A Data-Driven Tool for Evaluating the Accessibility of Planned Transportation Projects

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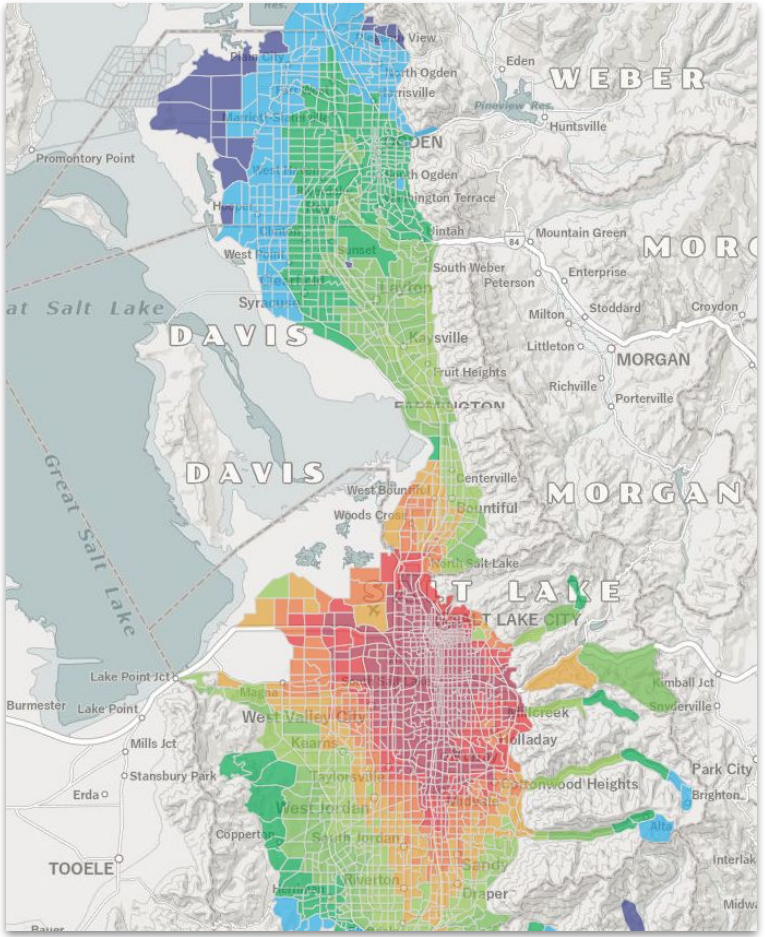
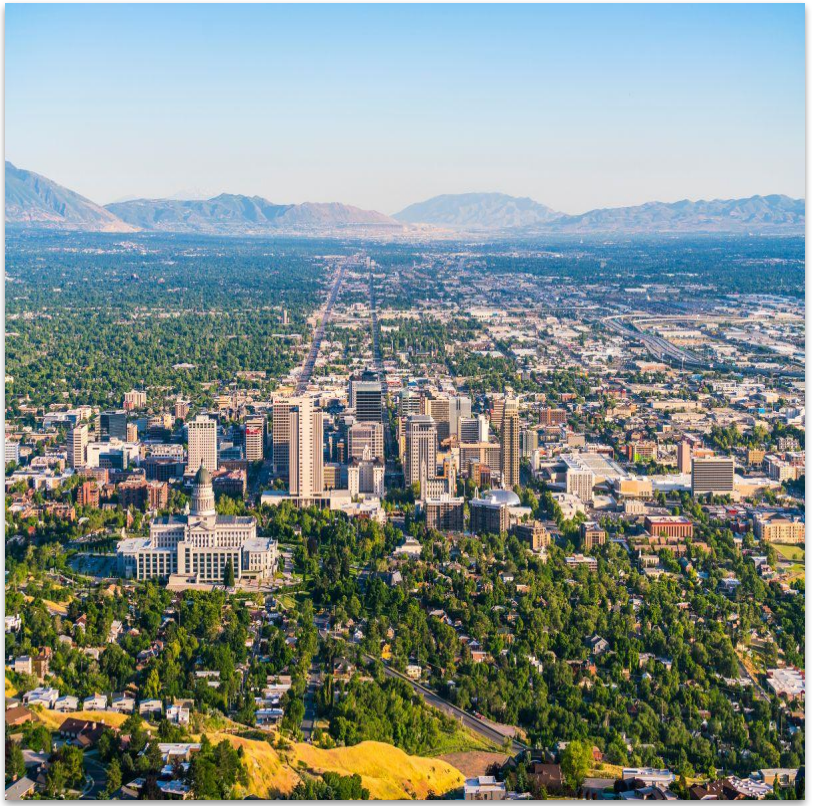
MoMo 9-16-2025

WFRC Analytics



About the Wasatch Front Regional Council (WFRC)



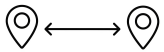
Est. 2 million persons within WFRC Region in 2025

What is Access to Opportunities?

Access to opportunities (ATO)

How far people can get within a travel time

+



How many things they can get to in that area

Access to opportunities

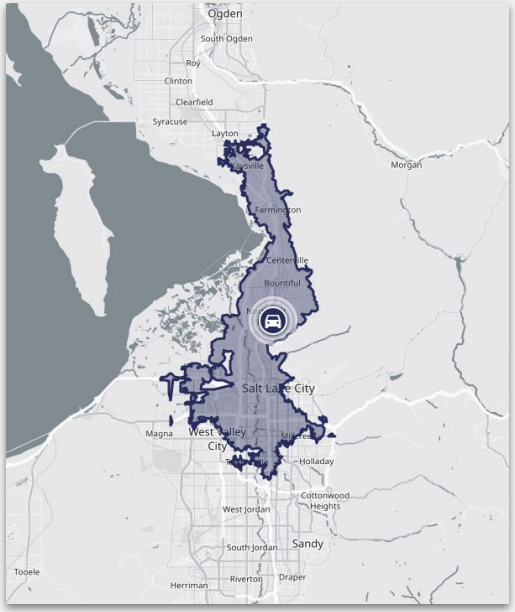
Access to opportunities (ATO)

