CUBE Access

Using CUBE Access for Accessibility Analysis

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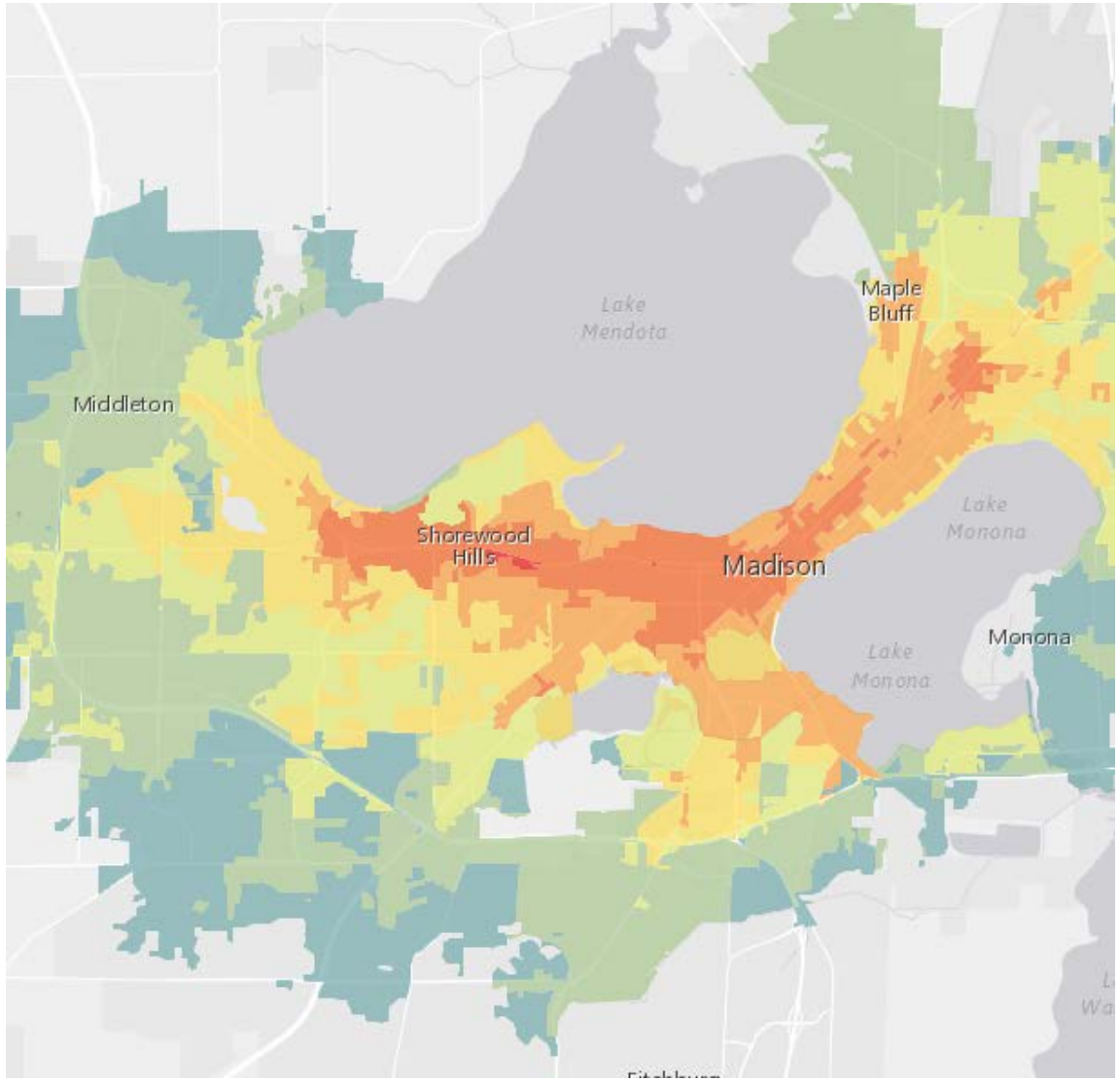
Advancing Infrastructure

What is CUBE Access?

- CUBE Access can be used to get metrics on people's accessibility to valued destinations, such as employment, health services, transportation hubs, and entertainment.
- It is an ArcGIS add-on providing an uncomplicated yet powerful GIS tool
- Can be used for national, regional or local analysis.
- Multi-modal with observed travel times, transit frequencies and mode allowances.



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Using CUBE Access for Accessibility Analysis

What is delivered with CUBE Access?

- ArcGIS network editor and analysis launchpad
- Road and Pedestrian network
- Public Transport network
- Demographic data
- Points of Interest

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Testing and Editing

- CUBE Access Network Editor
- Scenario Management
- Cloud Processing

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Types of Analysis

1. Access Score
   - Comprehensive score analyzing access to multiple destinations
2. Accessibility Calculator
   - Travel Time Analysis, calculates the minimum travel time to your chosen destination
   - Destination Summation Analysis, calculates the number of destinations with a specified travel time
3. Map Mixer
   - Easily compare scenarios in one map
4. POI Summary
   - Analyse access to new types of destinations

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Applications of CUBE Access

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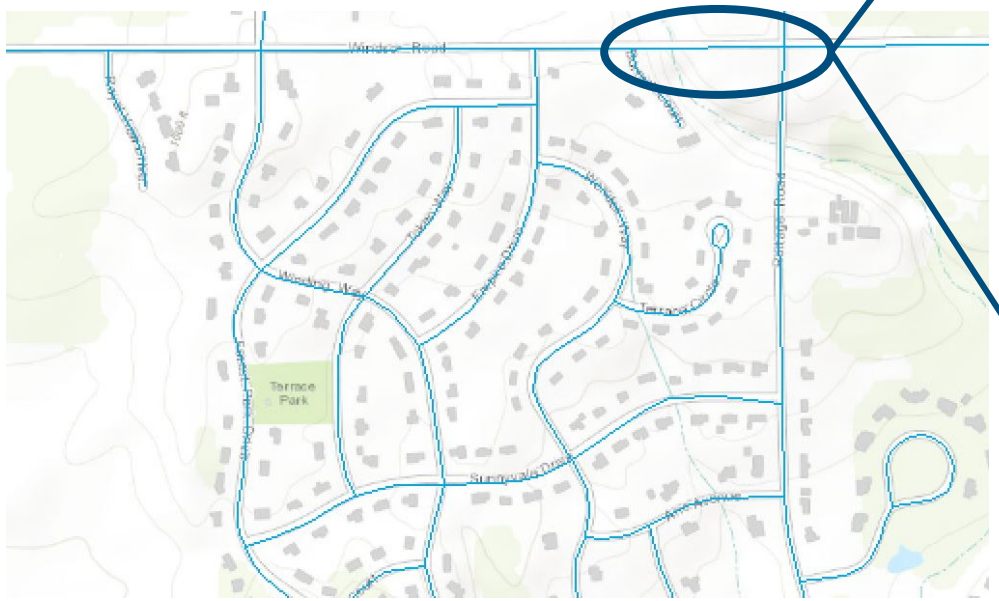
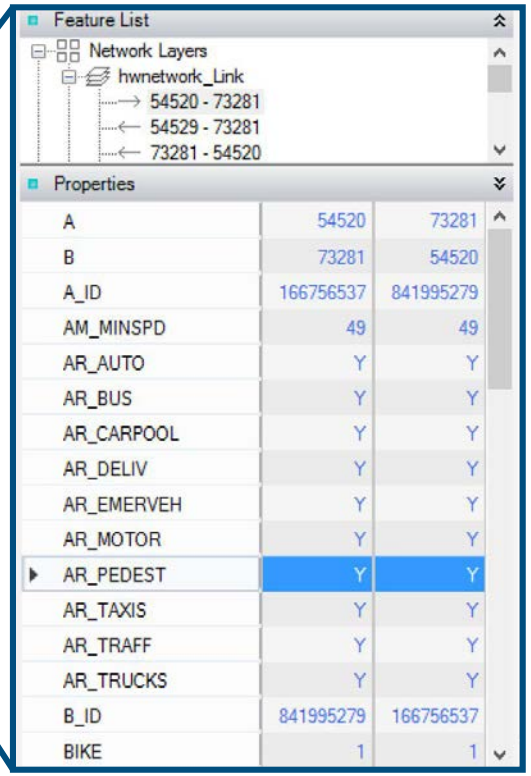
Input: HERE Road & Pedestrian Network

- Accurate and detailed networks from Here
- Historic speed data by time of day included
- Includes non-motorized paths
- Mode allowance
- Speed limits
- Editable





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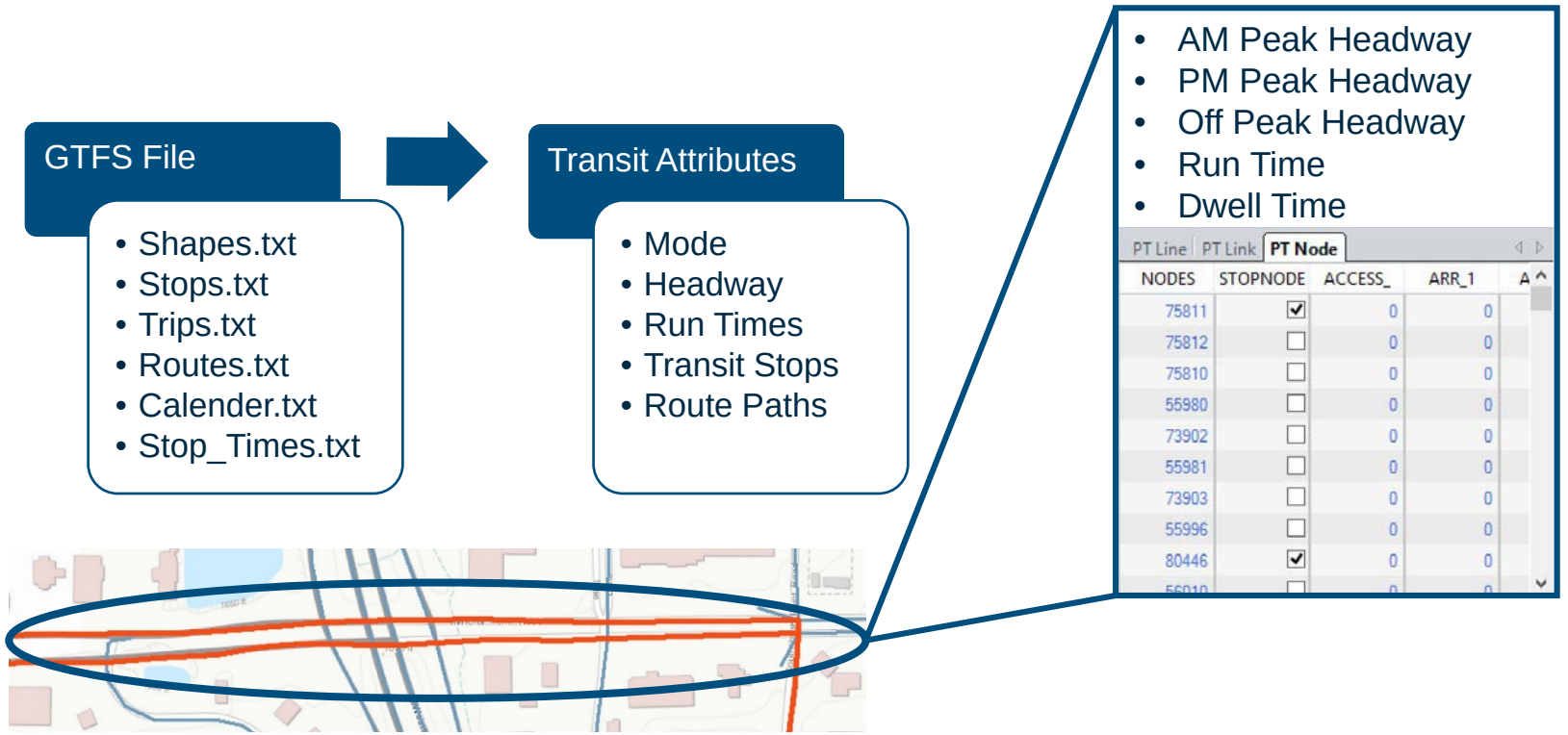
Input: Transit Network

