

digitalAECOM

Achieving New Insights in Environmental
Management and Infrastructure Planning

Kristi Teykl and Corby Schaub

The background of the image is a night sky featuring the Milky Way galaxy, which is visible as a bright, hazy band of light stretching across the upper left portion of the frame. The sky is filled with numerous stars of varying brightness. In the foreground, the dark silhouettes of mountain ranges are visible against the lighter, hazy glow of the horizon. A large, teal-colored circular graphic element is positioned in the center of the image, partially overlapping the text.

digital AECOM

digitalAECOM Solutions

1

InSite

2

PlanEngage

3

PipeInsights

4

AVReadi

in.site

A smarter approach to site evaluation

3 Modules | 3 Use Cases

The screenshot shows the AECOM inSITE web application interface. At the top, there is a search bar with the text "Search or enter website name" and navigation icons. The header features the AECOM | inSITE logo and the tagline "Intelligent Site Screening, Suitability, and Selection for Development". The navigation menu includes "HOME", "EXPLORE DATA", "SCREEN REGIONAL", and "SCREEN LOCAL".

The main content area starts with a "Welcome." message, followed by a paragraph: "inSite is a geo-planning tool designed to identify suitable sites for development based on a multi-criteria analysis process. The tool performs a screening analysis to identify suitable locations based on a scoring system, and operates on regional and local scales."

A central diagram illustrates the workflow. On the left, a cluster of teal circles lists criteria: "Pre-requisites", "Utilities, Infrastructure", "Risks", "Demographics", "Climate", "Location", and "Custom criteria". An arrow labeled "weights" points to a "Combination: Boolean/Score-based" box. The workflow then branches into three stages:

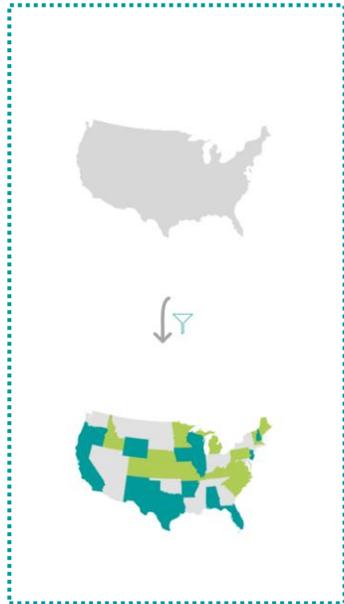
- EXPLORE DATA:** Shows a map of the United States with a grid overlay, indicating the initial data exploration phase.
- SCREEN REGIONAL:** Shows a zoomed-in map of Florida with a grid overlay, representing the regional screening process.
- SCREEN LOCAL:** Shows a detailed street-level map with a grid overlay and a green checkmark, representing the final local screening and selection.

Each stage has a corresponding button below it: "> EXPLORE DATA", "> SCREEN REGIONAL", and "> SCREEN LOCAL".

- 1 Explore Data
- 2 Screen Regional
- 3 Screen Local

1 Explore Data

Explore Data



“I just want to see the data.”

Select the region you want to screen:

ACROSS STATES STATE COUNTY

Select State
Virginia

Virginia X

a

Select your region of interest

Color by
Select Variable

Extreme Heat X

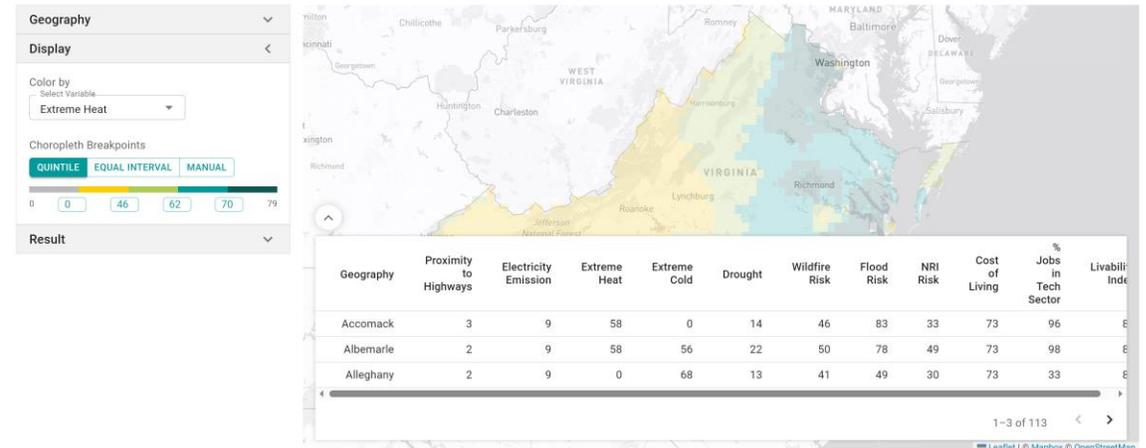
- Proximity to Highways
- Electricity Emission
- Extreme Heat
- Extreme Cold
- Drought
- Wildfire Risk
- Flood Risk
- NRI Risk

b

Select the variable you are interested in

c

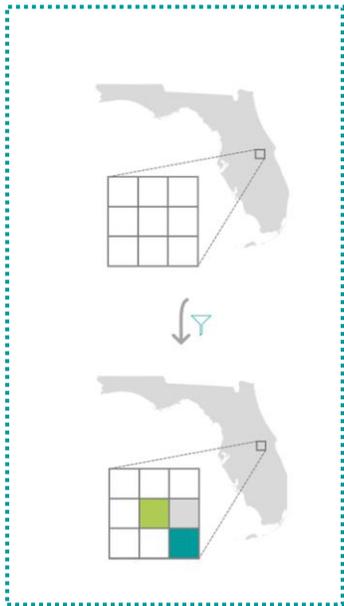
View map and table



2

Screen Regional

Screen Regional



"I have a region in mind and want to scan it for suitable locations."

Workflow:

Select region to screen

ACROSS STATES STATE COUNTY

Select State

Maryland

Virginia X Maryland X

... or upload your own points data:

UPLOAD CANCEL

Configure Criteria

Prerequisites

Proximity to Highways Less Than Custom km

Proximity to Airports Less Than Custom km

Proximity to Rail Less Than Custom km

Proximity to Cable or Optical Fiber Less Than

Other Criteria

Utility Infrastructure

Electricity Emission Higher Than Percentile Custom %

Electricity Rate Lower Than Percentile Custom %

Energy Diversity Higher Than Percentile Custom %

Solar Potential Higher Than Percentile Custom %

Climate Factors

Risks

Location

a

Select your region or upload your own candidate points

b

Configure your screening criteria and weights

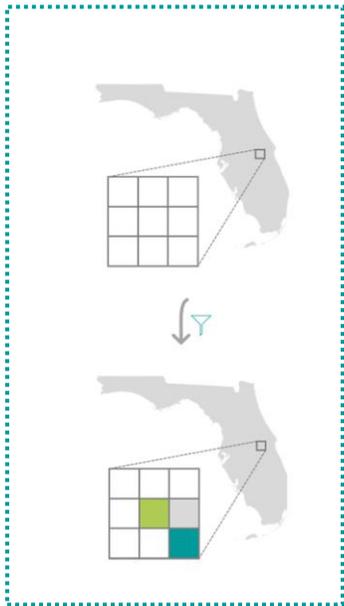
c

GO

2

Screen Regional

Screen Regional



“I have a region in mind and want to scan it for suitable locations.”

Setup

Scoring Result

Compare Locations

Click on location on map to highlight.

Custom Name: Location 1

Custom Name: Location 2

Overall score of Location 1: **74**

Name	ID	Score	Proximity to Highways	Electricity Emission (Score)	Extreme Heat (Score)	Extreme Cold (Score)	Drought (Score)	Wildfire Risk (Score)	Flood Risk (Score)
Location 1	3639	74	2	50	53	100	86	99	0
Location 2	9409	73	2	50	39	100	89	99	0
	30325	72	2	50	58	100	53	80	86

1-3 of 1322

d

Select locations to compare and view infographics

Setup

1

Select region to screen

ACROSS STATES STATE COUNTY

Select State

Virginia

Virginia X

... or upload your own points data:

UPLOAD

CANCEL

2

Select filtering method

SCORE-BASED **FILTER-BASED**

3

Scoring Result

Compare Locations

GO

HOME

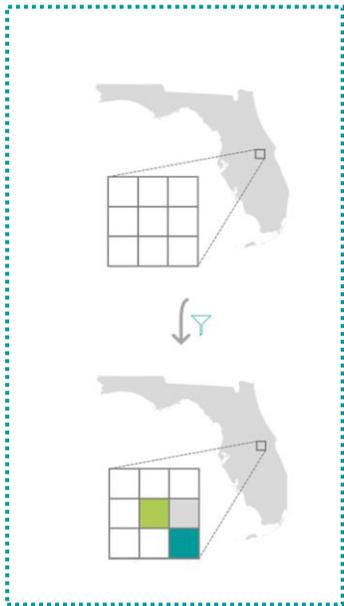


PREVIOUS

NEXT

Screen Local

Screen Regional



"I have a region in mind and want to scan it for suitable locations."