20-minute travelshed

+

200,000 jobs that can be reached

Both matter

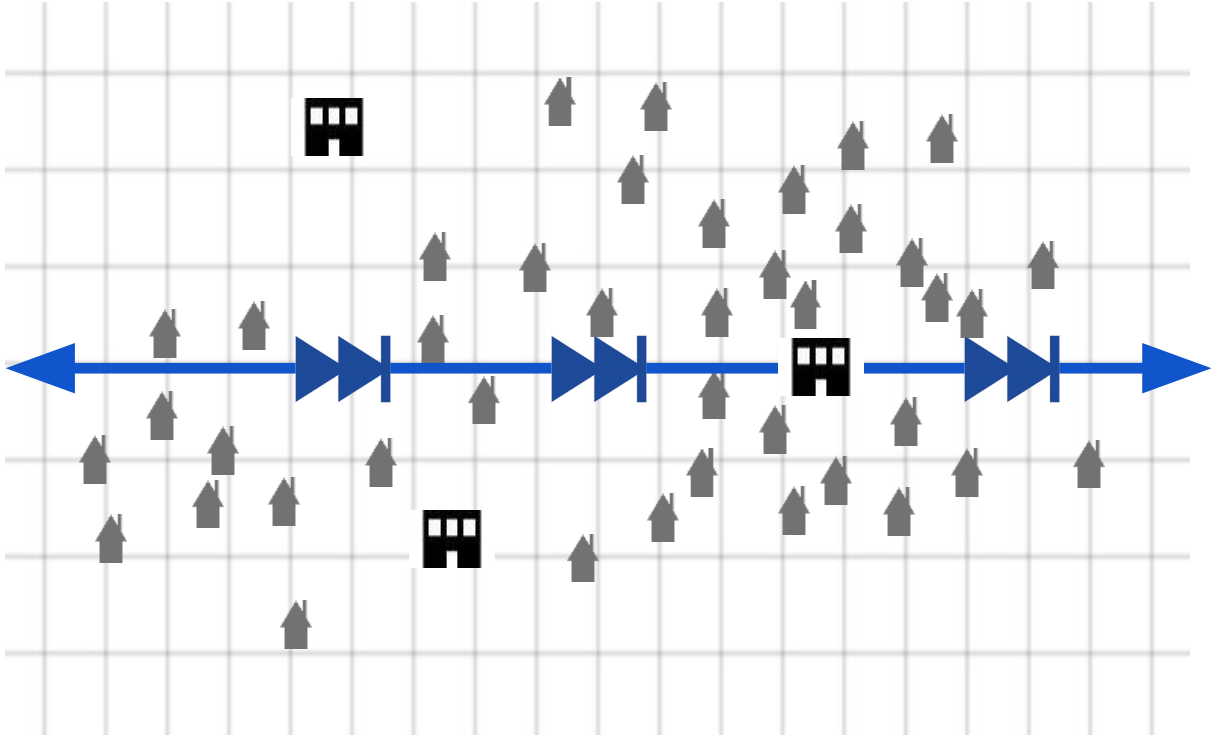


How can we improve ATO?

Increasing Travel Speeds on Roadways

Reduce Congestion

Operational Enhancements



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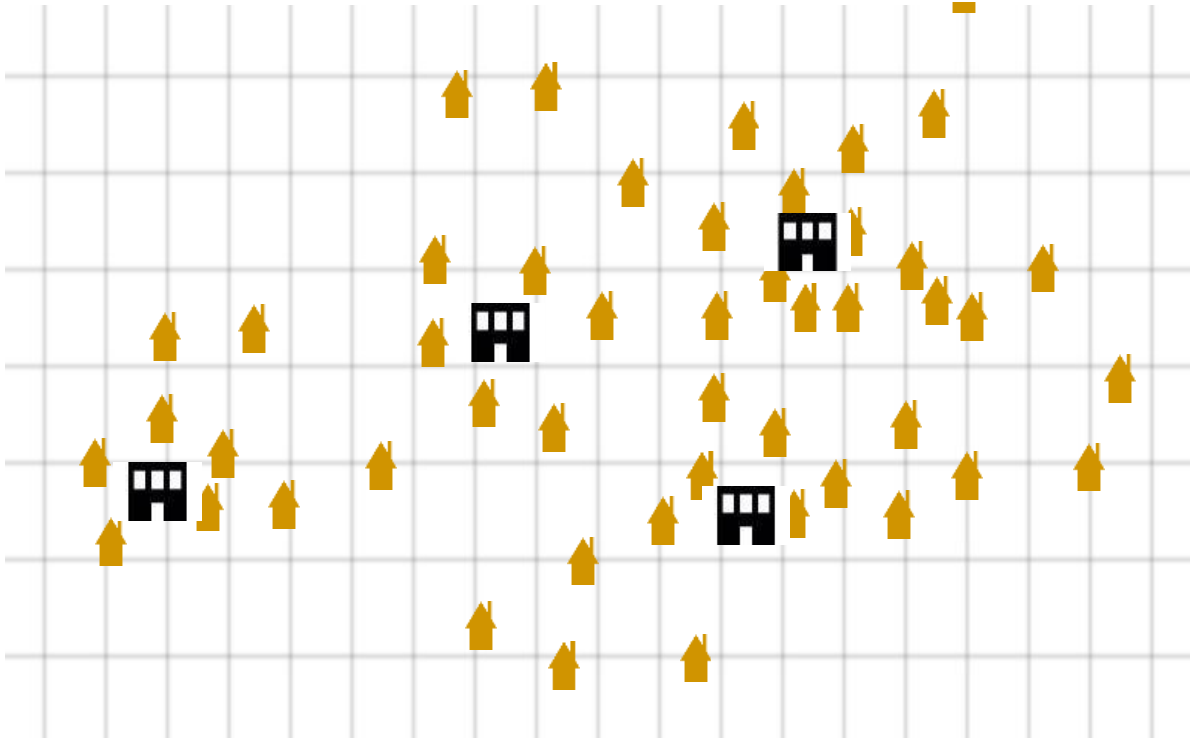
Linking Destinations Near Housing

