



THE BICYCLE MASTER PLAN

What is LTS?

February 3, 2016

Montgomery County Department of Transportation

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Topics

- [1] What is LTS?
- [2] Stress Levels
- [3] How does LTS work?

[1] What is LTS?

Level of Traffic Stress

- Initially developed by Peter Furth at Northeastern University
- Characteristics
 - Uses attributes of roadway/path to determine the amount of stress from traffic bicyclists experience
 - Streets are ranked from LTS 1 (very low stress) to LTS 4 (high stress)
 - Treats links differently from crossings (intersections)

Uses of LTS

- The methodology will allow us to measure connectivity of the network at different stress levels.
- It will also allow us to target investment so that they'll have the biggest impact on the network.

Four Types of Transportation Cyclists



Strong and Fearless (~1%)



Enthusied and Confident (~10%)



Interested but Concerned (~60%)



No Way, No How (~30%)

LTS Shows Available Networks

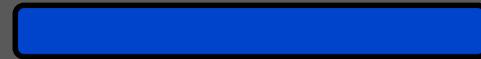
- LTS assumes that each cyclist will tolerate a certain amount of stress. If a street is above that threshold, they won't use it.
- Therefore parts of the network are unavailable to cyclists in the lower stress tolerant levels.

[2] Stress Levels

Level of Traffic Stress

- Furth LTS:

- LTS 1: Very Low Stress



- LTS 2: Low Stress



- LTS 3: Moderate Stress



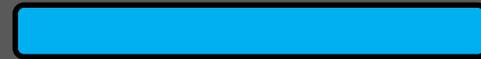
- LTS 4: High Stress



Level of Traffic Stress

- Revised LTS:

- LTS 0: No Traffic Stress



- LTS 1: Very Low Stress



- LTS 2: Low Stress



- LTS 2.5: Moderate Stress



- LTS 3: Moderate Stress



- LTS 4: High Stress



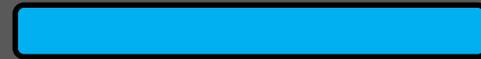
- LTS 5: Very High Stress



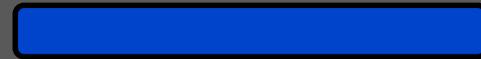
Level of Traffic Stress

- Revised LTS:

