LandDesign
CREATING PLACES
THAT MATTER.

+ **ACCESSIBILITY ANALYSIS**
FOR AN ACTIVE
TRANSPORTATION PLAN

The Carolina Thread Trail Forum
Session #1 09:40am – 10:40pm
12-02-2021

CAROLINA THREAD TRAIL

CAROLINA
THREAD
TRAIL

INTRO.

When designing trails + greenways, it is important to know who you are designing for.

Projecting trail usage can offer valuable insight to guide planning development, trail related design, and trail maintenance projections. This session will demonstrate how accessibility analysis can estimate potential visitors on trails based on existing and future land use development and transportation plans. This evaluation helps to understand the value of the trail system and interconnected network of trails.

INTRO.

Trail visitor count data reflects current trail users, but accessibility analysis can create a picture of potential visitors based on trail design scenarios, future town planning, and adjacent development.

We will illustrate how accessibility analysis can inform decision making for town master planning, ped & bike mobility planning, trail route choices of users, and trail management.

We will discuss the benefits of implementing data-driven based trail planning and design through a case study of Indian Trail, NC.

SPEAKER.

Beth Poovey is a Principal, and the Director of Greenways, Parks and Open Space for LandDesign, where she leads a studio focused on the creation of public spaces that matter. She has over 20 years of experience in greenway, trail, streetscape and park planning and design. Combining her sociology and landscape architecture degrees, her focus and passion has evolved into working with communities to create public open space that authentically integrates their unique assets with environmental stewardship opportunities. Public open space is her thing. Parks, trails, streetscapes, peds, bikes and even trikes.

Along with her national projects, Beth has played a significant role in defining the greenways and open space throughout the Charlotte region. A few of her notable projects include the vision plans for the Carolina Thread Trail, Little Sugar Creek Greenway, Cross Charlotte Trail and the Charlotte Rail Trail. All of which have been proven to provide positive economic and community impacts for the region.

SPEAKER.

Dr. Jung Woo is a GIS and data specialist at LandDesign with over 10 years of experience in GIS modeling and analytics. Building in the foundation of her architecture and urban design background, she leverages research, data, and metrics to inform design decision-making. As a widely published thought leader, Dr. Woo understands the significant role of data in influencing the design process to uncover feasible solutions that best function for a community. As part of the LandDesign team, she will utilize data to inform strategic alignments throughout multi-modal systems to identify a route that best serves the goals of the client and needs of the community.
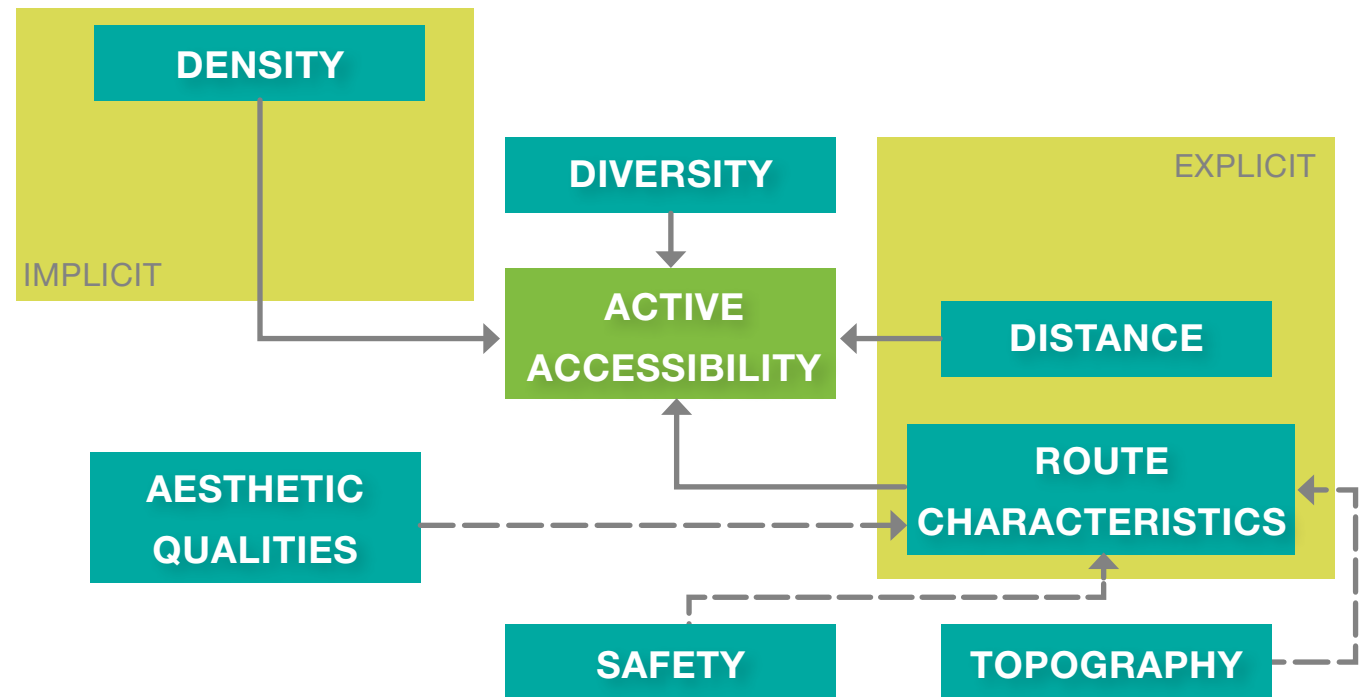
AGENDA.

What is an Accessibility Analysis?

+ Accessibility analysis is an essential element of understanding public service delivery in towns/cities.

+ Accessibility analysis measures what people can reach everyday destinations (schools, jobs, or parks) within a given timeframe.

+ Accessibility analysis evaluates the proximity, efficiency and diversity of trail network.

What is an Accessibility Analysis?

Active travel is associated with feature of the built environments, such as density, landuse mix (diversity), and route characteristics.

IMPLICIT

EXPLICIT

DENSITY

DIVERSITY

ACTIVE ACCESSIBILITY

DISTANCE

AESTHETIC QUALITIES

ROUTE CHARACTERISTICS

SAFETY

TOPOGRAPHY

Vale, David & Saraiva, Miguel & Pereira, M.. (2015). Active accessibility: A review of operational measures of walking and cycling accessibility. Journal of Transport and Land Use. 9. p.4.

