ITEM #10

Measuring Mobility - DC's Multimodal Congestion Management Study

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District Department of Transportation

Project Overview

Council-funded study to:

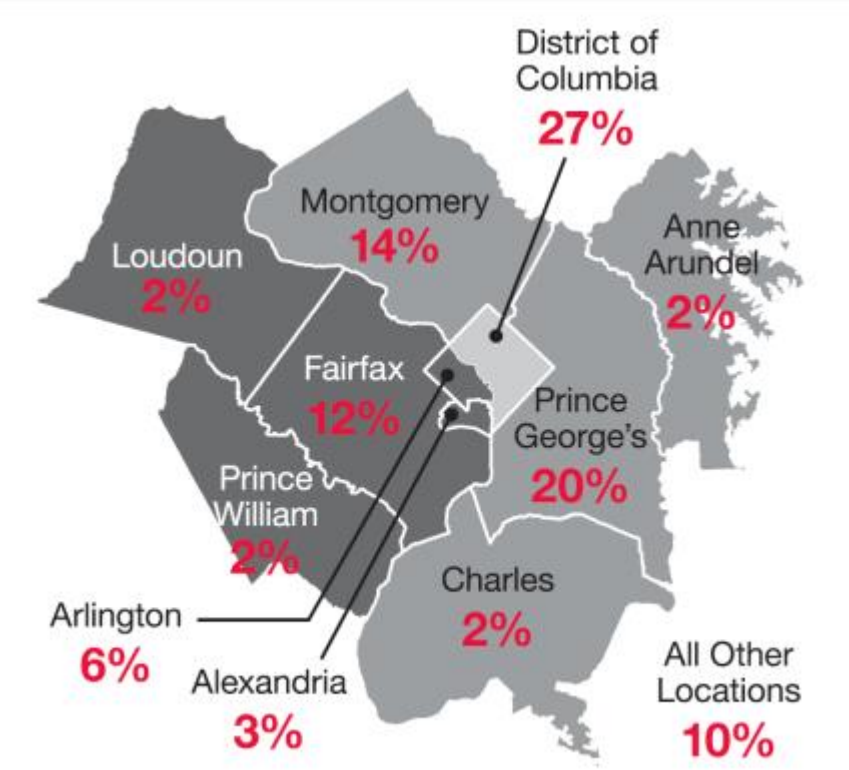
- Define the state of “multimodal congestion” - and the appropriate metrics and data to measure that
- Develop a web-based interface to communicate conditions and enable future updates
- Identify, evaluate, and prioritize management strategies
- Recommend an implementation plan (1, 3, 5, 10 year)

Will be completed by September 30.

DistrictMobility.org

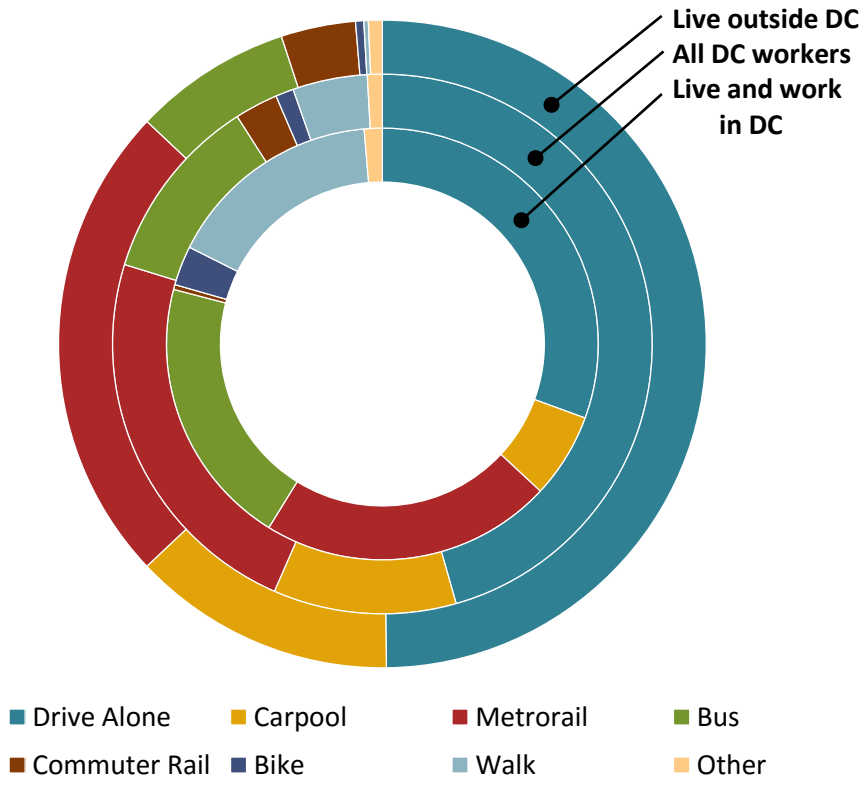
Commuting in DC

Where District Workers Live



Source: MoveDC

How District Workers Commute



Source: CTPP 2006-2010,

District Transportation Goals

The *moveDC* plan outlines a vision for a world-class transportation system that makes the city more livable, sustainable, prosperous, and attractive. Importantly, the system serves everyone with exceptional travel choices.

Goals and objectives include:

- Sustainability and Health: 75% of all commute trips by non-auto modes
- Accessibility, Mobility, and Connectivity:
  - Maximize system reliability and capacity for moving people and goods
  - Increase person-carrying capacity of the transportation system
  - Increase coverage of all modal networks throughout the District
- Safety and Security: get to zero fatalities (Vision Zero)
- Public Space: make streets functional, beautiful, and walkable
- System Preservation: maintenance and asset management
- Funding and Financing: supporting investment in transportation

Addressing Congestion in DC Context

- 3 big areas of focus
  - **Management of existing assets**: signal optimization, parking management, Transportation Demand Management
  - **Infrastructure investment**: Transit Signal Priority, bus improvements, major transit investments
  - **Human capital**: TCO deployment, system monitoring, incident response

- Need to prioritize resources across all three areas

Multimodal Congestion

Different ways to understand congestion and the problems associated with it:

- Intensity of Usage (traditional definition of “congestion”)
- Reliability (can I consistently get where I need to go?)
- Accessibility (what can I get to within a time budget?)

