N/A	Y	N/A	\$X,XXX
A2	Southeast curb ramp of Intersection of Street C and Street D	ADA	Exceeds cross-slope	Reconstruct the curb ramp	N/A	Y	N/A	\$X,XXX
P1	South side of Street C	PLOC	No buffer between road and sidewalk	Relocate the sidewalk to provide a 6-foot-wide buffer	150	N	Additional ROW is not available, See Plat #XXXX	\$X,XXX
P2	North side of Street A between Street B and Street C	PLOC	No street buffer between the sidewalk and roadway	Add a 6-foot-wide street buffer and relocate sidewalk	300	Y	ROW available. See Plat #XXXX	\$X,XXX
S1	South side of Street A between driveway and study area boundary	Streetlighting	Deficient streetlight spacing	Add 1 streetlight	N/A	Y	N/A	\$X,XXX
B1	East side of Street B between Street A and Street D	BLTS	Segment has a high speed limit with an on-street striped bike lane	Construct a two-way separated bike lane with transitions at both ends to the existing bike lane.	350	Y	ROW available. See Plat #XXXX	\$X,XXX

T1	North side mid-block of Street D	Transit	Flag bus stop with no pad, shelter or other amenities	Construct a bus shelter and bus pad	N/A	Y	N/A	\$X,XXX
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3. LATR Vision Zero Statement

- a. Review High Injury Network Segments (if applicable)
 - i. HIN Attributes
 - ii. HIN Crashes
 - iii. HIN Improvements
- b. Crash Summary
 - i. Brief summary of crashes in study area
 - ii. Map of crashes
 - iii. Map of severe and fatal crashes
 - iv. Table summarizing severe and fatal crashes

Example Table of Severe and Fatal Crashes

Crash Severity	Crash Date	Crash Location (Intersection or Segment)	Collision Type	Crash Mode
Severe	11/10/2021	Segment	Same Direction Sideswipe	Motor Vehicle
Fatal	04/05/2022	Intersection	Same Direction Rear End	Bicyclist

- c. Speed Study
 - i. Brief summary of study
 - 1. Roadways and their posted speeds
 - 2. Summary of methodology
 - ii. Map of speed study locations
 - iii. Table of observed speeds

Example Table of Observed Speeds

Location	Direction	Posted Speed Limit	50 th Percentile Speed	85 th Percentile Speed	10-mile per hour Pace	Speed Limit Exceeded by 20% (Y or N)
Street A Mid-Block	NB	35	35	40	30-40	Y

- d. Site Access
 - i. Summarize how the project’s right-of-way improvements will address HIN issues (if applicable)
 - ii. Summarize how projects ROW/frontage improvements will address identified safety issues
 - iii. Describe internal site circulation and how it promotes bicycle, pedestrian, and motor vehicle occupant safety

4. Motor Vehicle System Adequacy (if applicable)

- a. Study Intersections Map
- b. Existing Counts Figure
- c. Congestion Standard for Policy Area
- d. Pipeline developments map and table

Example Table of Pipeline Developments

Development Name	Development Plan Number(s)	Number of Residential Units (if applicable)	Non-Residential Square Footage (if applicable)	AM Peak Hour Vehicle Trips	PM Peak Hour Vehicle Trips
Pipeline Example A	12023###	400	5,000	165	241

- e. Pipeline CIP projects map and table (if applicable)

Example Table of Pipeline CIP Project

CIP Project Name	CIP Project ID Number	Anticipated Construction Year	Description of Project	Project Status (Planning, Design, etc.)
Example Bikeway and Safety Improvement	P#####	2026	This project provides for pedestrian and bicycle improvements for dual bicycle facilities and enhanced continuous pedestrian facilities along Street D from Street A to Street E.	Preliminary Design Stage

- f. Brief summary of analysis methodology
 - i. Trip Generation and Vehicle Generation
 - ii. Site Trip Distribution
 - iii. Site Trip Assignment
 - iv. CLV/HCM
 - v. Any additional analysis requested (queuing, gap analysis, etc.)

g. Vehicular Analysis Results

- i. Vehicular Analysis Summary Table – highlighting any intersections above the congestion standard

Example Vehicular Analysis Summary Table

Intersection	Signalized or Unsignalized	Measure of Performance (CLV or HCM)	Existing Conditions (AM)	Existing Conditions (PM)	Future Background Conditions (AM)	Future Background Conditions (PM)	Total Future Conditions (AM)	Total Future Conditions (PM)
Street A / Street B	Signalized	HCM, 80 seconds/vehicle	40	65	60	75	67	85
Street A / Street C	Signalized	HCM, 80 seconds / vehicle	30	40	50	55	60	68