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- LTS 2.5: Moderate Stress



- LTS 3: Moderate Stress



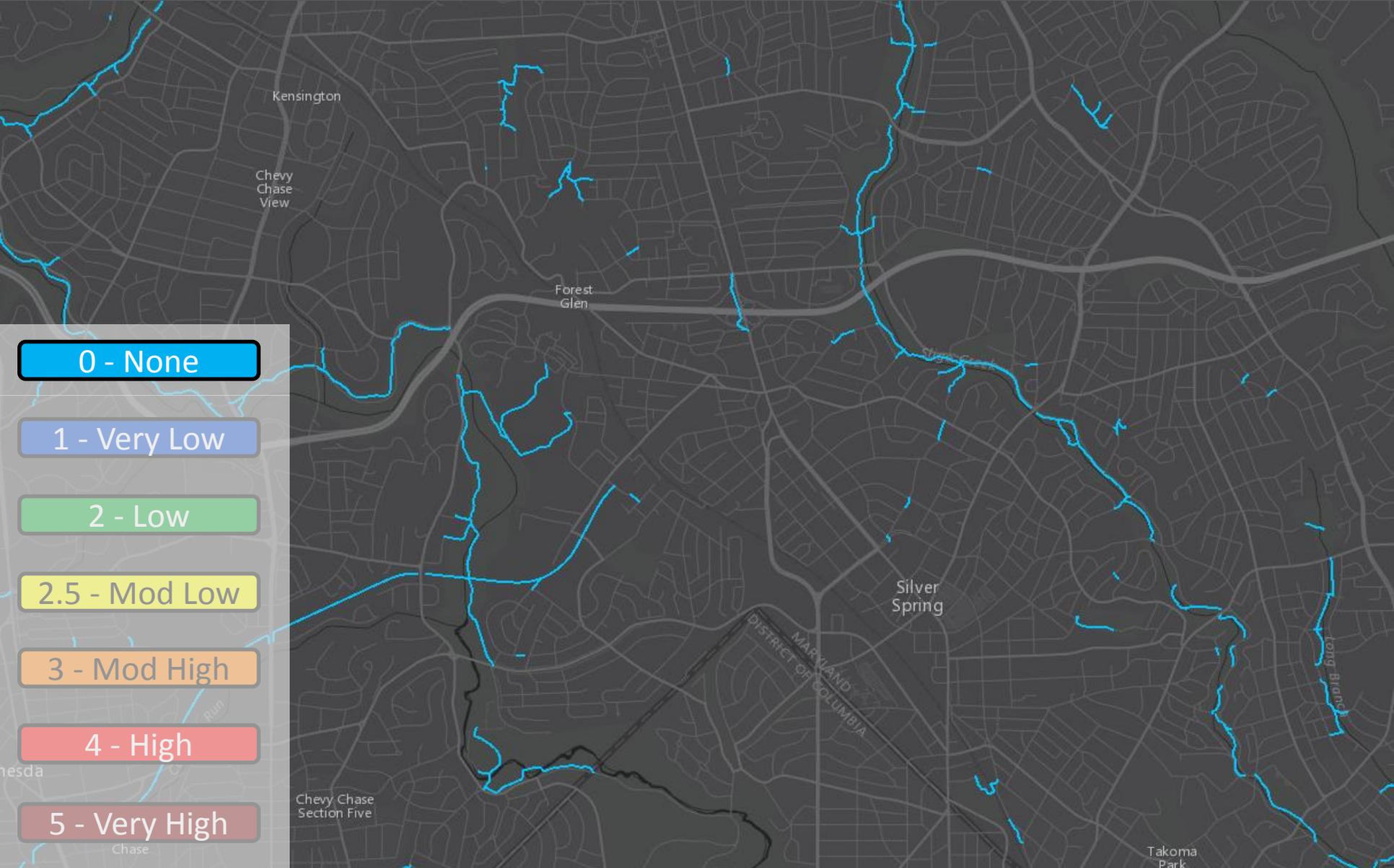
- LTS 4: High Stress



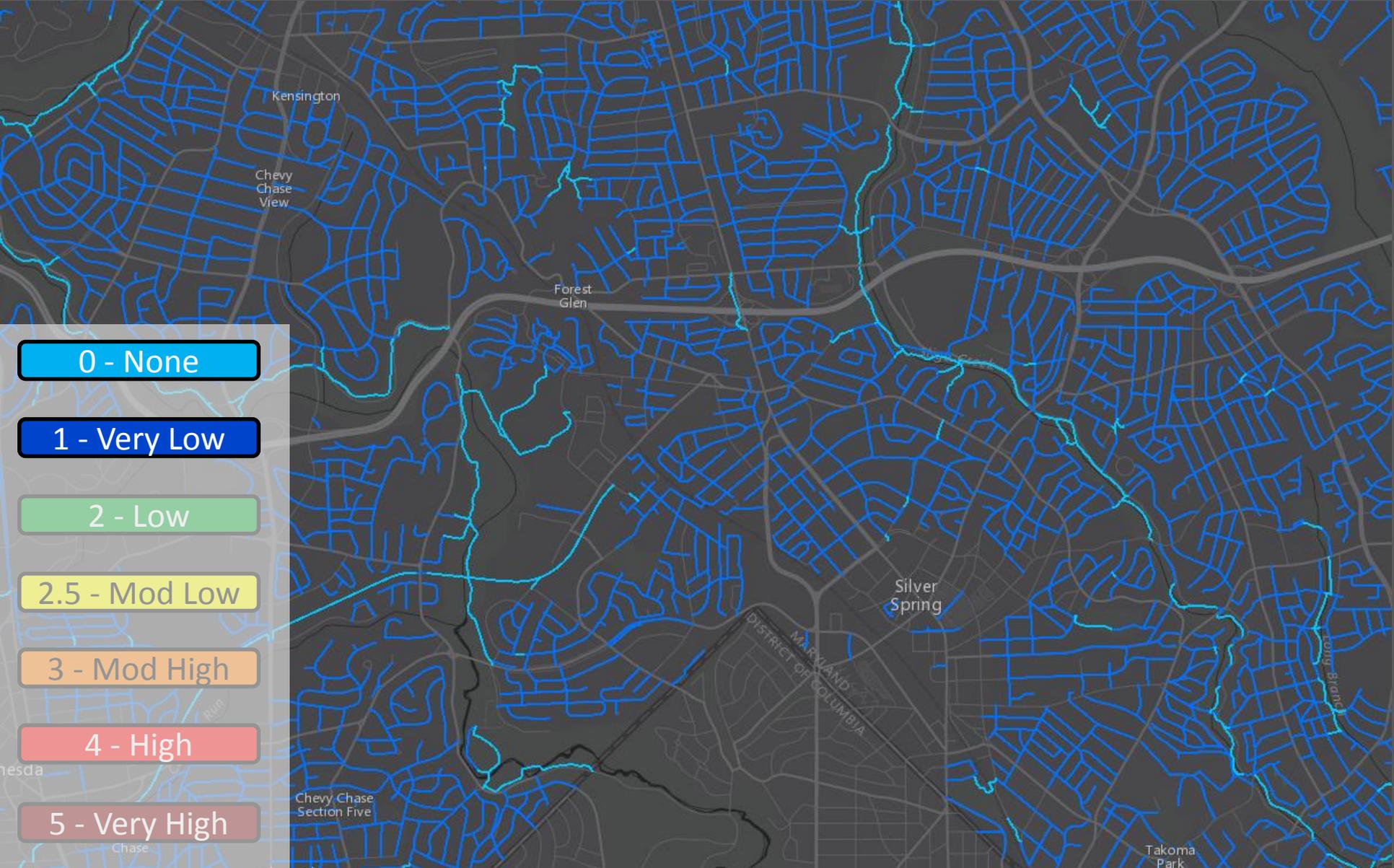
- LTS 5: Very High Stress



