



CUBE Access

Presented by Chris Simons

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Mobility Analytics *Products*



Streetlytics



CUBE



CUBE Access
(formerly Sugar Access)

AGENDA

- Product Overview
- Types of Analysis
 - Outputs
- User Interface
- Data Specifications
- Discussion



CUBE Access

CUBE Access *Applications*



CUBE Access is used to measure the connectivity of people to places in a region: current and future.

Helping a government **score** the performance of the transportation infrastructure

- Invest in projects that will improve access to jobs, healthcare, recreation, etc.
- Promote multi-modal transportation
- Streamline local government reporting
- Bring project stakeholders to the table



Defining CUBE Access



- Tool for linking people, jobs and communities
- Pre-packaged set of geospatial data to analyze an area's multimodal accessibility
 - Software and Data
 - Specific geographic area (statewide, region, city)
- ArcGIS extension for creating, editing, and defining network accessibility analysis input data and publishing output maps to ArcGIS Online.



Unique Features: CUBE Access

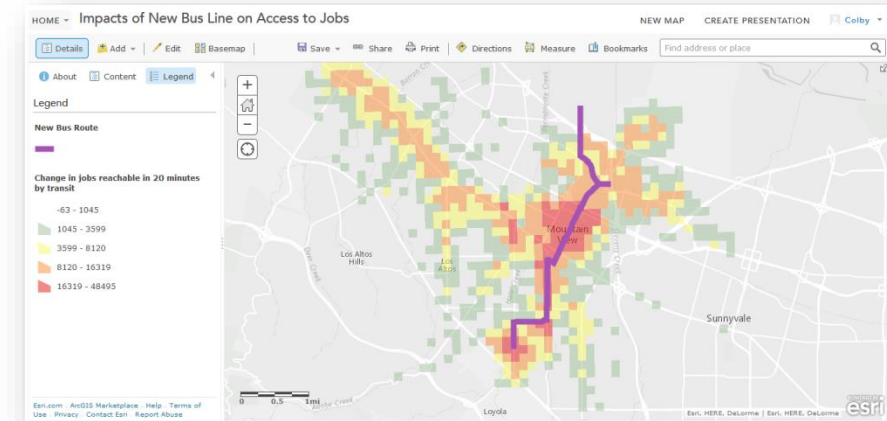
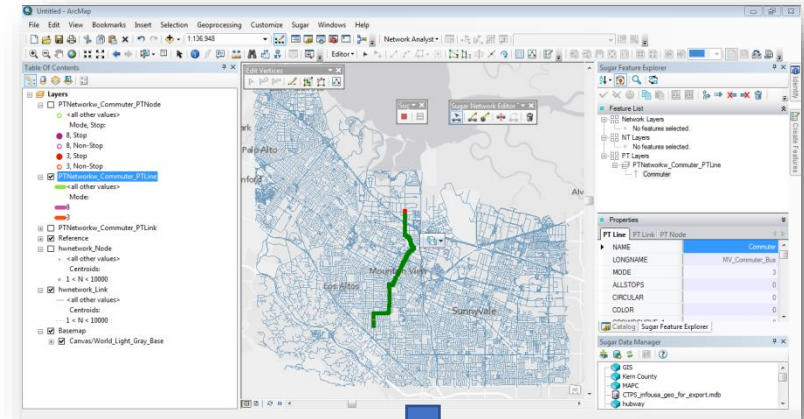


- Current transportation data (updated annually), including travel times derived from observed data (not estimates).
- Operates at the Census block level, providing much greater spatial detail than typical travel demand models.
- Multimodal, including the auto, public transport, walk and bike modes.
- Fully integrated with ArcGIS for ease and quality of graphic output.

What is Included: CUBE Access



- Software: CUBE Network Editor
 - Installed locally
 - ArcGIS Extension
 - 1 year term
- Data: Geodatabase
 - For use within CUBE Access only
- Cloud Computing: CUBE LaunchPad
 - Powered by AWS
 - Runtime included in subscription



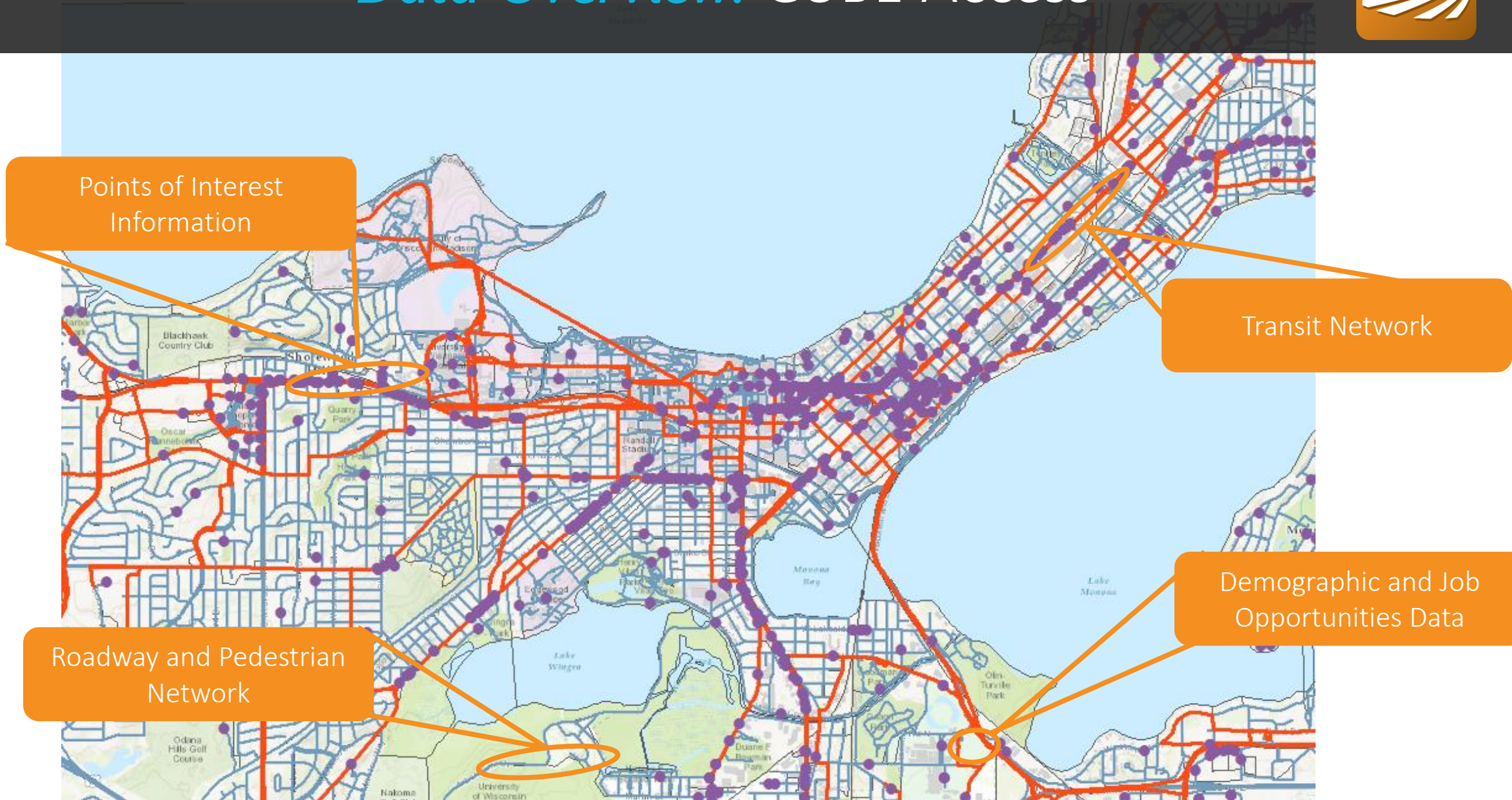
Using Sugar Access to analyze the impact of a new transit line on access to jobs without a car

Data Overview: CUBE Access



- Roadway and Pedestrian Network –HERE networks are detailed and accurate, including local walking paths as well as link travel times.
- Census Data – demographic and employment information at the census block or block group level
- Public Transport Network – Local GTFS files are utilized to build a complete local transit network, allowing for multiple agencies to be included in one multimodal network.
- POI Data – Local points of interest database from HERE. POIs include: hospitals, grocery stores, parks, schools and many more.

