

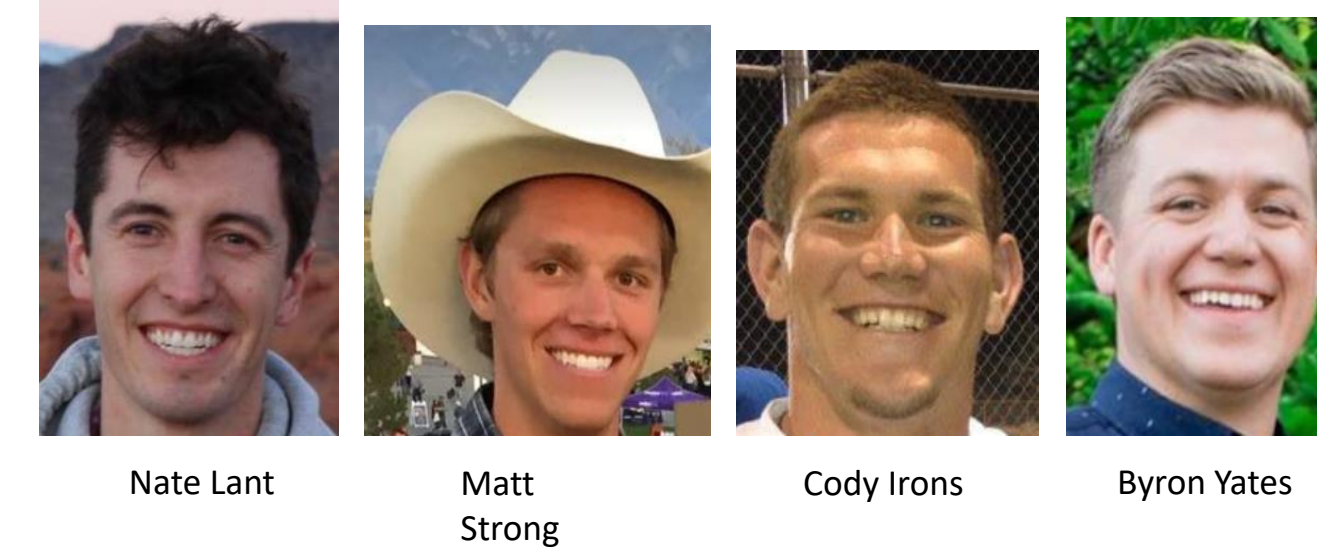
CEEn-2018CPST-015

UTA On-Demand Wheelchair Accessible Vehicle (WAV) Pilot

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# On-Demand Wheelchair Accessible Vehicle Pilot Program



## Project Description

The Utah Transit Authority (UTA) has partnered with the Utah Developmental Disabilities Council (UDDC) and with Lyft to test a new solution to enhance wheelchair accessible transportation in Salt Lake County in order to provide equal opportunity for all users in Salt Lake County.

The pilot is scheduled to run through September of 2019 and aims to deploy four wheelchair accessible vehicles (WAVs) on Lyft's on-demand ride-hailing platform within the Salt Lake Valley. This service will not replace the current UTA Paratransit buses, but rather it will introduce a new mode for persons with disabilities in Salt Lake County.

During this pilot, UTA will test the functionality of a WAV on-demand program, understand the WAV supply and ridership demand in Salt Lake County, gain operational experience with an on-demand WAV service, and understand the costs associated with implementing this solution. If successful, the pilot partners will work to identify future funding opportunities for expansion as part of future UTA innovative services.

The pilot is expected to operate 24-7, every day of the month. Hours of operation will be determined by drivers contracted by Lyft, and the vehicles will be leased from UTA at zero cost to the drivers. Drivers will be expected to meet the qualifications set by UTA and the Lyft.

In preparation to launch the pilot, the BYU capstone team assisted UTA on three main tasks: 1) Site Selection, 2) Cost Analysis, and 3) Creating an RFP.