Destinations Nearby

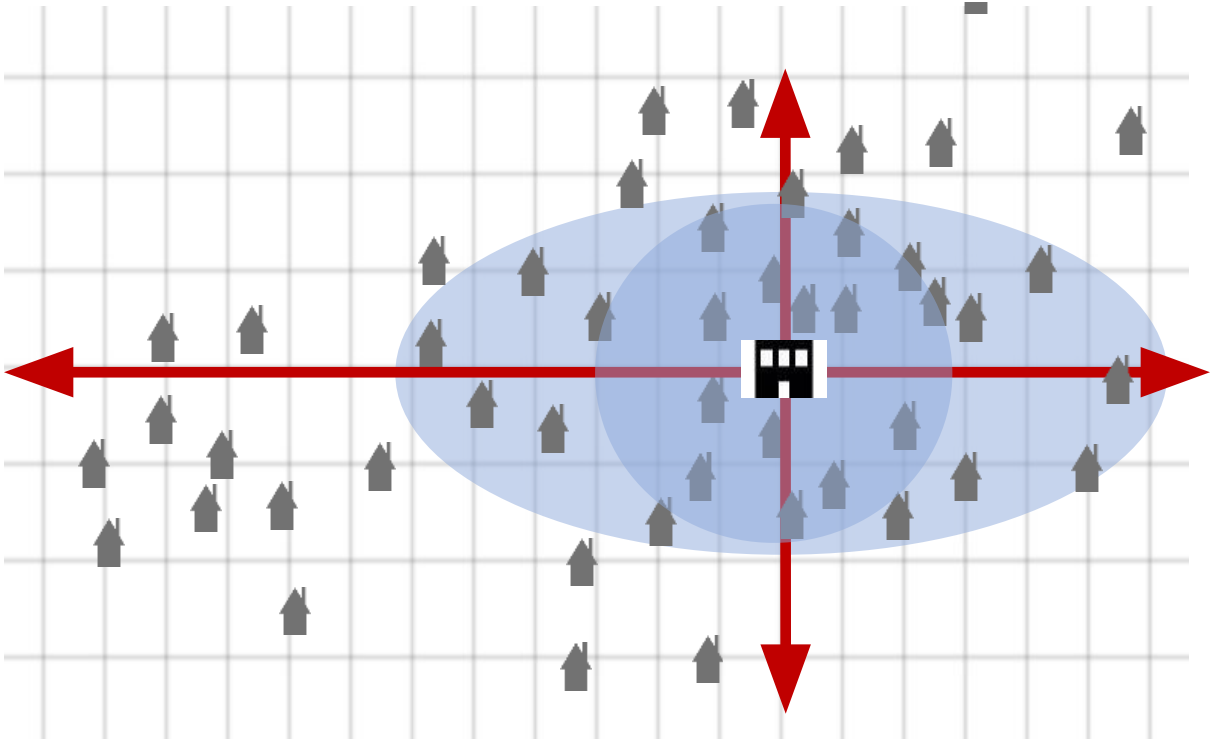
Housing Locations



WASATCH FRONT REGIONAL COUNCIL

Improving transportation connections

Transportation Improvement



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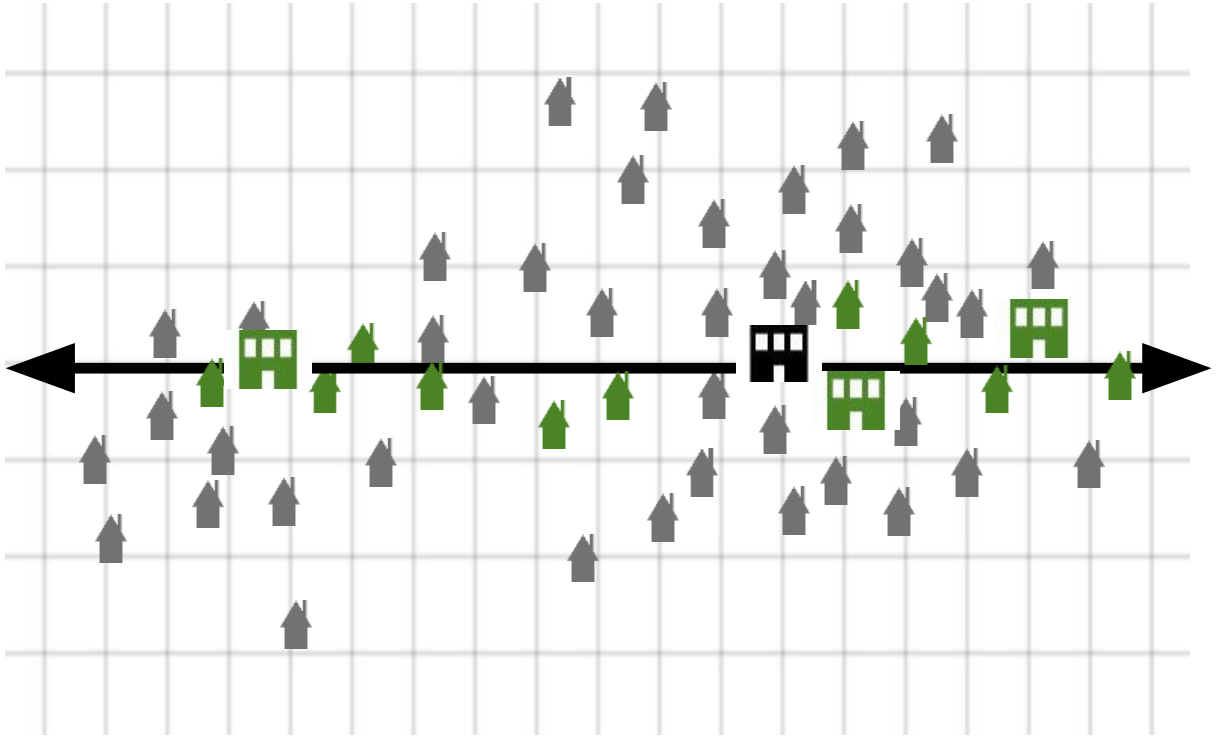
Infill Near Transportation

Development Decisions



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How do we measure a specific project's impact on ATO?