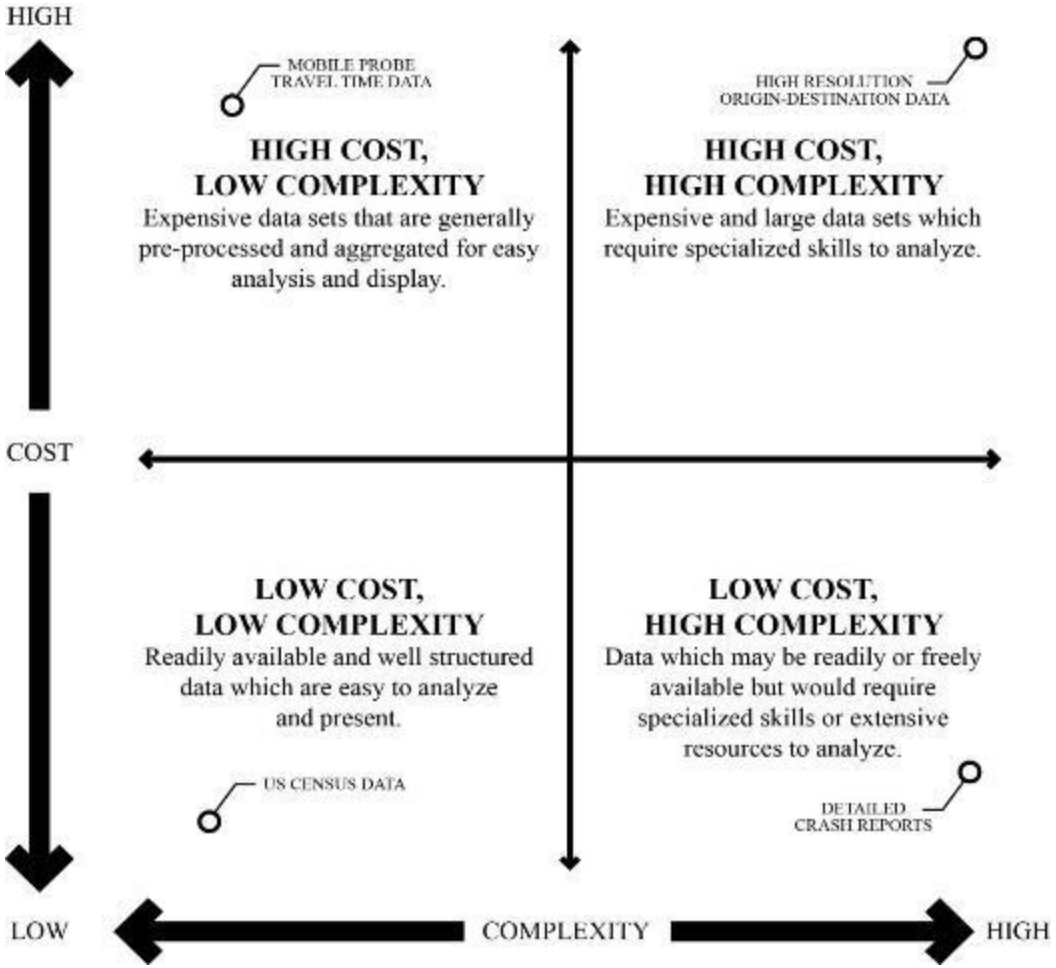
During moveDC outreach, people were most concerned with choice (access) and reliability.