Workflow:

Upload boundary shape

UPLOAD

CANCEL

Area_of_Interest
.geoJSON

Or, draw on the map



Or, drill down from previous step

DRILL FROM PREVIOUS STEP

Configure Criteria

Site Factors and Constraints

Parcel Size
 0.5 1 5 10 100 Custom 1 acres

Topography
 FLAT SLOPED

Flood Plains
 5 25 50 75 Custom 25 %

Utility Infrastructure

Risks

SAVE CRITERIA

IMPORT CRITERIA



a

Select area of interest



b

Configure your screening
criteria and weights

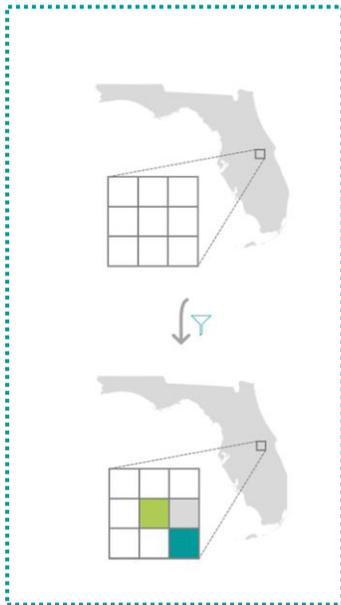


c

GO

Screen Local

Screen Regional



"I have a region in mind and want to scan it for suitable locations."

Setup ✓

Scoring Result ✓

Compare Locations <

Click on location on map to highlight.

Custom Name
Location 2 **RENAME** ✕ ↻

Overall score of **Location 2:**
81

Substations
Residential
Power-Lines
Highways

Street View ✓

GO

Compare Locations ✓

Street View <

12197 Fair Lakes Promenade Dr
Fairfax, Virginia
View on Google Maps

Allowable	Feet to Highways Score	Feet to High-Voltage Power Lines Score	Feet to High-Voltage Substations Score	Floodplain Ratio Score
No	81	100	0	100
No	100	100	0	100
No	56	100	0	100

1-3 of 44

Glen Alden

Leaflet | © Mapbox © OpenStreetMap

d

Select locations to compare and view infographics and StreetView

The background of the image is a dark, starry night sky. A silhouette of a wind turbine is visible, with its three blades extending from the center. The text 'plan • engage' is overlaid on the image. The word 'plan' is in a teal color, and 'engage' is in white. A small white dot separates the two words.

plan • engage

Better communication, improved outcomes

CHALLENGE – NEPA Planning and Permitting

Traditional paper- and .pdf-based approach

With different systems and processes, preparation of material can be delayed in a linear workflow

Complex report material can increase review time and reduce engagement and inclusion

Managing the approvals process can become difficult to manage with ineffective communication

1 Preparing reports involves huge amounts of information from different partner agencies to be collected and compiled which can be complex and time consuming.

3 Without a consistent approach submissions can be delayed while content is agreed and collated in a linear workflow.

5 Navigating the information and assessing content can result in delays especially if stakeholder organizations are understaffed.

7 Collecting and responding to feedback from different stakeholders and communication channels can be complex.

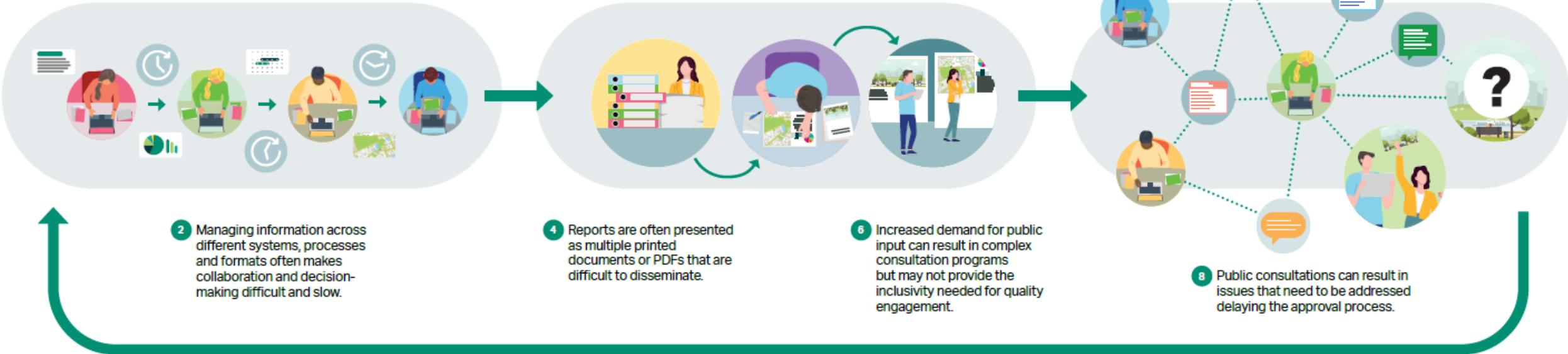
9 Resolving conflicts between different agencies and stakeholders can be convoluted and time consuming and may result in repeating the process.

2 Managing information across different systems, processes and formats often makes collaboration and decision-making difficult and slow.

4 Reports are often presented as multiple printed documents or PDFs that are difficult to disseminate.

6 Increased demand for public input can result in complex consultation programs but may not provide the inclusivity needed for quality engagement.

8 Public consultations can result in issues that need to be addressed delaying the approval process.



**Average time for an EIS
is currently 3.5 to 4 years**

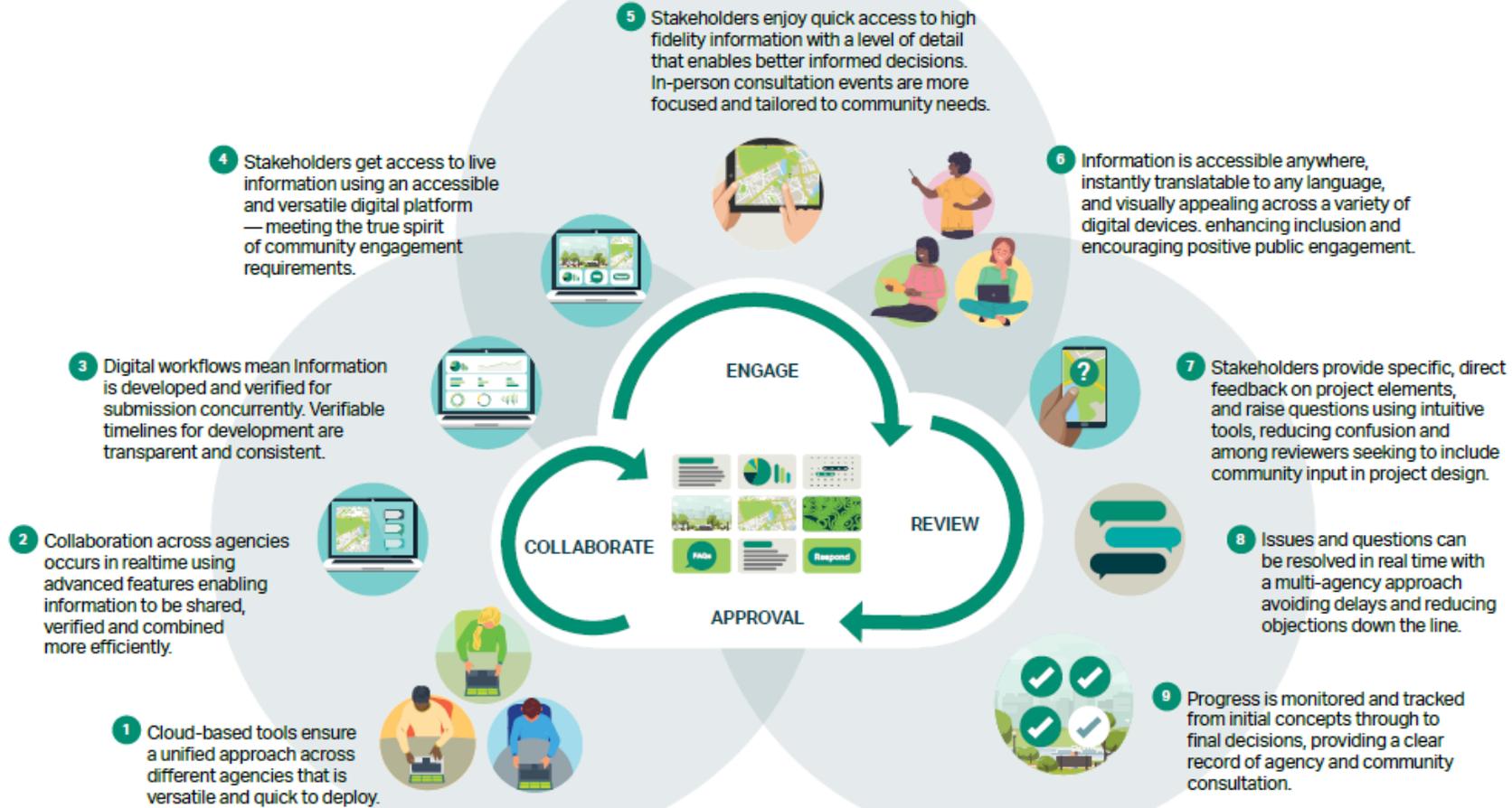
**Deliver EISs in 2 Years with Cloud-Based,
Interactive NEPA Documents**