- Captures all transit attributes from your local transit network file
- Additional capability to use other types of transit files e.g. Cube PT Networks



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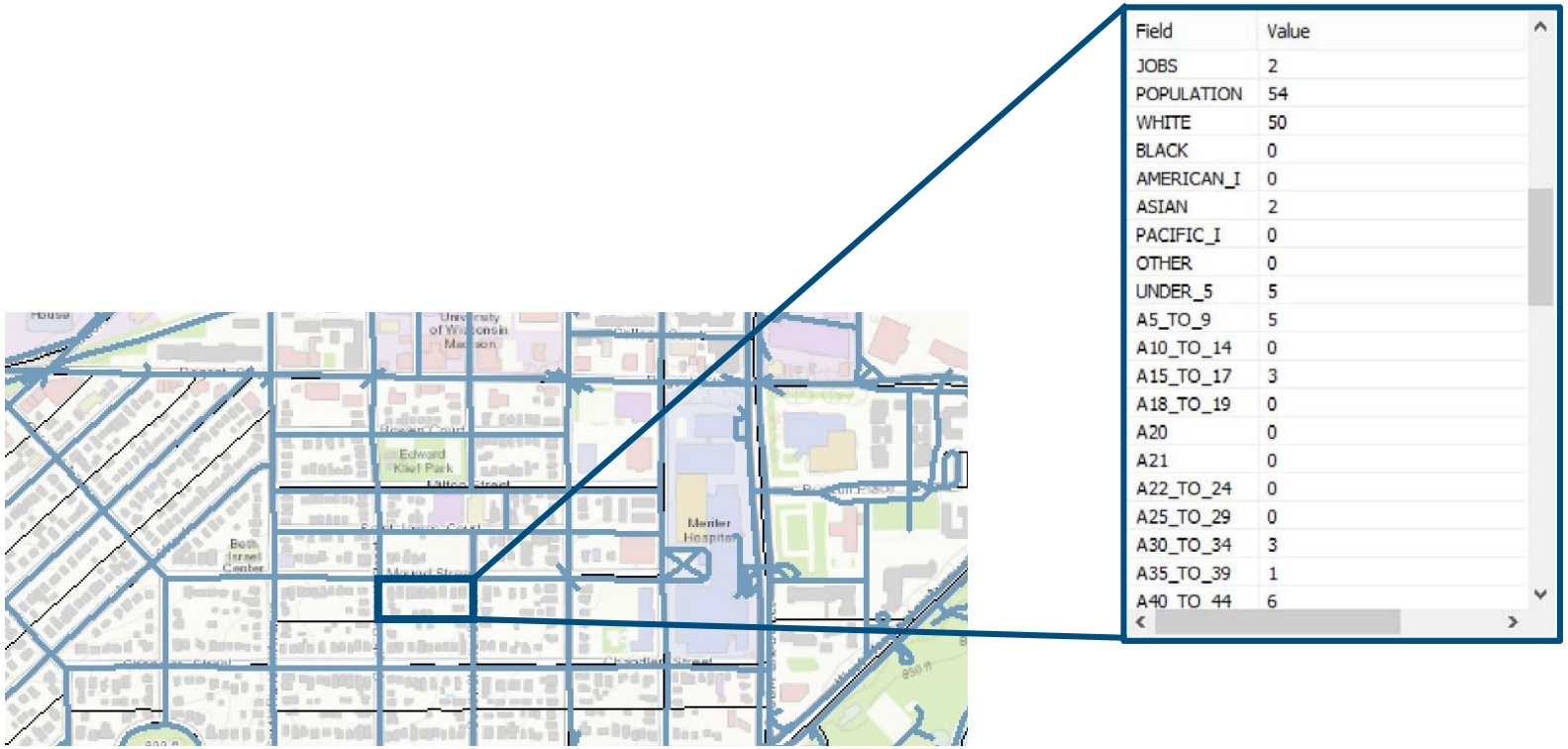
Input: Neighborhood & City Demographics

- Local population demographic data summarized in analysis zones
- Flexible polygon layer for further data integration



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Input:
Information on Every Destination

Points of interest database

- Schools, parks, restaurants, hospitals, every destination possible…
- 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 BONNIWELL 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

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Testing and Editing

- CUBE Access Network Editor
- Scenario Management
- Cloud Processing

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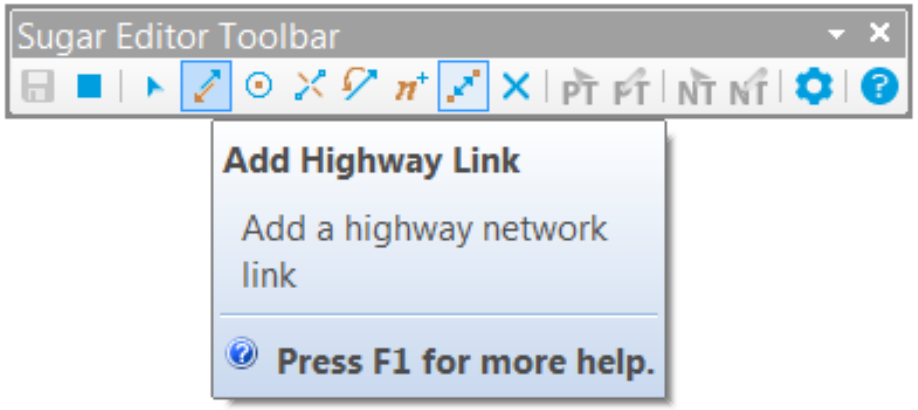
Analyze: Edit Network for Future Scenarios

CUBE Access Network Editor

- Simplifies the network editing process for users
  - Create new pedestrian and bike paths
  - Edit and create transit lines automatically aligned with existing roadway geometry
  - Automatic generation of roadway intersections
- Special multi-layer editing interface
- Editing toolbar and features



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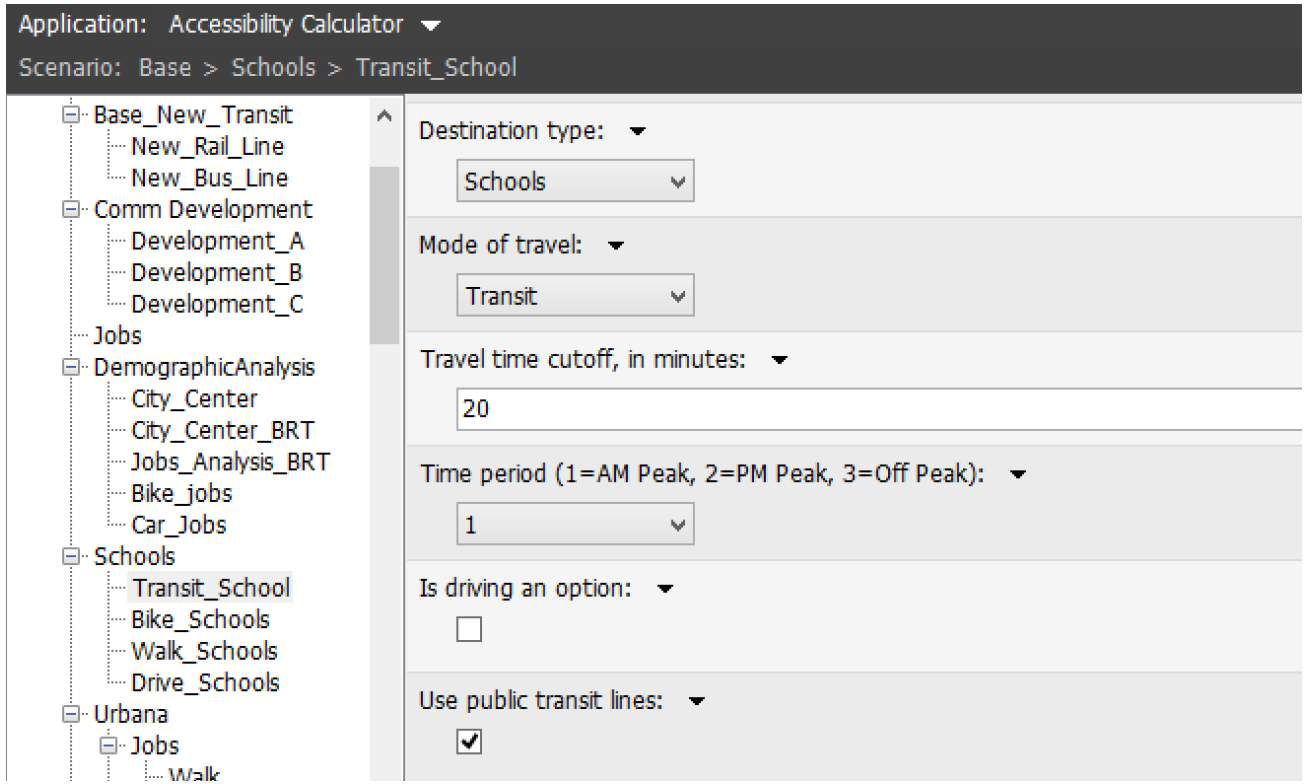
Analyze:
Create & Test Accessibility Scenarios

CUBE Access Scenario Management

1. Add any number of scenarios
2. Select options and/or data unique to scenario
3. Configuration saved to specific scenario