Behavior Modeling of the Environments
FOR TRAILS

+ Origins and destinations of trips
  - Home to Trails
  - Retail Stores to Trails
  - Schools to Trails
  - Parks to Trails
  - Public Transits to Trails

+ Route characteristics of trips
  - Foot trails
  - Bikeways
  - Nature Trails
  - Multi-Use Trails

+ The characteristics of the area around origins and destinations
  - Recreational, transport, residential, commercial, and natural land use
 - Density of the areas

Benefits of Trail Connectivity

+ Trails and greenways provide connections that tie communities together with recreation opportunities and commuter routes.

+ Well-connected trails provide important environmental, economic, social, and health benefits for individuals, communities, and regions.

+ Trails can revitalize corridors in towns and guide growth and development to achieve community priorities, such as efficient use of land, revitalized downtowns, improving capacity of roadways, and improving access to schools & other public facilities.

+ Walking and bicycle counts can uncover information to analyze and improve trail design and functionality for pedestrians and bicyclists.

3 W's of Data-Driven Design/Planning Benefits

+ Publicly available big-data sets - easy to do data acquisition and analysis

+ Gain insight from data analysis, making better decisions for design and planning

+ A complementary design solution, from an empirical research approach

WHO

WHAT

WHEN
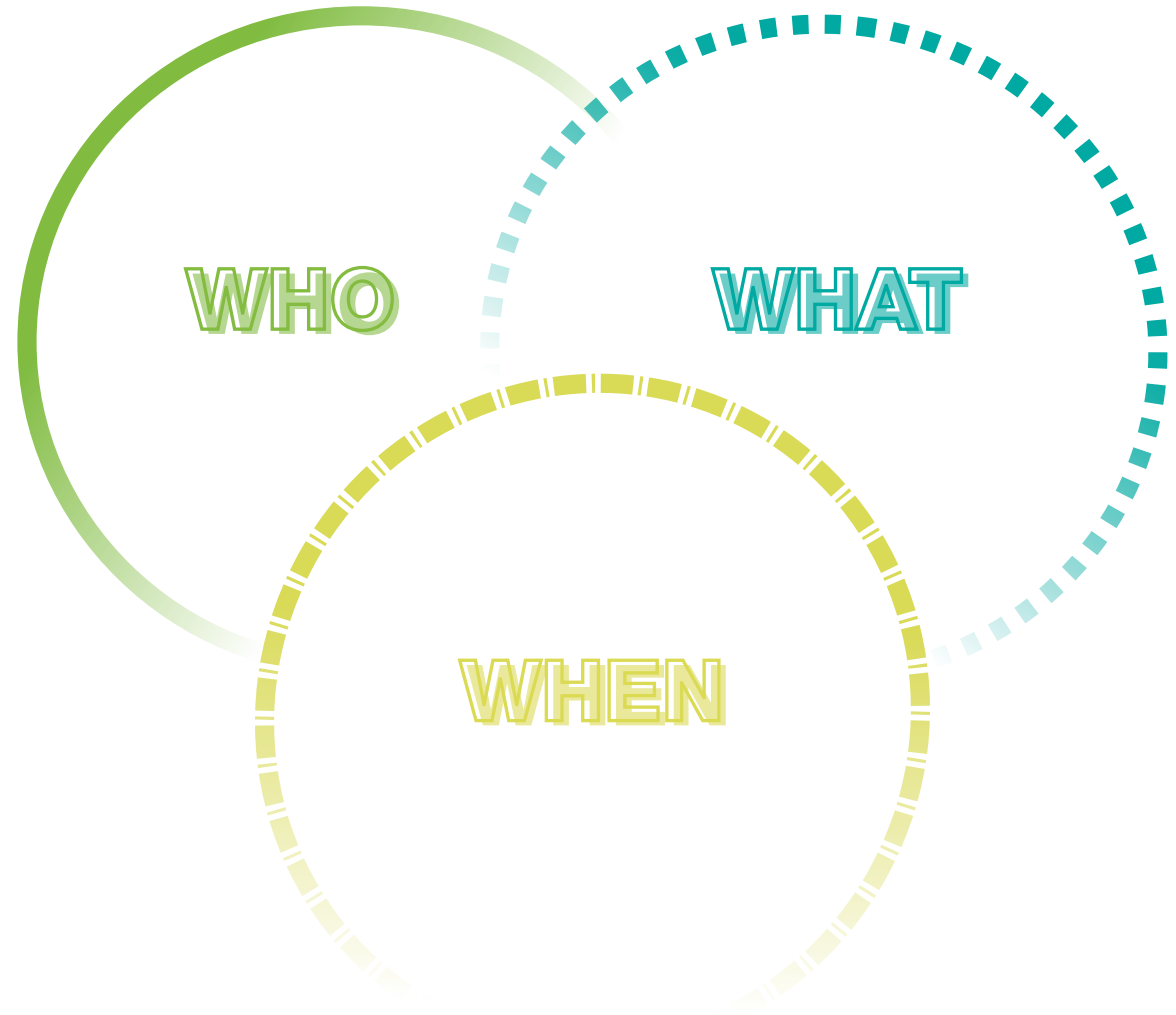
Benefits

WHO?

+ Designers + planners can use accessibility analysis to evaluate preferred trail alignments to inform their decision making.

+ Institutions and policy makers can understand potential trail users to get the best fit for their community.

+ Efficient and strategically placed trails support healthy and sustainable lifestyles for locals and visitors.

+ Trails for all users

Benefits

WHAT?

+ Analyzing the trail system - highly active or under-utilized street segments in the trail system.

+ Quantifying pedestrian + bike accessibility with spatial indicators.

+ Estimating economic value of the trail system - demand, saving travel time and cost

Benefits

WHEN?