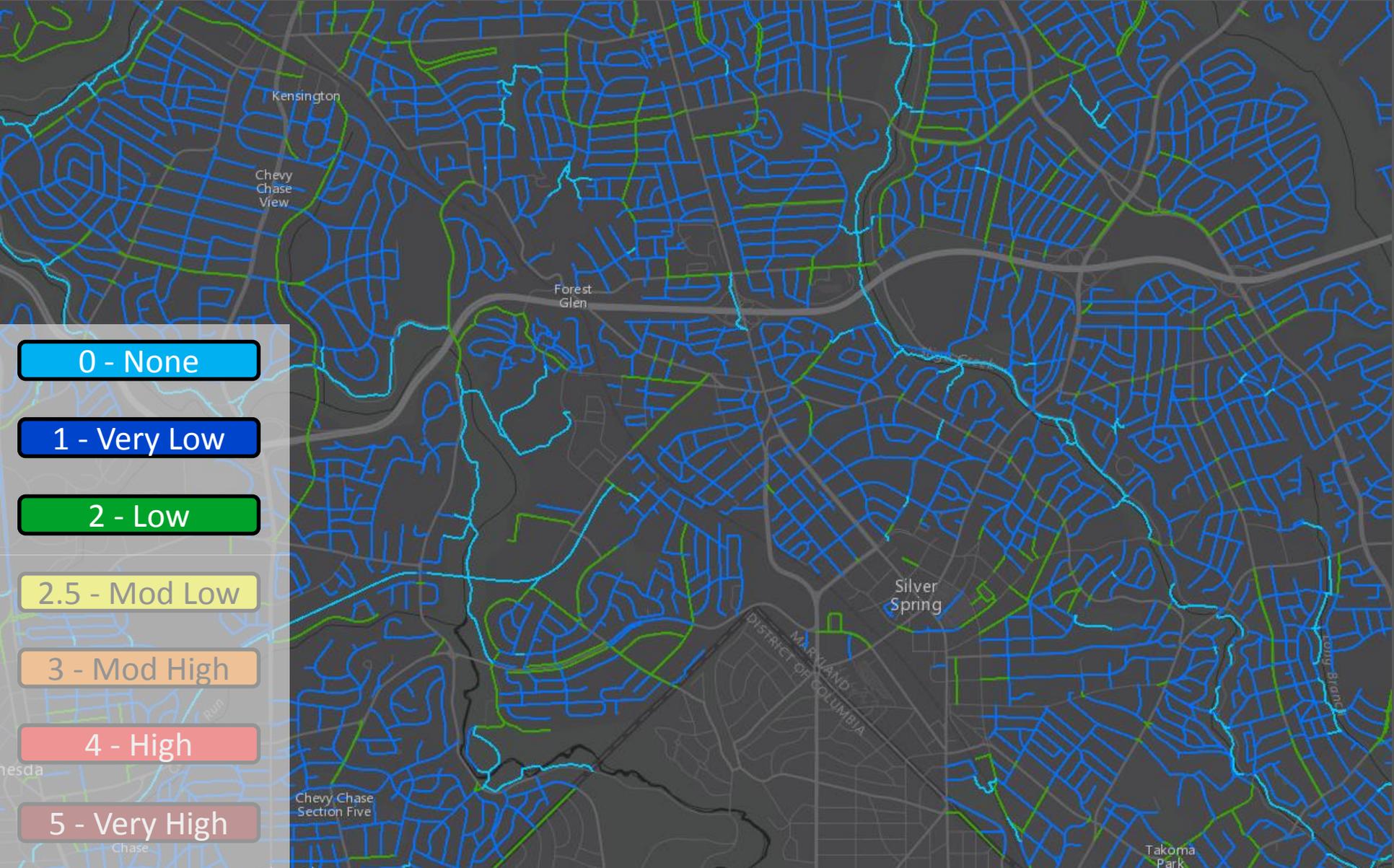
LTS Shows Available Networks



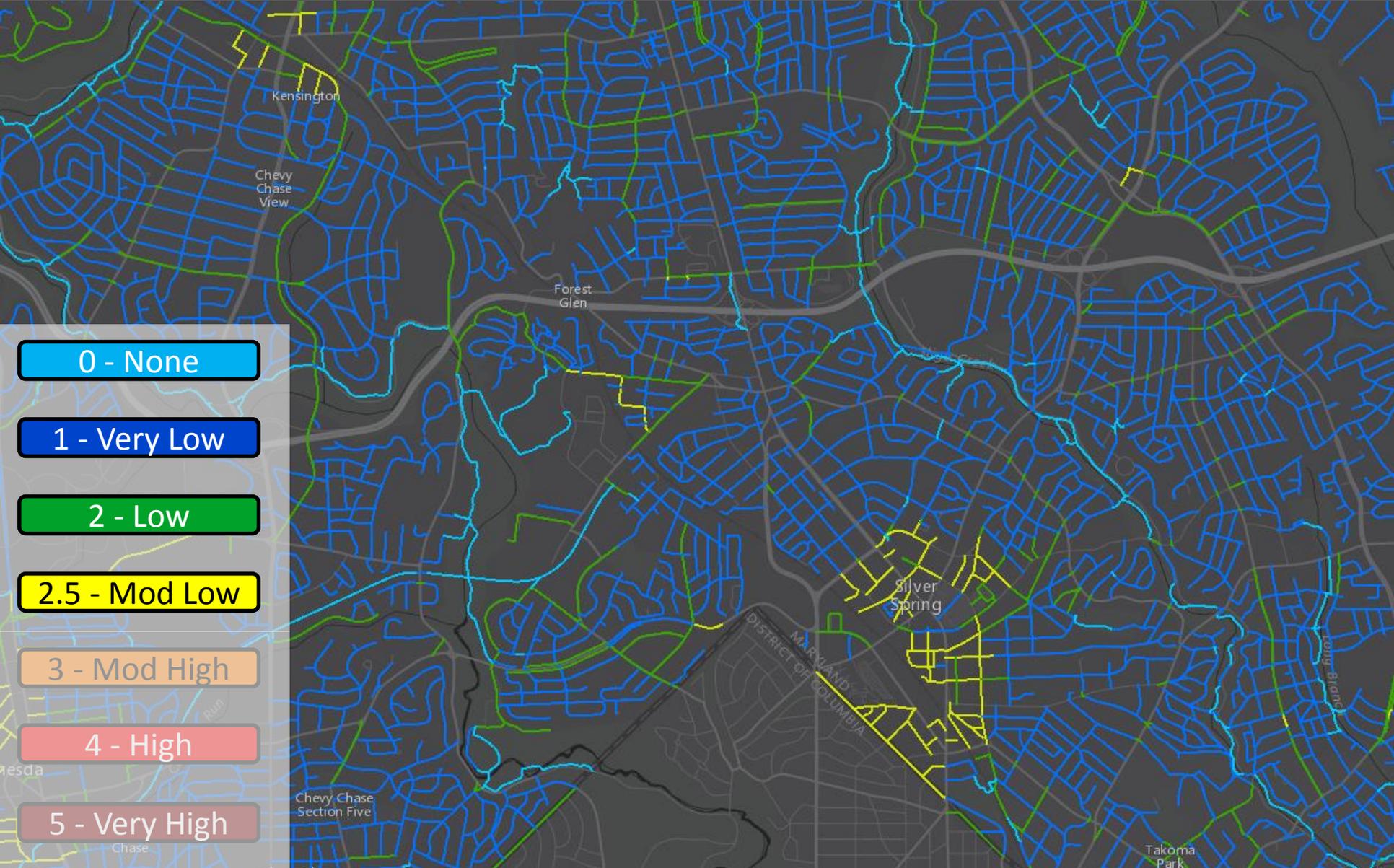