Really monitoring *system performance from a mobility perspective*

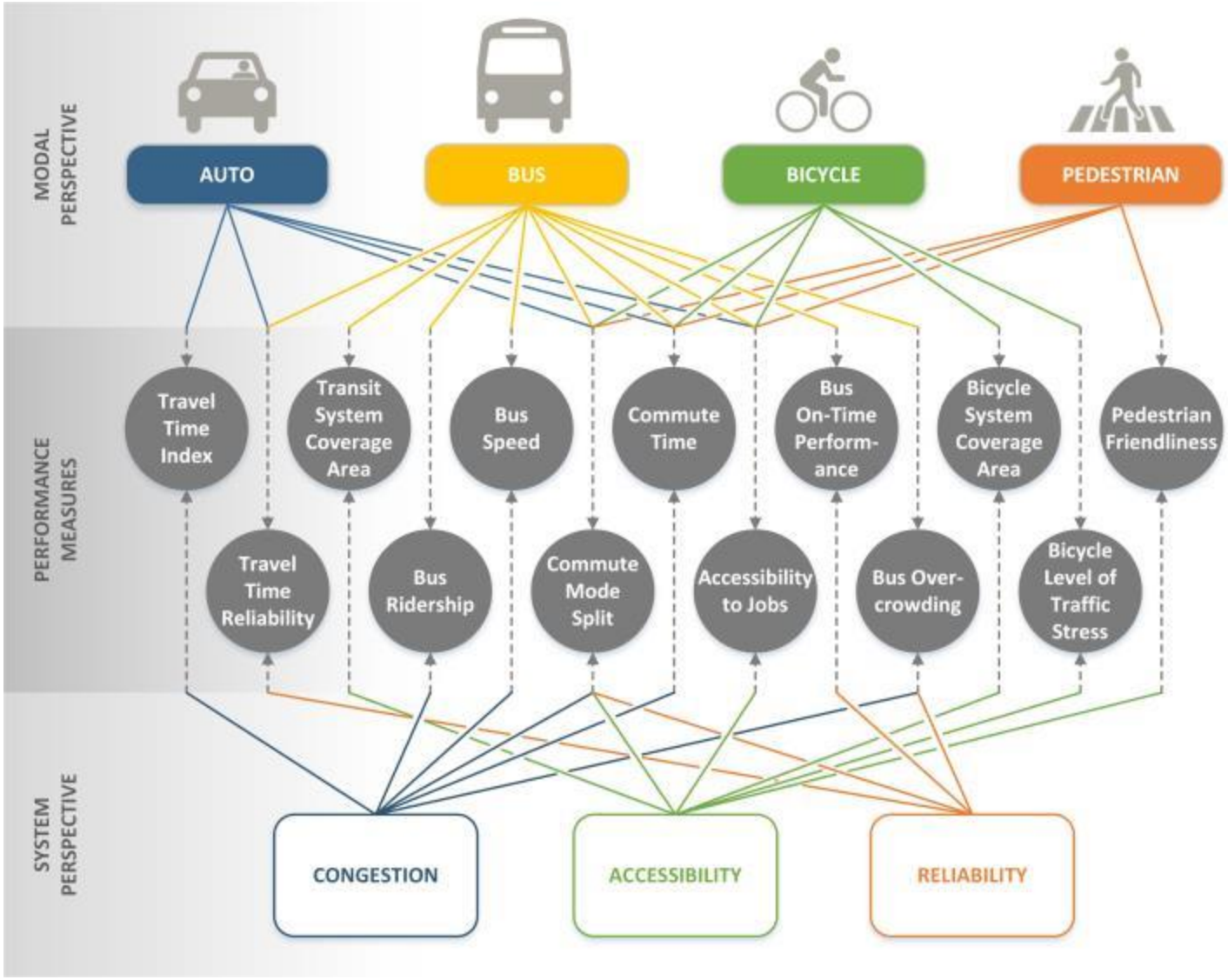
Process Overview

Data

Focus on available, reliable, repeatable, usable data



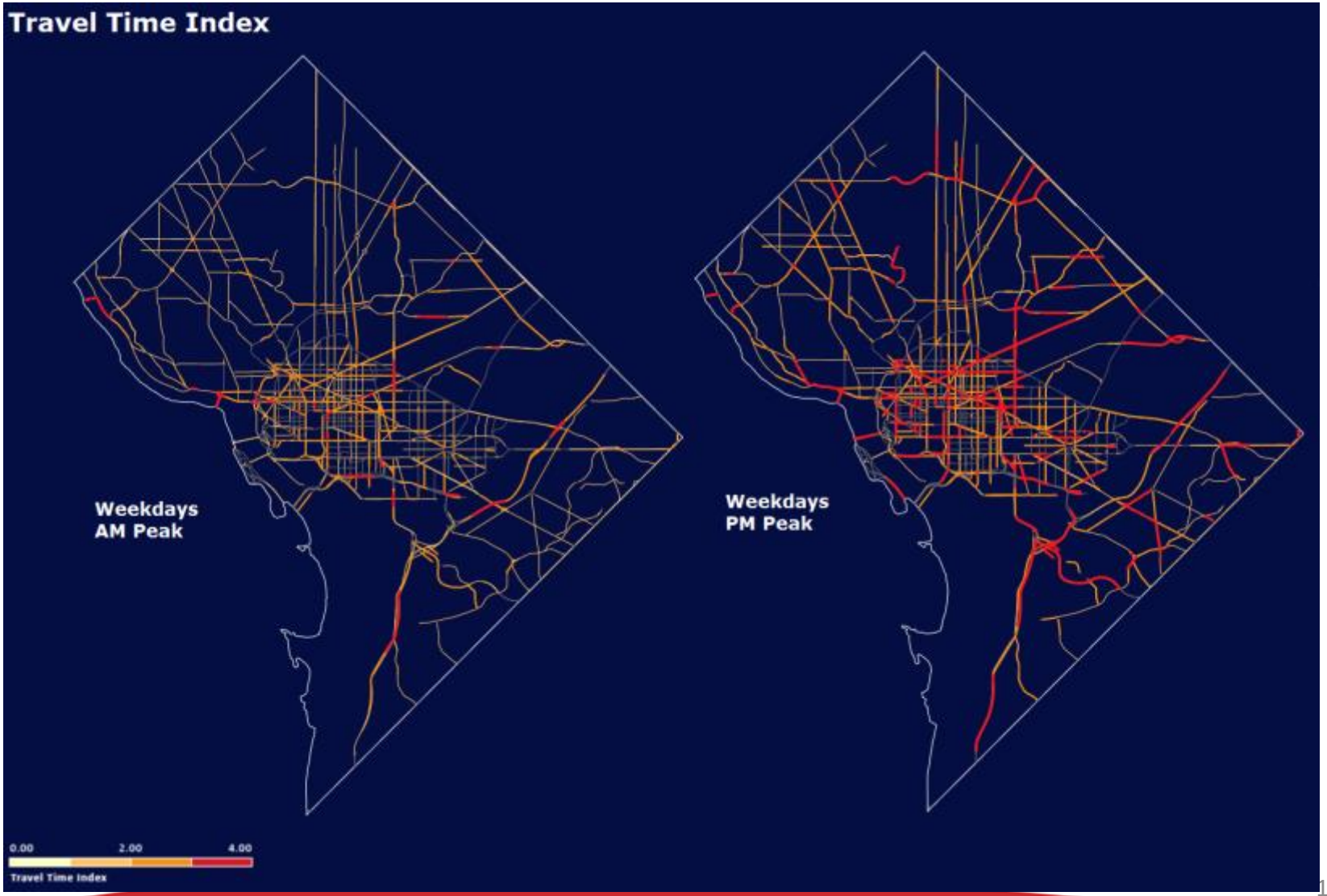
Selected Metrics



Congestion Measures

Measure	Outputs	Temporal	Modes	Geography
Commute Mode Split	Percent of commuters using mode	Daily average	Pedestrian Bicycle Transit Auto	District Block / Ward
Commute Time	• Average commute time • Commute time distribution	Daily average	Pedestrian Bicycle Transit Auto Overall	District Block / Ward
Roadway Congestion	Auto travel time index	Over the day and over the week	Auto	District
Bus Ridership	•Average bus stop level activity by time period • Route level ridership – citywide and top 10 routes	• Over the day (by time period) • Daily	Bus	District
Bus Overcrowding	• Top 10 most crowded bus routes • Maximum load per route, by time period, on roadway links	Over the day (by time period)	Bus	District
Bus Travel Speed (Time)	Average bus speeds per route	15-minute intervals	Bus	District
Corridor Intensity (Persons)	Number of persons per corridor	Daily	Transit/ Auto	Corridors