SOLUTION – NEPA Planning and Permitting with PlanEngage

Present information clearly and transparently
to increase high-quality engagement

Collaborate, prepare and
update information in real
time using cloud based
tools in less time



Respond to
conflicts quickly
and speed up the
approvals process

Case study

The Federal Highway Administration and ADOT publish the first fully interactive digital transportation Environmental Impact Statement (EIS) in the U.S. with the help of PlanEngage™

“

The interactive EIS was a first for ADOT [Arizona Department of Transportation] and the State of Arizona, and it was a huge accomplishment for the I-11 study team. It allowed ADOT and FHWA to explore a virtual method for public involvement while providing tools to help the public fully understand the final Tier 1 Environmental Impact Statement document. The success of the interactive EIS and the number of views it has received has clearly demonstrated its value to ADOT and the necessity to implement this kind of interactive tool for other studies.”

Steven Olmsted, Arizona Department of Transportation Program Delivery Manager

U.S. Department
of Transportation

● WHY PLANENGAGE

Rather than producing their usual PDF output for the Interstate 1-11 project Tier 1 Environmental Impact Statement (EIS), Arizona DOT used the PlanEngage platform to produce a digital and interactive online format that proved a game-changer for accessibility, providing easy access for all stakeholders from any device and at any time. Community members could clearly understand how the project would impact them by using intuitive tools like interactive maps where users could change views and toggle between GIS layers to view the information that was most relevant to them.

● THE RESULT

The Federal Highway Administration and Arizona DOT published the first fully interactive transportation Environmental Impact Statement (EIS) in the U.S. Regulatory agencies and the local community were able to gain deeper project understanding, demonstrated by 3,000 views of the digital EIS. The PlanEngage platform facilitated a broader, more inclusive audience than a traditional EIS. Arizona DOT also set the bar for industry transformation and was recognized by the Environmental Business Journal as an award recipient for the 1st U.S. Digital Interactive Tier-1 Environmental Impact Statement (EIS).



pipe • insights

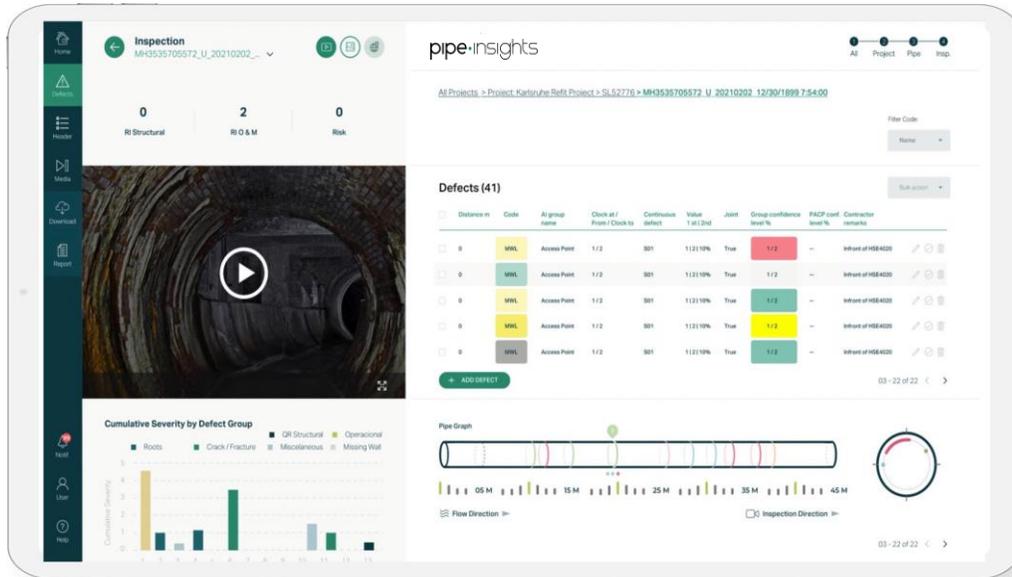
Improve the speed and accuracy of sewer inspection programs

CHALLENGE – condition assessment of subsurface pipe networks and CIP development



Reviewing and evaluating CCTV data for thousands of miles of pipe is time-consuming and inefficient

SOLUTION – Consistent, accurate, streamlined condition assessment and rehabilitation planning with PipeInsights



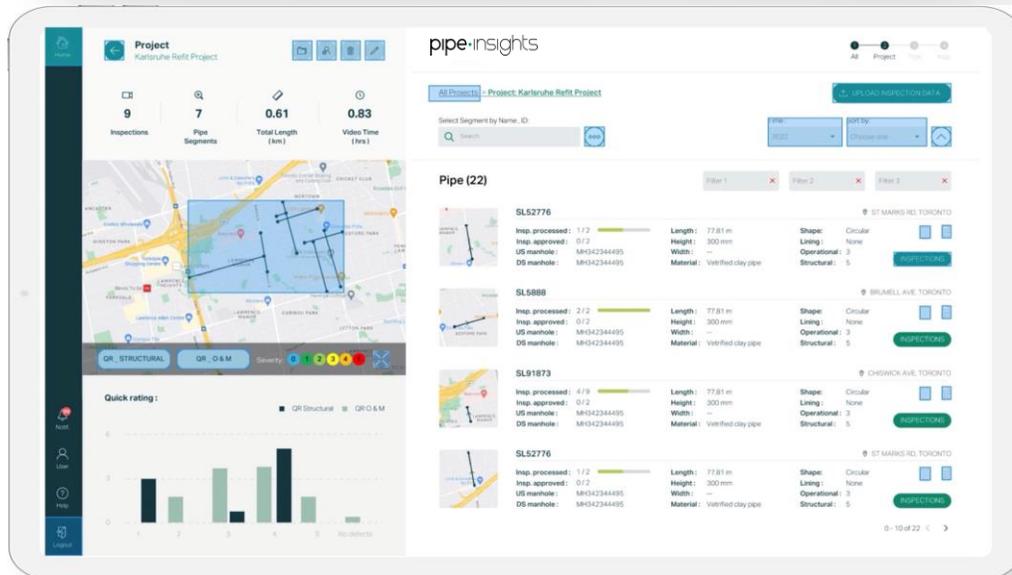
Improves accuracy, speed and efficiency of sewer inspection programs

Artificial Intelligence (AI) for:

- Validation: assesses accuracy of coding
- Detection: uncoded pipe or missed codes

GIS-enabled cloud-based service on Azure

- Store inspections and access them anywhere
- Quickly view inspection history and diagnose problems
- GIS interface to quickly locate inspections
- No software to install or maintain