Data Overview: CUBE Access



Types of Analysis: CUBE Access



- Open Access Score
 - Number of destinations of a particular type accessible
 - Minimum travel time to a select destination type
- Access Score Work
 - Analyze accessibility to reach jobs of all types, or specific jobs based on industry or wages.
- Access Score Non-Work
 - Analyze accessibility to reach all non-work destinations
- POI Summary
 - Application allow users to summarize desired destination type within their zonal system
- Scenario Analyzer
 - Easily compare accessibilities between different scenarios

Types of Analysis: CUBE Access



Open Access Score

- Summarize the number of destinations in particular type and Calculate the minimum travel time to a select destination type
 - Mode of Travel: Walk, Bike, Transit, All modes, Non-Auto, and Non-Transit
 - Time Period: Morning Peak, Afternoon, Evening Peak and Night Time
 - Destination Type: Restaurant, Schools, Hospital, Groceries and more
 - Max Travel Time: max travel time allowed for analysis
- Customize your Accessibility Studies by (optional):
 - Using Local Parcels
 - Updating Roadway and Public Transit Networks
 - Updating Time Decay Curve: value short trips more than long trips
 - Updating Level of Service and Speed values to particular links.

Types of Analysis: CUBE Access



Open Access Score

Sugar Launch Pad

Application: Open Access Score

Scenario: Base > Jobs_AllModes_Midday

Base

- Health_Transit_AMPeak
- Restaurant_Walk_PMPe
- Grocery_Auto_Night
- Jobs_AllModes_Midday

Type of Analysis: Dest_Summat

Analysis Location: C:\Users\engineer1\szhou\Sugar\ClientSupport\SACOG\Streetytics_SA_SACOG_Deliver_2020\SACOG_2020_Cube.gdb\CensusBlocks_East_POI

Destination: Jobs

Time Period: Afternoon

Mode of Travel: All

Maximum Travel Time (minutes): 60

Roadway Network: C:\Users\engineer1\szhou\Sugar\ClientSupport\SACOG\Streetytics_SA_SACOG_Deliver_2020\SACOG_2020_Cube.gdb\HWNetwork

Turn Penalties: C:\Users\engineer1\szhou\Sugar\ClientSupport\SACOG\Streetytics_SA_SACOG_Deliver_2020\SACOG_2020_TurnProhibitors.pen

Public Transport Network: C:\Users\engineer1\szhou\Sugar\ClientSupport\SACOG\Streetytics_SA_SACOG_Deliver_2020\SACOG_2020_Cube.gdb\ptines

Upload to ArcGIS Online:

Average Walking Speed (mph): 3.1

Average Cycling Speed (mph): 9.6

Use Decay Curves for Value of Time?:

Custom Lookup Table for Value of Time (Optional):

Custom Lookup Table for Updated Link Speeds (Optional):

Types of Analysis: CUBE Access



Access Score Work

- Calculate Access Scores to reach employment opportunities.
 - Jobs Type: Jobs of all types or specific jobs based on industry and wages
 - Mode of Travel: Walk, Bike, Transit, All modes, Non-Auto, and Non-Transit
 - Time Period: Morning Peak, Afternoon, Evening Peak and Night Time
- Customize your Accessibility Studies by (optional):
 - Using Local Parcels
 - Updating Roadway and Public Transit Networks
 - Updating Time Decay Curve: value short trips more than long trips
 - Updating Level of Service and Speed values to particular links.

Types of Analysis: CUBE Access



Access Score Work

Sugar Launch Pad

Application: Access Score Work
Scenario: Base

Base
Work
Walk_Morning
Bike_Morning
Transit_Morning_120
AllModes_Morning

Analysis Location:

Destination: Specify a dataset path to load field names

Time Period: Morning-Peak

Mode of Travel: Walk

Roadway Network:

Turn Penalties:

Public Transport Network:

Average Walking Speed (mph): 3.1

Average Cycling Speed (mph): 9.6

Upload to ArcGIS Online:

Custom Lookup Table for Value of Time (Optional):

Lookup Table for Updated Link Speeds (Optional):

Types of Analysis: CUBE Access



Access Score Non-Work

- Calculate Access Scores to reach all non work destinations.
 - Mode of Travel: Walk, Bike, Transit, All modes, Non-Auto, and Non-Transit
 - Time Period: Morning Peak, Afternoon, Evening Peak and Night Time
- Customize your Accessibility Studies by (optional):
 - Using Local Parcels
 - Updating Roadway and Public Transit Networks
 - Updating Time Decay Curve: value short trips more than long trips
 - Updating Level of Service and Speed values to particular links.
 - Updating Access Score Destination Weights

Types of Analysis: CUBE Access



Access Score Non-Work

Sugar Launch Pad

Application: Access Score Non-Work
Scenario: Base

Base
└ Auto

Analysis Location:

Time Period:

Mode of Travel:

Points of Interest:

Roadway Network:

Turn Penalties:

Public Transport Network:

Average Walking Speed (mph):

Average Cycling Speed (mph):

Upload to ArcGIS Online:

Custom Lookup Table for Value of Time (Optional):

Lookup Table for Updated Link Speeds (Optional):

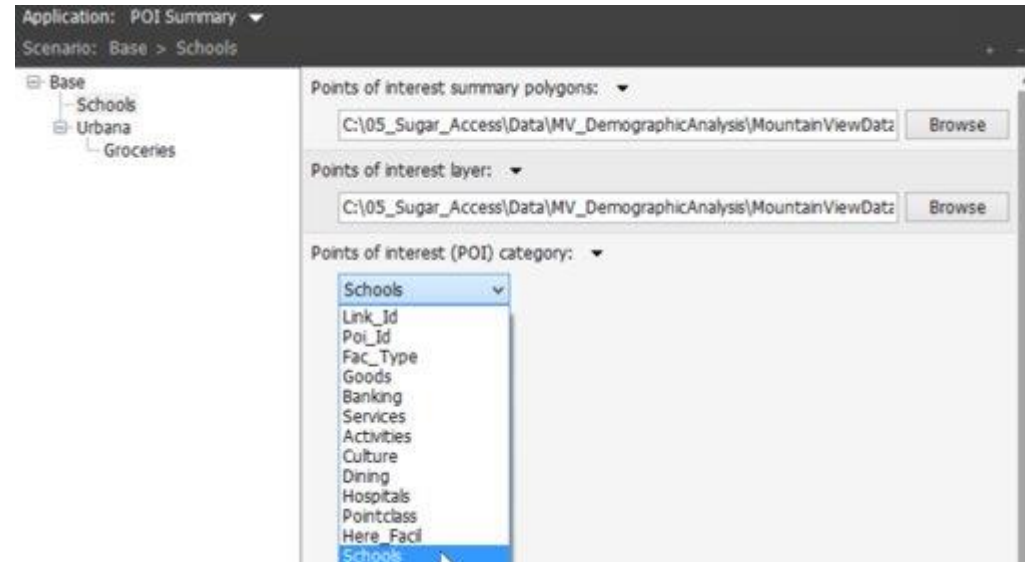
Custom Access Score Destination Weights (Optional):

Types of Analysis: CUBE Access



POI Summary

- Aggregated selected destination type into a zonal polygon layer



Types of Analysis: CUBE Access



Scenario Analyzer

Sugar Launch Pad

Application: Scenario Analyzer

Scenario: Base

- Base

Base Scenario:

Travel Mode to Analyze:

Base Result (mdb):

Comparison Scenario:

Comparison Result (mdb):

Upload to AGOL:

Types of Analysis: CUBE Access



Scenario Analyzer

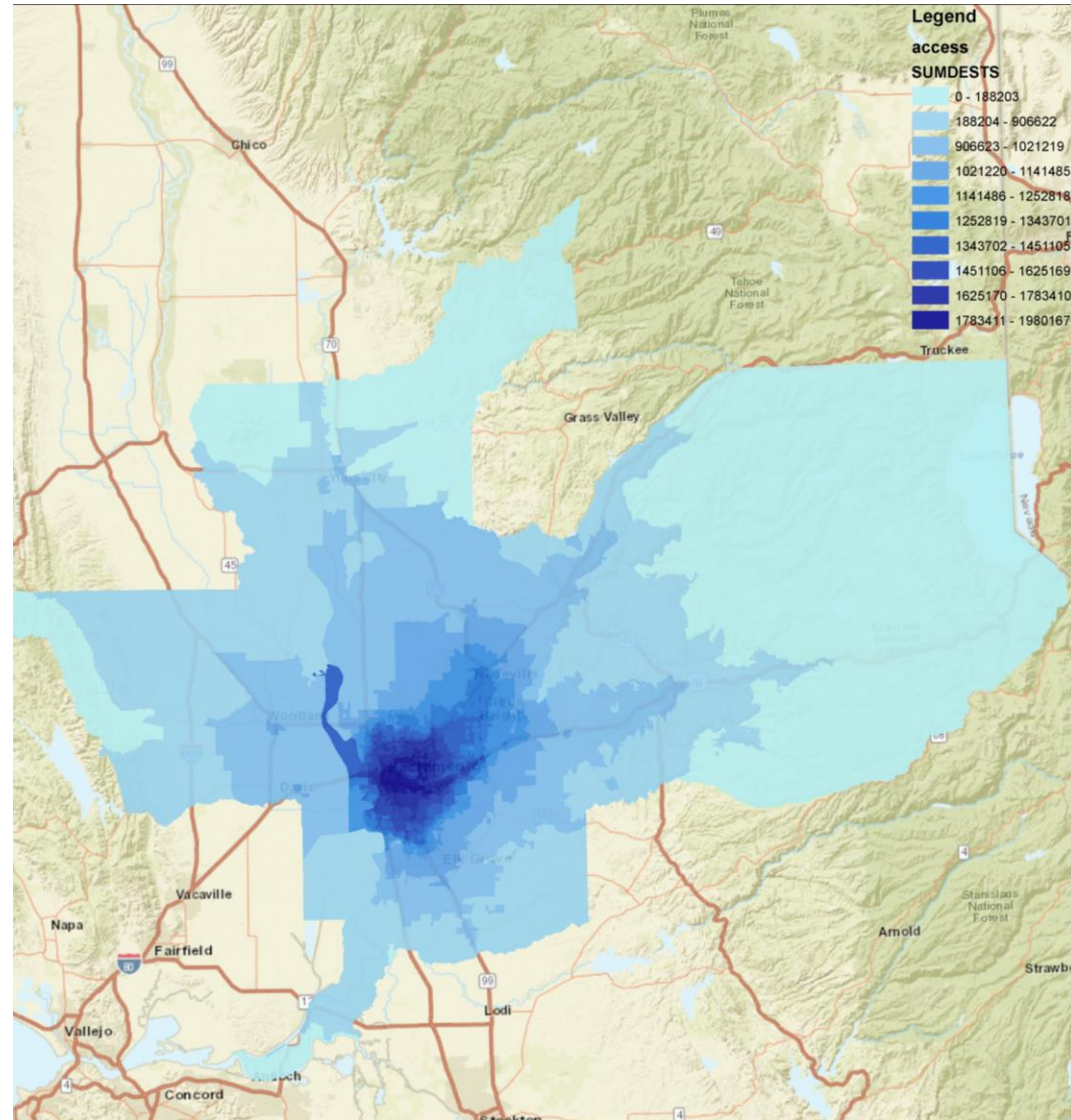
- Compare different scenarios and calculate the differences or changes in accessibility.
- Summarize these results across different demographic groups

CATEGORY ▾	Base ▾	BRT ▾	JobsGained ▾	% Diff ▾
TOTAL	52407	59879	7472	14.26
WHITE	50615	58128	7513	14.84
BLACK	35580	40259	4679	13.15
A_INDIAN	56977	63799	6822	11.97
ASIAN	58736	67247	8511	14.49
PACIFIC	28301	30961	2660	9.4
OTHER	49722	55179	5457	10.98
MINORITY	54265	61694	7429	13.69
MINORITY_ZONE	58539	65868	7329	12.52

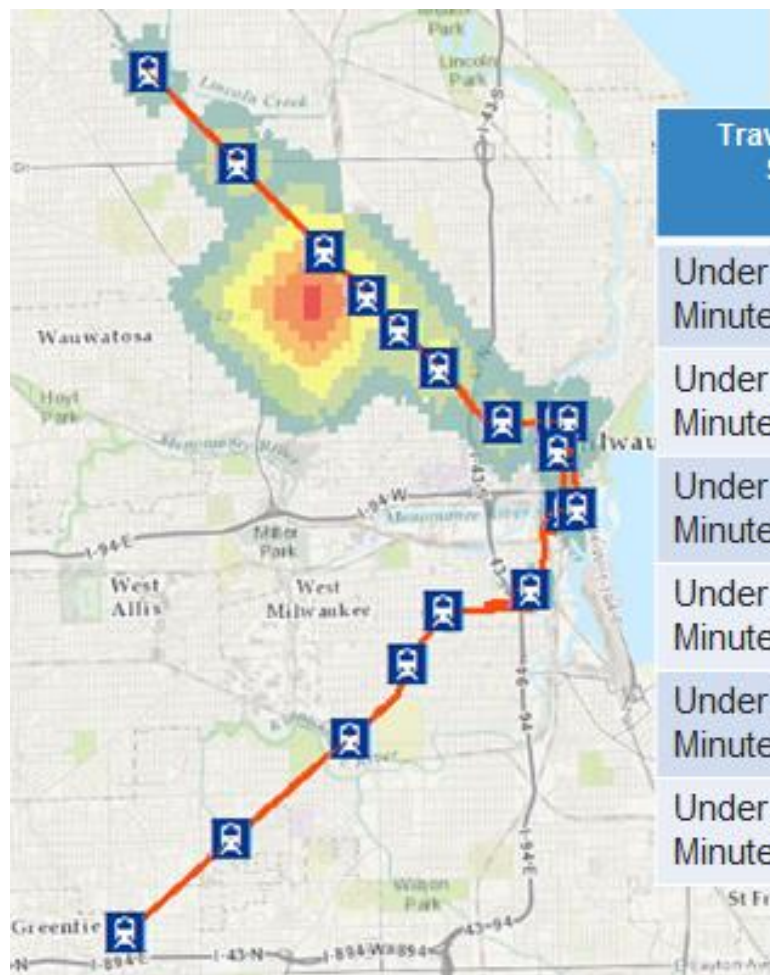
Cube Access *Outputs*



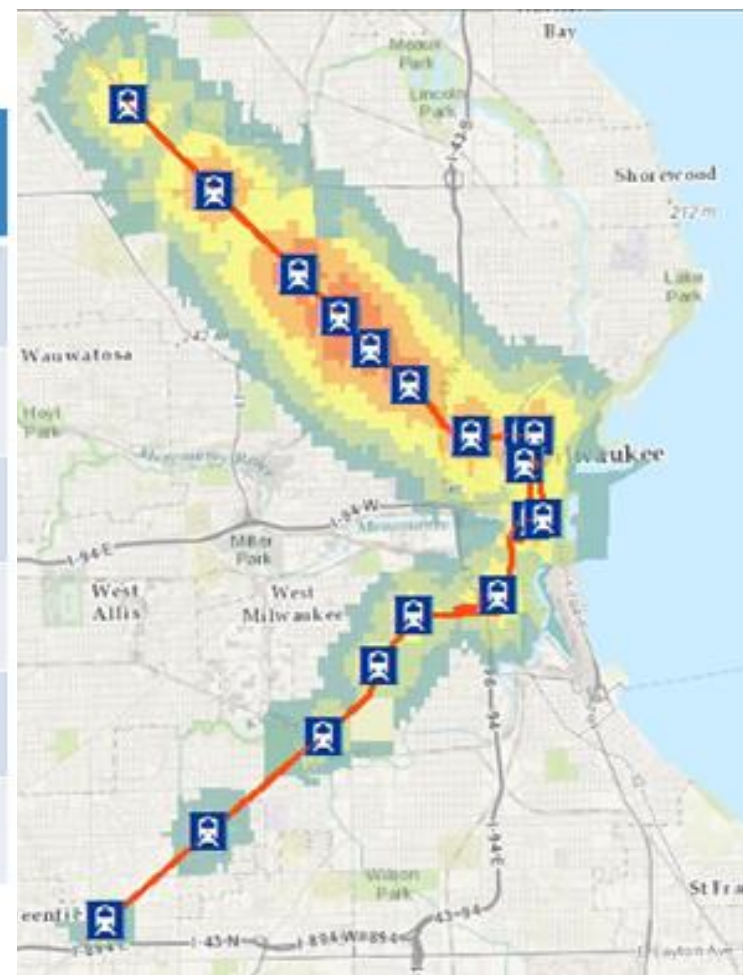
Accessibility to Jobs by all modes within 60 minutes