Congestion Visualized Roadway

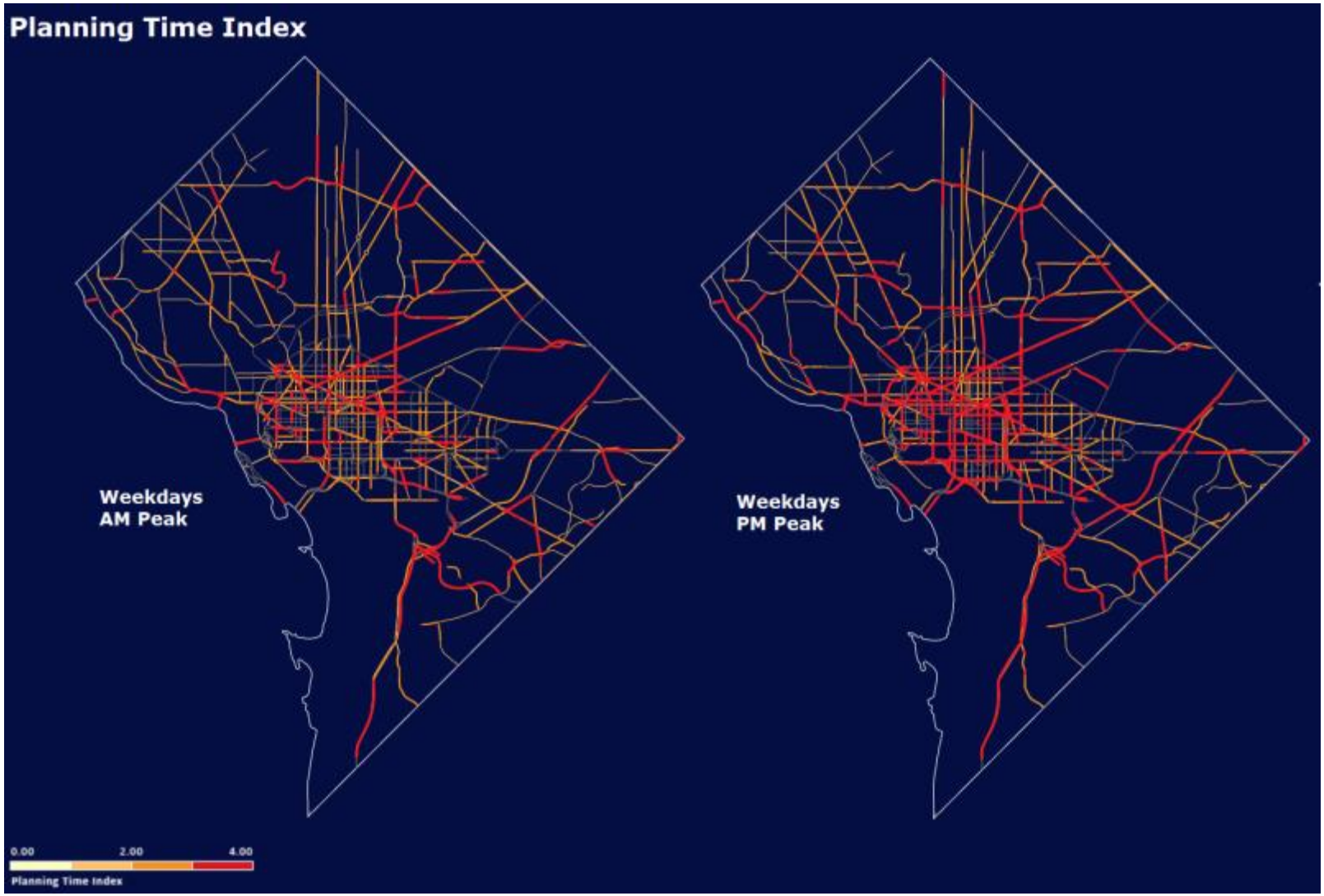


Congestion Visualized
Bus Overcrowding

Reliability Measures

Measure	Outputs	Temporal	Modes	Geography
Auto Travel Time Reliability	• Top 10 most reliable/unreliable roads by planning time index, arterials and freeways separately • Planning time index for arterials	• AM & PM peak • Over the day and over the week	Auto	District Corridors
Bus On-Time Performance	On-time performance for all bus routes in the District	Over the day (can do up to 15 min increments	Bus	District Corridors