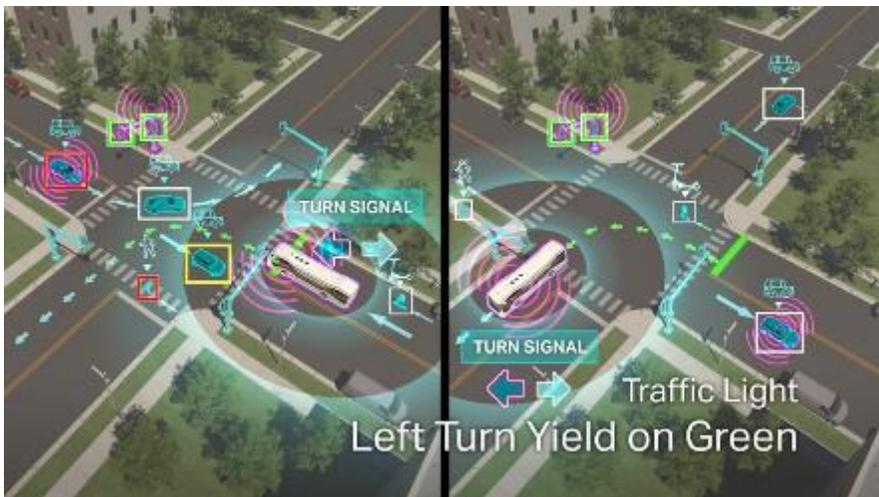
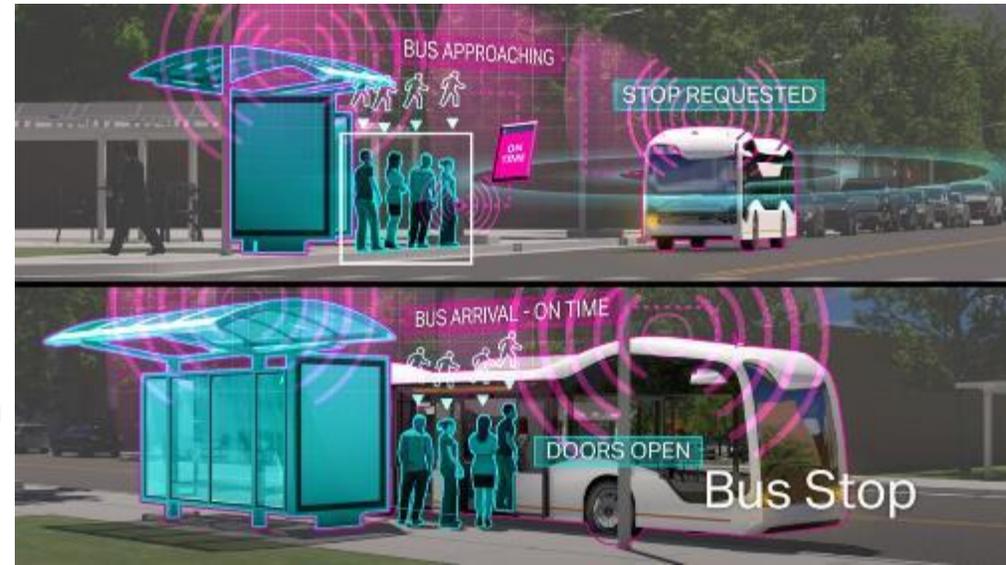




AV-Readi™ Process and Tool Overview

Automated Bus Consortium (ABC)

- AECOM-developed
- Participation by 22 transit agencies
- First-ever ADS performance specification
- RFP released Jan 2022

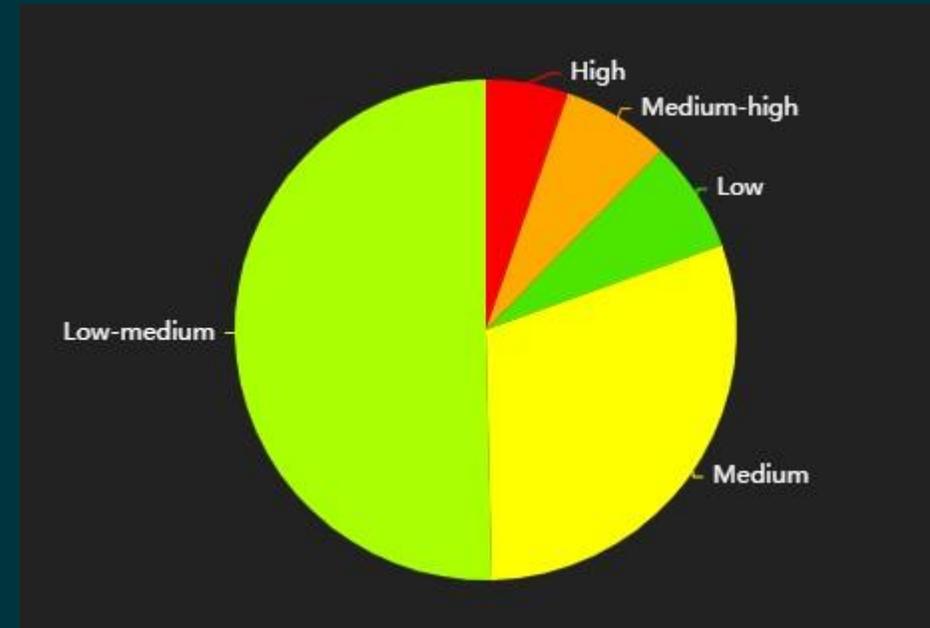


Example AV-Readi™ Results



Complexity Map

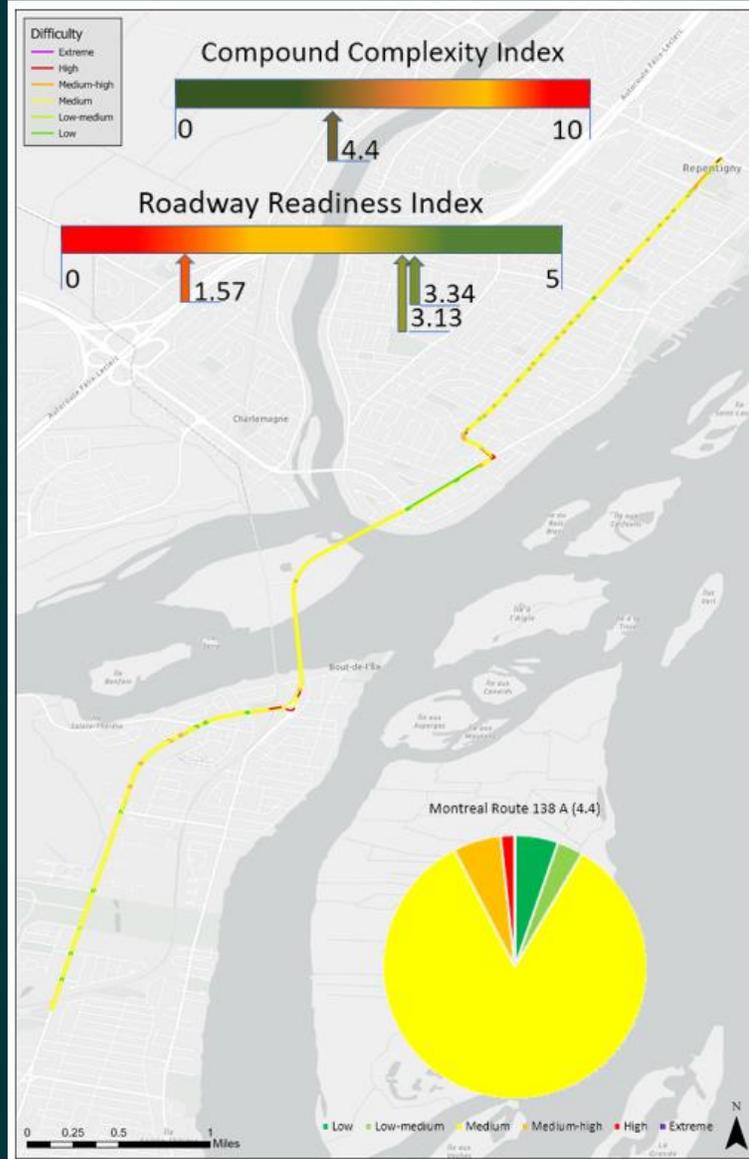
Index Score: 3.51/10 (Low-Medium)