ATO Impact Tool

Developed by High Street and WFRC

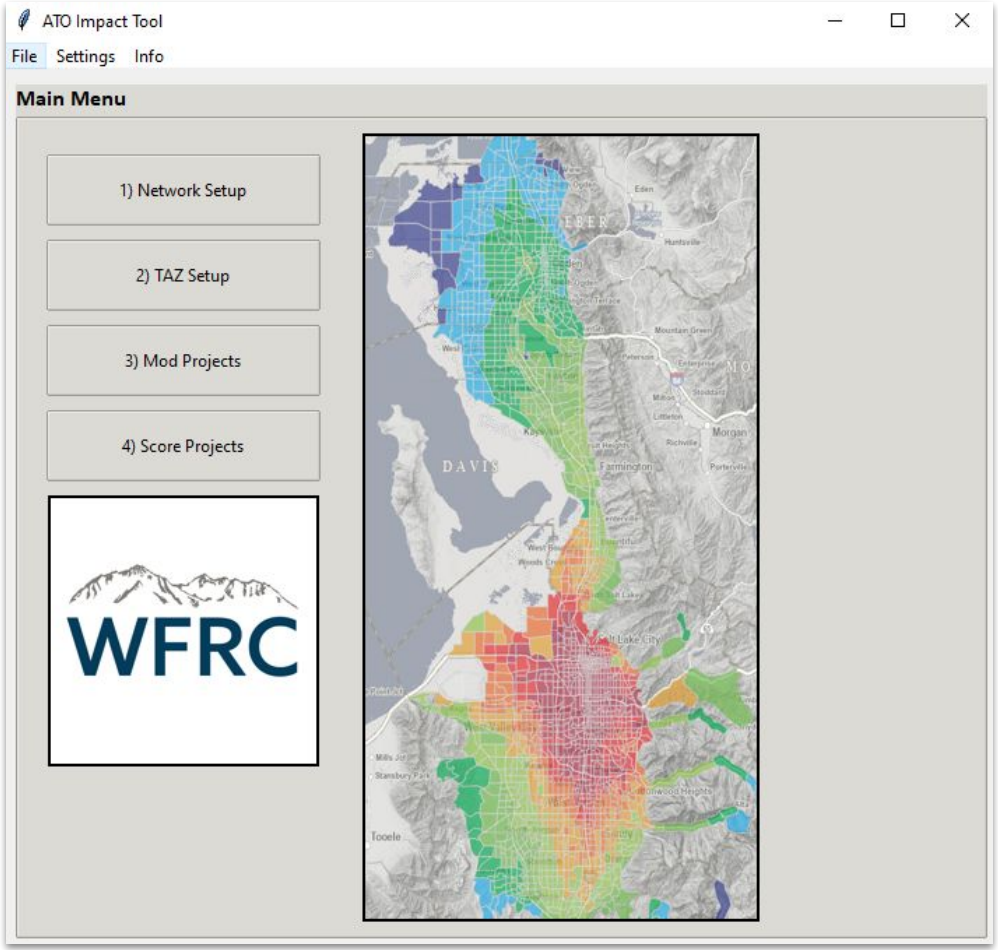
Desktop application that runs using Python and ArcGIS Pro - Network Analyst

Hosted in Github

Designed for use by Planners with some GIS training

Jupyter Notebook → Tkinter

ArcGIS



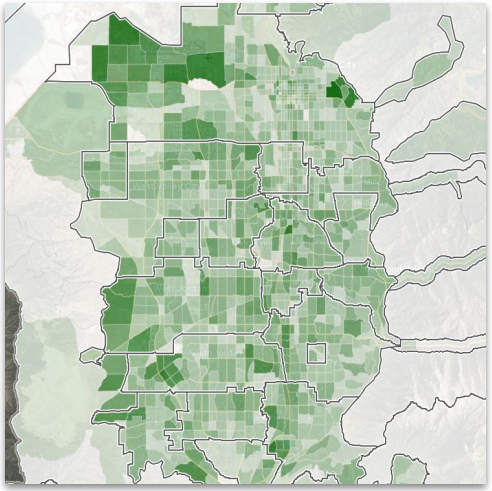
Key Input Datasets

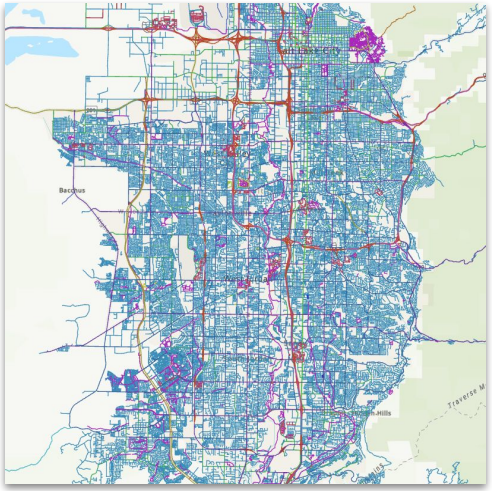
Household and Job Forecast

- Traffic Analysis Zone (TAZ) GIS layer
- Annual Household and Job Forecast (2019 - 2050)

Multi-modal GIS Network

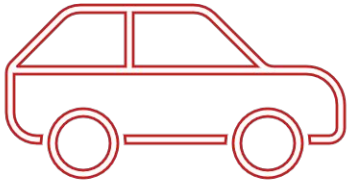
- Funded by UDOT
- Maintained by Utah Geospatial Resource Center (UGRC)
- Updated monthly
- Travel costs for auto, transit, bike, and pedestrian travel



