ACCESSIBILITY ANALYSIS
FOR AN ACTIVE TRANSPORTATION PLAN
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.
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.
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.
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?
+ Behavior Modeling of the Environments
+ Benefits of Trail Connectivity
+ 3 W’s of Data-Driven Design/Planning Benefits
+ Methodology
+ Case Study: Indian Trail, NC
  - Existing Conditions
  - Accessibility Analysis
  - Active Transportation Plan
+ Takeaways
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.

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
Designers and 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
Methodology
Data Needs

+ Building density
+ Land use
+ Building use
+ Roads (sidewalk, bike path, walking trails, and bike trails)
+ Demographics
+ Topography
+ Floodplain
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
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.
Major Destinations

- Chestnut Square Park
- Crooked Creek Park
- Sun Valley Commons & Sports Practice Area
- Indian Trail Town Hall
- Elementary Schools
- Sun Valley Commons
- 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)
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)
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
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.
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.
THANK YOU.