+ Trail Planning Phase

Testing goals of a project

Estimating visitor/user demand

+ Trail Design Phase

Design adjustments

Design decisions

+ Trail Management & Maintenance Phase

Visitor counts

Finding trails with effects of more visitors

Re-evaluate the accessibility based on
the changes of town master plan
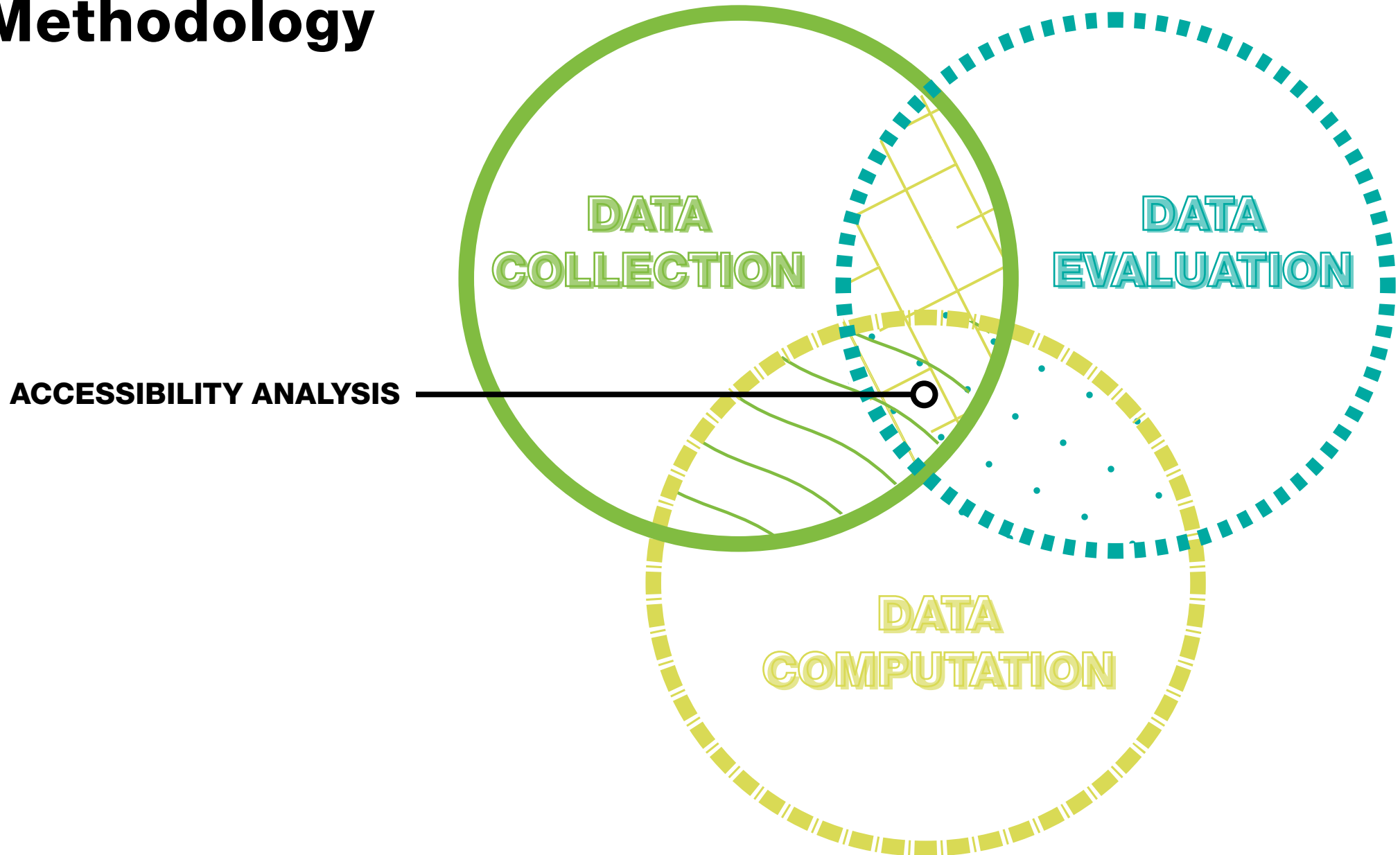
+ Data Needs

+ Building density

+ Land use

+ Building use

+ Roads (sidewalk, bike path, walking trails, and bike trails)

+ Demographics

+ Topography

+ Floodplain

+ Computational Tools

+ An accessibility analysis can be performed using geospatial data inputs evaluated through ArcGIS and the Urban Network Analysis Toolbox in Rhino3D.

+ Data Evaluation Process

+ Set Origins and Destinations.

+ Set street networks for ped/bike path.

+ Run Network Analysis finding the best routes based on road hierarchy, geometry, travel distance and time.

+ Estimation for potential numbers of visitors at the destinations.

Case Study: Indian Trail, NC

+ **Regional Context**

+ **Existing Conditions**

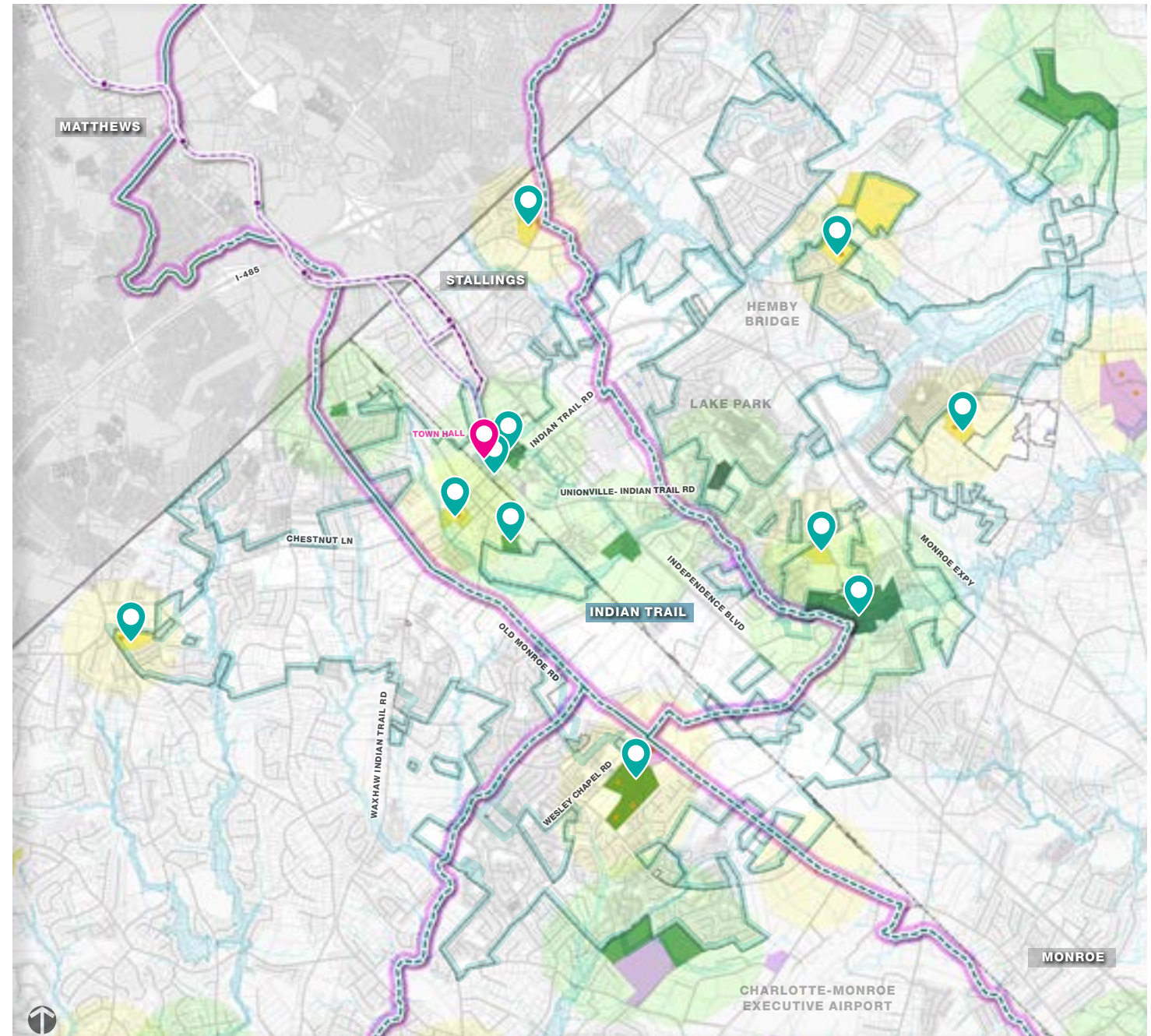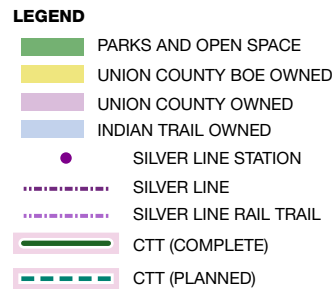+ **Accessibility Analysis**