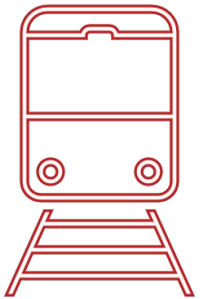


ATO Analysis Modes

Auto

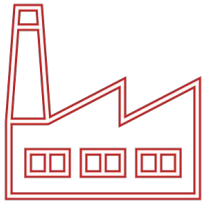


Transit

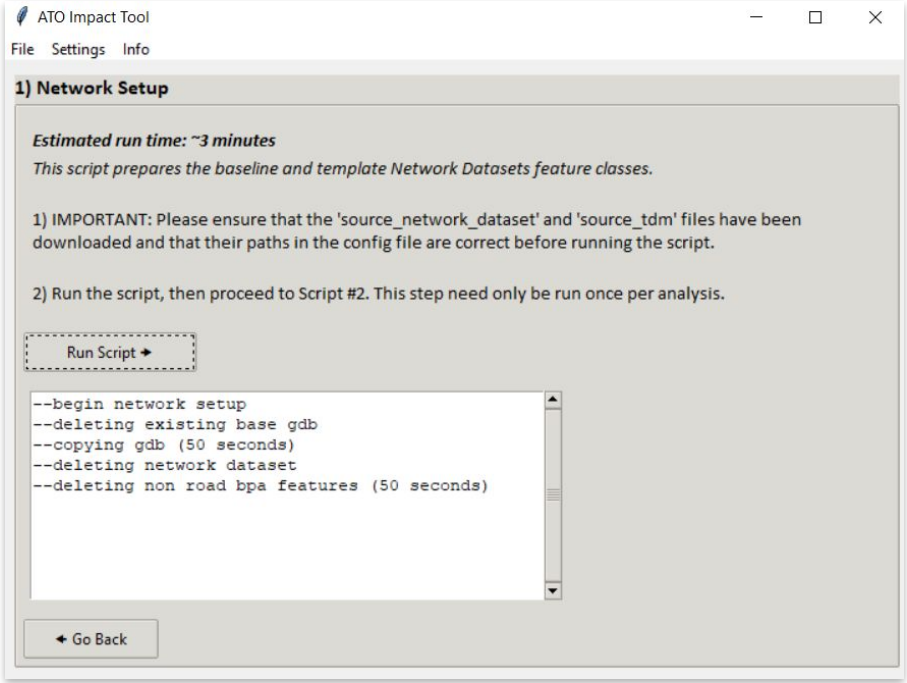


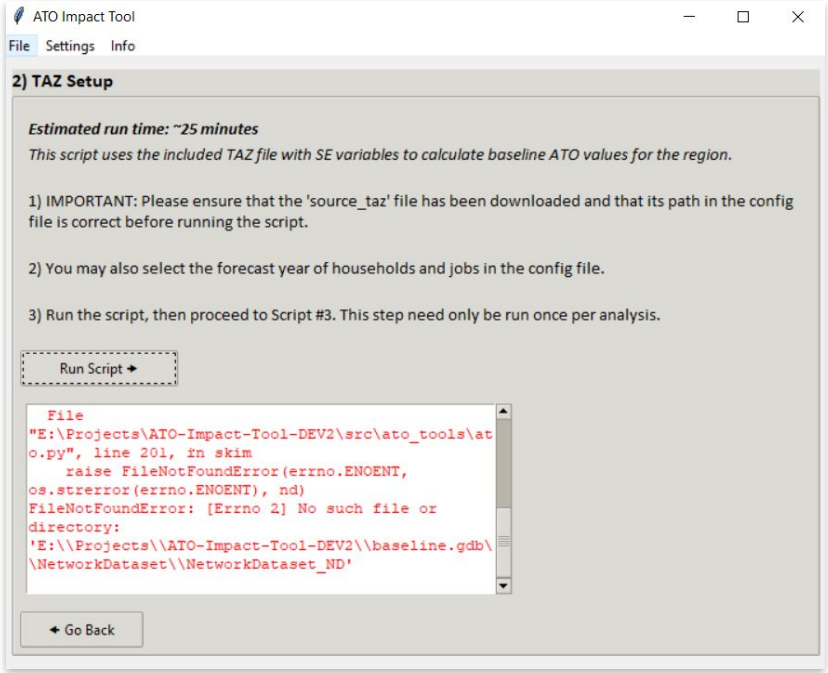
Cycling

Land Use



Baseline Network and Zone Setup





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Project Setup

3C) Mod Bike

Estimated run time: ~5 minutes per scenario

Modify a copy of the baseline NetworkDataset with a bicycle infrastructure improvement.

1) Input the scenario name and select the modification type below before running the script.

2) Run the script, ArcGIS Pro will launch. Add your edits to the network.

3) IMPORTANT: When you are done making your edits, leave the edited feature selected. Remember to save your edits and the project.

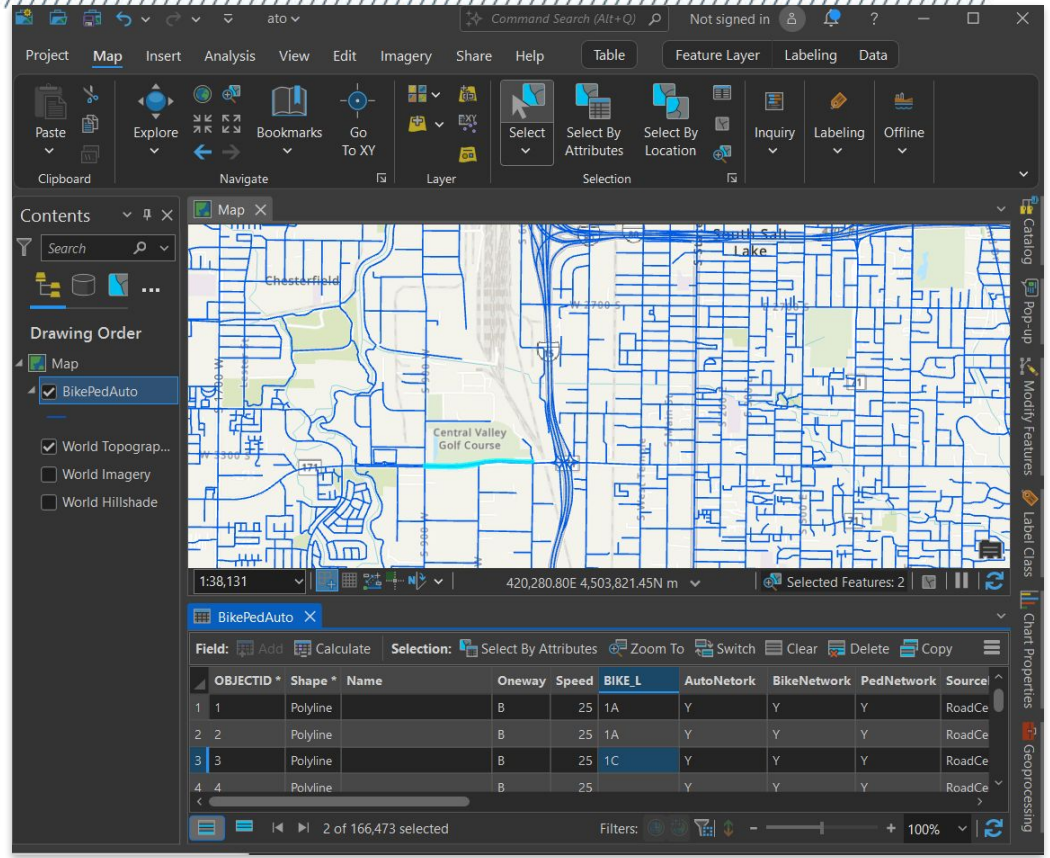
4) Once finished, close down ArcGIS Pro, the ATO tool will resume processing.