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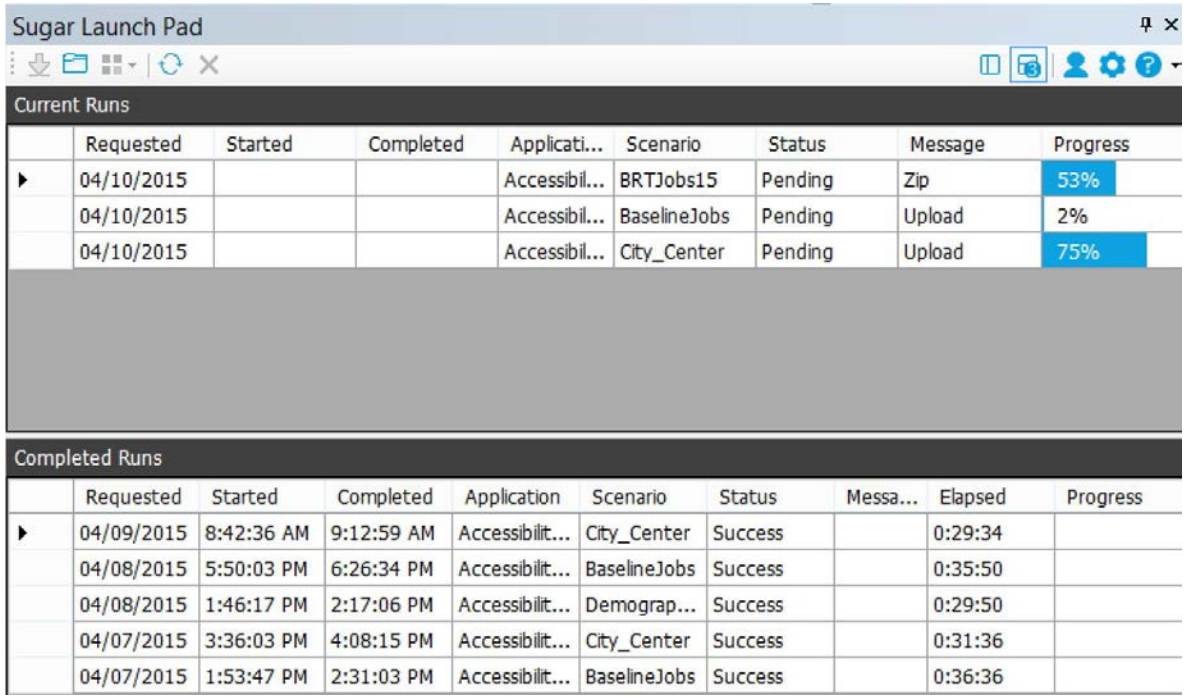
Analyze:
Explore
Unlimited
Alternatives

CUBE Access Cloud Processing

- Utilizes cloud technology to run your scenarios
  - Run multiple scenarios at a time
  - History of previous runs
  - Free up your computer's memory for other tasks



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1. Access Score

- Calculate Access Scores to Healthy Foods, Daily Errands, Parks, Recreation…
  - Via walking, transit or multi-modal
- Customise your Access Score by:
  - Choosing important destinations
  - Weighting the importance of those destinations

POINTCLASS	FAC_TYPE	DESCRIPTIO	POI_TARGET	CAT_WEIGHT
200, 210	5800, 9996, 9532, 2084, 5813	Restaurant/Coffee Store/Bar or Pub/Winery/Nightlife	4	40
180	6512, 9567	Shopping/Specialty Store	2	16
500, 510	7929, 7832	Performing Arts, Cinema	2	16
730, 740	7996, 7985	Amusement Park/Casino	1	6
700	5999, 7999, 8410, 9718	Historical Monument/Tourist Attraction/Museum/Animal Park	1	8
720	7947, 9517	Park/Recreation Area/Campground	1	8
750	7940, 7990	Sports Complex, Convention/Exhibition Centre	1	4
710	7992, 7012, 7014	Golf Course/Ski Resort/Ski Lift	1	2
711	7997, 7998	Sports Centre/Ice Skating Rink	1	2
760	4580, 4493	Public Sport Airport, Marina	1	1
170	9995	Bookstore	1	3

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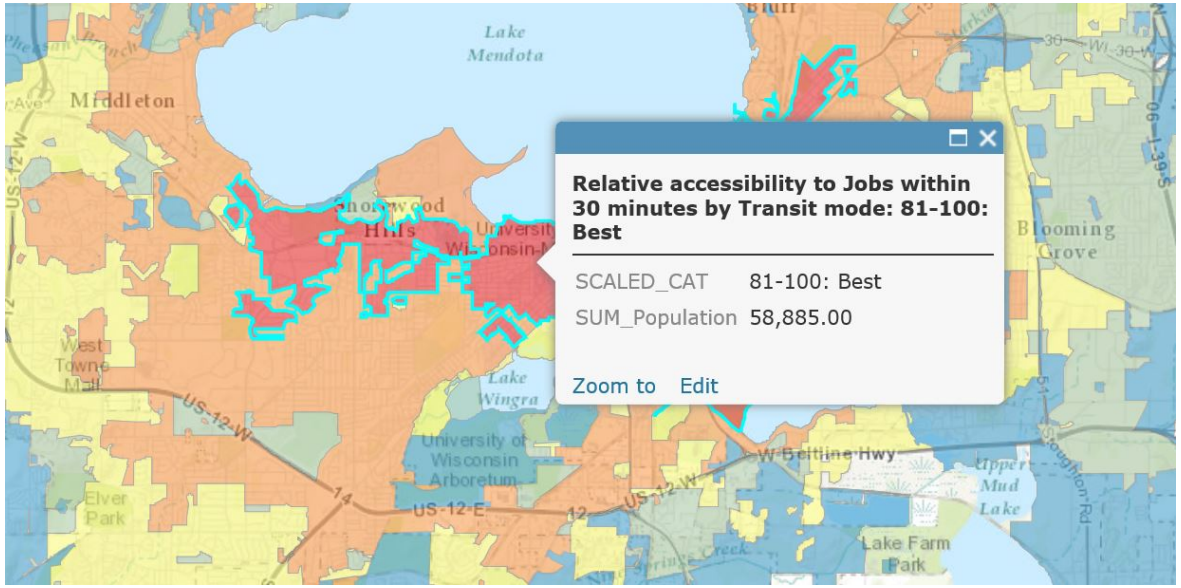
2. Accessibility Calculator

- Analyse metrics such as:
  - Number of jobs accessible via driving during peak hour traffic
  - Walk times to local schools
  - Minimum travel time to a hospital via public transport



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3. Map Mixer

- Calculate the additional number of jobs that are now accessible or the decrease in travel time due to your new project
- 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

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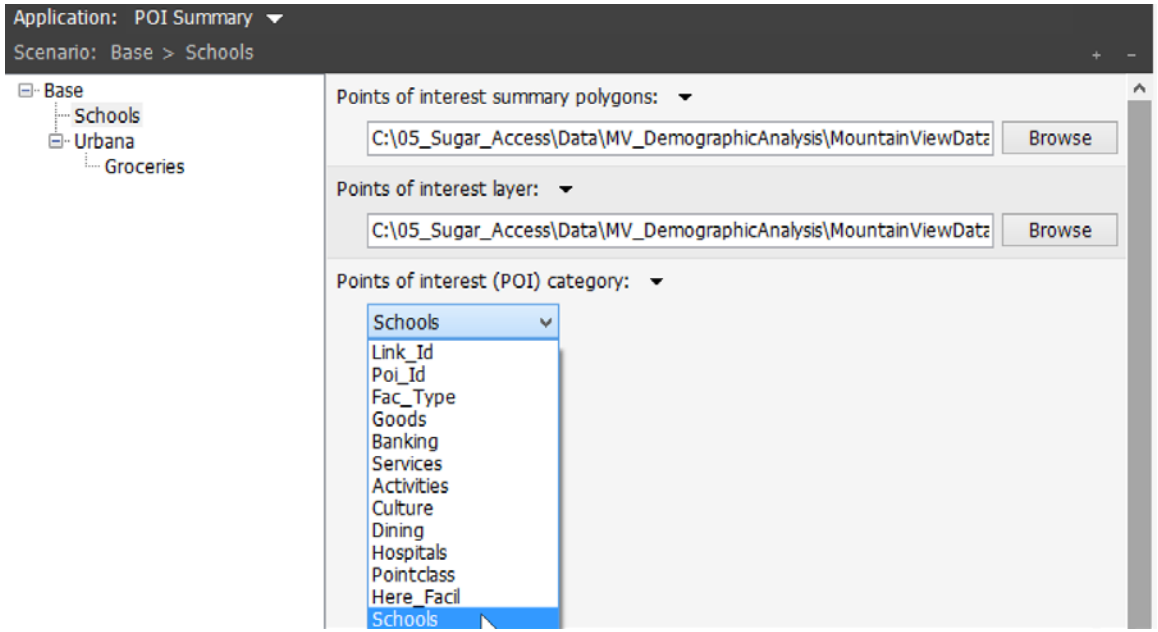
4. POI Summary

- Destinations are summarized (aggregated) in a zonal polygon layer
- Analyze Accessibility to additional destinations such as Schools, Hospitals, Grocery Stores, …



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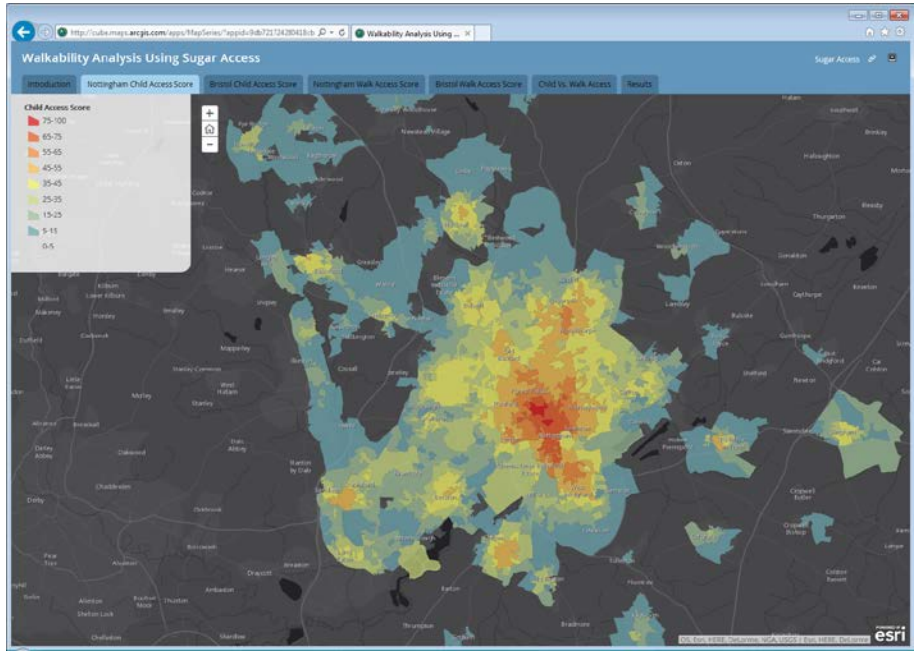
Results

- Option to directly output to ArcGIS Online account
- Full accessibility results
- One database online and/or desktop
- Summary statistics
- Export to…e.g. Excel, for further analysis