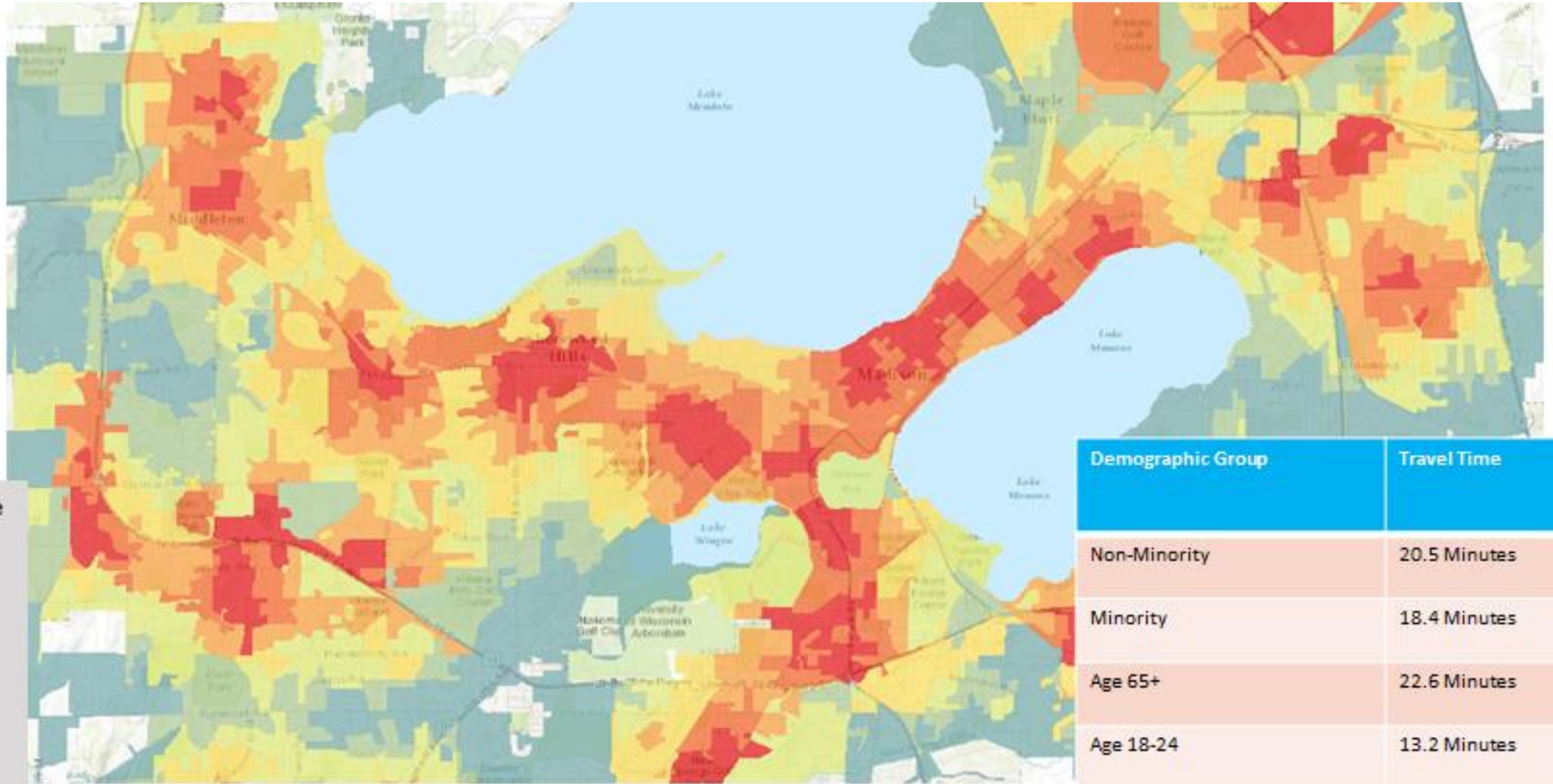
Cube Access *Outputs*



Travel Time Shed	Jobs Accessible (Location A)	Jobs Accessible (Location B)
Under 5 Minutes	4 Jobs	156 Jobs
Under 10 Minutes	136 Jobs	6,667 Jobs
Under 15 Minutes	579 Jobs	30,328 Jobs
Under 20 Minutes	10,319 Jobs	93,197 Jobs
Under 25 Minutes	33,689 Jobs	115,290 Jobs
Under 30 Minutes	89,422 Jobs	145,477 Jobs

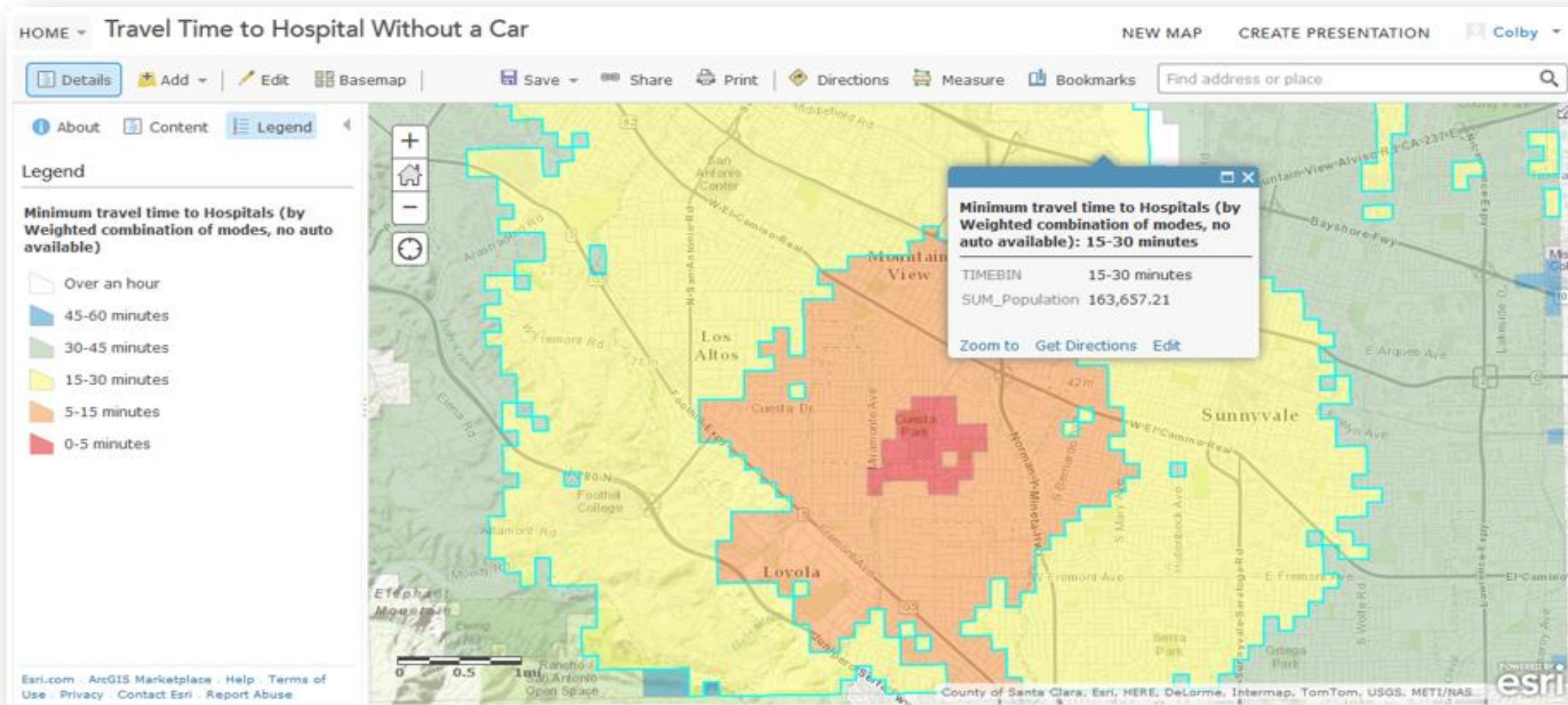


Cube Access *Outputs*



Demographic Group	Travel Time
Non-Minority	20.5 Minutes
Minority	18.4 Minutes
Age 65+	22.6 Minutes
Age 18-24	13.2 Minutes

Cube Access *Outputs*



Cube Access *Outputs*



Change Style

Job Access AbsoluteAccess - Accessibility to Jobs within 30 minutes by Transit mode

SUMDESTS

Classify Data

Using Manual Breaks

With 9 classes

Round classes: Select an option

Draw features with out of range or no value.