Please visit "Info" -> "Help" for more details.

Scenario Name: New Separated Lane 3300 South

Bike Facility Type: protected_bike_lane

Run Script



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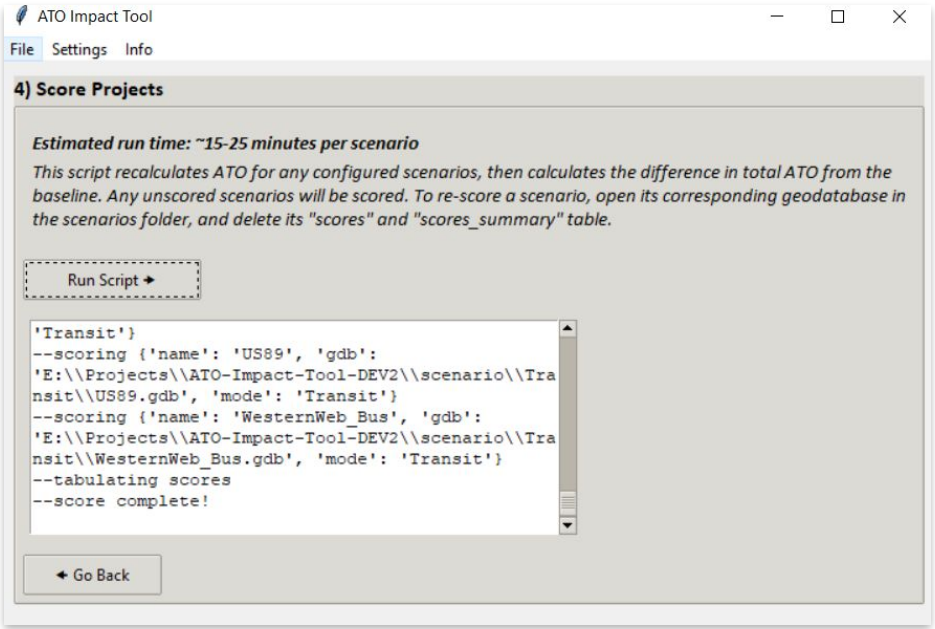
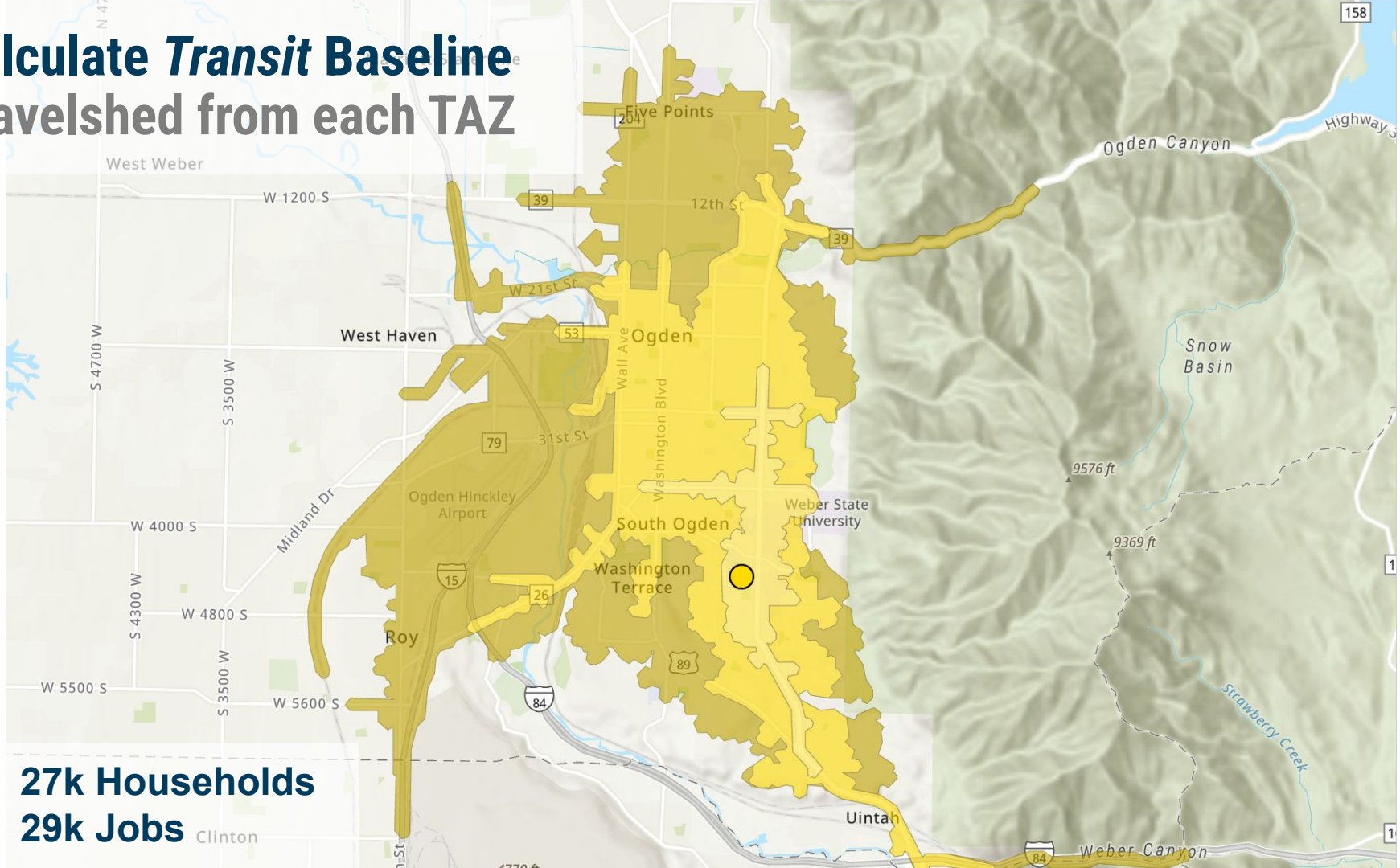
Scenario Calculation