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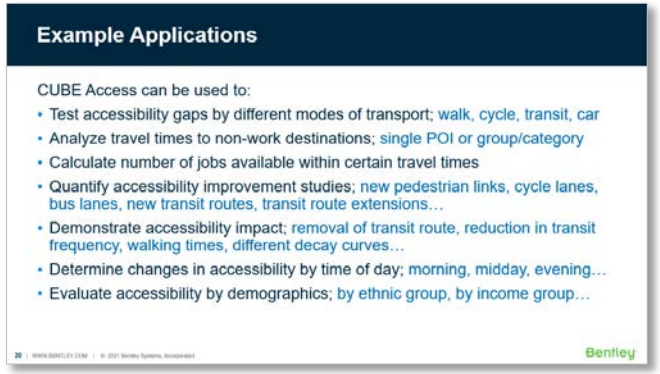
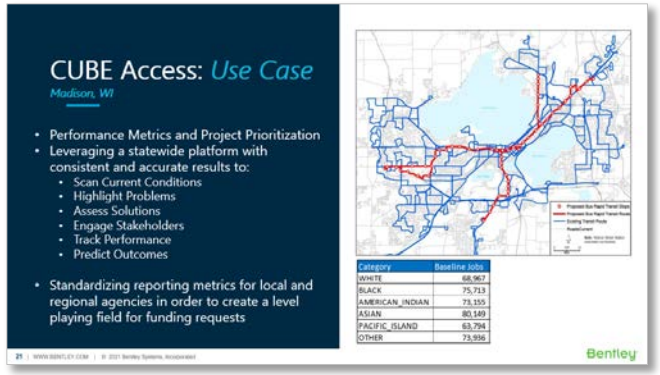
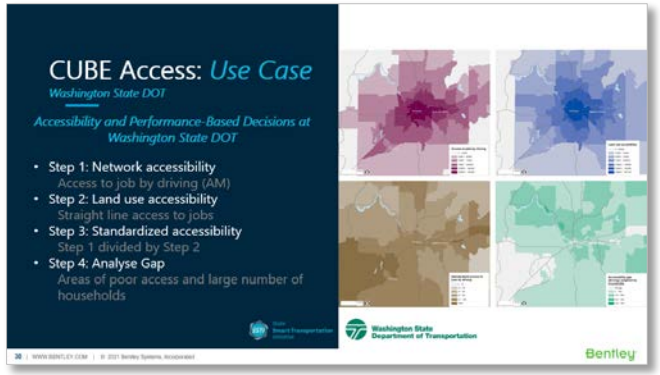
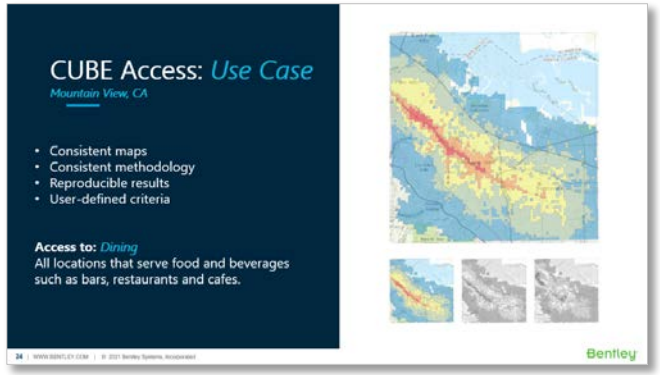
Applications of CUBE Access









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Example Applications

CUBE Access can be used to:

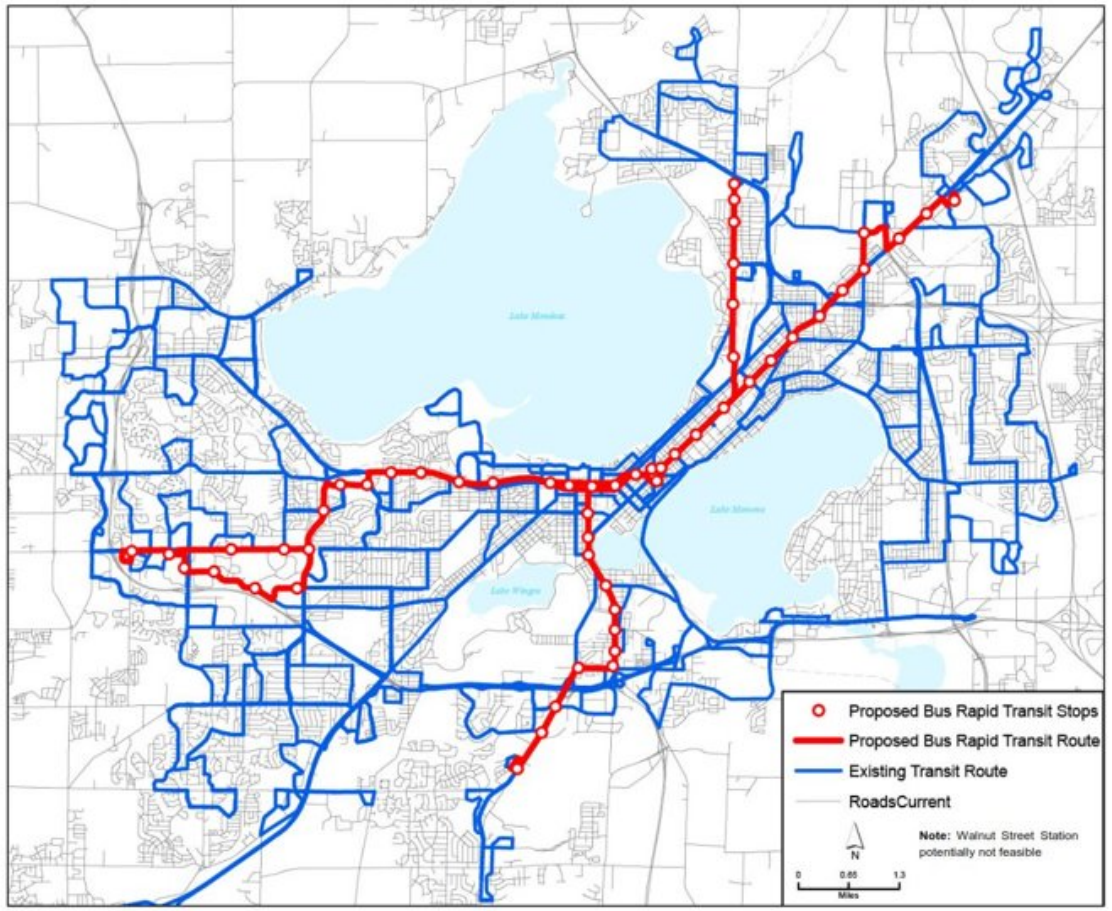
- Test accessibility gaps by different modes of transport; walk, cycle, transit, car
- Analyze travel times to non-work destinations; single POI or group/category
- Calculate number of jobs available within certain travel times
- Quantify accessibility improvement studies; new pedestrian links, cycle lanes, bus lanes, new transit routes, transit route extensions…
- Demonstrate accessibility impact; removal of transit route, reduction in transit frequency, walking times, different decay curves…
- Determine changes in accessibility by time of day; morning, midday, evening…
- Evaluate accessibility by demographics; by ethnic group, by income group…

CUBE Access: *Use Case*

Madison, WI

- Performance Metrics and Project Prioritization
- Leveraging a statewide platform with consistent and accurate results to:
  - Scan Current Conditions
  - Highlight Problems
  - Assess Solutions
  - Engage Stakeholders
  - Track Performance
  - Predict Outcomes

- Standardizing reporting metrics for local and regional agencies in order to create a level playing field for funding requests



Category	Baseline Jobs
WHITE	68,967
BLACK	75,713
AMERICAN_INDIAN	73,155
ASIAN	80,149
PACIFIC_ISLAND	63,794
OTHER	73,936

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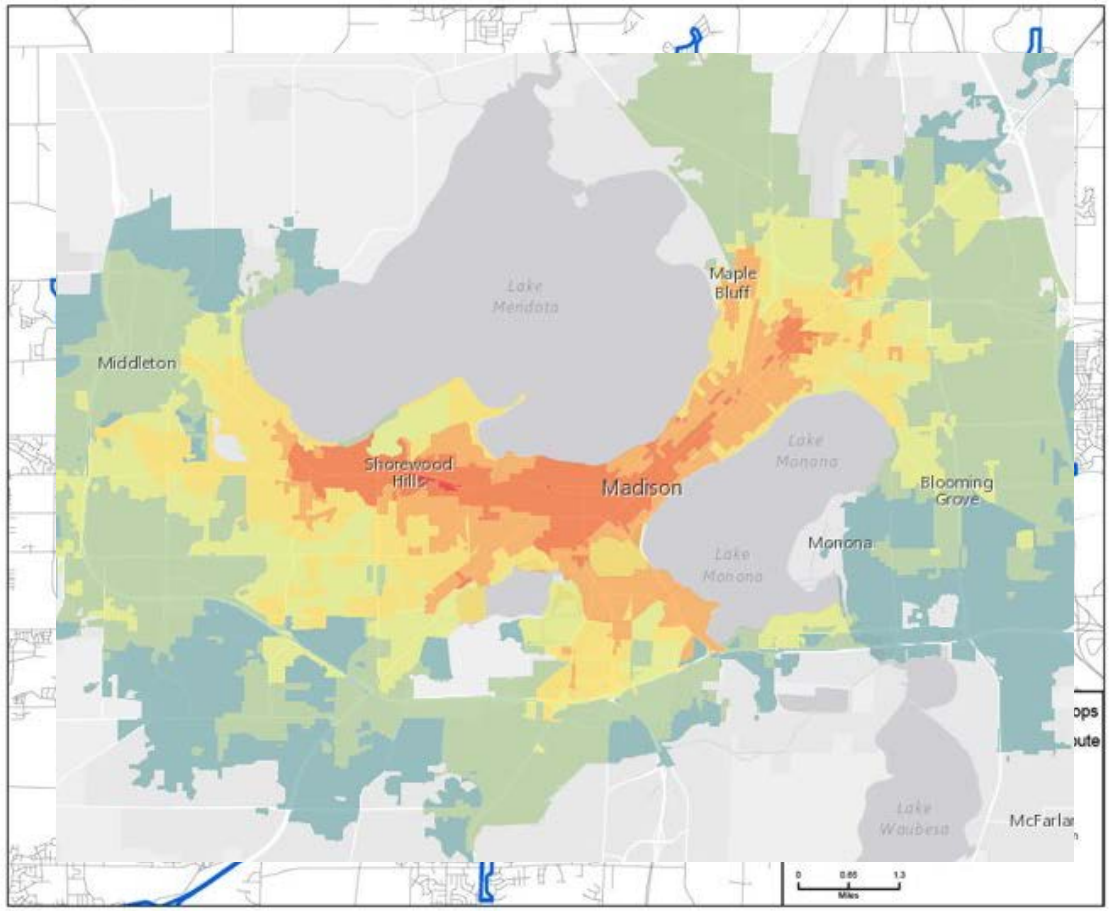