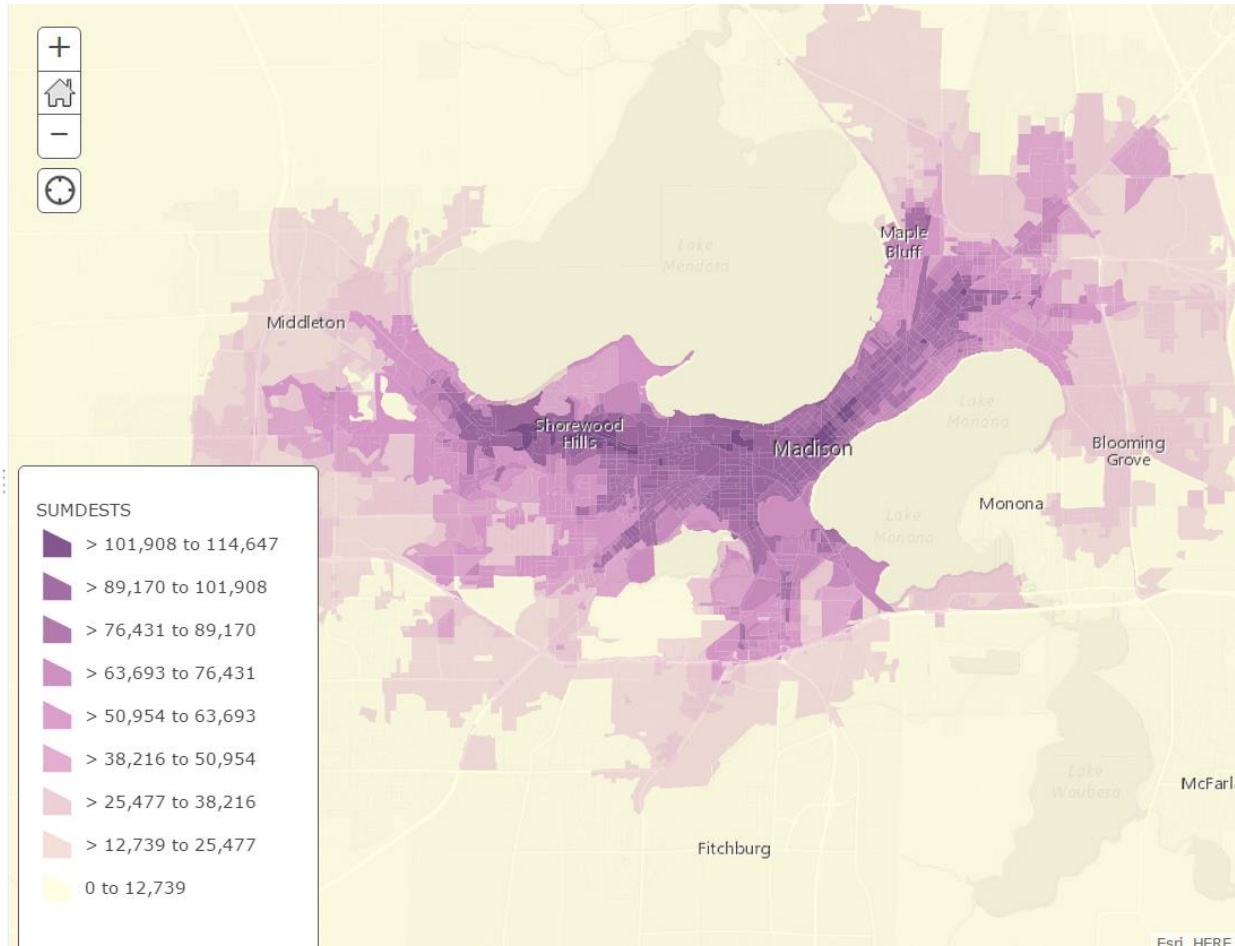
Transparency

0% 50% 100%

Visible Range

OK CANCEL

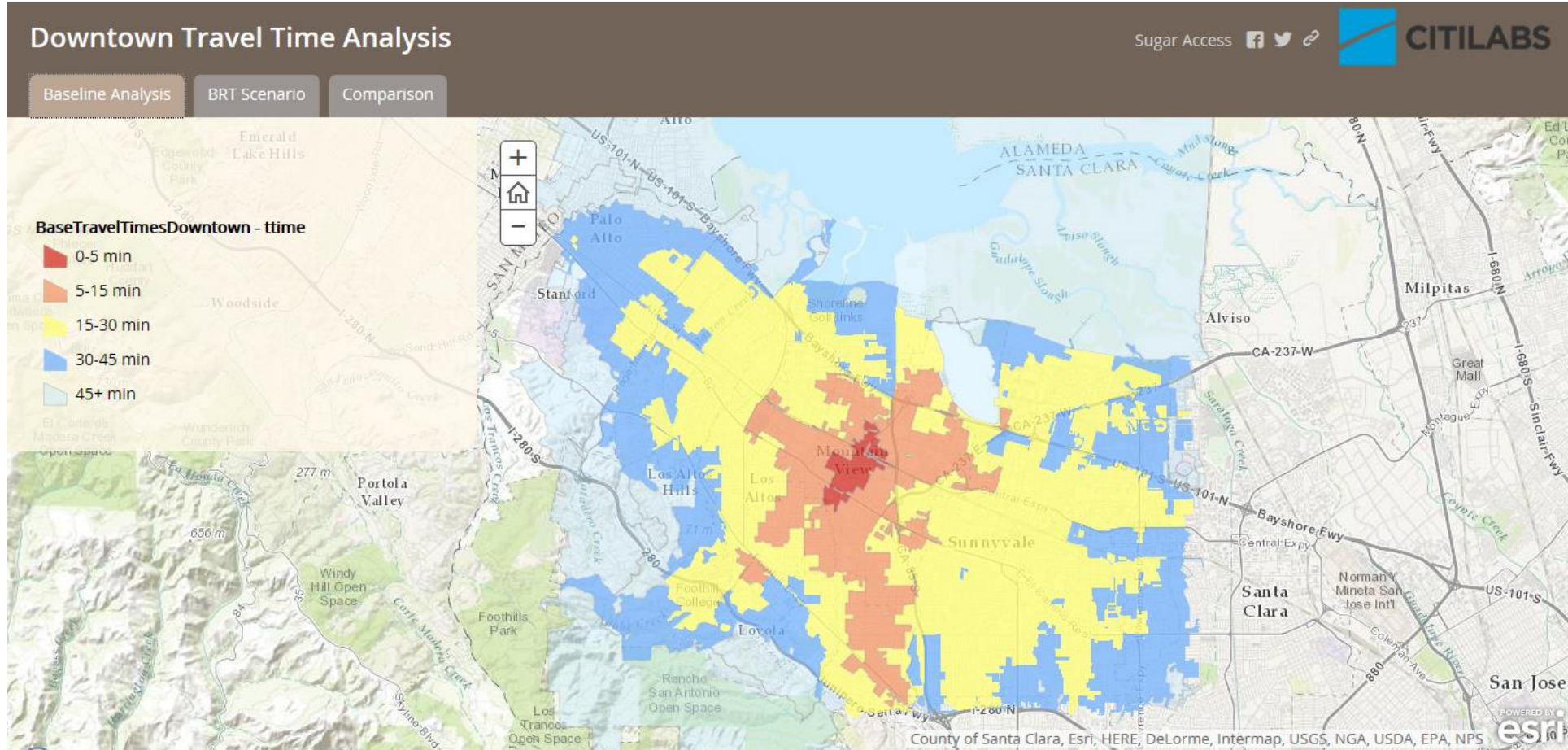
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Cube Access *Outputs*