- h. Map of intersections (if applicable)

- i. Summary of proposed mitigations (if applicable)

- j. Map and corresponding table of proposed mitigations (if applicable)

Example Table of Deficiencies Proposed to be Addressed

ID	Location	Deficiency	Recommended Mitigation	Measure of Performance After Mitigation (CLV or HCM) (AM)	Measure of Performance After Mitigation (CLV or HCM) (PM)
M1	Street A / Street B	Operates above the delay standard.	Modify signal timing	67	75

- k. Table Summarizing Pedestrian Crossing Time at all Studied Signalized Crossings

Example Table of Pedestrian Crossing Times

Intersection	Leg	Distance of Ped Crossing (feet)	Time needed for 3.5 feet/second	Clearance Time Reduction (seconds)	New Crossing Time Required (Seconds)	Walk (seconds)	Flash Don't Walk (seconds)	Total Walk Time (seconds)	Adequate time with respect to Walk + Flash Don't Walk	Adequate time with respect to Flash Don't Walk
Street A / Street B	North	78	22.0	5.5	16.5	10	12	22	Yes	Yes
Street A / Street B	South	85	24.0	5.5	18.5	10	12	22	Yes	Yes
Street A / Street B	East	49	14.0	4.5	9.5	8	17	25	Yes	Yes
Street A / Street B	West	52	15.0	4.5	10.5	8	17	25	Yes	Yes

5. Pedestrian System Adequacy

- a. Brief summary of Pedestrian Level of Comfort (PLOC) Conditions
 - i. Map and corresponding table of PLOC segments in study area identified as “Uncomfortable” or “Very Uncomfortable” with proposed mitigations and cost estimates (if applicable) – **This should be before factoring in the proportionality guide**

Example Table of Deficiencies and Mitigations

ID	Segment or Crossing	Location	Linear Feet (if applicable)	Existing PLOC and Description	Proposed Mitigation	PLOC After Mitigation	Cost Estimate	Feasible to Construct (Y or N)	Notes on Feasibility (ROW with Plat #, etc)
P1	Segment	North side of Street A	500	Uncomfortable, 4-foot sidewalk with 2-foot buffer	Widen sidewalk to 6-feet and widen street buffer to 6-feet	Very comfortable	\$X,XXX	N	Not enough ROW to widen the sidewalk and street buffer. Plat #XXXX
P2	Crossing	Mid-block crossing of Street A	25	Undesirable, no marked crossing, but identified on PLOC map as a crossing location.	Construct bulb-outs and stripe high visibility cross-walk	Somewhat comfortable	\$x	Y	N/A

- b. Brief Summary of Street Lighting Conditions

- i. Map and corresponding table of Streetlights in Study Area that do not meet MCDOT standards with proposed mitigations and cost estimates (if applicable) – **This should be before factoring in the proportionality guide**

Example Table of Streetlight Deficiencies and Mitigations

ID	Location	Streetlighting Deficiency	Proposed Mitigation	Cost Estimate	Feasible to Construct (Y or N)	Notes on Feasibility (ROW with Plat #, etc)
S1	South side of Steet C mid-block	Streetlight spacing	Add 1 streetlight	\$X,XXX	Y	N/A

- c. Brief Summary of ADA Compliance
 - i. Map and corresponding table(s) of segments and curb that do not meet ADA standards with proposed mitigations and cost estimates (if applicable) – **This should be before factoring in the proportionality guide**

Example Table of Existing ADA Deficiencies and Mitigations

ID	Location	ADA Category Type	ADA Deficiency	Linear Feet (if applicable)	Proposed Mitigation	Cost Estimate	Feasible to Construct (Y or N)	Notes on Feasibility (ROW with Plat #, etc)
A1	Street A / Street C intersection, north-south crossing, NE corner	Curb Ramps	Exceeds cross-slope	N/A	Remove and replace curb to meet ADA standard for crossing slope	\$X,XXX	Y	N/A
A2	North side of Street A between Street B and Street C	Segment	Missing sidewalk	300	Construct sidewalk	\$X,XXX	N	ROW not available to add sidewalk, See Plat #xxxxx

6. Bicycle System Adequacy

- a. Brief summary of Level of Traffic Stress (BLTS)

- i. Map and corresponding table of BLTS segments that are identified as High or Moderate Levels of Stress with proposed mitigations and cost estimates (if applicable) – **This should be before factoring in the proportionality guide**