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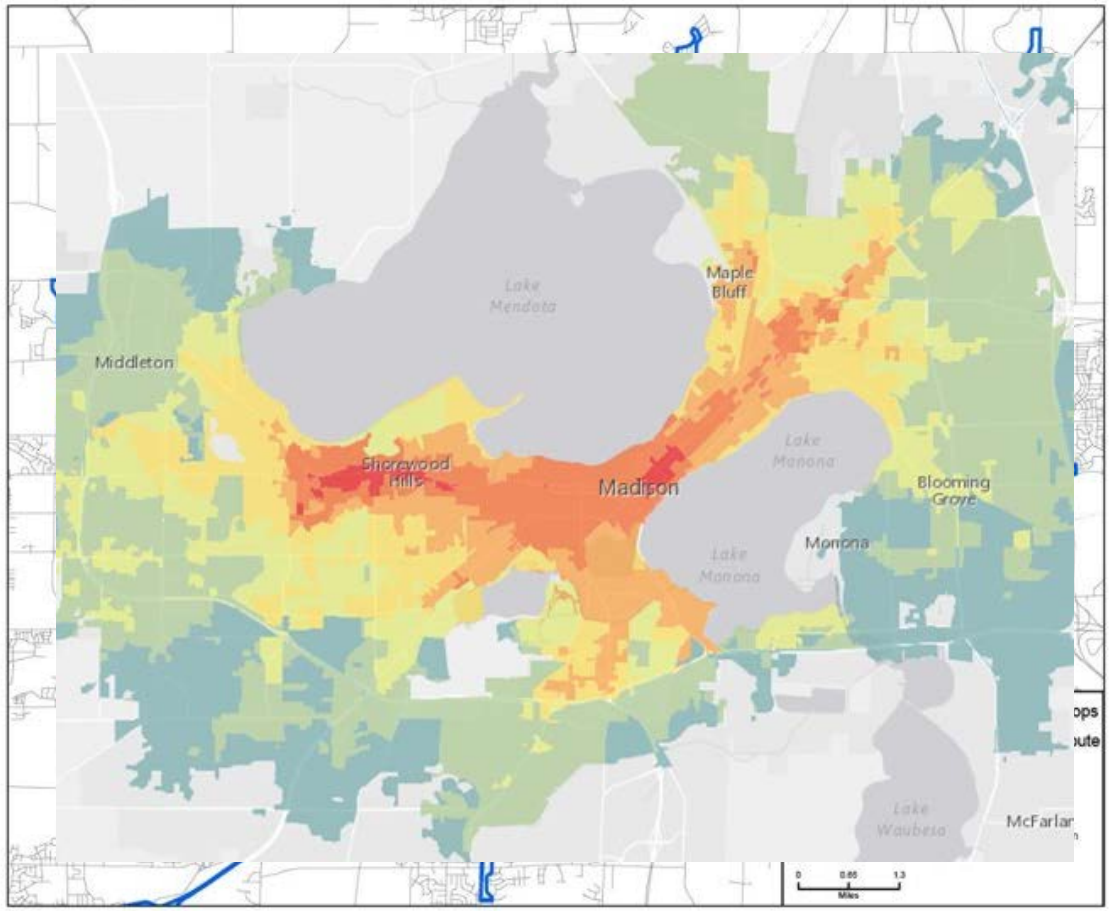

Category	Baseline Jobs	BRT Jobs	Difference	% Change
WHITE	68,967	75,409	6,442	9%
BLACK	75,713	85,943	10,230	14%
AMERICAN_INDIAN	73,155	81,390	8,235	11%
ASIAN	80,149	87,071	6,922	9%
PACIFIC_ISLAND	63,794	73,073	9,279	15%
OTHER	73,936	83,467	9,531	13%

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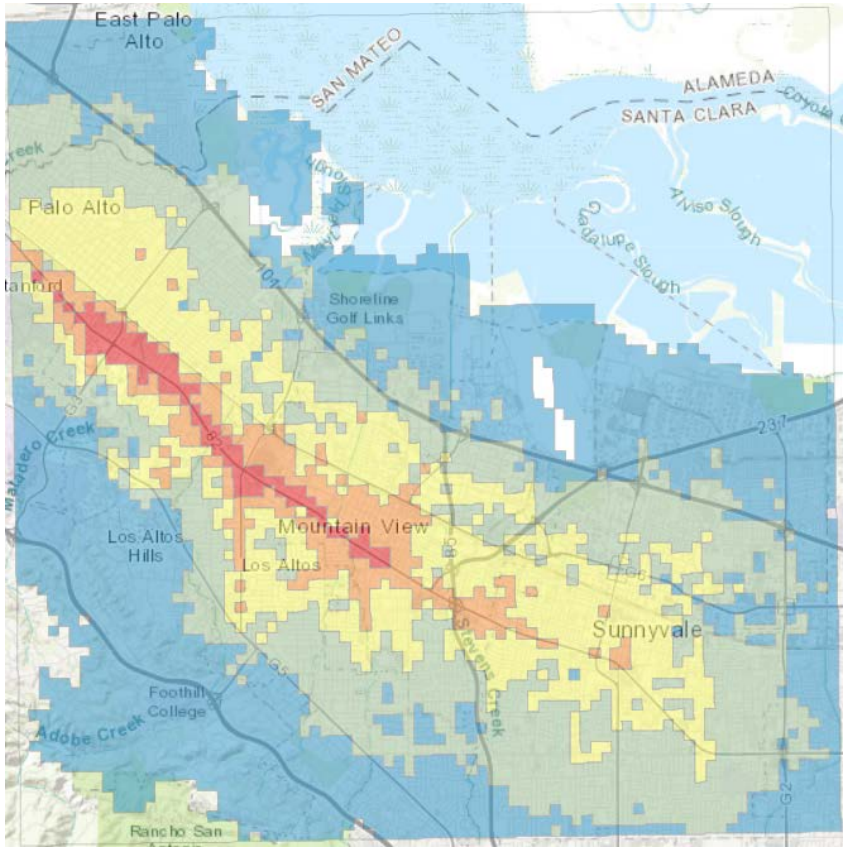
CUBE Access: *Use Case*

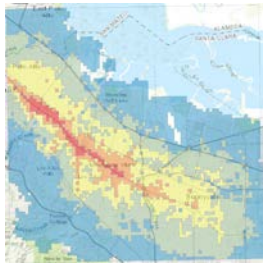
Mountain View, CA

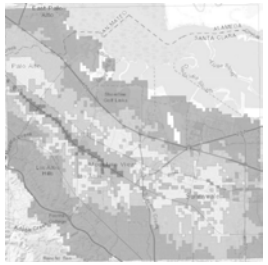
- Consistent maps
- Consistent methodology
- Reproducible results
- User-defined criteria

Access to: *Dining*

All locations that serve food and beverages such as bars, restaurants and cafes.







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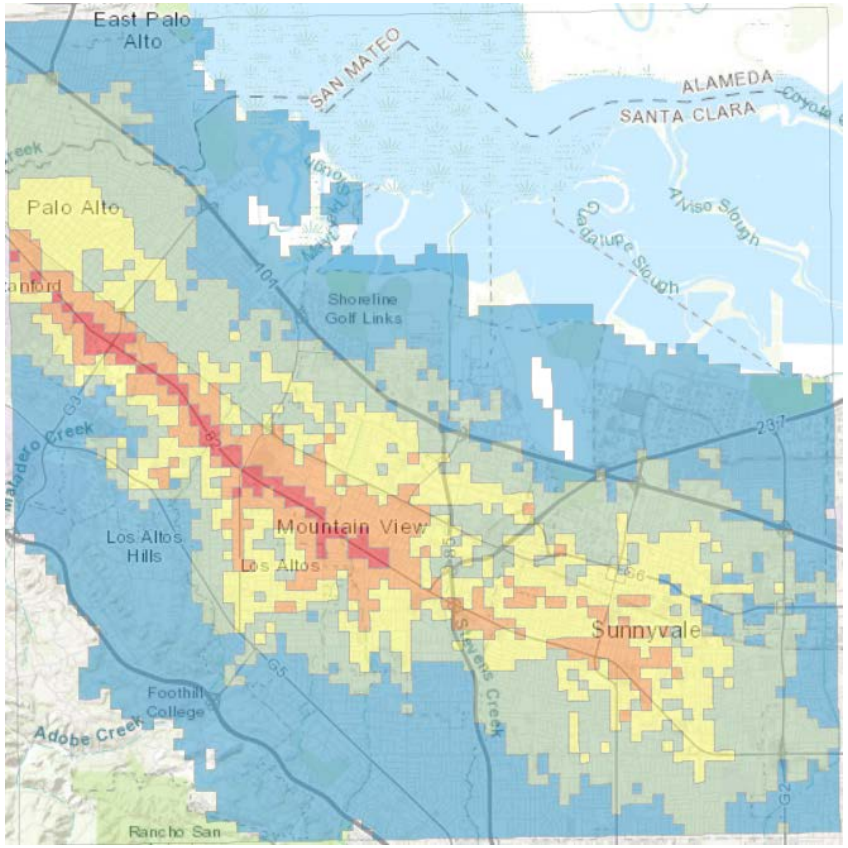
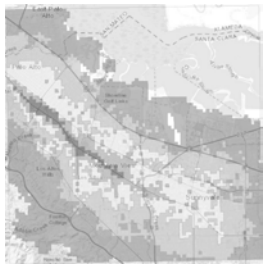
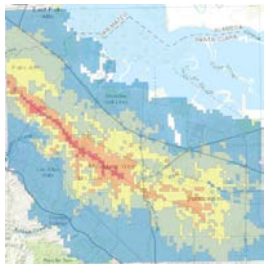
Access to: *Culture*

Cultural locations such as museums, sports arenas and performing arts







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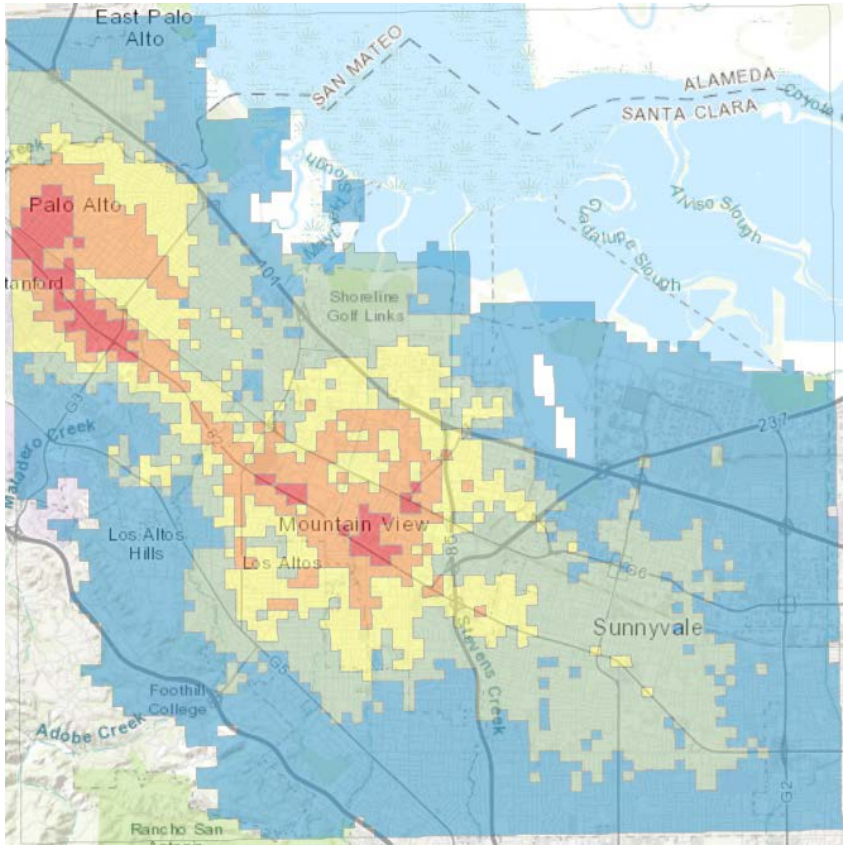
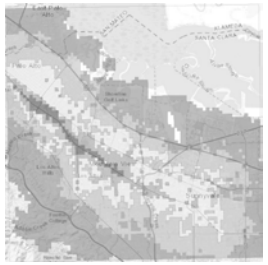
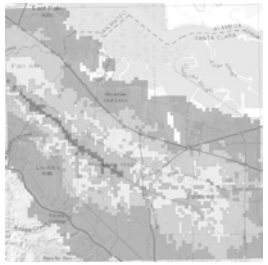
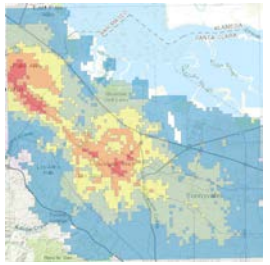
Access to: *Activities*