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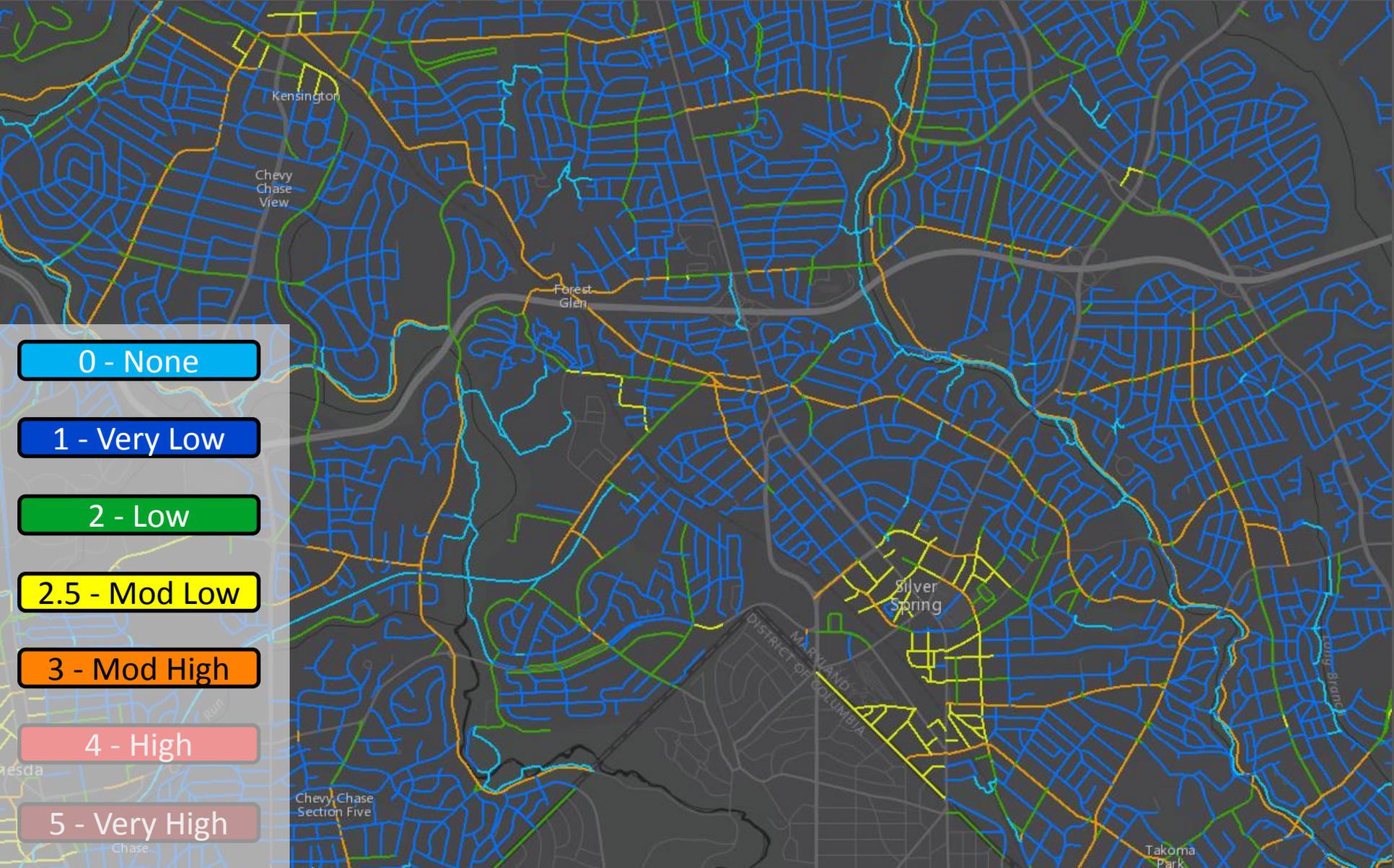
