

APPENDIX D

LEVEL OF TRAFFIC STRESS METHODOLOGY

REVISED LEVEL OF TRAFFIC STRESS

While the LTS methodology has proved to be a highly useful approach to understanding the challenges to bicycling in Montgomery County, the Montgomery County Planning Department felt that the LTS methodology did not fully capture stress levels on some of the roads in the County. To provide a more nuanced analysis of traffic stress, the Department created a revised methodology. The following discussion explains the differences between the original LTS and the revised LTS.

2.1 ADDITIONAL STRESS LEVELS

The revised LTS methodology seeks to create a more fine-grained analysis, creating three additional stress levels: LTS 0 (no traffic stress), LTS 2.5 (moderate / low traffic stress) and LTS 5 (very high traffic stress).

When added to the original LTS categories, the revised approach comprises seven stress levels:

- LTS 0 - None
- LTS 1 - Very Low
- LTS 2 - Low
- LTS 2.5 - Moderate Low
- LTS 3 - Moderate High
- LTS 4 - High
- LTS 5 - Very High

LTS 0 creates a new category of bikeway for completely separated bicycling infrastructure. This classification reflects the absence of traffic on trails and paths that exist outside of roadway right-of-way. It helps to distinguish those places with no traffic stress from areas with very low stress. From a policy perspective, the effect of adding this level is limited, however, staff felt it was important to be able to communicate the differences between trails in independent right-of-ways and sidepaths and separated bike lanes to the public. Trails in independent right-of-ways tend to have long segments with no interaction

with traffic. Sidepaths and separated bike lanes tend to cross intersecting driveways with greater frequency and are set back from the road in varying widths.

LTS 2.5 creates a new category because the gulf between the comfort levels of LTS 2 and LTS 3 is large. While the literature states that approximately 60 percent of the population will feel comfortable riding on LTS 2 roads, only 10 percent of the population will feel comfortable riding on LTS 3 roads - a 50 percent difference. This large gap in the two categories leaves out many streets (and bicyclists) that fall somewhere in between.

LTS 5 creates a new category of roads with very high speed limits to reflect that very few bicyclists are likely to brave these roads. The policy implications of adding this level is limited since bicycling on such roads is almost nonexistent. However, distinguishing roads with very high traffic speeds (exceeding 40 mph) from other Level 4 roads is important because there are many existing bicyclists in Montgomery County who will ride on Level 4 roads, but few who will ride on LTS 5 roads.

2.2 SEPARATED BIKEWAYS

Under the original LTS methodology, all separated bikeway infrastructure, including trails, sidepaths and separated bike lanes, were assigned the lowest stress rating, LTS 1. The Planning Department felt that not all separated bike facilities are very low stress and that the stress level can vary based on how these bikeways are designed. The revised LTS therefore proposes the following changes:

- **Shared Use Paths:** There is a wide range in the stress level of shared use paths, based on the speed of an adjacent roadway, the width of the buffer between the street and the path, and the frequency of driveways. This range includes the following:

Intersections: Original Level of Traffic Stress
Unsignalized Intersections

LTS is the more stressful of (1) and (2) below:

1. Intersection LTS (see table; right)
- Or
2. Street Segment LTS (see previous pages)

Posted Speed Limit on Street Being Crossed	# of Lanes of Street Being Crossed					
	No Median Refuge			Median Refuge (≥6 ft wide)		
	2 to 3	4 to 5	6+	2 to 3	4 to 5	6+
≤25	1	2	4	1	1	2
30	1	2	4	1	2	3
35	2	3	4	2	3	4
≥40	3	4	4	3	4	4

Intersections: Original Level of Traffic Stress
Signalized Intersections

LTS of the street segment (see pages 8-13) is carried through the intersection.