	A	B	C	D	E
1	name	mode	hh_access	jobs_access	comp_access
2	PowerDistrict_Navajo	Driving	6.6	8	6.6
3	221_LoganOgden	Transit	1882.5	3017.3	2360.8
4	254_280_3000West	Transit	101.8	163.2	123.6
5	281_SunsetWestPoint	Transit	501.9	804.4	666.7
6	282_HooperLayton	Transit	179.6	287.8	217.4
7	296_WXNSL	Transit	263.5	422.3	327.4
8	328_WVCMagna	Transit	60.1	96.3	72.7
9	336_WestValley	Transit	146.5	234.8	198.5
10	339_OlympiaHills	Transit	15.9	25.4	20
11	457_LCCUofUBus	Transit	50.4	80.8	63.8
12	458_RedLCCBus	Transit	197.7	316.8	254.2
13	462_700EastBus	Transit	257	411.9	326.8
14	463_BlueLineEastBus	Transit	106.5	170.8	130.2
15	6200South_Enhanced	Transit	541.3	867.4	677.4
16	AirportDB	Transit	927.8	1487.2	1202.3

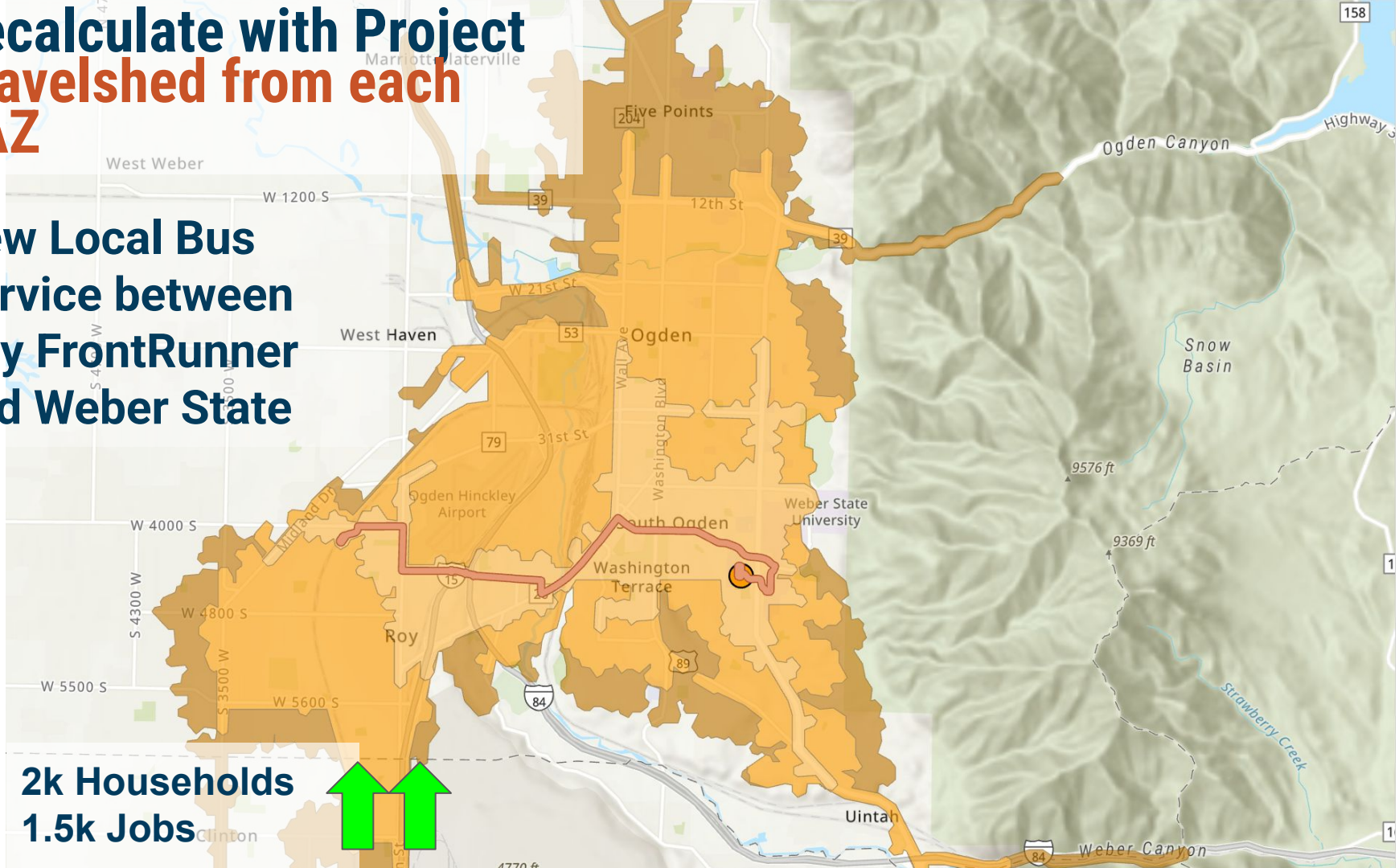
Calculate *Transit* Baseline
Travelshed from each TAZ