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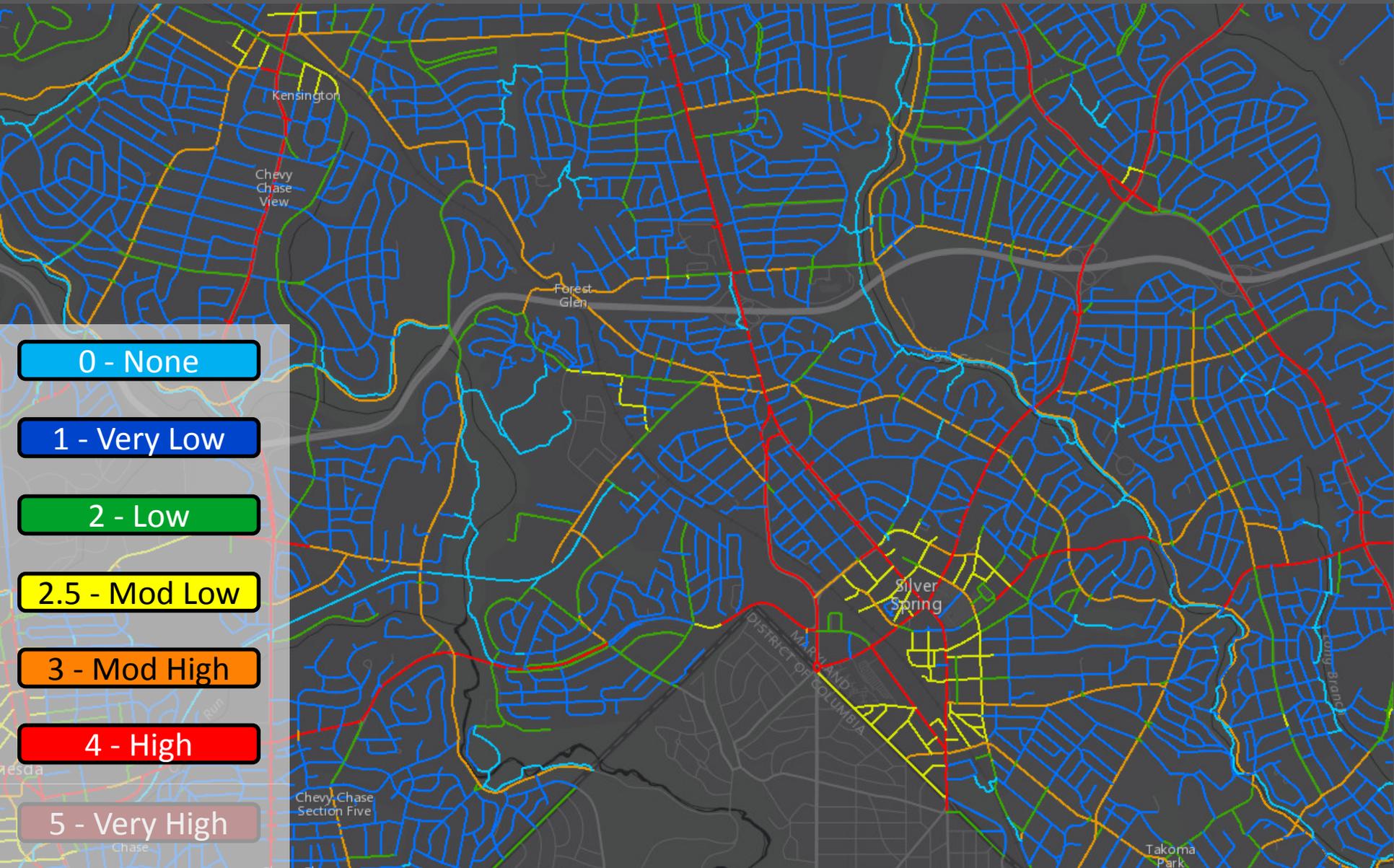
LTS Shows Available Networks