Intersections: Revised Level of Traffic Stress
Unsignalized Intersections

LTS is the more stressful of (1) and (2) below:

1. Intersection LTS (see table; right)
- Or
2. Street Segment LTS (see previous pages)

Posted Speed Limit on Street Being Crossed	# of Lanes of Street Being Crossed					
	No Median Refuge			Median Refuge (≥6 ft wide)		
	2 to 3	4 to 5	6+	2 to 3	4 to 5	6+
≤25	1	2	4	1	1	2
30	2	2.5	4	1	2	2.5
35	2.5	3	4	1	2.5	3
≥40	3	4	4	2	2.5	4

Intersections: Revised Level of Traffic Stress
Signalized Intersections

LTS of the street segment (see pages 8-13) is carried through the intersection.

Street Segments: Revised Level of Traffic Stress

Bikeway: Mixed Traffic

Posted Speed Limit (mph)	# of Through Lanes	Mixed Traffic					
		No Parking		Parking			
		Center Line	No Center Line	Center Line & High Parking Turnover	Center Line & Low Parking Turnover	No Center Line & Non-Residential	No Center Line & Residential
≤25	2-3	3 (2c)	2 (1d)	2.5	2	2.5	2 (1d)
	4-5	3	n/a	3	3	n/a	n/a
	≥6	4	n/a	4	4	n/a	n/a
30	2-3	3	2	3	3	2.5	2
	4-5	4	n/a	4	4	n/a	n/a
	≥6	4	n/a	4	4	n/a	n/a
35	2-3						
	4-5	4	4	4	4	n/a	n/a
	≥6						
40	2-3						
	4-5	4	4	4	4	n/a	n/a
	≥6						
≥45	2-3						
	4-5	5	5	5	5	n/a	n/a
	≥6						

Street Segments: Revised Level of Traffic Stress
Bikeway: Bike Lanes

Posted Speed Limit (mph)	# of Through Lanes	Bike Lanes						
		No Parking			Parking			
		Infrequently Obstructed		Frequently Obstructed	Infrequently Obstructed / Low Parking Turnover			Frequently Obstructed / High Parking Turnover
		Bike Lane ≤ 5.5 ft	Bike Lane ≥ 6.0 ft		Bike Lane + Parking	Bike Lane + Parking = 14.0 - 14.5 ft	Bike Lane + Parking = 15.0 ft	
≤25	2-3	2	1	2.5	2.5 (2a)	2	1	2.5
	4-5	2.5 (2b)	2.5 (2b)	2.5	3			
	≥6	3			3			
30	2-3	2	2	2.5	2.5	2	2	2.5
	4-5	2.5 (2b)	2.5 (2b)	2.5	3			
	≥6	3			3			
35	2-3							
	4-5	3			3			
	≥6							
40	2-3	3			n/a			
	4-5	4 (3b)						
	≥6	4						
≥45	2-3				n/a			
	4-5	4						
	≥6							

Street Segments: Revised Level of Traffic Stress

Bikeway: Sidepaths, Independent Rights-of-Way and Separated Bike Lanes

Posted Speed Limit (mph)	# of Through Lanes	Shared Use Path			Separated Bike Lanes			
		Sidepath with Buffer < 5 ft (and no railing) OR Many Driveways	Sidepath with Buffer ≥ 5 ft (or railing) AND Few Driveways	Independent ROW	Flex Posts	Separated Bike Lanes with Buffer < 5 ft (and no railing) OR Many Driveways	Separated Bike Lanes with Buffer ≥ 5 ft (or railing) AND Few Driveways	Parked Cars
≤25	2-3	2 (1f)	1	0	1	2 (1f)	1	1
	4-5				2			
	≥6				2.5			
30	2-3	2 (1f)	1	0	2	2 (1f)	1	1
	4-5				2.5			
	≥6				2.5			
35	2-3	2 (1f)	1	0	2	2 (1f)	1	1
	4-5				2.5			
	≥6				2.5			
40	2-3	2	2 (1e)	0	2.5	2	2 (1e)	n/a
	4-5							
	≥6							
≥45	2-3	2	2 (1e)	0	2.5	2	2 (1e)	n/a
	4-5							
	≥6							