Example Table of BLTS Deficiencies and Mitigations

ID	Location	Existing BLTS	Linear Feet (if applicable)	Proposed Mitigations	BLTS After Mitigation	Cost Estimate	Feasible to Construct (Y or N)	Notes on Feasibility (ROW with Plat #, etc)
B1	Street D between Street E and Street F	High	500	Construct 10-foot wide Sidepath	Low	\$X,XXX	Y	N/A

7. Bus Transit System Adequacy

- a. Brief summary of bus stop conditions
 - i. Maps and corresponding table of bus stops assessed – highlighting any bus stops where shelters are not provided.

Example Table of Existing Bus Stop Conditions

ID	Bus Stop Location	Bus Routes that Serve the Bus Stop	Shelter Present (Y or N)	Real Time Travel Information Displays Provided (Y or N)	Other Amenities at Bus Stop (bench, trash receptacles, etc.)	Bus Pad Size	Connected to a Pathway (Y or N)
T1	Mid-block along Street A	Ride On: 8, 9 Metrobus: C2, C4	N	N	Bench	None	Y

- ii. Map and corresponding table of proposed mitigations and cost estimates (if applicable) – **This should be before factoring in the proportionality guide**

Example Table of Bus Stop Mitigations

ID	Bus Stop Location	Proposed Mitigation	Cost Estimate	Feasible to Construct (Y or N)	Notes on Feasibility (ROW with Plat #, etc)
T1	Mid-block along Street A	Construct a bus shelter	\$17,500	Y	N/A

8. LATR Proportionality Guide (if applicable)

- LATR Proportionality Guide Calculation
- Brief summary of off-site mitigation considerations
- Summary map and table of proposed mitigations (all modes) or note if mitigation payment is proposed instead

Example Table of Proposed Mitigations

ID	Location	Deficiency Type (ADA, PLOC, Transit, etc.)	Deficiency Description	Recommended Mitigation	Linear Feet (if applicable)	Cost Estimate
A1	Northeast curb ramp of intersection A and B	ADA	Broken curb ramp with no DWS	Reconstruct the curb ramp and add DWS	N/A	\$ X,XXX
P2	North side of Street A between Street B and Street C	PLOC	No street buffer between the sidewalk and roadway	Add a 6-foot-wide street buffer and relocate sidewalk	300	\$ X,XXX
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T1	North side mid-block of Street D	Transit	Flag bus stop with no pad, shelter or other amenities	Construct a bus shelter and bus pad	N/A	\$ X,XXX

- d. Summary map and table of back-up mitigation projects that replace a project listed in the proposed mitigation list (if applicable)

Example Table of Back-up Mitigation Projects

ID	Location	Deficiency Type (ADA, PLOC, Transit, etc.)	Deficiency Description	Recommended Mitigation	Linear Feet (if applicable)	Cost Estimate
A2	Southeast curb ramp of Intersection of Street C and Street D	ADA	Exceeds cross-slope	Reconstruct the curb ramp	N/A	\$X,XXX

9. Appendices

- a. Signed Scoping Agreement
- b. Detailed Project Trip Generation (including initial ITE outputs, ITE Rate Adjustment Factors, and Mode Split Assumptions)
- c. ADA Compliance Survey Data
- d. Streetlight Adequacy Verification
- e. Speed Study Data
- f. Traffic Count Data (if applicable)
- g. Pipeline CIP Project Information (if applicable)
- h. Pipeline Project Trip Generation, Distribution, and Assignment Figures (if applicable)
- i. Site Vehicle Trip Distribution and Assignment Figures (if applicable)
- j. CLV Results (if applicable)
- k. HCM Results (if applicable)
- l. Queuing Reports (if applicable)
- m. Signal Warrant Analysis (if applicable)
- n. Weaving/Merge Analysis (if applicable)
- o. Proportionality Calculation (if applicable)
- p. Cost Estimates (if applicable)
- q. TDM Strategy Statement (if applicable)
 - i. Description of TDM Plan elements
 - ii. Vehicle trip reduction goals
 - iii. TDM Plan actions and quantitative assessment of how this will achieve the vehicle reduction goals
 - iv. Required duration of TDM Plan
 - v. Enforcement measures
 - vi. Monitoring

- vii. Security instrument to fund continuation of program for its remaining term if the applicant defaults
- viii. Penalties if reduction goals are not met
- ix. Written statements from MCDOT and Planning Department Staff concurrence proposed approach