+ **Active Transportation Plan**

Regional Context

+ The Carolina Thread Trail is planned to provide over 100 miles of trails to Union County. Here, Indian Trail is positioned as a junction point between Mecklenburg and Union County.

+ Indian Trail is within 10 miles of Charlotte, Matthews, Monroe, Waxhaw and many others- approximately an hour bike ride.
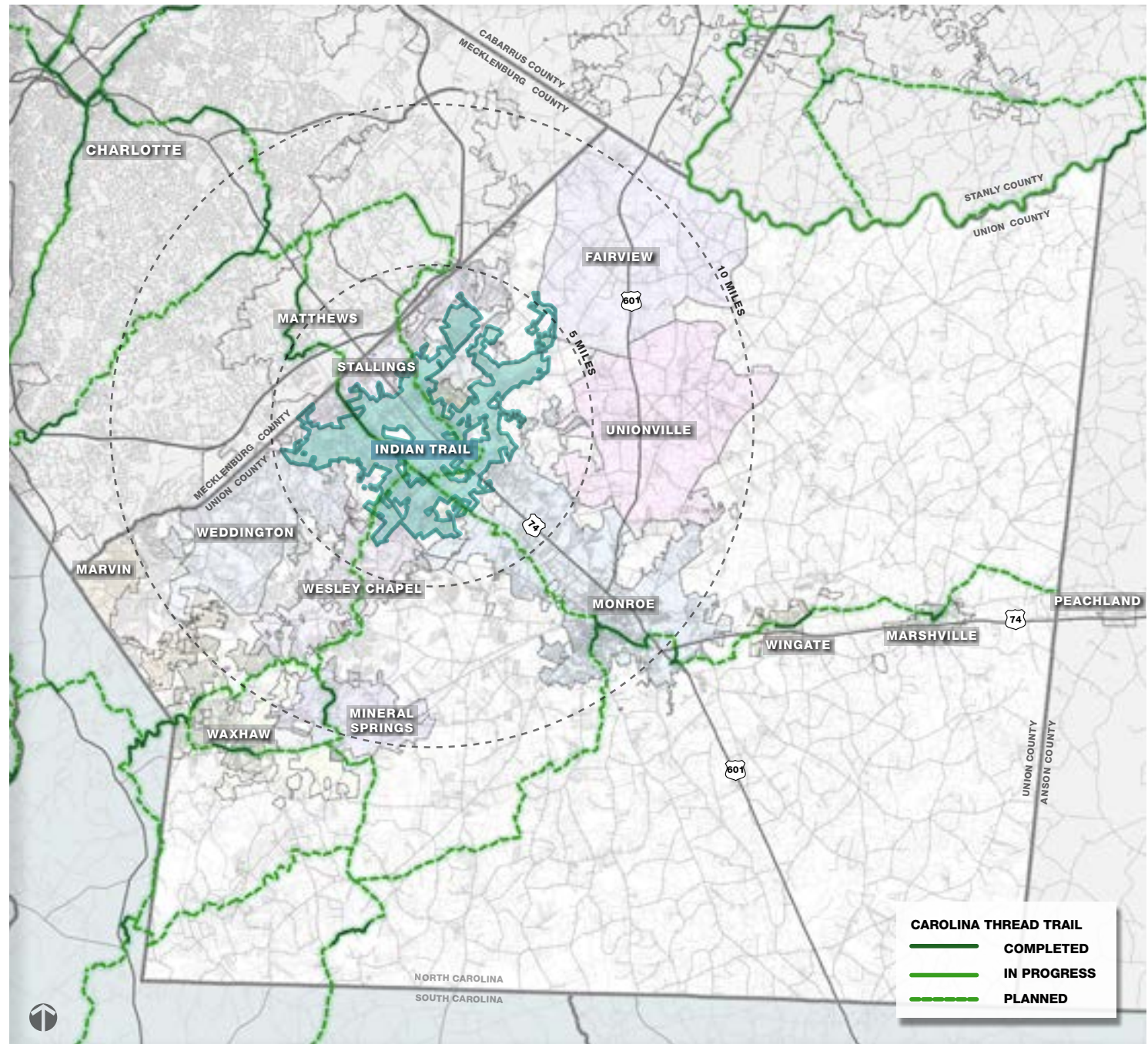
Existing Conditions

+ There are many destinations in Indian Trail, such as the Town Hall, parks, schools, and shopping centers - but there is very little ped/bike access between these and throughout town.
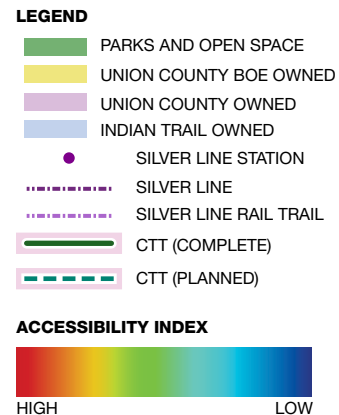

LEGEND

- PARKS AND OPEN SPACE
- UNION COUNTY BOE OWNED
- UNION COUNTY OWNED
- INDIAN TRAIL OWNED
- SILVER LINE STATION
- SILVER LINE
- SILVER LINE RAIL TRAIL
- CTT (COMPLETE)
- CTT (PLANNED)