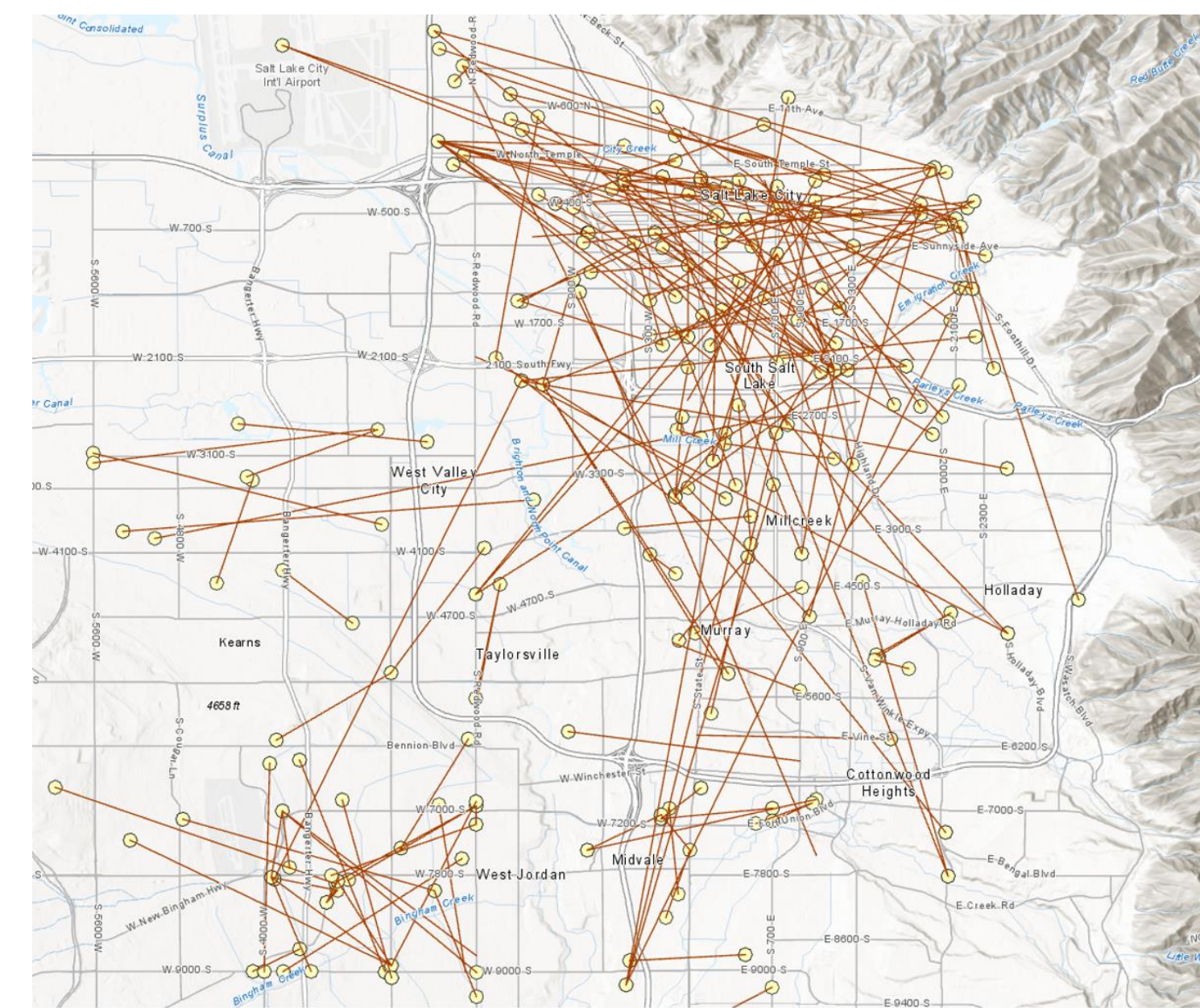


Figure 1 Pick-up and drop-off points and respective connection of UTA paratransit service during the week of Sept. 17-21, 2018 (554 total rides).