Destinations where you perform physical activity e.g. parks, gyms, golf courses…









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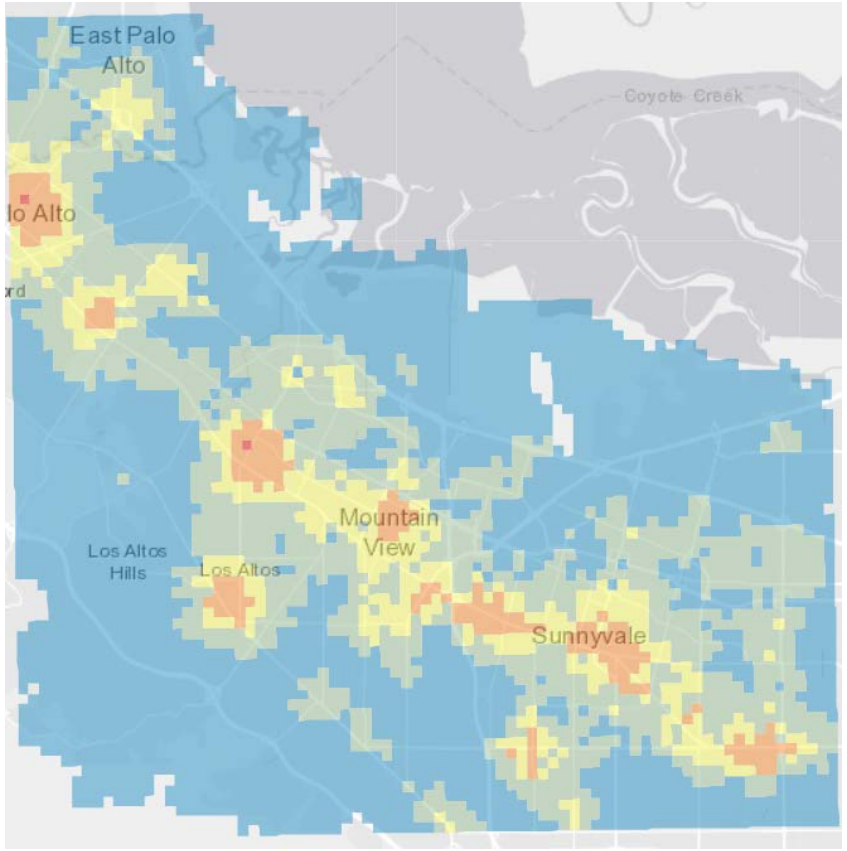
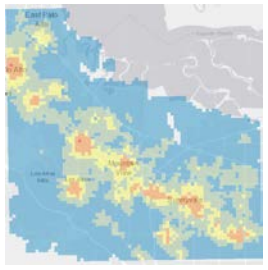
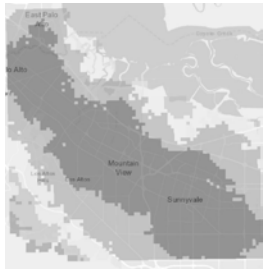
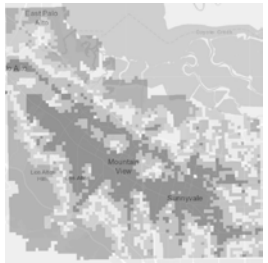
Access to Errands by: *Walking*

Destinations related to daily errands include grocery stores, pharmacies, convenience stores, and ATMs/banks.









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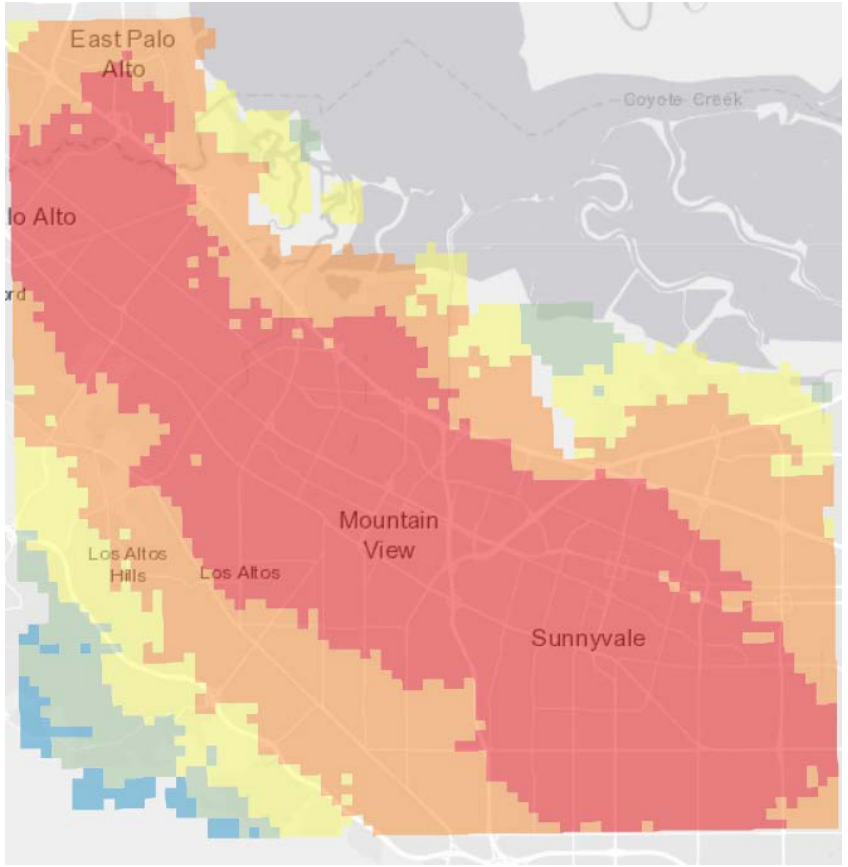
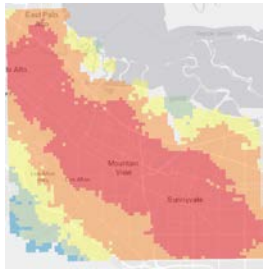
Access to Errands by: *Cycling*

Destinations related to daily errands include grocery stores, pharmacies, convenience stores, and ATMs/banks.





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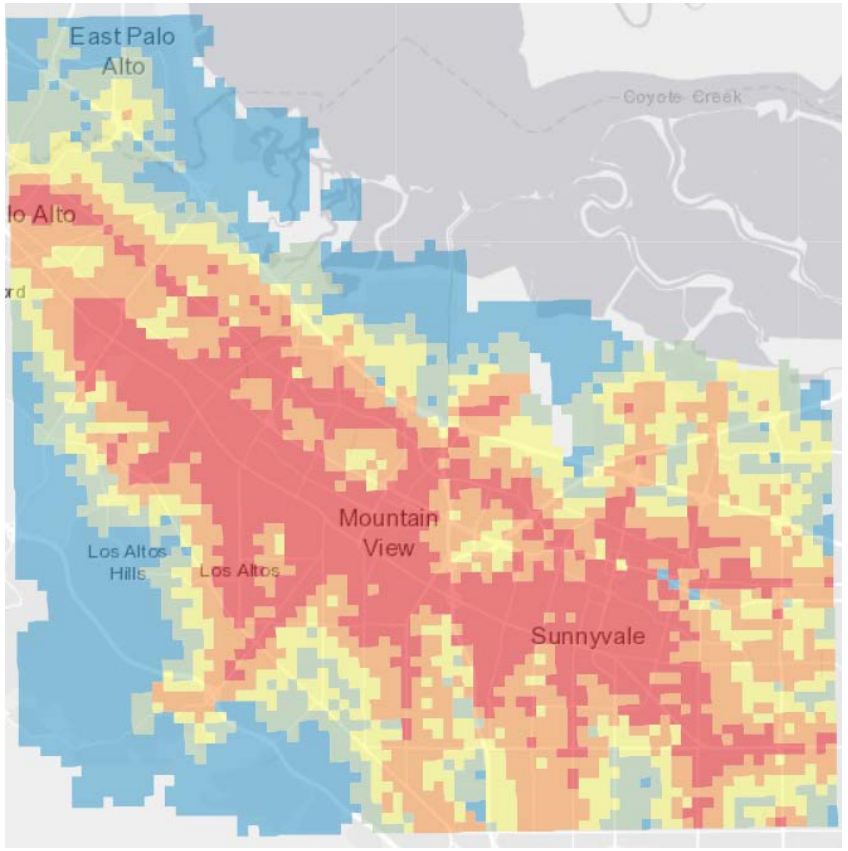
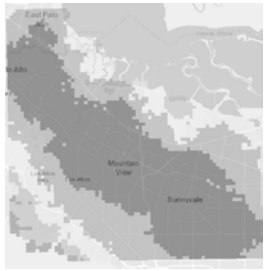
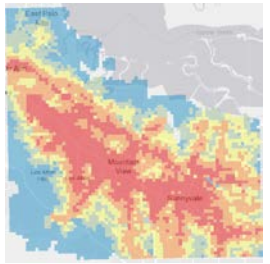
Access to Errands by: *Transit*
Destinations related to daily errands include grocery stores, pharmacies, convenience stores, and ATMs/banks.







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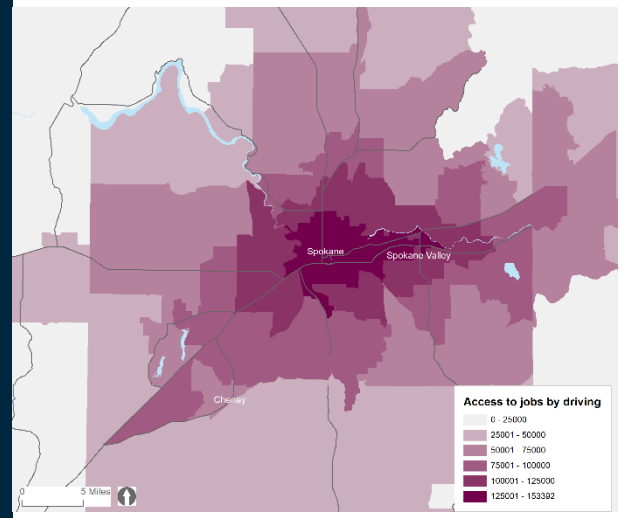
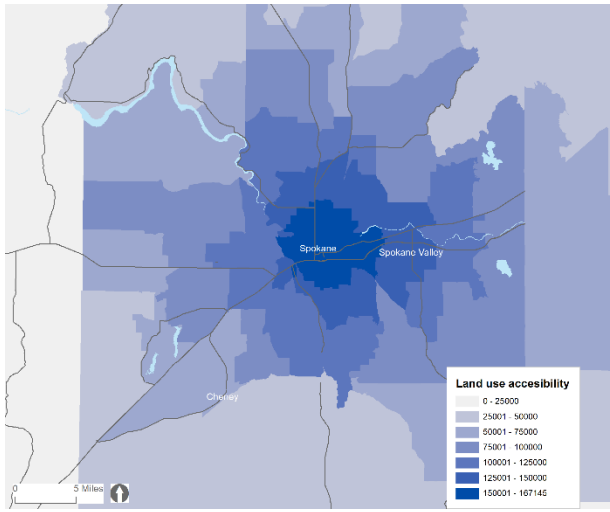
CUBE Access: *Use Case*