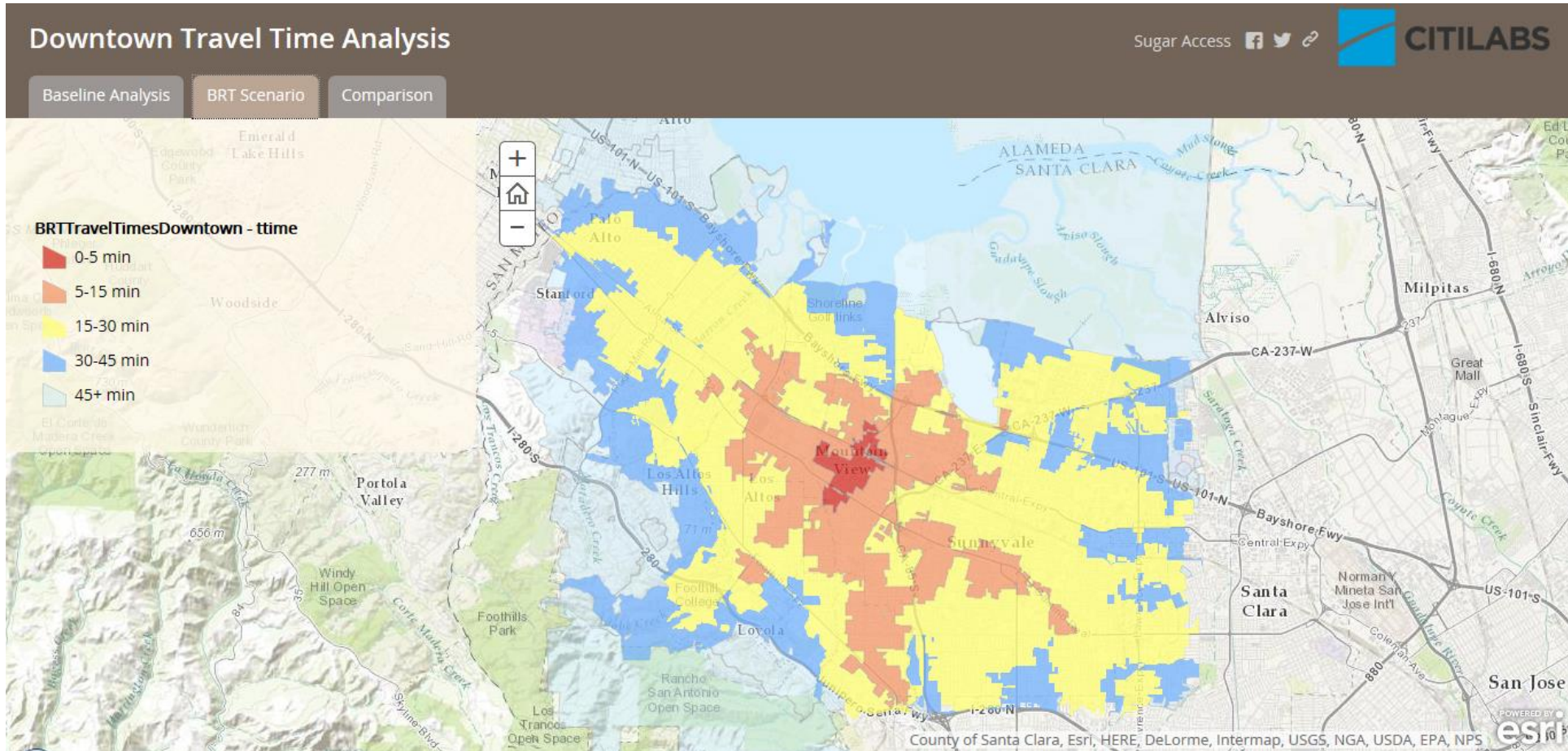
Base Scenario



Cube Access *Outputs*



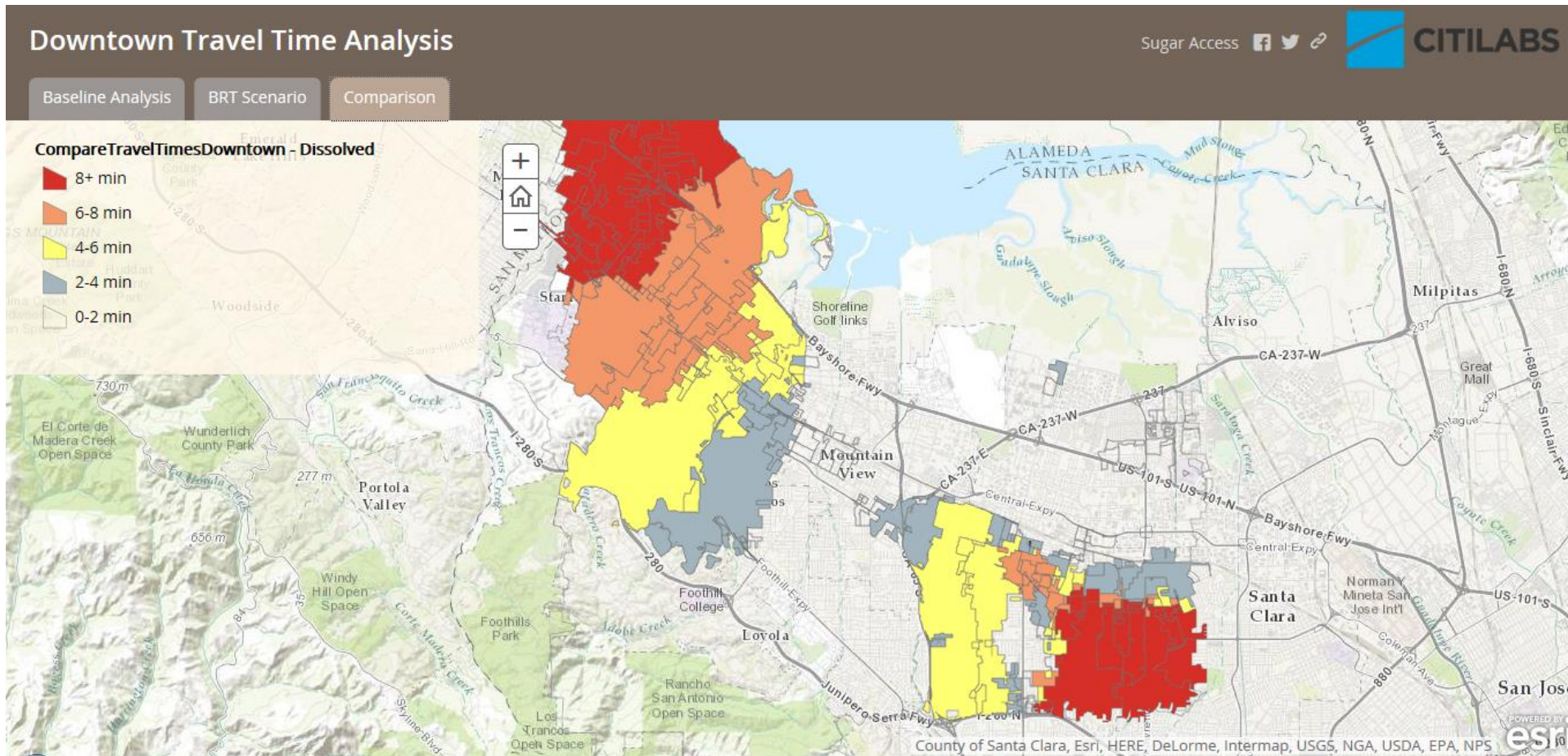
Future Scenario



Cube Access *Outputs*



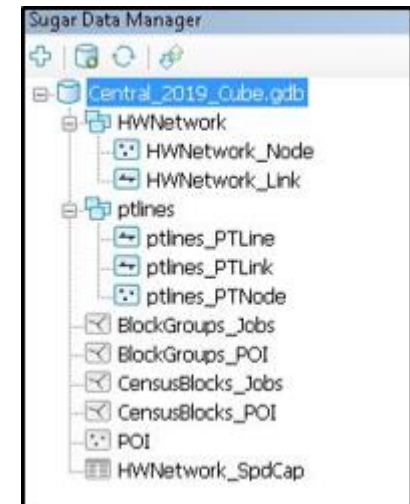
Comparison



User Interface: CUBE Access



- CUBE Network Editor, Data Manager: ArcGIS extensions
 - Provide user easier way to manage database and edit network
- CUBE LaunchPad: Cloud based computing environment
 - Unlimited number of simultaneous scenarios runs
 - Runtime included in subscription