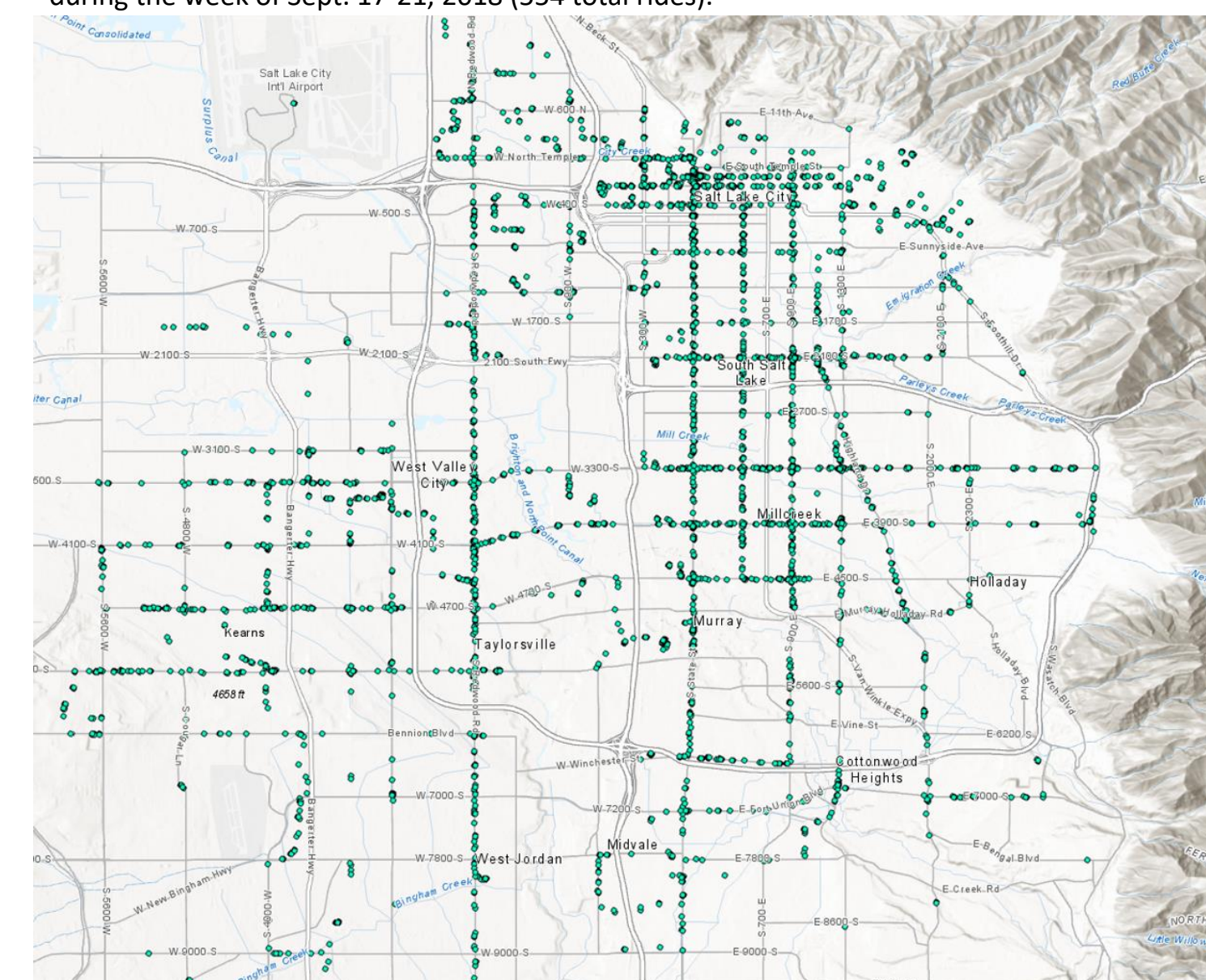


Figure 2 Wheelchair ramp activations on UTA buses during the month of August 2018 (17,853 total activations).