Major Destinations

CHESTNUT SQUARE PARK

INDIAN TRAIL TOWN HALL

SUN VALLEY COMMONS

CROOKED CREEK PARK

ELEMENTARY SCHOOLS

SUN VALLEY COMMONS & SPORTS PRACTICE AREA

HIGH SCHOOLS

INDIAN TRAIL PLAZA

Accessibility Analysis

 Scenario 1. Home to the Parks

- Highly Accessible Roads:
Indian Trail Rd South, Wesley
Chapel Stouts Rd, Old Monroe
Rd

- Approximately 967
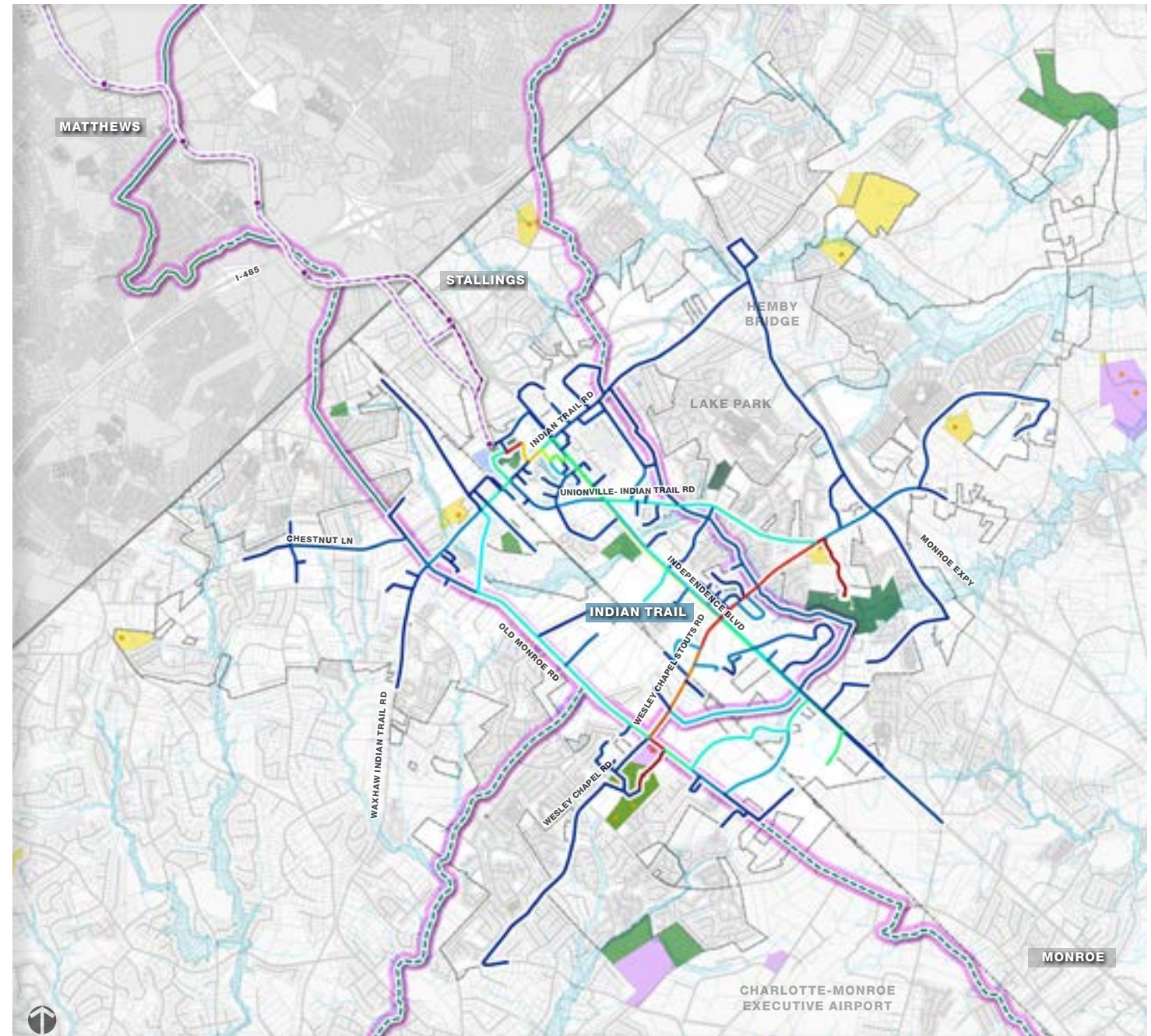households of the town can
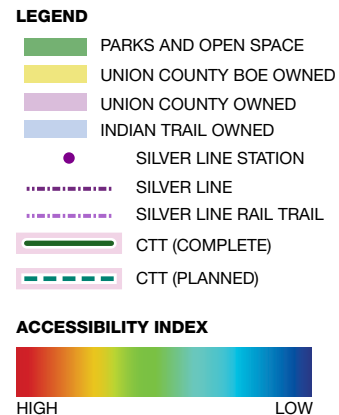access the parks on foot.
(1 mile)
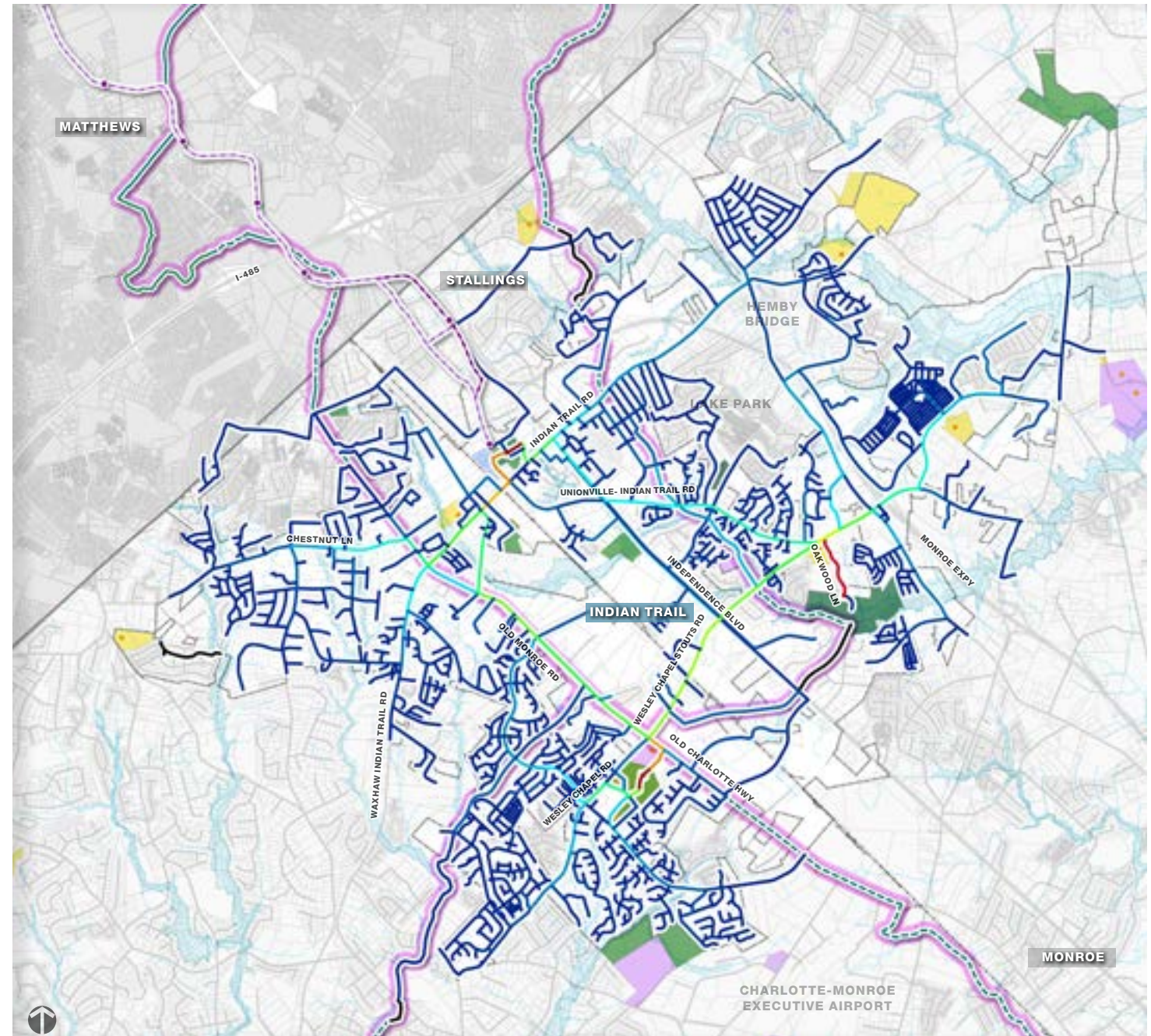
Accessibility Analysis