Reliability Visualized



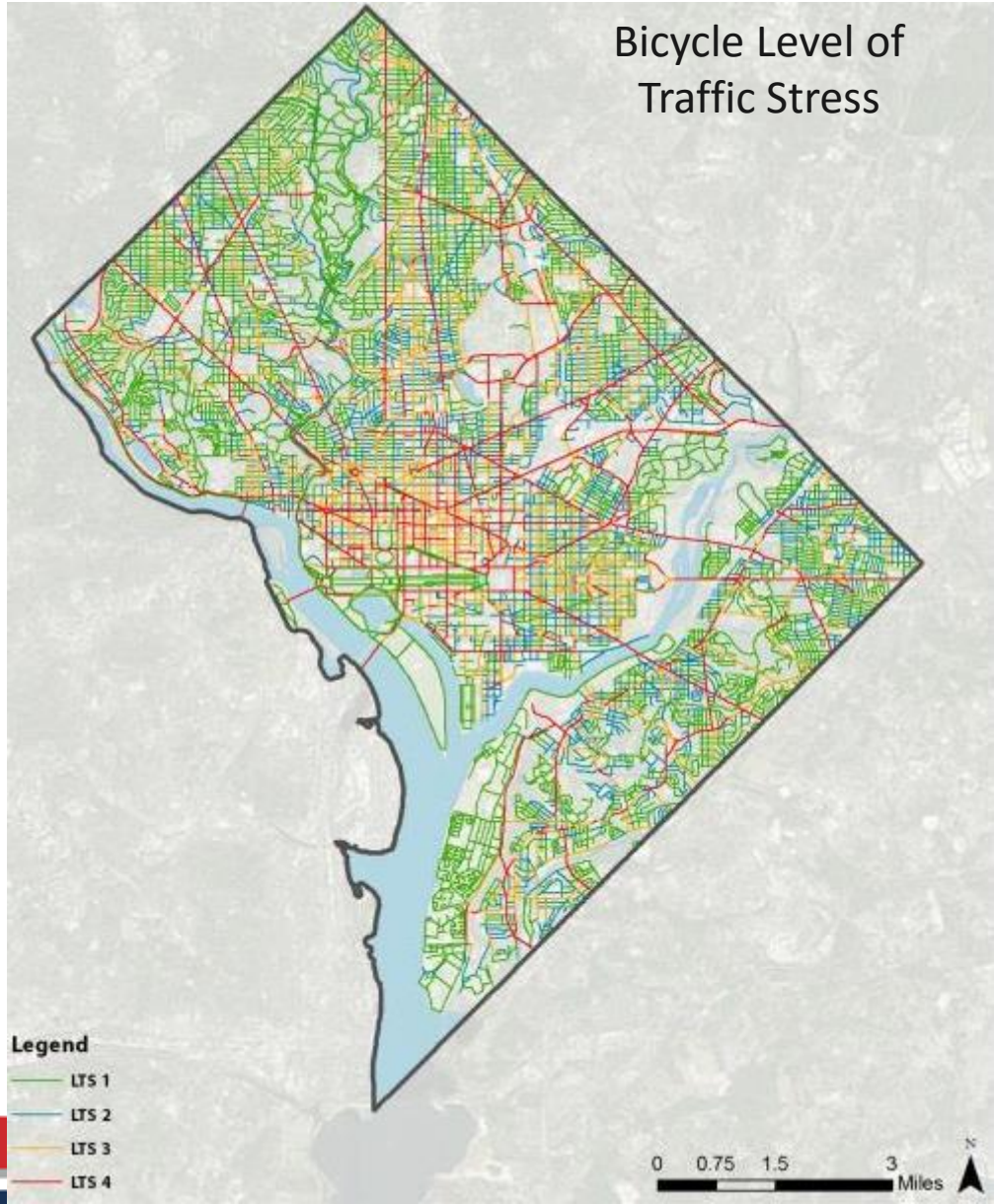
Accessibility Measures

Measure	Outputs	Temporal	Modes	Geography
Transit System Coverage	• Walksheds to all transit service (0.5 miles to Metrorail, 0.25 miles to bus) • Walksheds to high frequency transit service	Over the day and over the week	Transit	District Ward
Bikeshare System Coverage	Walksheds to bikeshare stations (0.25 miles)	N/A	Transit Bicycle	District Ward
Bike System Coverage	Walksheds to a bicycle facility, including low-stress streets and bikeshare stations (0.25 miles or 2 minute ride)	N/A	Bicycle	District Ward
Walkability Index	Scores based on walkability methodology	N/A	Pedestrian	Ward Neighborhood (ANC)*
Accessibility to Jobs	Number of jobs accessible by mode	AM Peak	Pedestrian Transit Auto	Ward Neighborhood (ANC)*
Transit System Coverage	• Walksheds to all transit service (0.5 miles to Metrorail, 0.25 miles to bus) • Walksheds to high frequency transit service	Over the day and over the week	Transit	District Ward
Bikeshare System Coverage	Walksheds to bikeshare stations (0.25 miles)	N/A	Transit Bicycle	District Ward

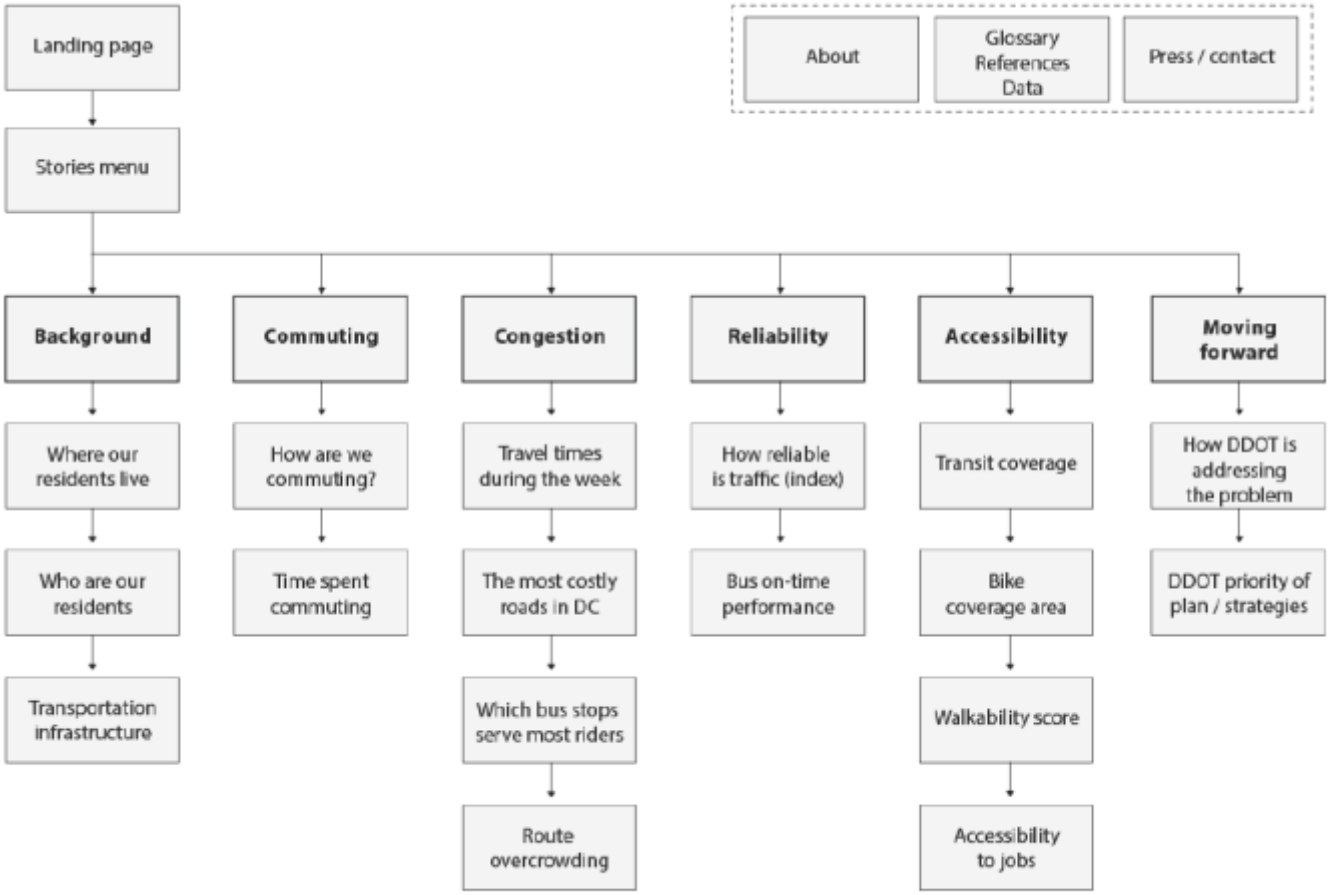
**Advisory Neighborhood Commissions (ANCs) are a sub-ward level of political oversight in the District*