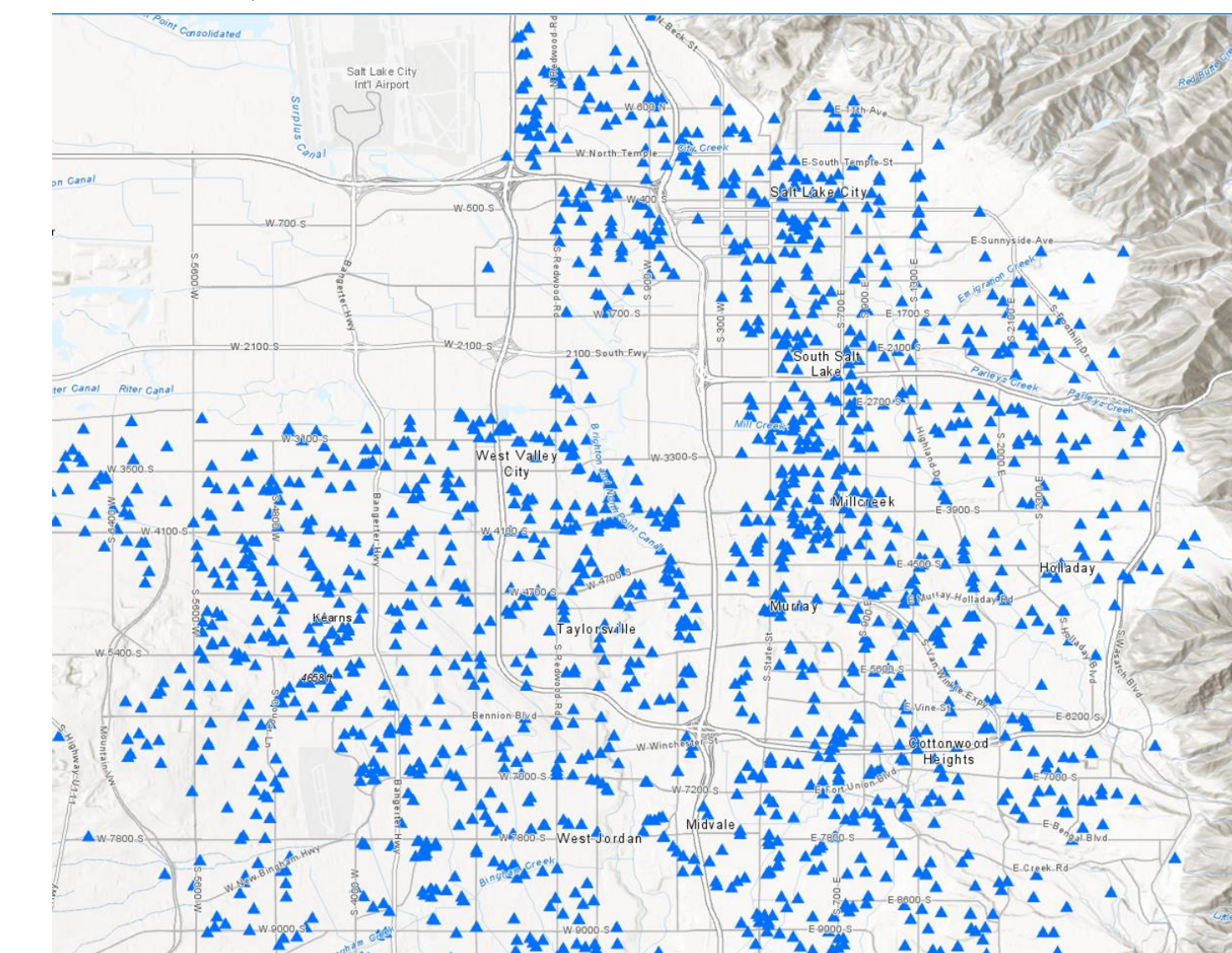


Figure 3 Addresses of qualified applicants for UTA Paratransit services in Salt Lake County (2,564 total locations).