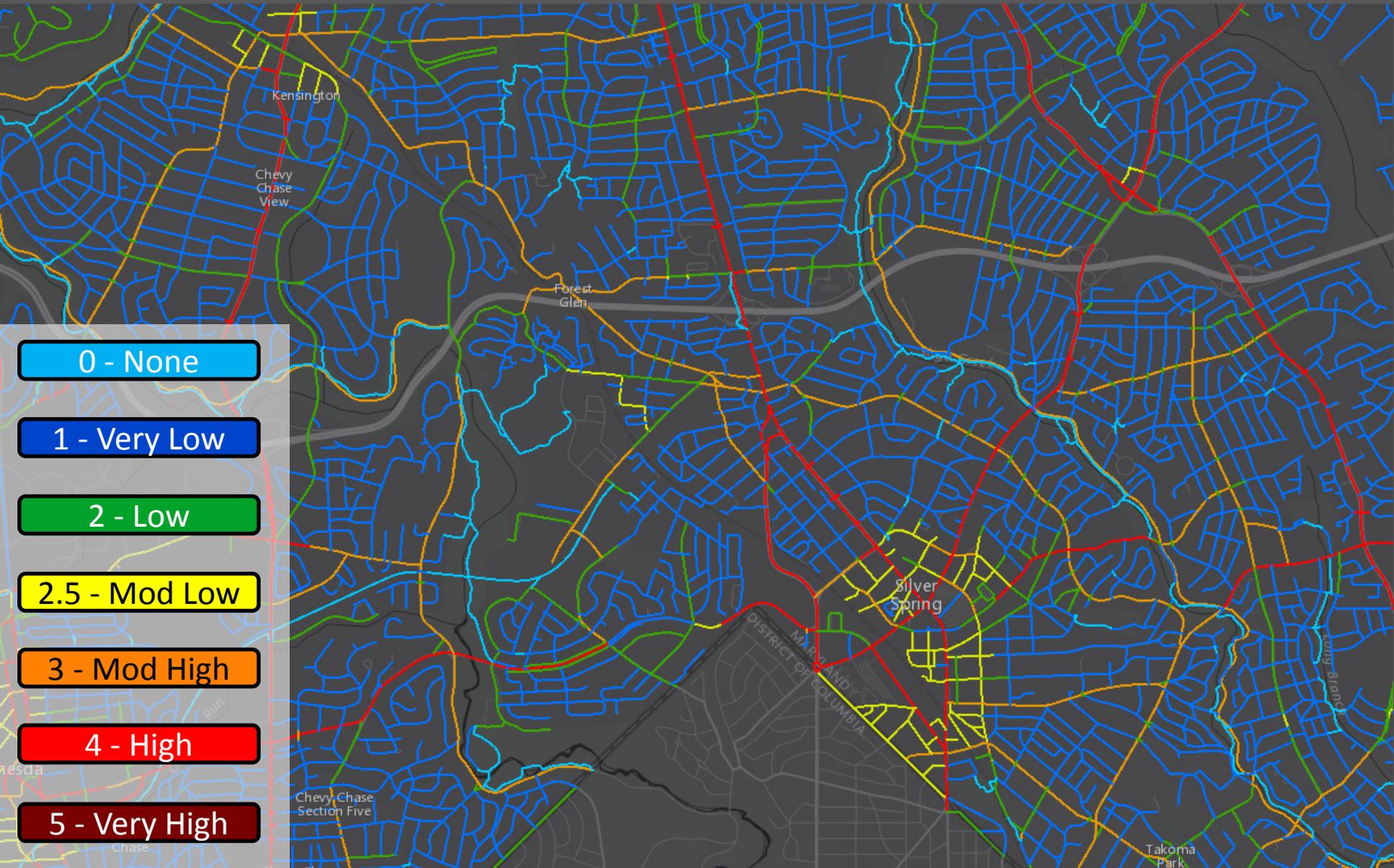
LTS Shows Available Networks



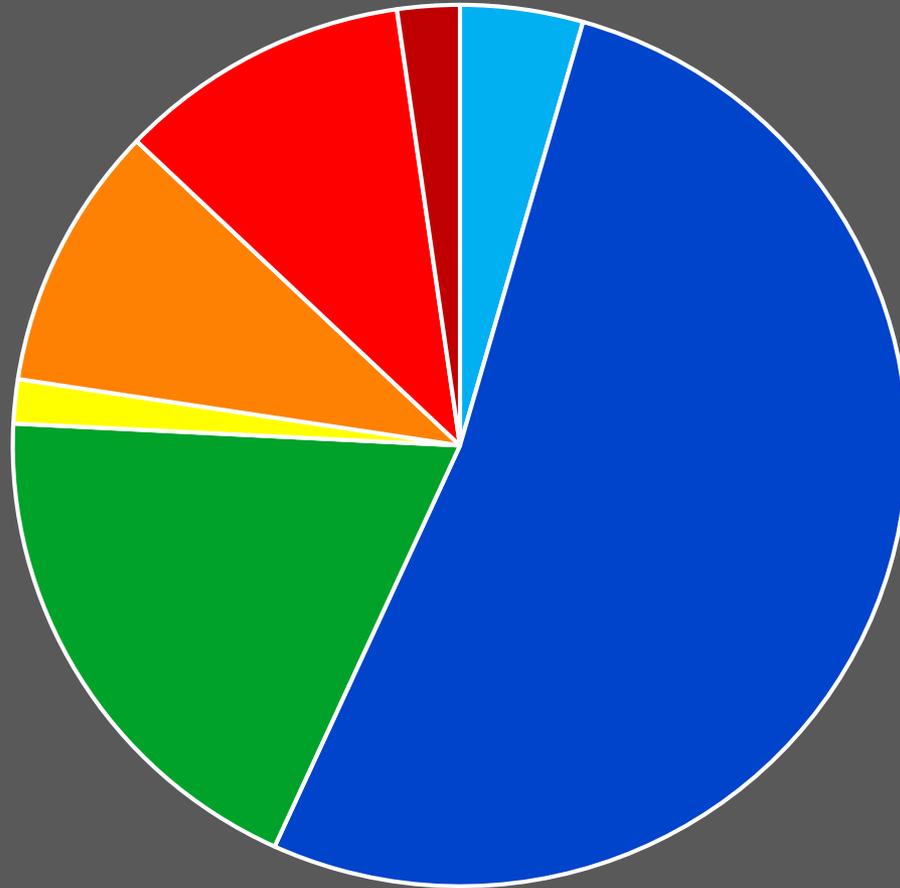
LTS Shows Available Networks



LTS Shows Available Networks



Level of Traffic Stress (revised) mileage



■ LTS 0 ■ LTS 1 ■ LTS 2 ■ LTS 2.5 ■ LTS 3 ■ LTS 4 ■ LTS 5

[3] How does LTS work?

Attributes: Furth LTS

- Type of bike facility
- Bike lane width
- On-street parking
- Parking turnover
- Number of travel lanes
- Posted speed limit
- Striped center line

Attributes: Revised LTS

- Added attributes
 - Buffer type for bike facility
 - Driveway frequency
 - Width of bike lane
 - Industrial street

Speed Limit

- Posted speed limit affects LTS
 - 35+ is automatically high stress (LTS 4)
 - Speed limit + number of lanes is a major factor
- Why not use actual speed?
 - Data is limited
 - No easy way to collect comparable data



Number of Lanes

- The number of lanes affects LTS
 - In most cases, 4+ lanes is automatically high stress (LTS 4)



On-Street Parking

- On-street parking can also affect stress
 - Turbulence
 - Turnover
 - Bike lane blockage
 - “Dooring”
- It can also act as a proxy
 - What’s the setting?