Accessibility Visualized

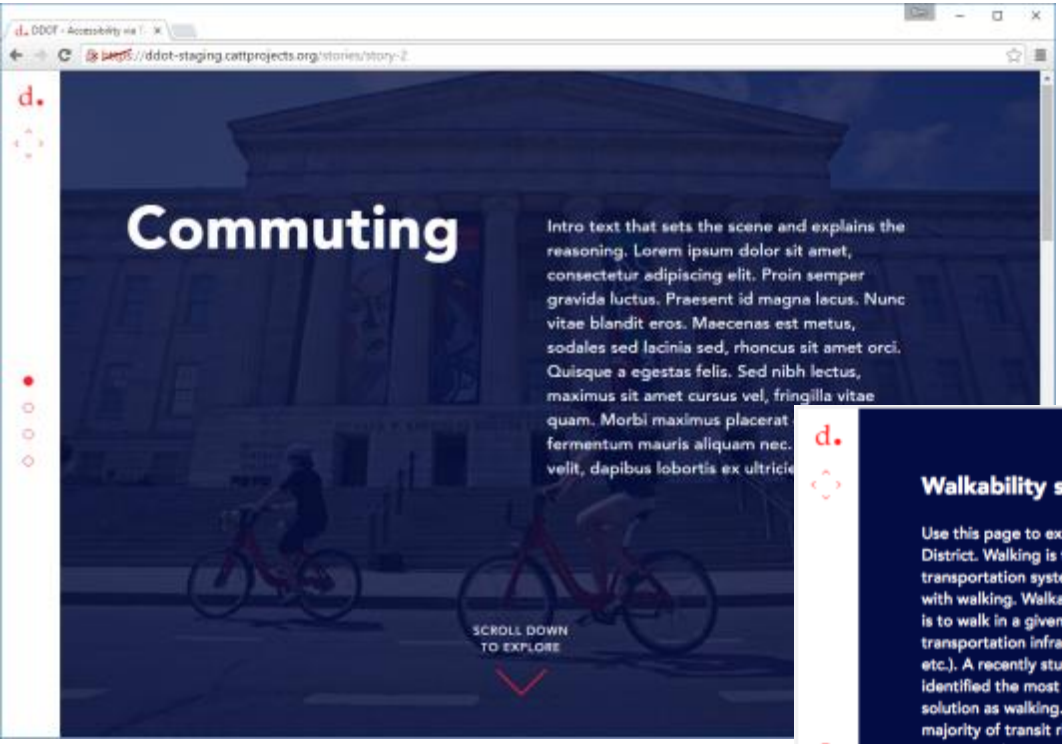
LTS 1 & LTS 2 Intersections in the District			
Ward	LTS1 and LTS 2 Intersections	All Intersections	Ratio
1	325	854	0.38
2	418	1739	0.24
3	1326	2493	0.53
4	1394	2709	0.51
5	1232	2715	0.45
6	813	2453	0.33
7	1330	2441	0.54
8	1260	2051	0.61