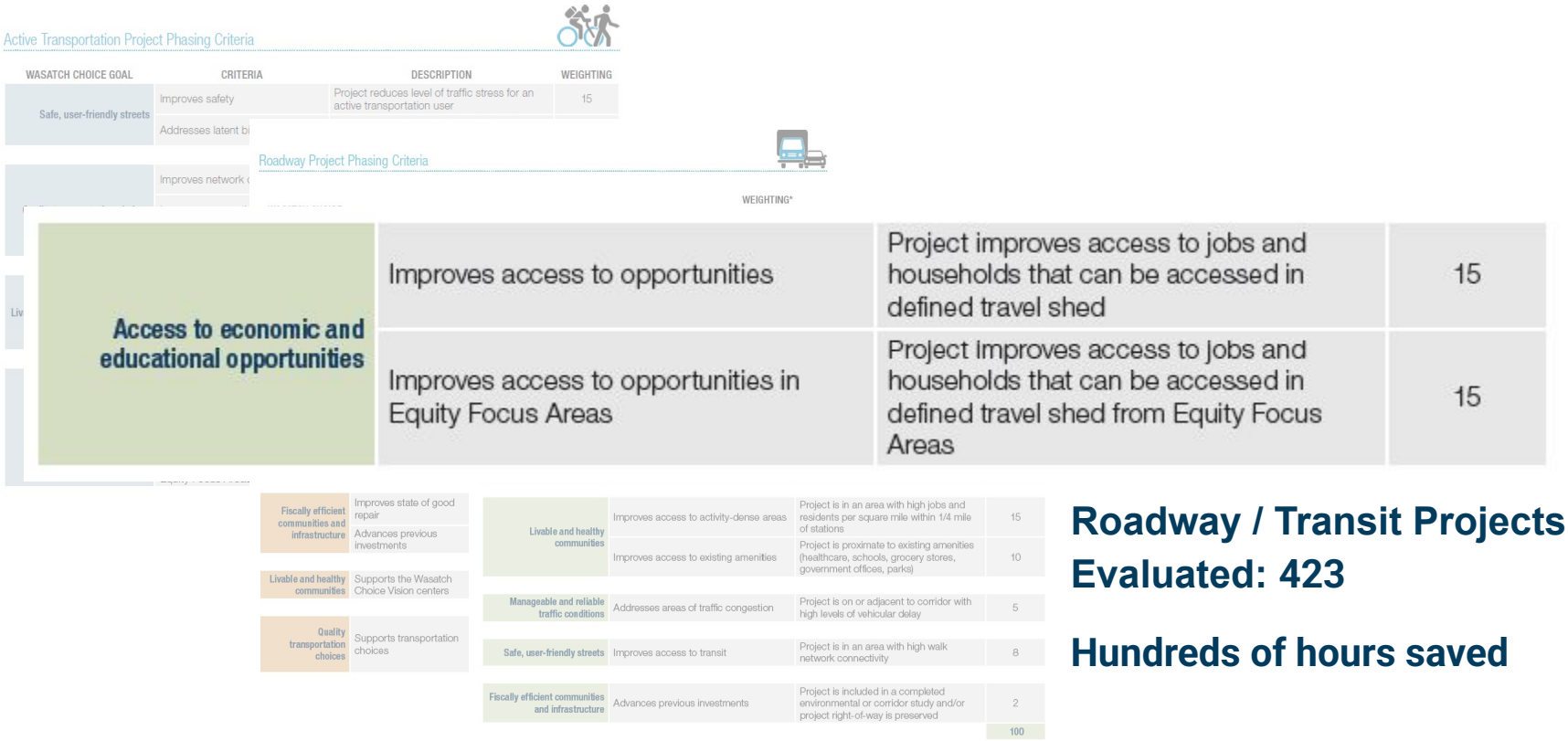
27k Households
29k Jobs

Recalculate with Project Travelshed from each TAZ

New Local Bus Service between Roy FrontRunner and Weber State



How WFRC Has Used the Tool



Active Transportation Project Phasing Criteria

WASATCH CHOICE GOAL	CRITERIA	DESCRIPTION	WEIGHTING
Safe, user-friendly streets	Improves safety	Project reduces level of traffic stress for an active transportation user	15
	Addresses latent bi		
	Improves network		

Roadway Project Phasing Criteria

			WEIGHTING*
Access to economic and educational opportunities	Improves access to opportunities	Project improves access to jobs and households that can be accessed in defined travel shed	15
	Improves access to opportunities in Equity Focus Areas	Project improves access to jobs and households that can be accessed in defined travel shed from Equity Focus Areas	15

Fiscally efficient communities and infrastructure	Improves state of good repair		
	Advances previous investments		
Livable and healthy communities	Supports the Wasatch Choice Vision centers		
Quality transportation choices	Supports transportation choices		

Livable and healthy communities	Improves access to activity-dense areas	Project is in an area with high jobs and residents per square mile within 1/4 mile of stations	15
	Improves access to existing amenities	Project is proximate to existing amenities (healthcare, schools, grocery stores, government offices, parks)	10
Manageable and reliable traffic conditions	Addresses areas of traffic congestion	Project is on or adjacent to corridor with high levels of vehicular delay	5
Safe, user-friendly streets	Improves access to transit	Project is in an area with high walk network connectivity	8
Fiscally efficient communities and infrastructure	Advances previous investments	Project is included in a completed environmental or corridor study and/or project right-of-way is preserved	2
			100

Roadway / Transit Projects Evaluated: 423

Hundreds of hours saved

Conclusions

ATO as a metric, effectively captures **network efficiency** and **destination accessibility**

Our tool is easy to for non-modelers to use and processes scenarios quickly

Some opportunities for improvement:

- Add more robust road attributes (freeflow/peak hour)
- Improve transit realism (headways, transfers)
- Reflect bike rider differences (skill/comfort)

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github.com/WFRCAnalytics/ATO-Impact-Tool

Steps

- Prepare network, calculate missing attributes
- Calculate baseline skims using search distance
- Add up reachable opportunities (baseline score)
- Draw project using ArcGIS Pro
- Recalculate skims using new network
- Calculate new score
- Compare scores
- Repeat for additional projects