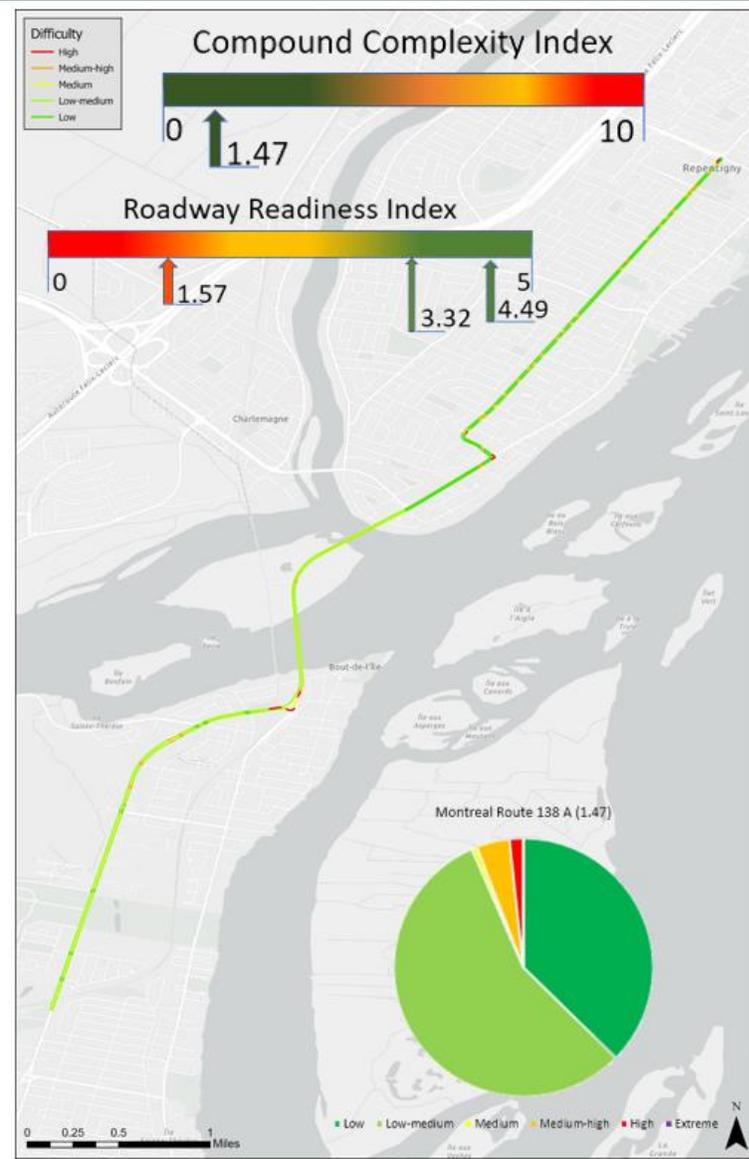
Complexity Distribution by Length

Dedicated Lane Scenario Results Using AV-Readi™

Existing

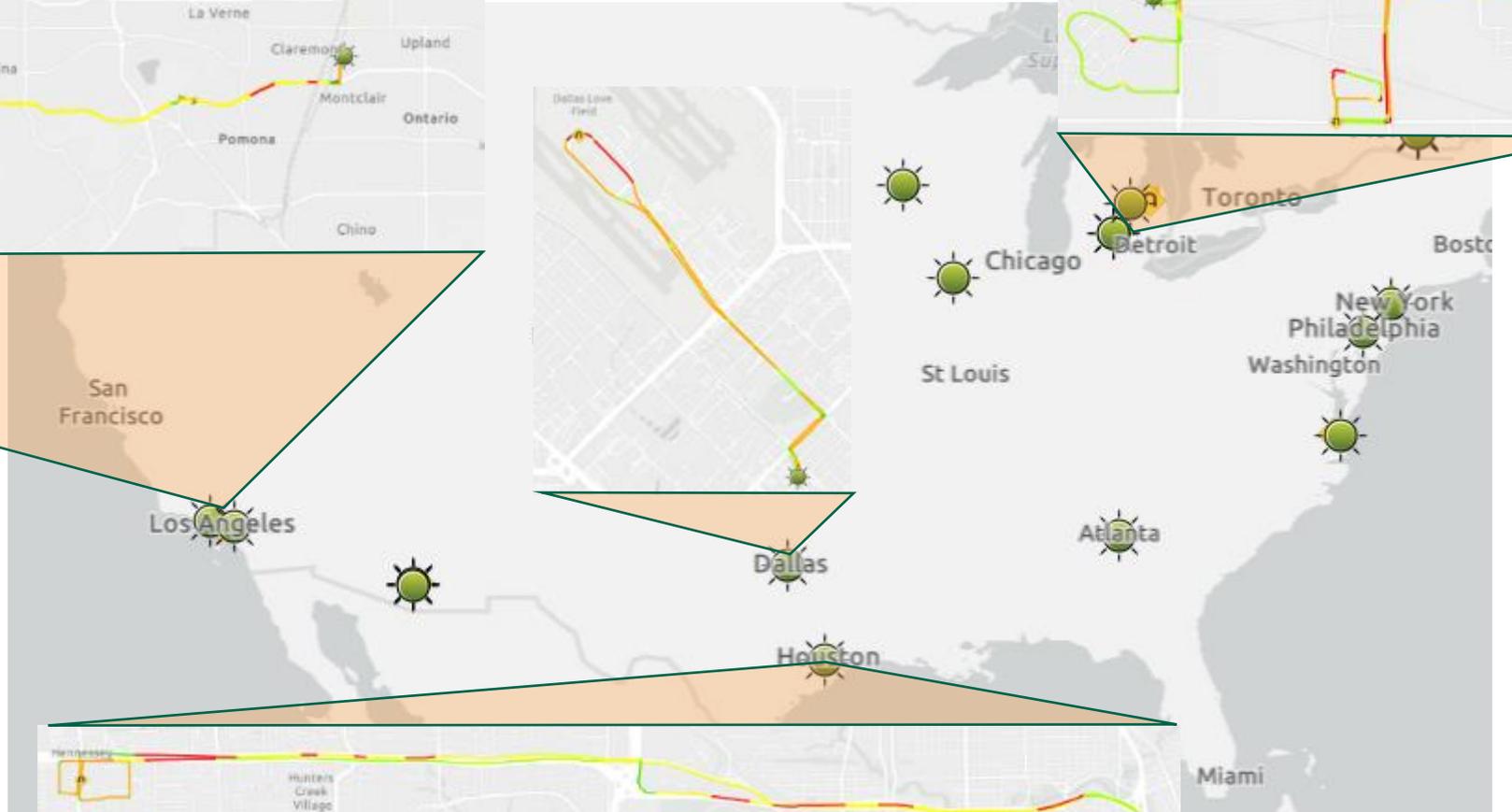
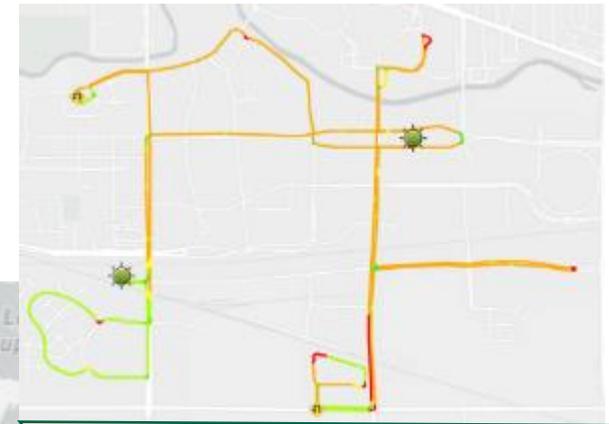
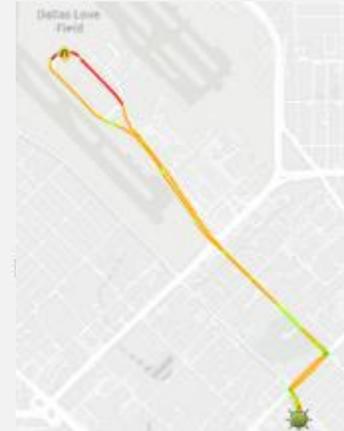
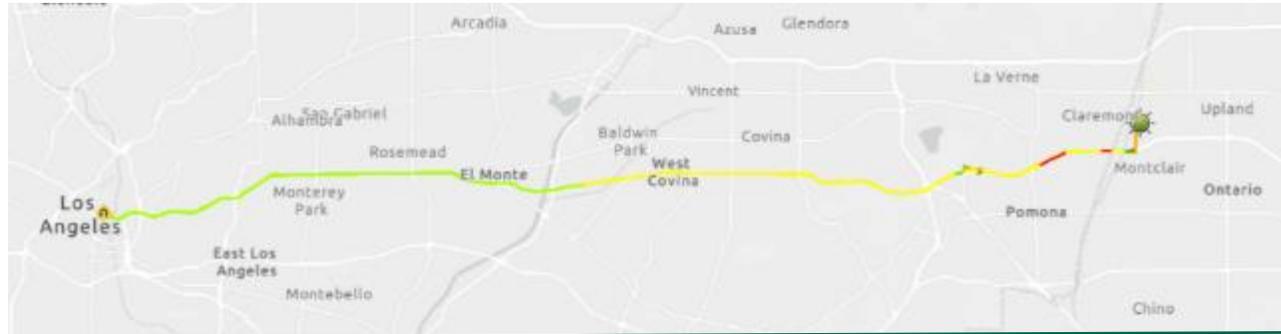