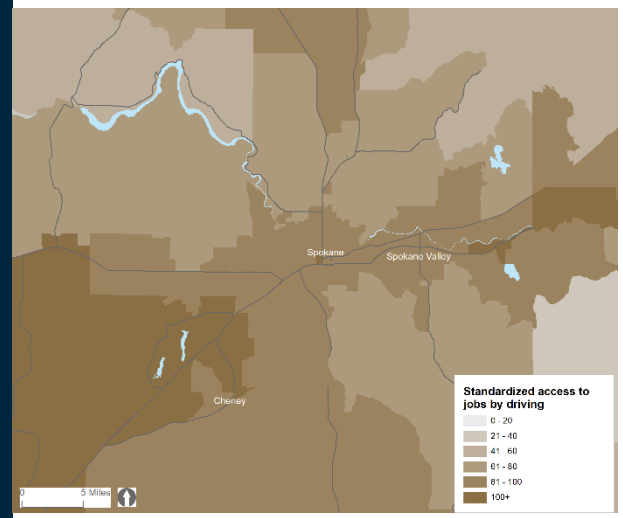
Washington State DOT

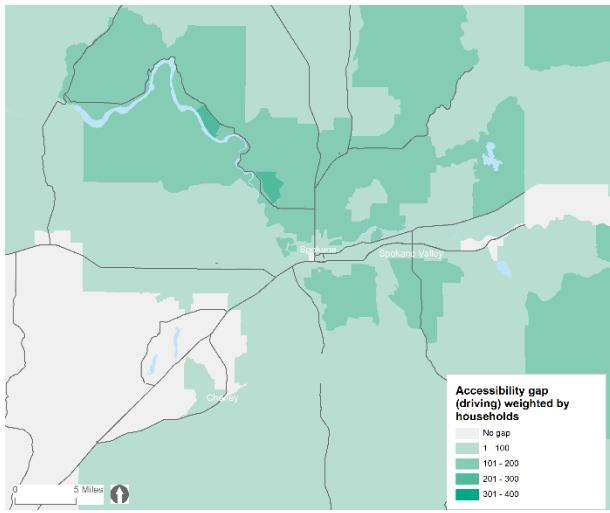
Accessibility and Performance-Based Decisions at Washington State DOT

- Step 1: Network accessibility
  - Access to job by driving (AM)
- Step 2: Land use accessibility
  - Straight line access to jobs
- Step 3: Standardized accessibility
  - Step 1 divided by Step 2
- Step 4: Analyse Gap
  - Areas of poor access and large number of households









State Smart Transportation Initiative

Washington State Department of Transportation

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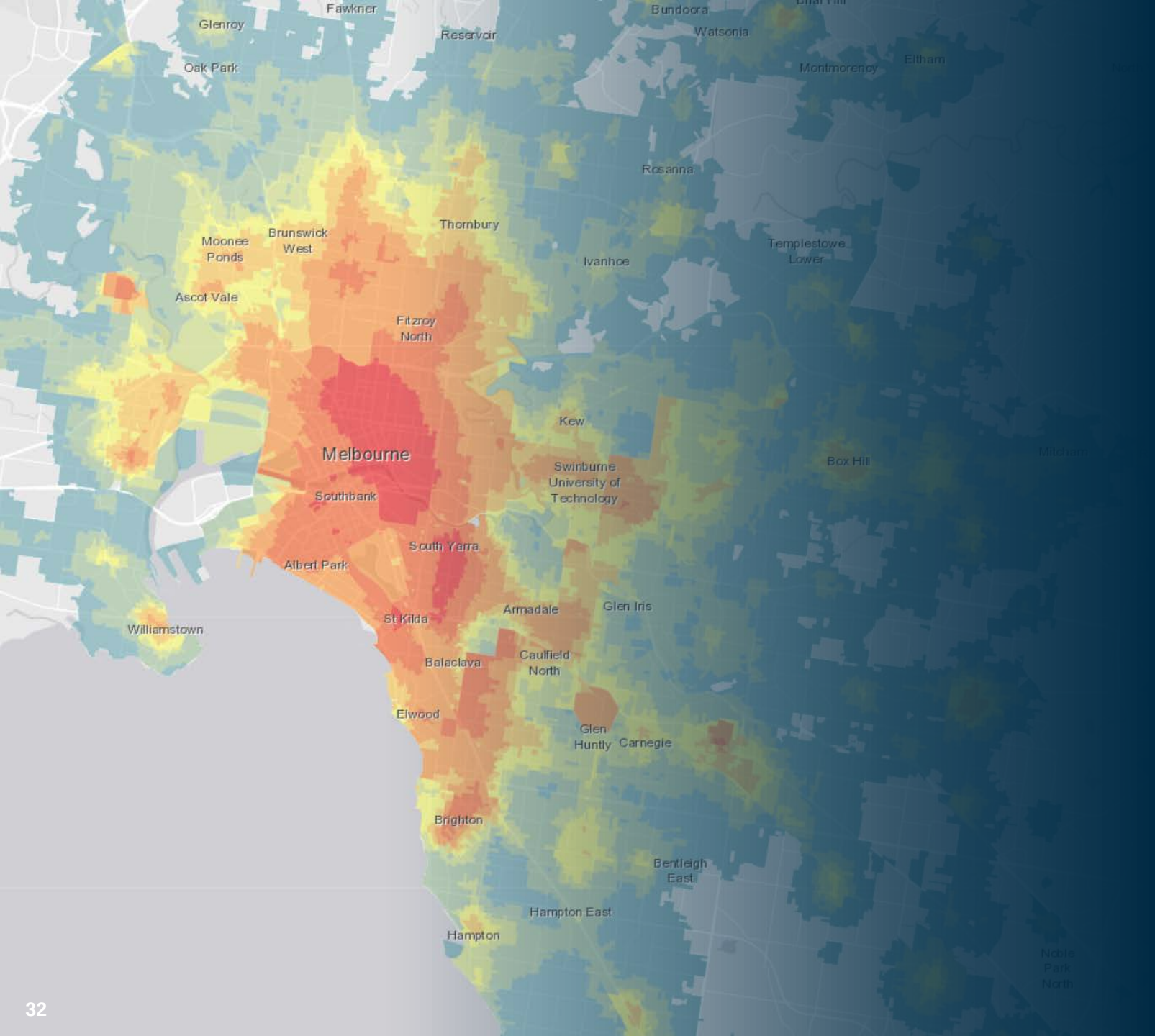

Access to non-work locations

Melbourne, Australia

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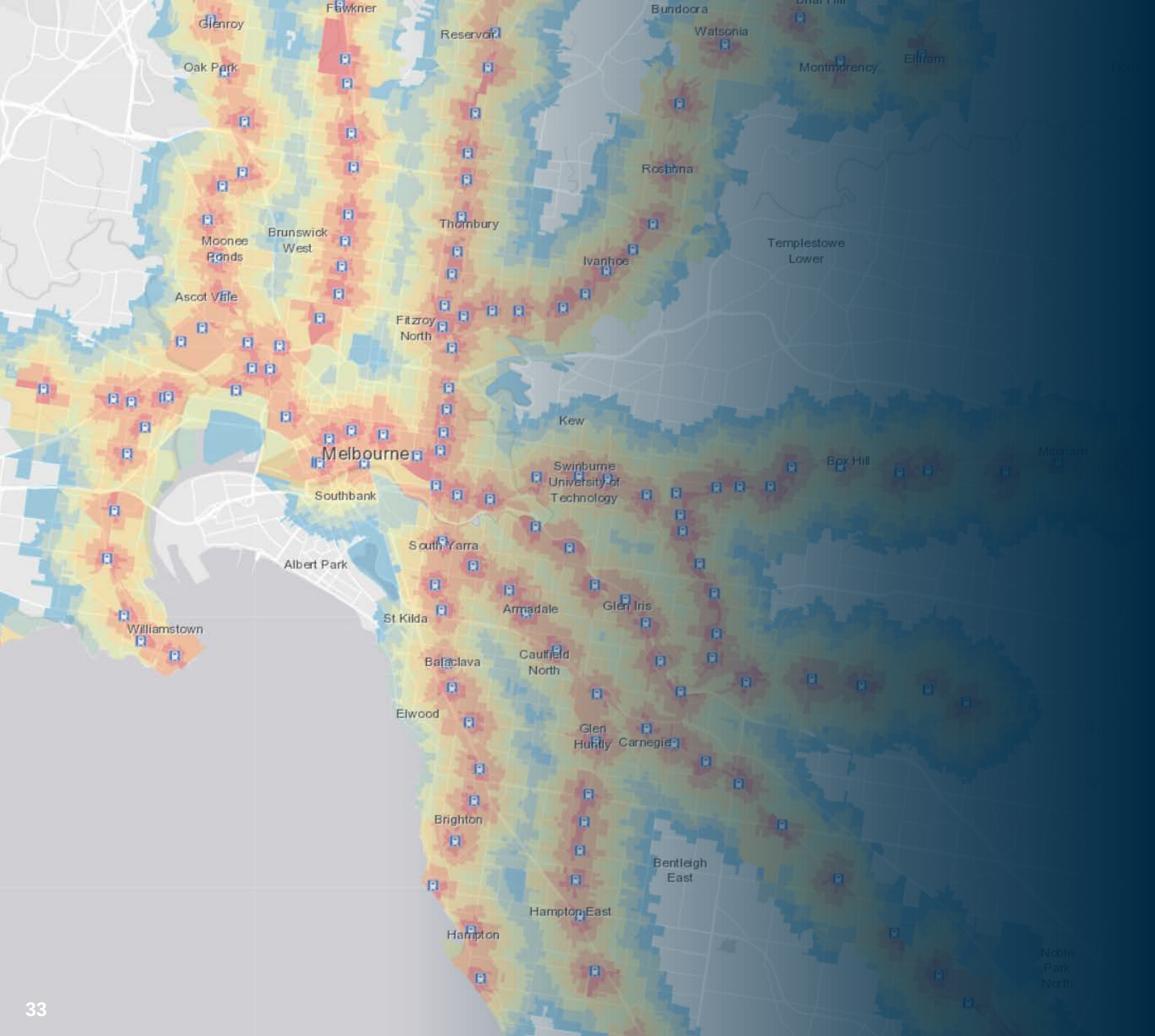