Scenario 2.
Commercial Developments to the Parks

- Highly Accessible Roads:
Indian Trail Rd South,
Wesley Chapel Stouts Rd,
Independence Blvd, Old
Monroe Rd

- Approximately 236
commercial facilities locate
around the parks.
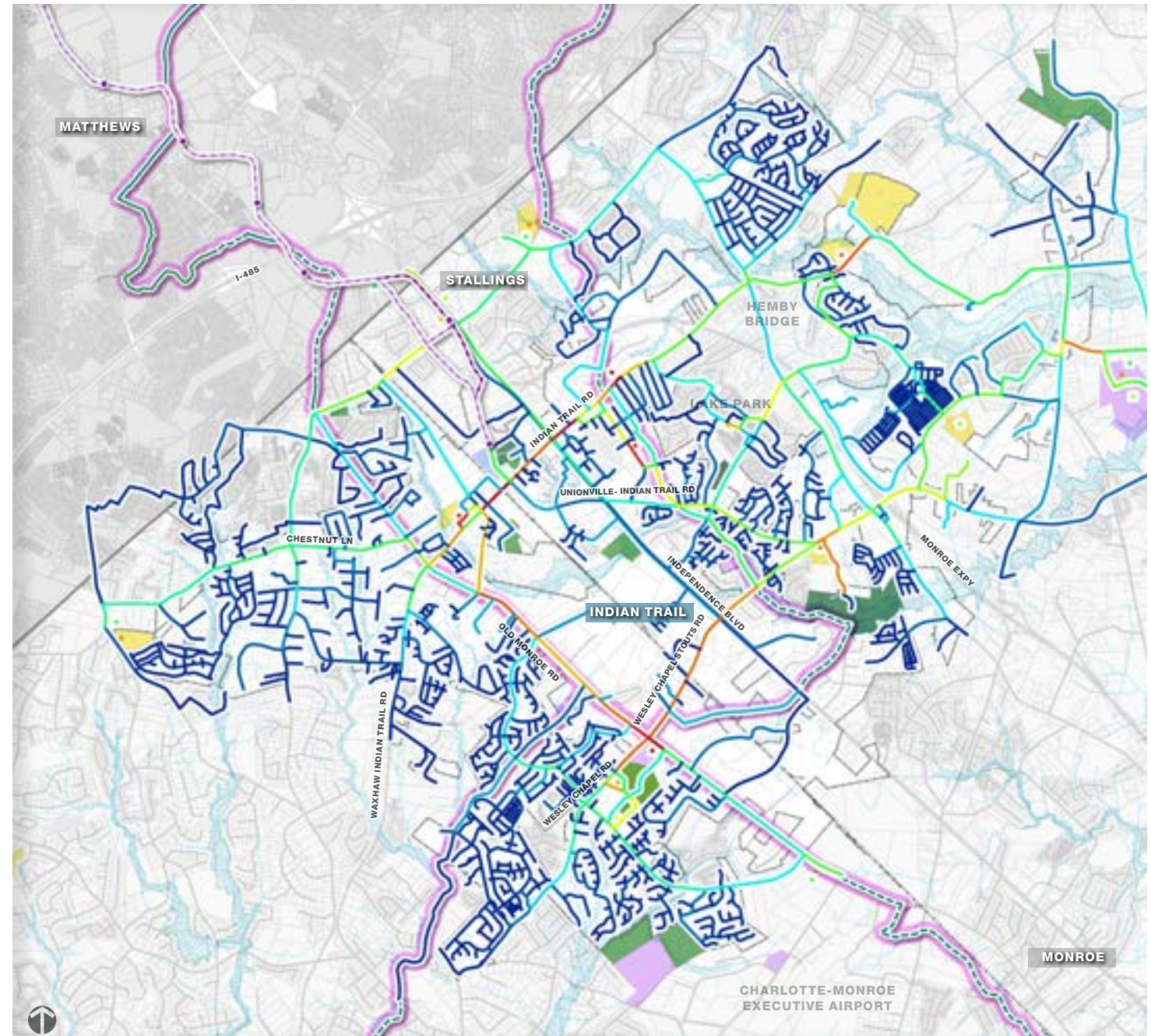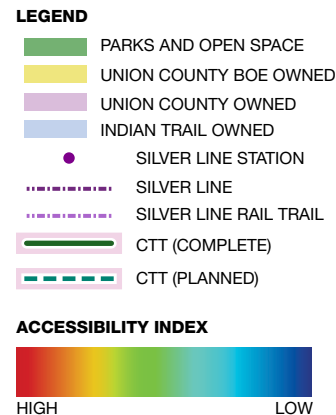(1 mile)