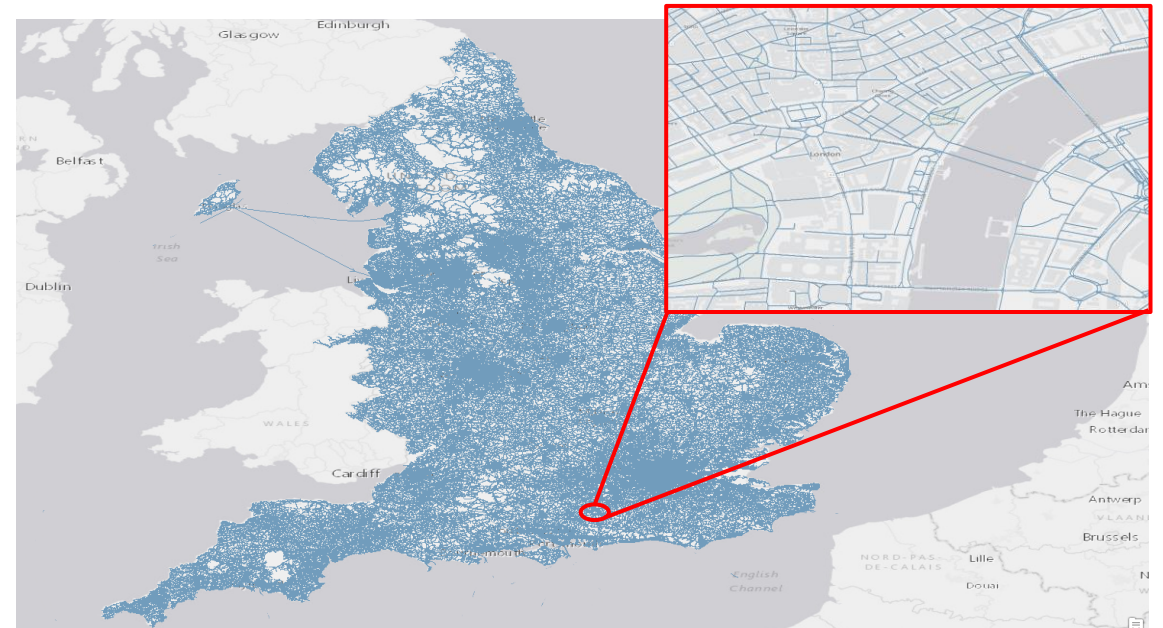


Current Runs								
	Requested	Started	Completed	Application	Scenario	Status	Message	Progress
▶	08/24/2015			Accessibility Ca...	Alternative_A	Running	Step 1:MATRIX (v....	
	08/24/2015			Accessibility Ca...	Alternative_B	Running	Step 3:NETWORK (...	
	08/24/2015			Accessibility Ca...	Alternative_D	Running	Step 3:NETWORK (...	
	08/24/2015			Accessibility Ca...	Alternative_C	Running	Step 4:NETWORK (...	

Data Specifications: CUBE Access



- HERE is a leader in navigation, mapping and location experiences.
- Build high-definition (HD) maps and combine them with cloud technology to help in navigating a complex world with personalised solutions.
- Anytime, everywhere, across a broad range of devices, operating systems and vehicles.



Data Specifications: CUBE Access



- All necessary road link attributes recorded for accurate multi-modal modeling:

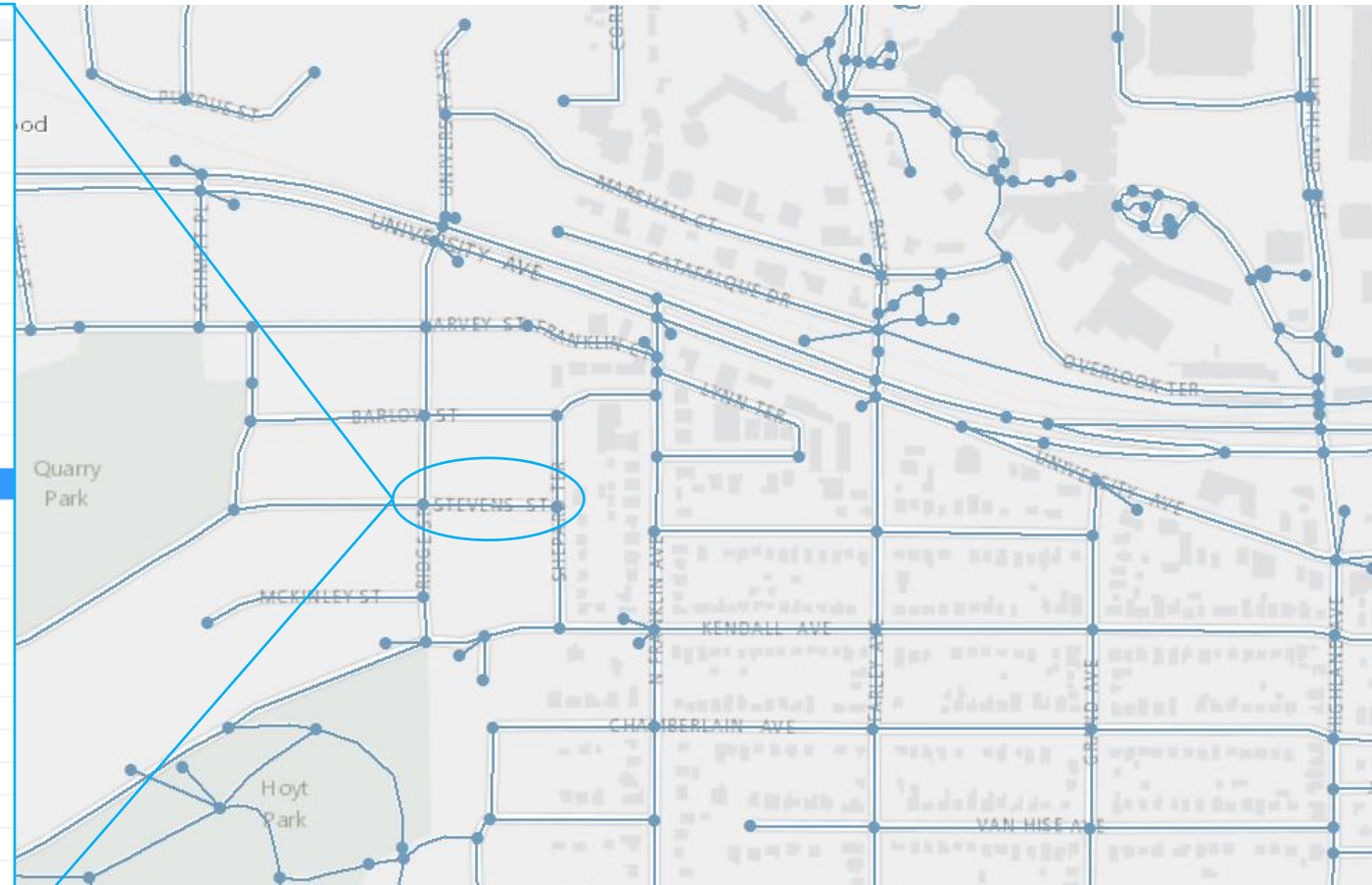
- Hourly Link Travel Times

- Mode allowance

- Speed Limit

- Functional Class

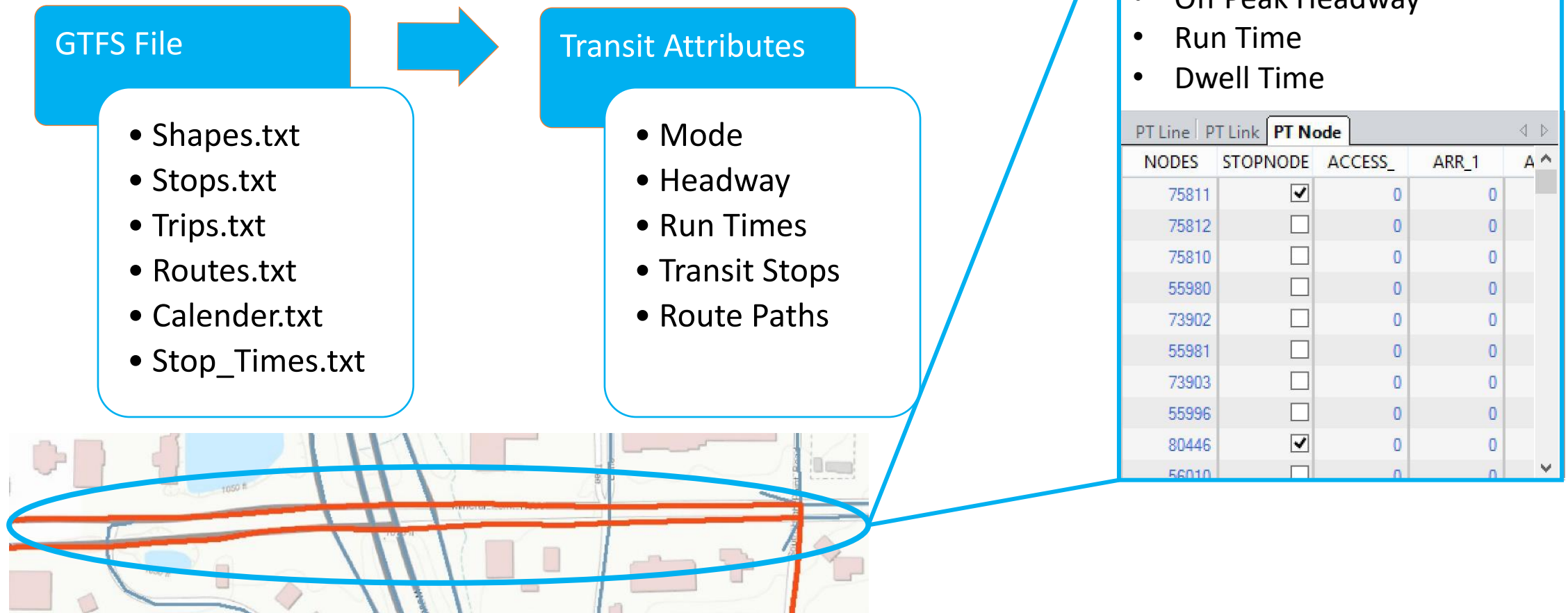
Field	Value
A_ID	166767199
B_ID	166767208
W	39
SPDFLAG	1
SPEED	25
SPD_LIMIT	25
LANES	1
ST_NAME	STEVENS ST
FEAT_ID	741496389
FUNC_CLASS	5
SPEED_CAT	6
LANE_CAT	1
DIVIDER	N
DIR_TRAVEL	F
L_POSTCODE	53705
R_POSTCODE	53705
AR_AUTO	Y
AR_BUS	Y
AR_TAXIS	Y
AR_CARPOOL	Y
AR_PEDEST	Y
AR_TRUCKS	Y
AR_TRAFF	Y
AR_DELIV	Y
AR_EMERVEH	Y
AR_MOTOR	Y
PAVED	Y



Data Specifications: CUBE Access



- Captures all transit attributes from your local GTFS file



Data Specifications: CUBE Access



- Demographic information for every census block
- Detailed employment information throughout your city
- Flexible polygon based system for integration of local user data

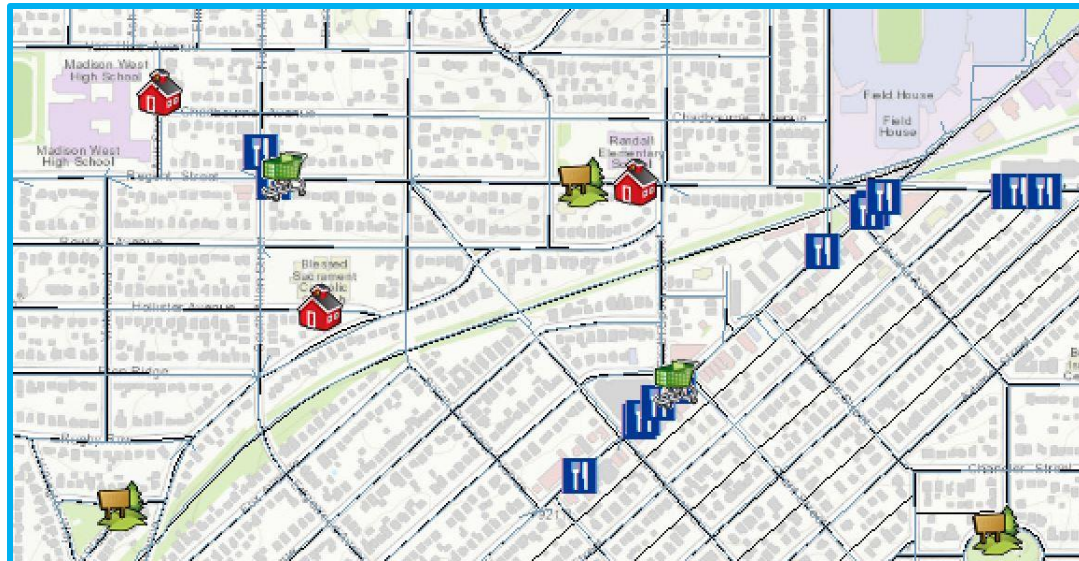


Field	Value
JOBS	2
POPULATION	54
WHITE	50
BLACK	0
AMERICAN_I	0
ASIAN	2
PACIFIC_I	0
OTHER	0
UNDER_5	5
A5_TO_9	5
A10_TO_14	0
A15_TO_17	3
A18_TO_19	0
A20	0
A21	0
A22_TO_24	0
A25_TO_29	0
A30_TO_34	3
A35_TO_39	1
A40_TO_44	6

Data Specifications: CUBE Access



- Here points of interest database
 - Schools, parks, restaurants
 - Individually coded based on type
 - Geocoded to their exact locations



POI_NAME	POI_ST_NUM	ST_NAME	HERE_CATEG
BOY SCOUT PARK	W61N701	RIVEREDGE DR	Park/Recreation
CATHEDRAL SQUARE	850	N JEFFERSON ST	Park/Recreation
CAESAR'S PARK	1999	N WARREN AVE	Park/Recreation
GRAFTON HERITAGE SETTLEMENT PARK	770	HOMESTEAD TRL	Park/Recreation
SCHANEN PARK		S TOWER DR	Park/Recreation
DYER FIELD	151	N 80TH ST	Park/Recreation
GRAFTON WILDWOOD PARK	1399	1ST AVE	Park/Recreation
ALGONQUIN PARK	7800	N 51ST BLVD	Park/Recreation
HONEY BEAR PARK		S HONEY CREEK DR	Park/Recreation
ALCOTT PARK	3701	S 97TH ST	Park/Recreation
JACK E WORKMAN PARK		W FOREST HILL AVE	Park/Recreation
KOSCIUSZKO PARK	2101	S 7TH ST	Park/Recreation
REGAL PARK	4401	S REGAL DR	Park/Recreation
MILWAUKEE HISTORICAL CENTER	910	N OLD WORLD 3RD ST	Museum
TATS PUB & GRILL	4671	S LAKE DR	Restaurants
CARIBOU COFFEE	418	N MAYFAIR RD	Coffee Shop
INTERNATIONAL FOODS	1920	E CAPITOL DR	Restaurants
GARDEN ROOM	2107	E CAPITOL DR	Restaurants
MEE KWON RESTAURANT	6333	W BONNWELL RD	Restaurants
CARIBOU COFFEE			Coffee Shop
CARIBOU COFFEE	17335	W BLUEMOUND RD	Coffee Shop
SUBWAY	12735	W CAPITOL DR	Restaurants
ROCKY ROCOCO PIZZA& PASTA	5300	S 76TH ST	Restaurants
PAPA MURPHY'S	1965	WISCONSIN AVE	Restaurants

Open Access Score



Questions?

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