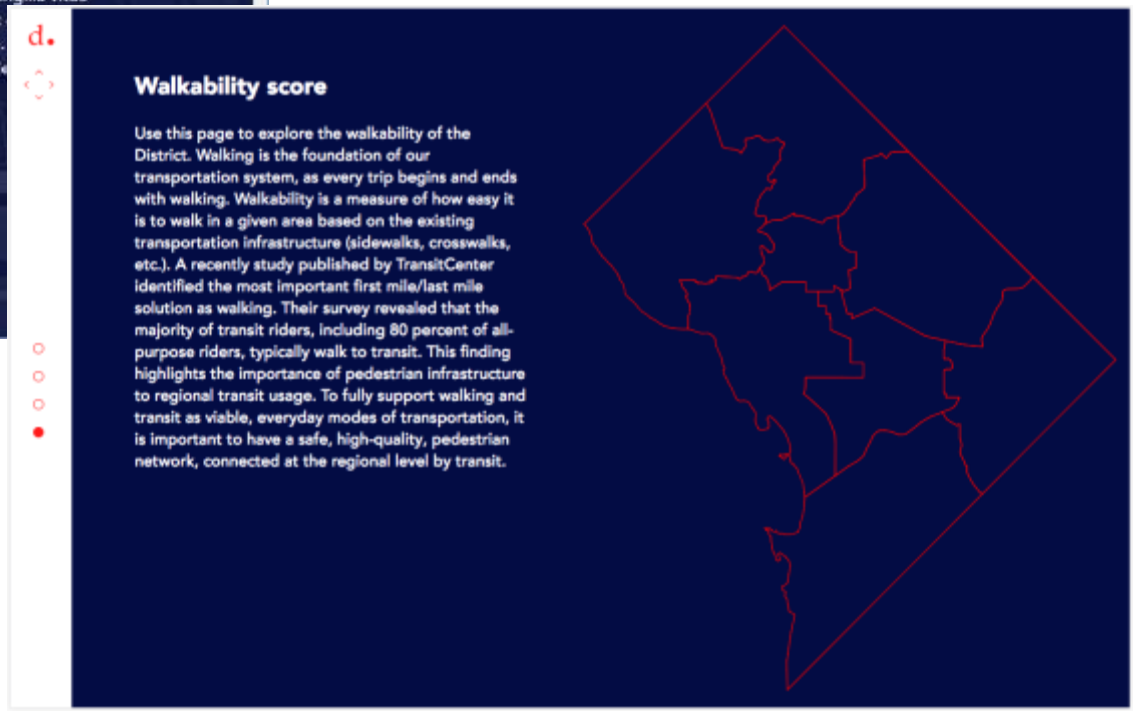


Tool Design


Landing page
Stories menu
About
Glossary
References
Data
Press / contact
Background
Commuting
Congestion
Reliability
Accessibility
Moving forward
Where our residents live
Who are our residents
Transportation infrastructure
How are we commuting?
Time spent commuting
Travel times during the week
The most costly roads in DC
Which bus stops serve most riders
Route overcrowding
How reliable is traffic (index)
Bus on-time performance
Transit coverage
Bike coverage area
Walkability score
Accessibility to jobs
How DDOT is addressing the problem
DDOT priority of plan / strategies

Website Images





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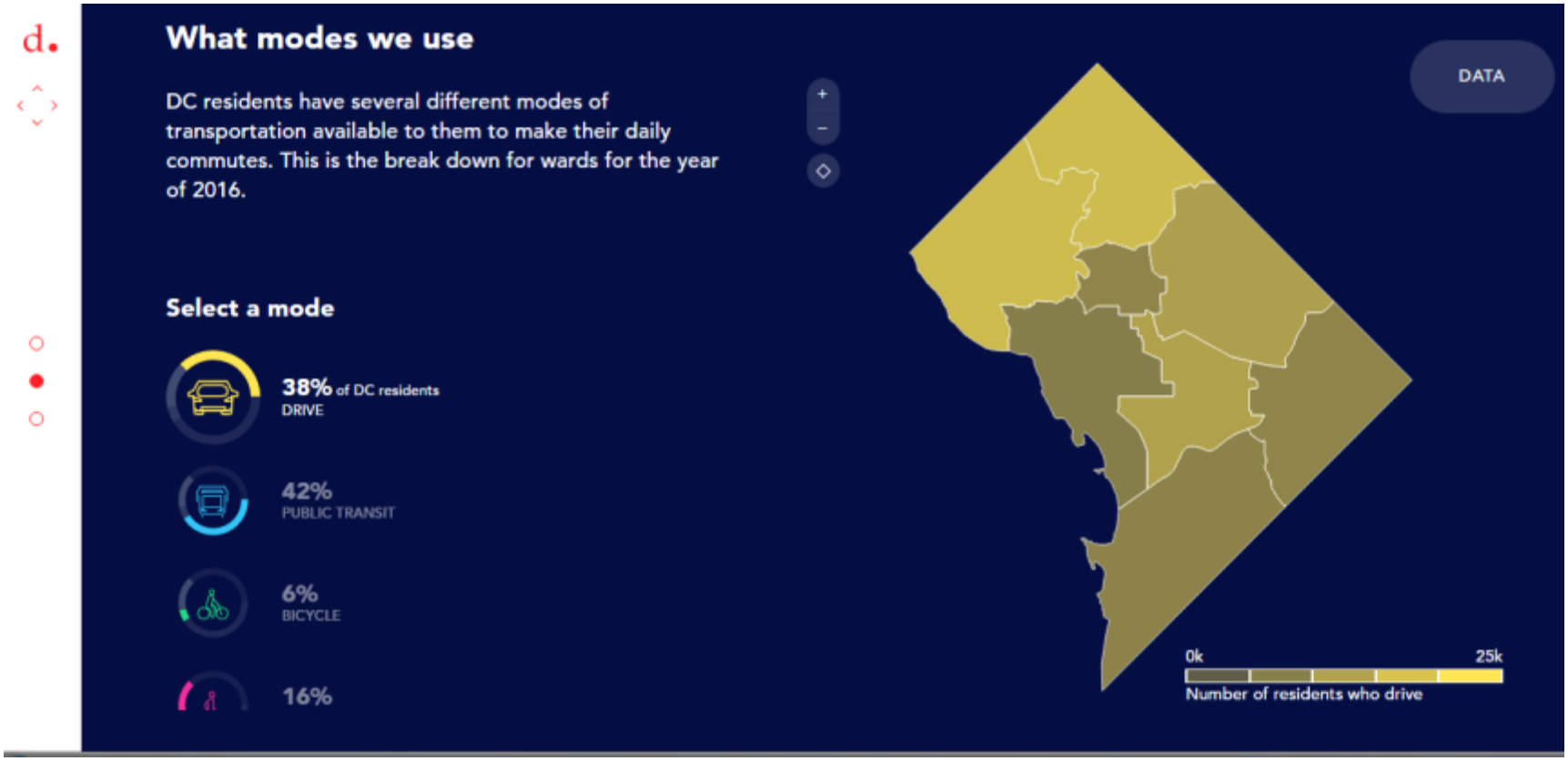