Dedicated Lane Scenario



AV-Readi™ ~6,000 Miles Analyzed

Complexity Maps



Roadways Analyzed

- Highways
- Rural
- Urban
- Suburban
- Campuses
- Airports

AV-Readi GIS Methodology and Automation



GIS Concepts

Network Analysis

LRS Polyline Segmentation

LRS Point Segmentation

AV-Readi Dashboard

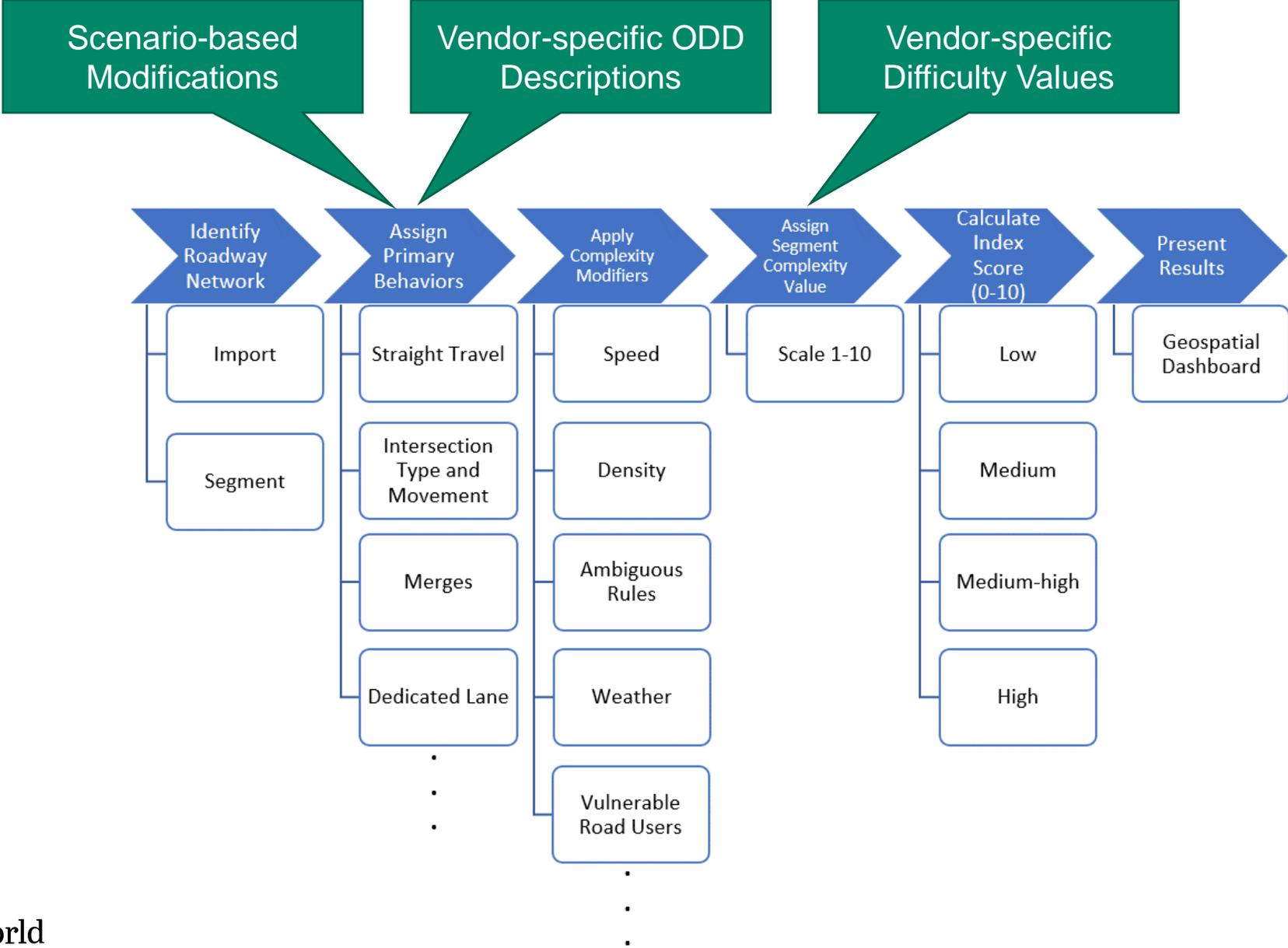
AV-Readi Complexity Evaluation

Scenario Based Modifications

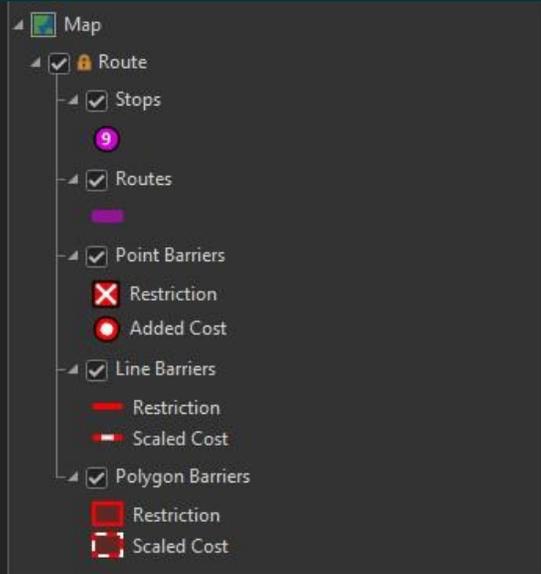
Vender Specific ODD Descriptions

Vender Specific Complexity Values

AV-Readi™ Roadway Complexity Evaluation



AV-Readi Network Analysis