## Site Selection:

Using data supplied by UTA, we were able to analyze a number of different variables to come to a conclusion on where the most productive site would be for the pilot program to run. Figures 1, 2, and 3 show different graphical versions of data that assisted in seeing which areas of Salt Lake County were most traveled by users with disabilities. Tables 1 and 2 show how we divided Salt Lake County into different sites and different metrics such as square mileage, travel time, number of addresses of qualified users of paratransit services, paratransit weekly pickups and monthly bus ramp activations. After our data analysis, we suggested that expanding the ride service to the entire Salt Lake County area would be beneficial to help those who were farther away from the downtown area to have access to the new mode of transportation.

Table 1. Site Selection and Respective Components

Static Sites	Area (mi <sup>2</sup> )	Travel Time (min)		Addresses	Pick-Ups	Bus Ramps
		East-West	North-South			
SLC Downtown	9	30	18	178	94	3820
South Salt Lake	10.2	15	25	302	98	4883
West Jordan	9.5	15	15	267	74	450
Sandy	14.25	22	15	131	22	123
Dynamic Zones		East-West	North-South			
Salt Lake City		17	30	388	186	6669
Murray		16.25	25	338	79	4649

Table 2. Factors and Calculations of Vehicle Miles Traveled (VMT) By Area

Site	Bus Ramp Activations	# of Trips	Avg. Trip Distance (miles)	Usage Factor	VMT (per month)	VMT (per day)
SLC Downtown	3820	1910	2.06	0.2	785.01	26.17
South Salt Lake	4883	2442	2.56	0.2	1250.05	41.67
West Jordan	450	225	2.36	0.2	106.09	3.54
Sandy	123	62	2.73	0.2	33.58	1.12
Salt Lake City	6669	3335	3.14	0.2	2095.73	69.86
Murray	4649	2325	2.56	0.2	1190.14	39.67

## Cost Analysis

In order to determine the monthly cost of this program for UTA, our team identified each individual variable and then combined them into an equation for analysis, as shown in Equation 1. By taking the derivative of the equation with respect to each individual variable, we identified the influence of each variable that affects the cost of the pilot program each month. The cost of maintenance had the steepest slope. By pinpointing these most dynamic variables, we were able to advise UTA on the most efficient ways to reduce cost and maintain their target budget. Table 3 illustrates this budget tool.

Table 3. Monthly Budget Tool

Variable	Min Value	Max Value	
Number of Vans	4	4	
Wage (per driver per hour)	\$ -	\$ -	
Hours of Operation (per day)	10	10	
Days of Operation (per month)	31	31	
Insurance (per month)	\$ 1,200.00	\$ 1,200.00	
Maintenance (per mile)	\$ 0.09	\$ 0.09	
Vehicle Miles Traveled (VMT) (per van per day)	25	75	
MPG	15	15	
Gas Price	\$ 3.50	\$ 3.50	
Depreciation (per month)	\$ 855.00	\$ 855.00	
	\$ 2.97	\$ 1.20	Per mile
	\$ 296.99	\$ 360.66	Per day
	\$ 2,301.71	\$ 2,795.13	Per week
Cost of Operation	\$ 9,206.83	\$ 11,180.50	Per month
	\$ 2,301.71	\$ 2,795.13	Per van per month

Equation 1. Total monthly cost as a function of fleet size, gas price, vehicle miles traveled (VMT), days of operation, costs of insurance and maintenance, and wage.

$$MC = \left[ \frac{VMT * \$gas * \#days * \#vans}{MPG} \right] + (\$insurance * \#vans) + \left[ \frac{\$maintenance}{mile} * VMT * \#days * \#vans \right] + (wage * \#hours/day * \#days * \#vans) + (\$depreciation * \#vans)$$

## Creating an RFP

Uber and Lyft were the two competing transportation network companies (TNCs). Both were interested in partnering on the pilot, but were slow to act or define their role. UTA requested our assistance in drafting the request for proposal (RFP). As a team we were able to write the RFP that was used by UTA and sent out to Uber and Lyft, who responded eagerly to the request. The project was eventually awarded to Lyft, who will now be providing the on-demand network for riders with disabilities to request the UTA owned WAVs. The RFP identified the roles of UTA, Lyft and the independently contracted drivers and requested specific data to measure the effectiveness of the pilot over the course of the program.