Access to Mode Specific Locations

Melbourne, Australia

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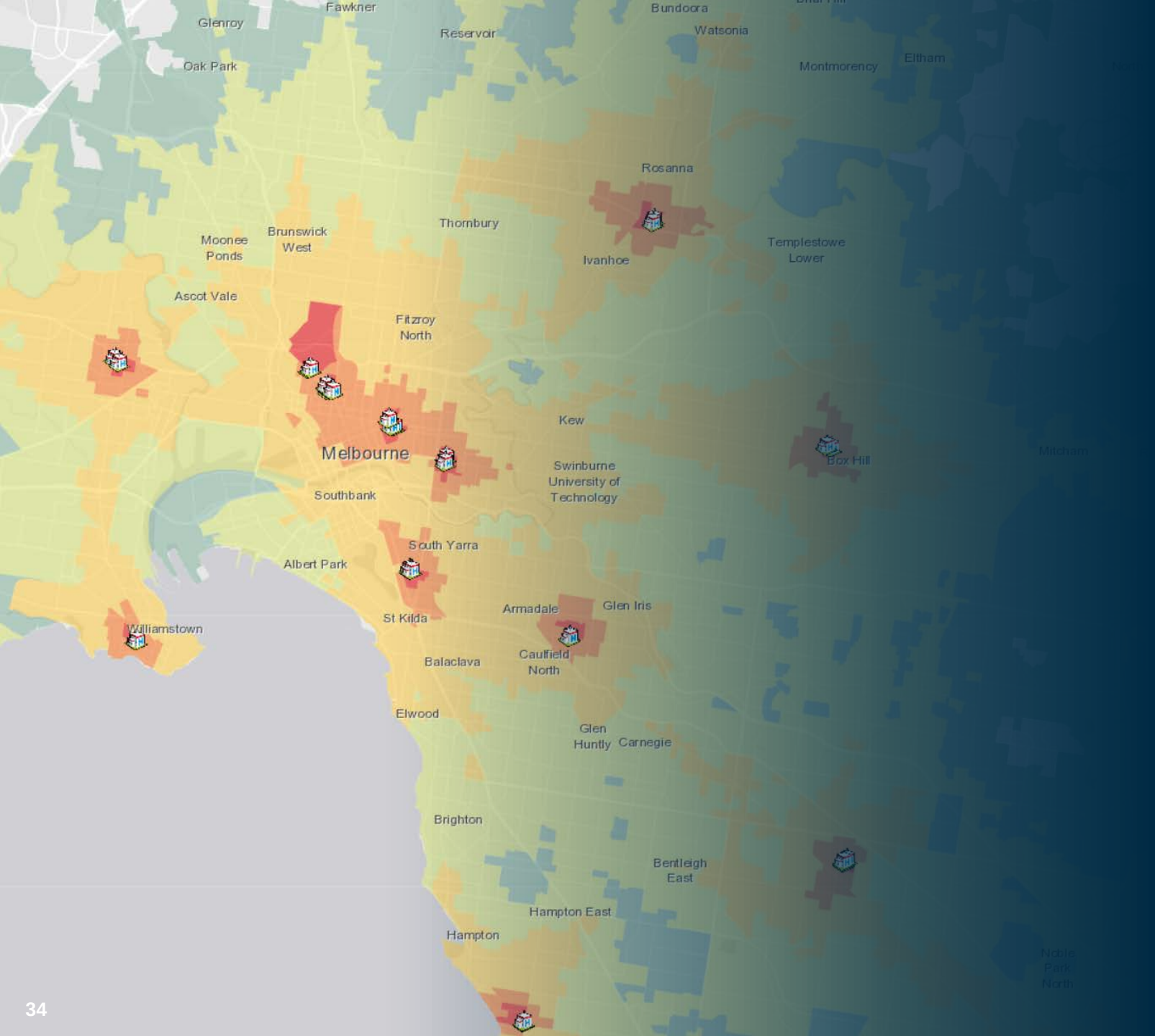

Access to Facilities

Melbourne, Australia

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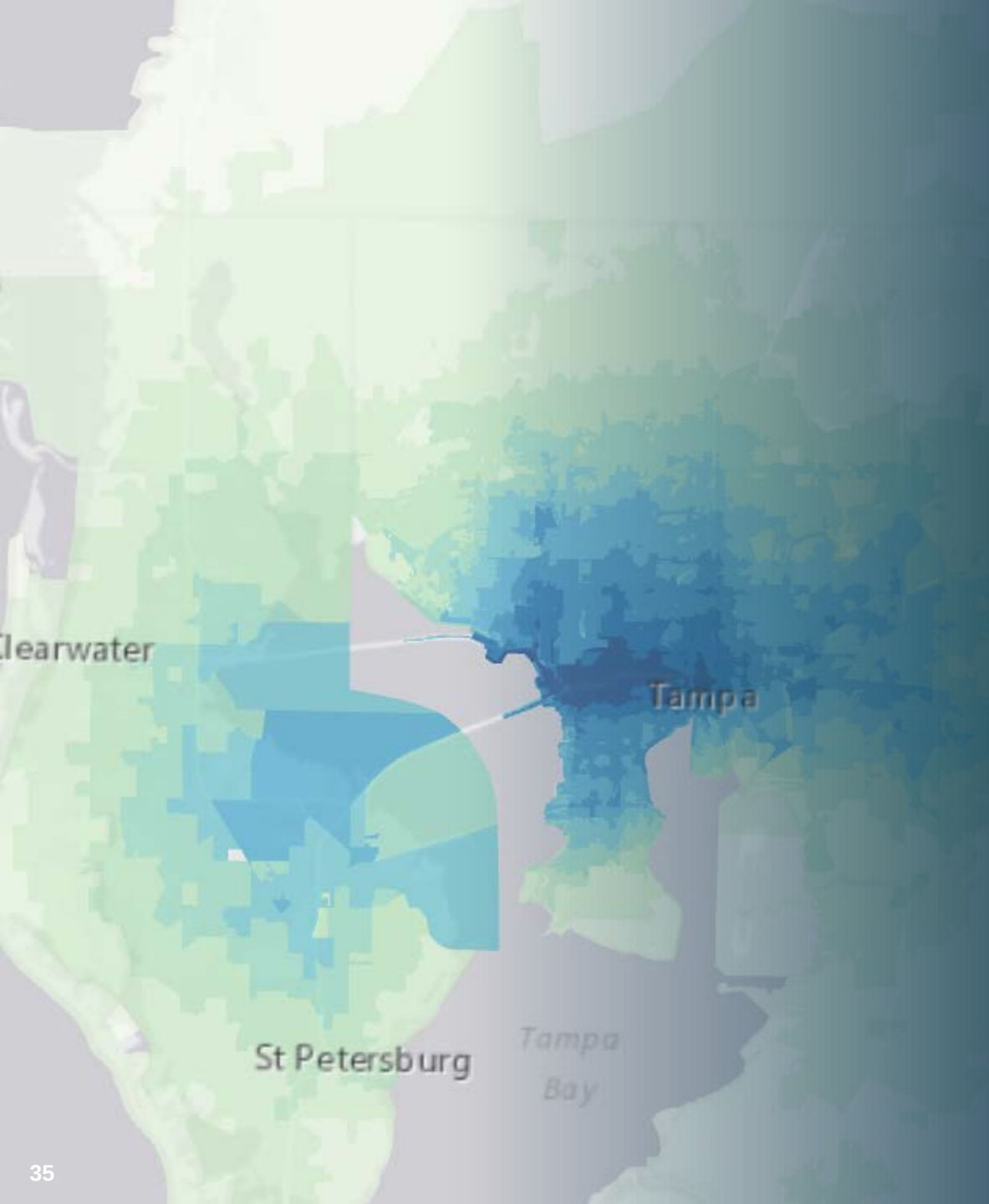

Job Access: AM Peak (driving)

Tampa, FL

Jobs Accessible

- 120,000 - 180,000
- 180,000 - 230,000
- 230,000 - 270,000
- 270,000 - 300,000
- 300,000 - 335,000
- 335,000 - 365,000
- 365,000 - 400,000
- 400,000 - 430,000
- 430,000 +

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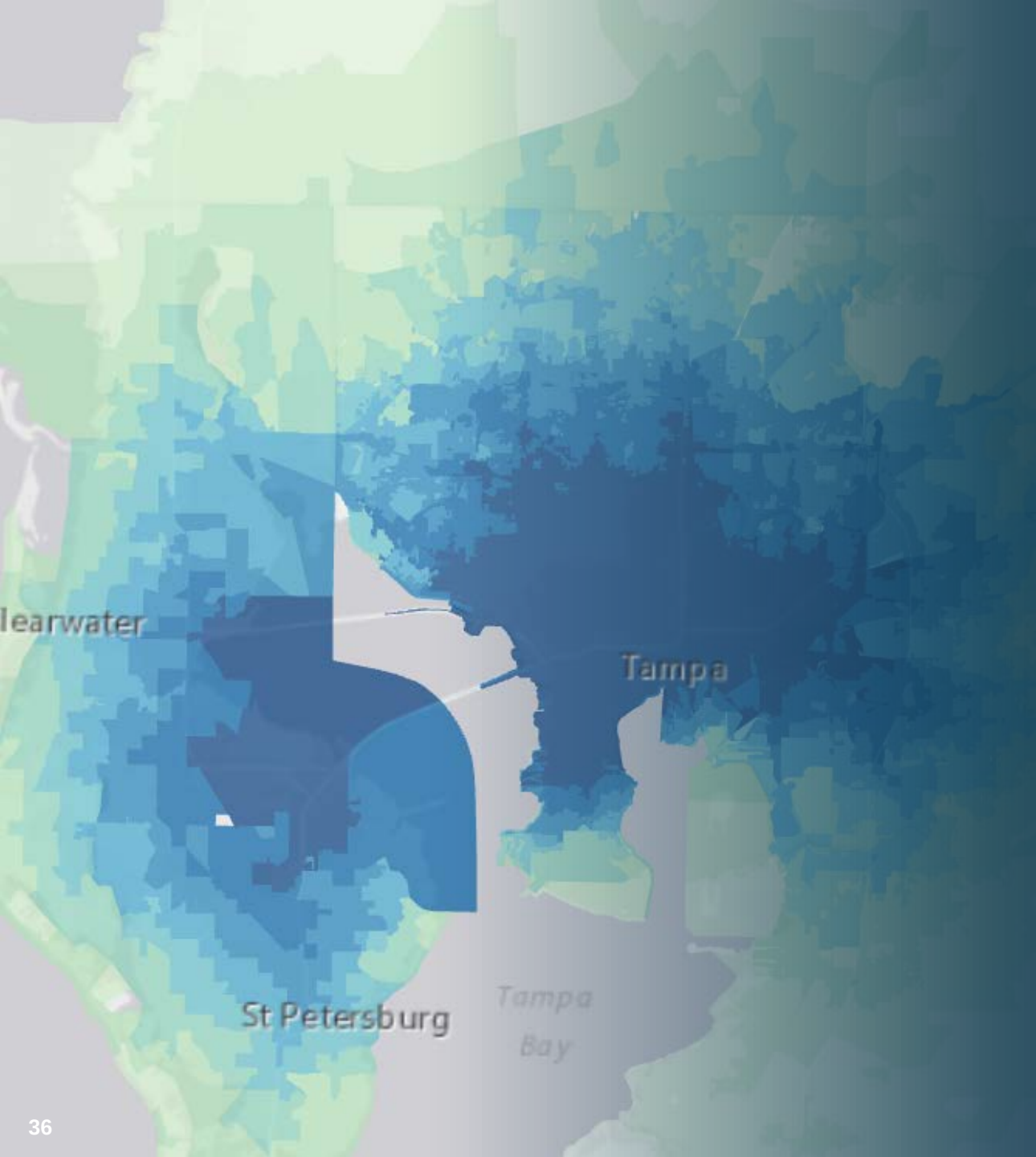

Job Access: Off Peak (driving)

Tampa, FL

Jobs Accessible

- 120,000 - 180,000
- 180,000 - 230,000
- 230,000 - 270,000
- 270,000 - 300,000
- 300,000 - 335,000
- 335,000 - 365,000
- 365,000 - 400,000
- 400,000 - 430,000
- 430,000 +

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CUBE Access

Using CUBE Access for Accessibility Analysis

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