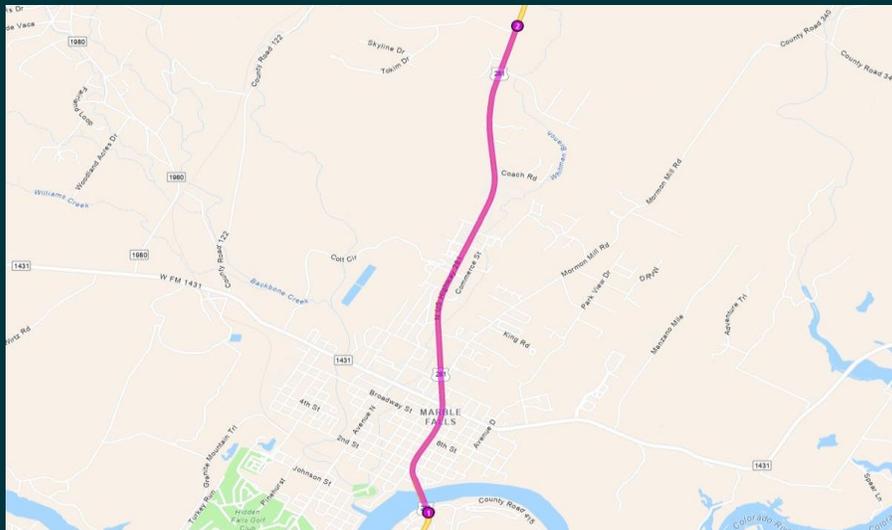


Network Analysis Route

AECOM AGOL hosted by ESRI

Route – Shortest Distance

Stops – Used to create route provided by the client



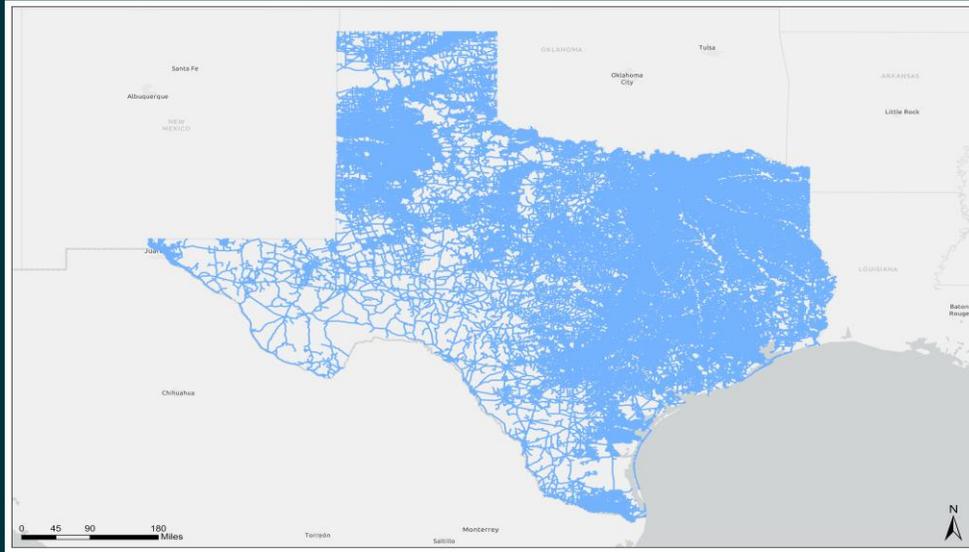
LRS Lane Specific Result

Single LRS Route

Single LRS Route Result = AV Readiness Input

Route to be Segmented

AV-Readi Polyline Segmentation Automation



Raw Data

Roadway Inventory from DOT

Attribution Field – Highway Name

Highway Name – Inverse Query – Cross St

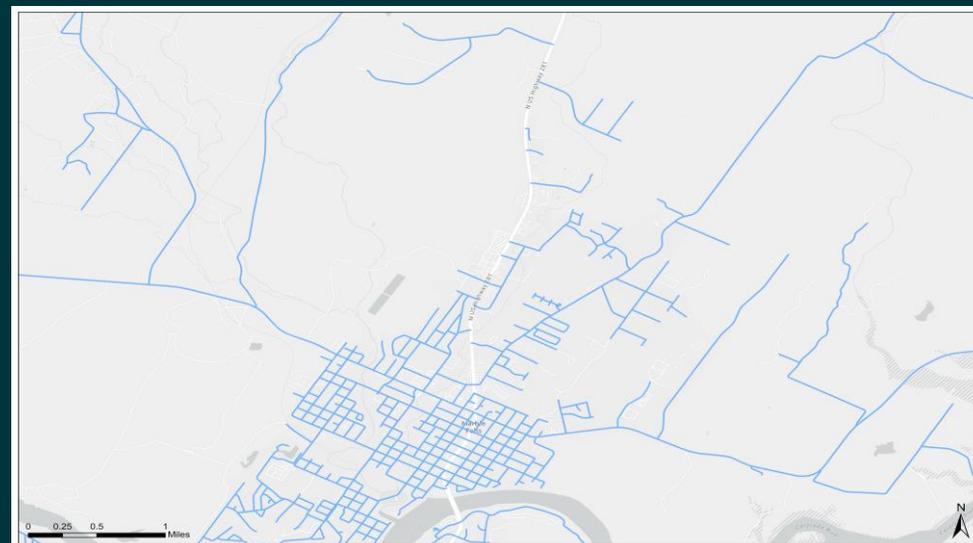
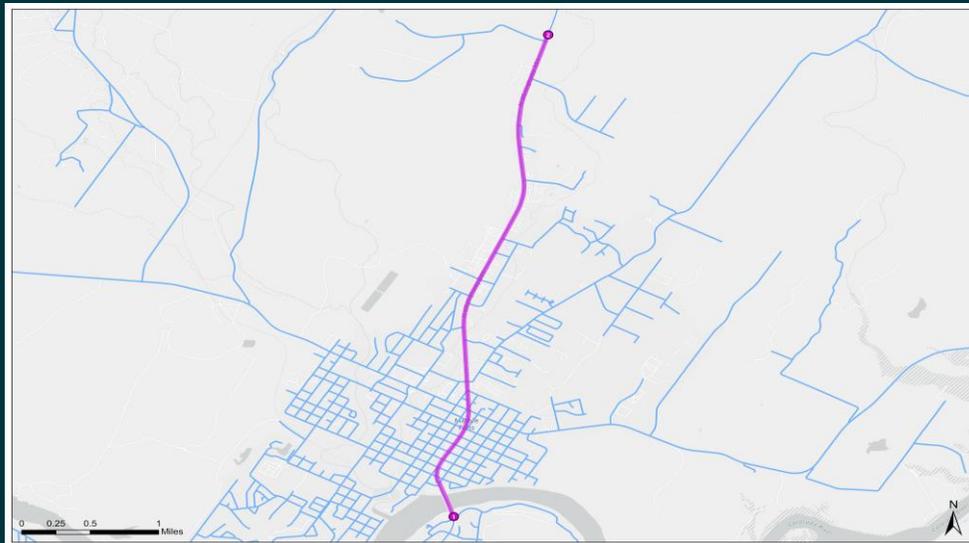
This example:

TxDOT Roadway Inventory

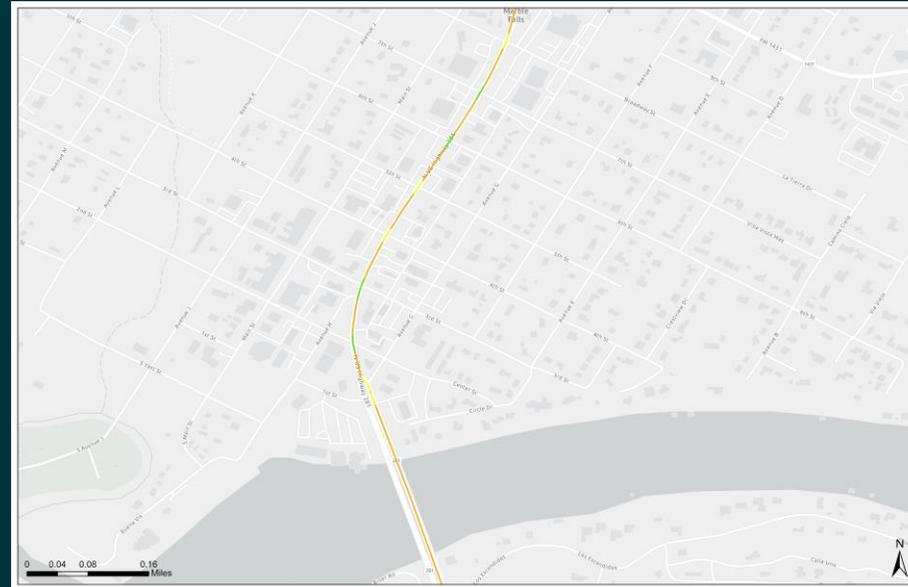
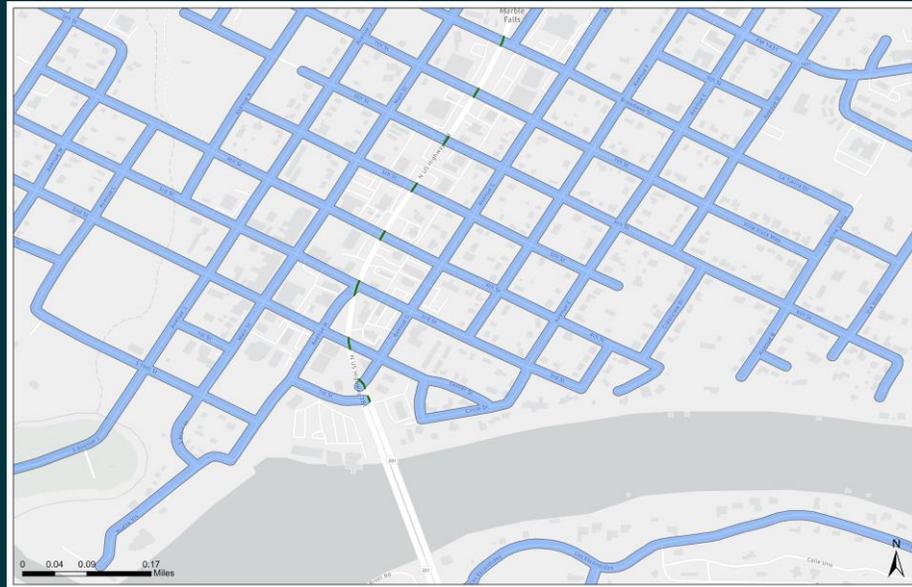
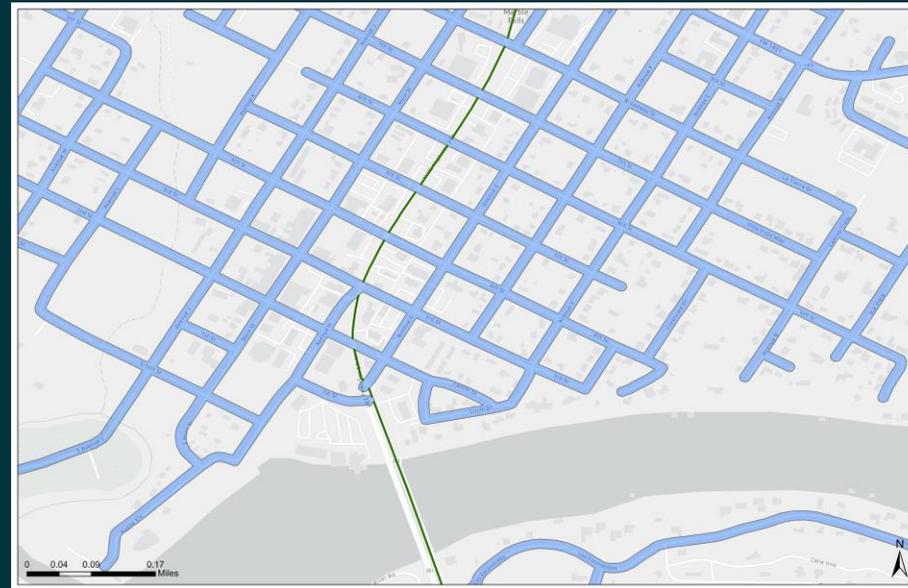
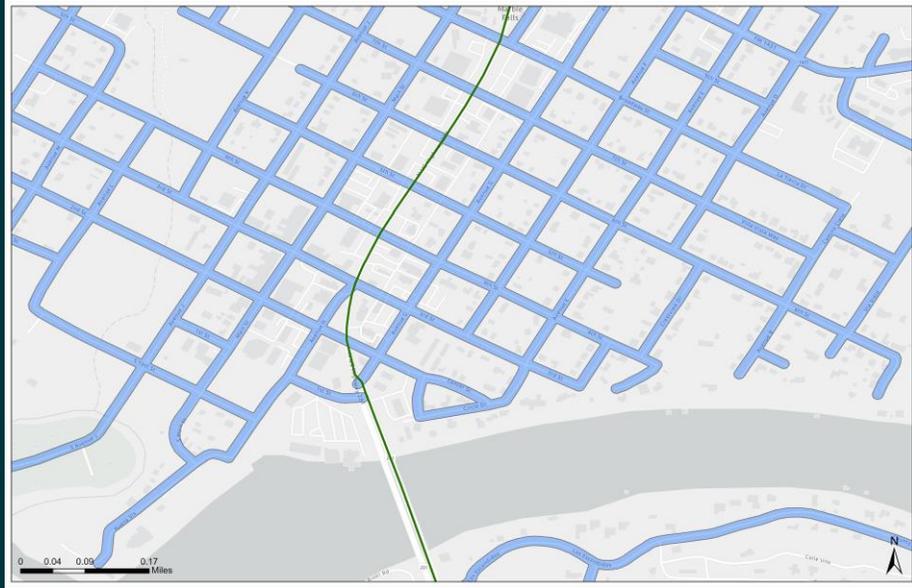
Attribution Field = HWY

HWY = US0281

Inverse Highway Query



AV-Readi Polyline Segmentation Automation



Buffer Analysis – Cross Streets



Clip Analysis – Main Route

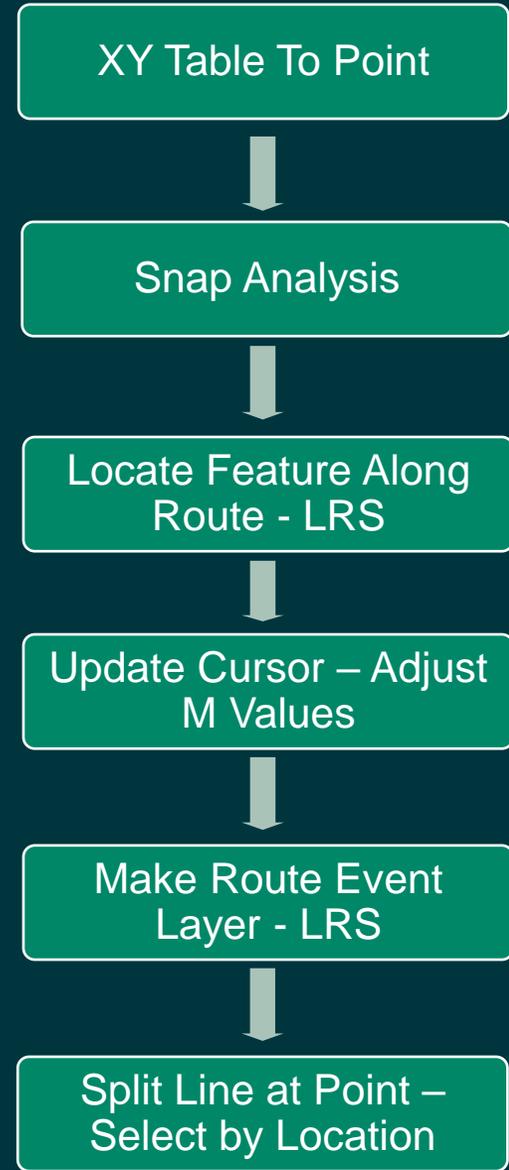
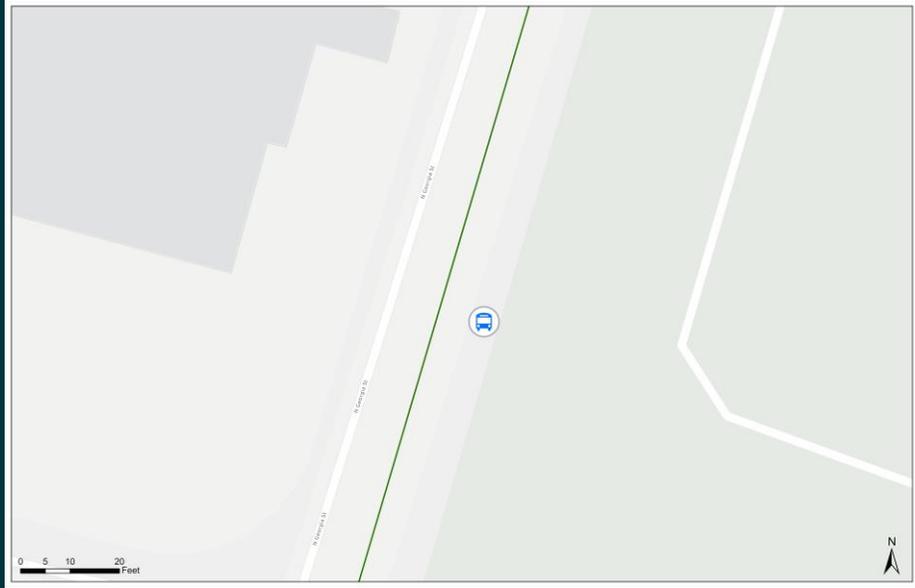


Erase Analysis – Main Route



Append Segmentation Results – Complexity Evaluations and Algorithms Proceed

AV-Readi Point Location Automation – Bus Stop Example





AV-Readi™ Dashboard Demo

THANK YOU

Kristi Teykl and Corby Schaub

AECOM Delivering a
better world