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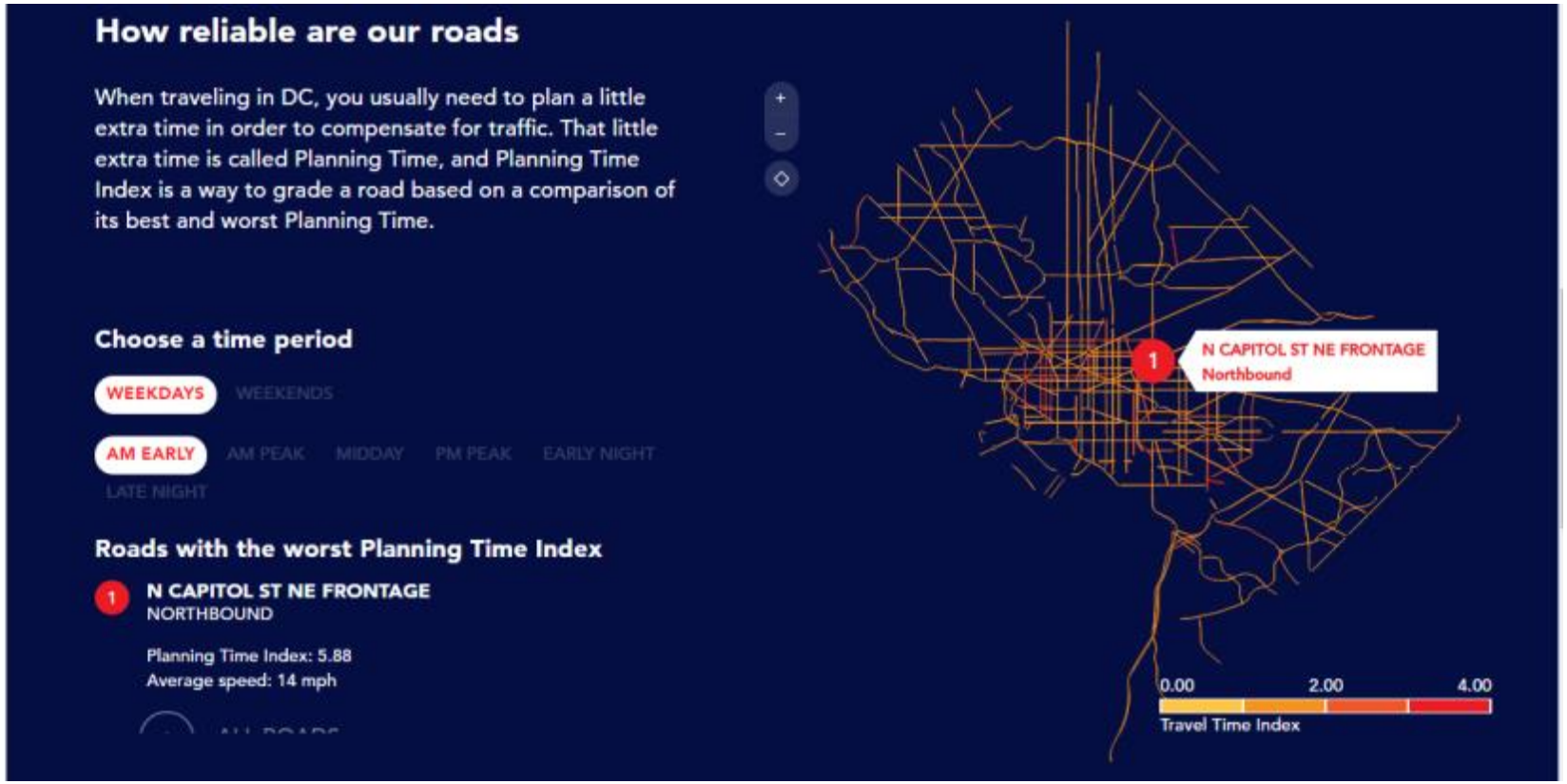

Future Measures

There were several measures we considered by rejected, largely due to data availability issues:

- **Person Throughput**: can be estimated for bus + auto but the effort required put it outside the scope of this initial tool development
- **Pedestrian Congestion**: we lack system-wide pedestrian volume counts, as well as a systematic measure of pedestrian clearway on sidewalks (or width in general). Could start this in a limited area where data is available – which also tend to be the more congested areas.
- **Bicycle Congestion**: began looking into Strava Metro data, but did not have a good enough means of scaling up their data based on observed counts due to our limited count data. Working with Strava to also refine the data to peak periods.
- **Modal Comparisons**: to assess the efficiency of various modes, we could compare travel times between a series of origin-destination pairs. Starting to have more data to do this, but need to develop an approach to defining the pairs and link estimated network travel times to observed data.

What Do We Do With This?

- Understanding the “baseline”
  - How is transportation functioning within the District?
  - Where are there gaps? Where are there points of interest?
  - Quantifying and qualifying multimodal urban system
- Streamlining data collection and analysis
  - Aggregate reliable and repeatable data for set time frames
  - Leverage existing systems and processes
- Elevating the discussion
  - Understanding the system to prioritize future investments and activities
  - Effective engagement of “end users” (public, agency, council)
- Leveraging data to prioritize future efforts
  - Are current projects and future efforts addressing known issues?
  - Adjust priorities based on supplemental data years

The Plan

- Hot spot maps for congestion, reliability, and accessibility
- 1,3 year plan: Look at what we are already doing in our plans
- 3, 5, 10 year plan: Analyze the hot spots
  - Immediate term actions (e.g. deploy TCOs)
  - More in-depth study to address (e.g. corridor study)
- Suite of strategies and the general timelines for their implementation

- Prioritization: Call for Projects process has a framework that can use these data/maps to inform project selection

Ongoing Management

Report and District Mobility visualization tool completed by September 30.

Then what?

- Update metrics and tool on an annual basis
  - Add trend information in 3rd year
- Encourage other projects to use these measures
  - Related effort identified a broader suite of measures for individual projects to track before/after performance
  - Coordinate internally on overlapping projects – collaborate efforts if there is an active project in an area
- Use the data to inform projects
  - Bicycle team proposing continued evaluation to help target facilities that can bridge between raes

More Information

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