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ACCESSIBILITY INDEX

HIGH   LOW

Accessibility Analysis

Scenario 3. Home to the Schools

- Highly Accessible Roads:
Indian Trail Rd South, Wesley
Chapel Stouts Rd, Old Monroe
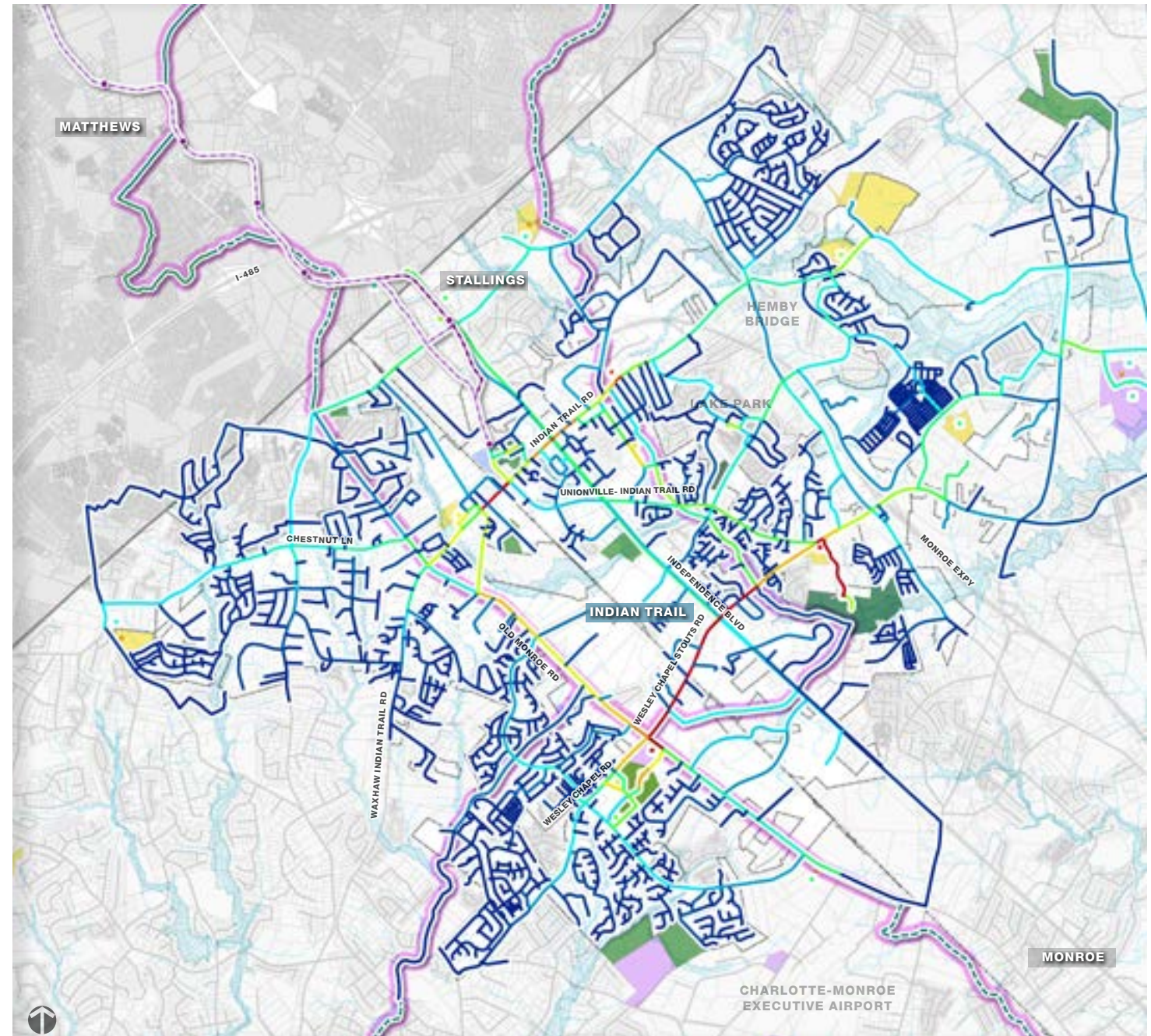Rd

- Approximately 5,694
households of the town can
access the schools on foot.
(1 mile)

LEGEND

- ▉ PARKS AND OPEN SPACE
- ▉ UNION COUNTY BOE OWNED
- ▉ UNION COUNTY OWNED
- ▉ INDIAN TRAIL OWNED
- ● SILVER LINE STATION
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ACCESSIBILITY INDEX

HIGH   LOW

Accessibility Analysis

Scenario 4. Home/Commercial
Developments to the Parks/Schools

- Highly Accessible Roads:
Indian Trail Rd South, Wesley
Chapel Stouts Rd, Old Monroe
Rd