Parking Proxy

- Are these equivalent?



Separated Bike Facilities

- Buffer type and width affects stress on separated bike facilities, like **sidepaths** and **cycletracks**.
 - Best: Barrier/parked cars
 - Best: 5'+ separation
- Driveway frequency also contributes to stress

Crossings and Links

- Crossings may increase stress, but they do not lower it.
 - At an intersection, the LTS is the worse of either:
 - The “Link” LTS or
 - The “crossing” LTS
 - Signalized crossings are not considered to add stress.



Crossings and Links

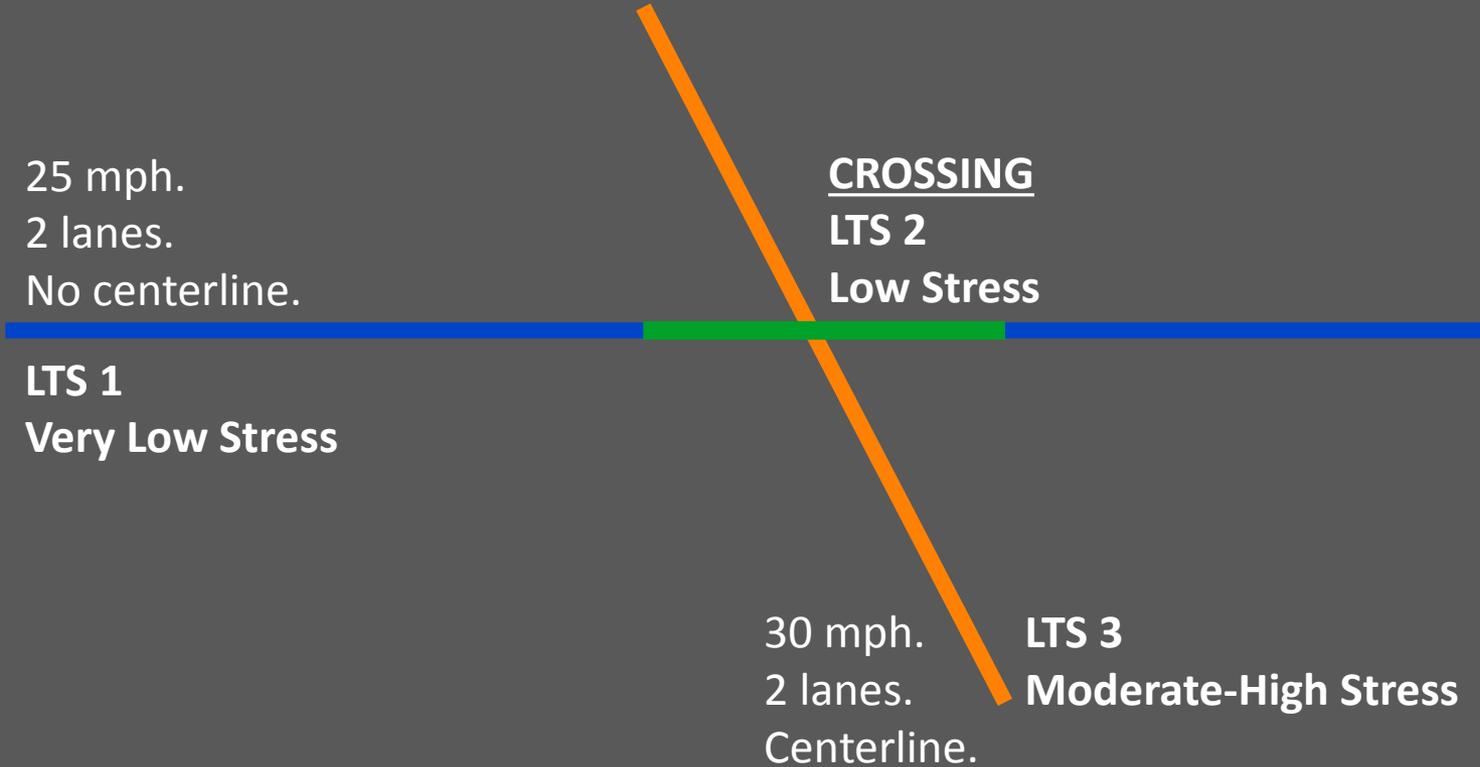
25 mph.
2 lanes.
No centerline.

LTS 1
Very Low Stress

CROSSING
LTS 2
Low Stress

30 mph.
2 lanes.
Centerline.

LTS 3
Moderate-High Stress



Questions?

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