LEGEND

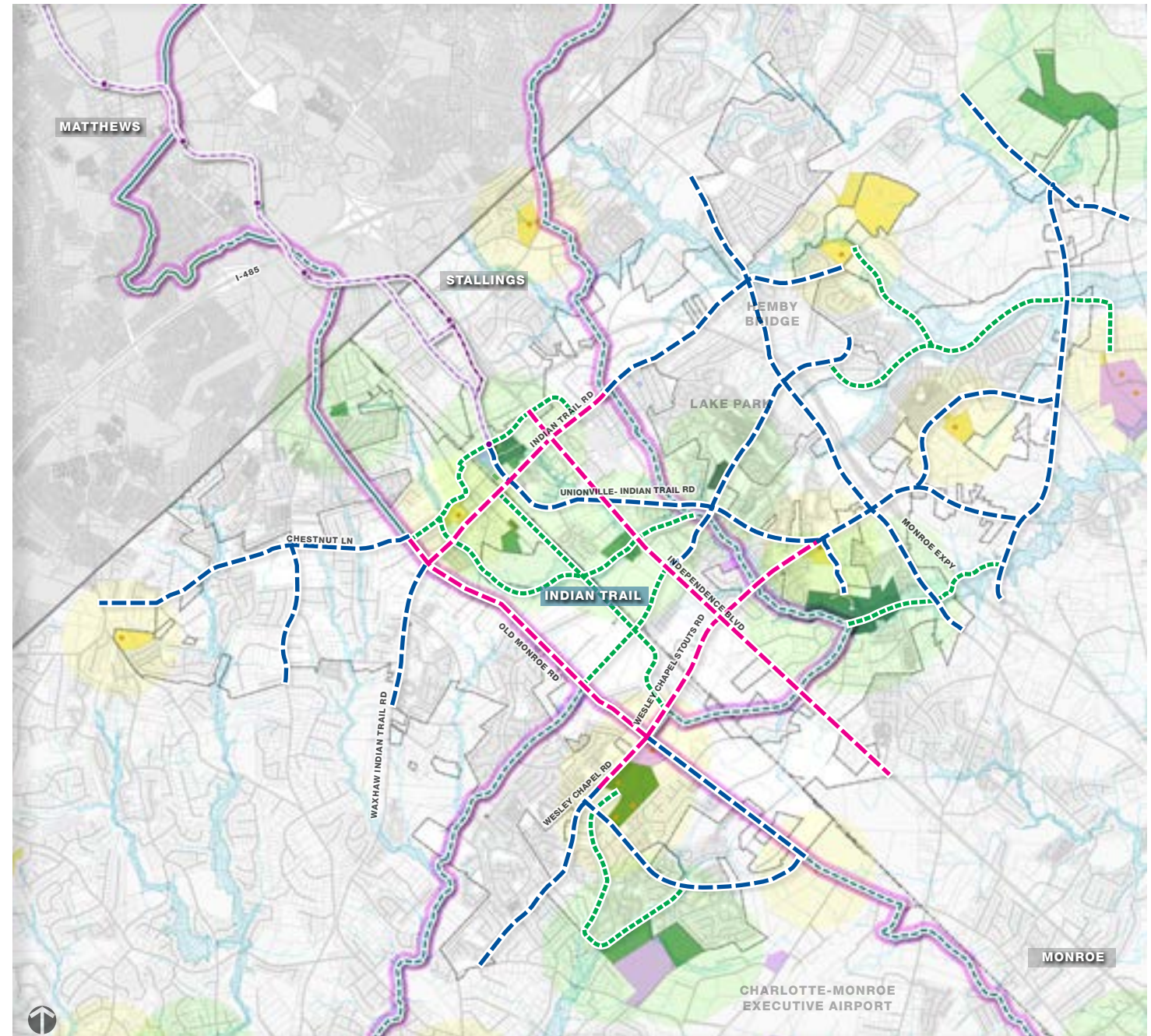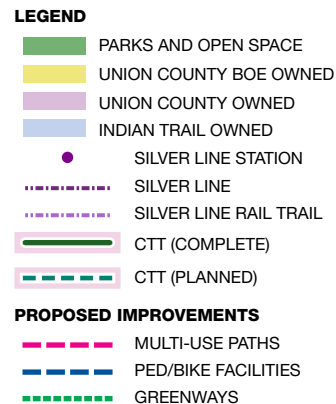- 🟩 PARKS AND OPEN SPACE
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ACCESSIBILITY INDEX
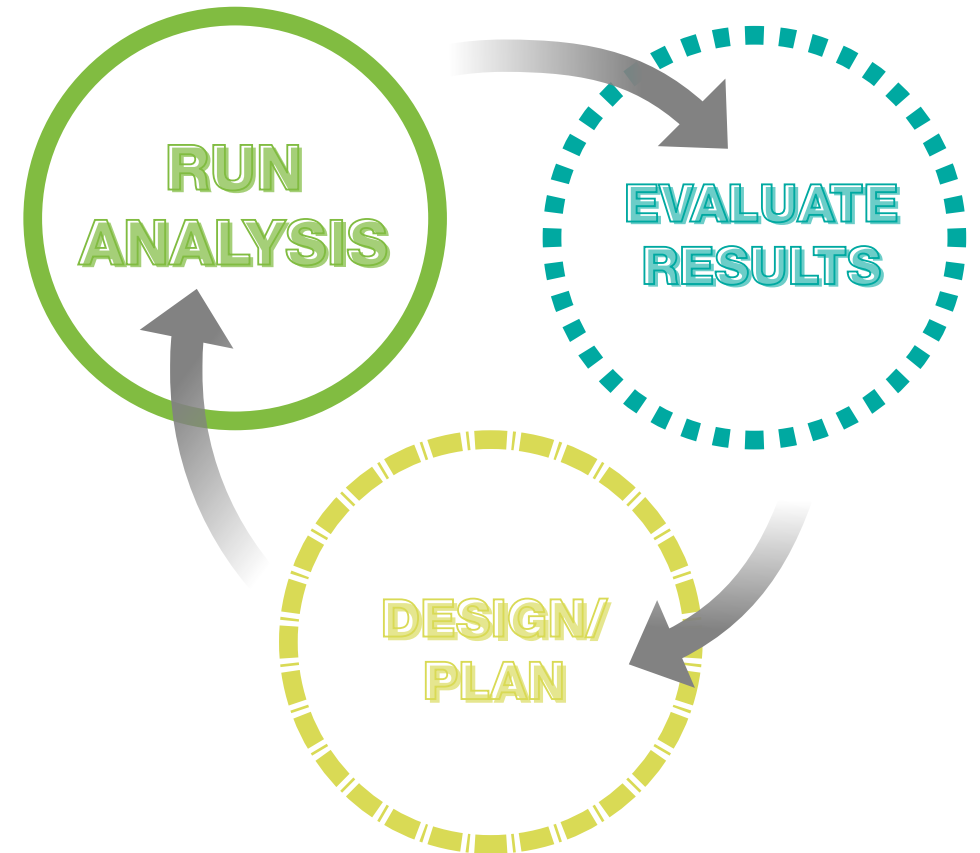
HIGH — LOW

Proposed Active Transportation Plan

- Utilizing the information from the accessibility analysis, we can identify which routes should be improved and where new routes should be introduced to provide optimal access.

- Greenway loops building from the CTT increase access to key destinations and establish greater E-W connectivity.

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PROPOSED IMPROVEMENTS

- MULTI-USE PATHS
- PED/BIKE FACILITIES
- GREENWAYS

+ Takeaways

**Role and Application of Accessibility Analysis
for Trail Planning**

- Trail development strategic plan

- Effective management for trail network and local connectivity

- Activate the trail network

- Vision for trail prioritization plan

- Guide for the town's trails, parks, and recreation system
 (trail classification-primary, secondary, recreational)

- Adjacency to other infrastructure
 (CATS Silver Line Light Rail, schools, parks)

- Decision-making tool for master planning

- Assessment of the trail system, usage, and demand

-This process of analysis is cyclical and can be repeated to test iterations throughout the design process in order to fine-tune the design.

RUN ANALYSIS

EVALUATE RESULTS

DESIGN/ PLAN

THANK YOU.