MEMORANDUM

DATE: January 7, 2016

TO: Angelo Papastamos, UDOT, and Jonathon Bates, University of Utah

FROM: Tim Sullivan and Michael Baker, Parametrix

SUBJECT: TravelWise UNiversity of Utah Research Park Transportation Demand Mangement Analysis

CC:

INTRODUCTION

This memorandum summarizes the background, methodology, and findings of the TravelWise Transportation Demand Management (TDM) study of the University of Utah Research Park.

The Utah Department of Transportation TravelWise Program seeks to optimize mobility, improve air quality, and reduce energy consumption through voluntary travel demand management programs. The program is conducted on a voluntary basis and consists of organizations and individuals guided by the UDOT TravelWise Team.

The University of Utah Research Park is a large employment center on the East Bench of Salt Lake City. Research Park contains both University of Utah departments and other affiliated offices as well as private companies and organizations. Some 10,000 full-time equivalent employees work at the organizations and companies located in the park. Research Park is accessed by several corridors that are congested at peak travel hours, and streets and intersections within the park are congested as well. The park's concentration of employees, proximity to a range of transportation amenities, and circulation issues make it a prime candidate to benefit from travel demand management strategies.

This study analyzes travel demand and supply in the University of Utah Research Park and immediately adjacent areas, and propose opportunities and strategies to address Research Park's transportation challenges. Specifically, the goals of the project are to:

1) Paint a picture of transportation supply and demand in Research Park and areas directly affecting Research Park.
2) Complement work of University of Utah Transportation Plan.
3) Propose short and long-term strategies to address Research Park transportation goals.
4) Engage Research Park users in collective transportation planning for Research Park through the use of surveys and conversations.
5) Explore funding mechanisms to implement the strategies.

This report comprises the first phase of this work.

BACKGROUND AND CONTEXT

Research Park exists in a dynamic transportation context. At a basic level, it is a major employment center with 165 organizations employing the full-time equivalent of 10,487 employees. These employees come from all over the Wasatch Front, and are a major contributor to the congestion occurring on regional corridors such as Foothill

Drive. Research Park is growing. Many of the major employers in the park describe plans for growth of both capital facilities and human resources.

Research Park is part of one of the largest employment hubs in the state of Utah that also includes the University of Utah main campus and the University of Utah Medical Center. Adjacent to this hub is a cluster of attractions increasingly known as the "cultural district," which includes Hogle Zoo, This is the Place Heritage Park and the Utah Museum of Natural History. Due to this concentration of destinations, Research Park is surrounded by several important transportation facilities, including the Foothill Drive/500 South/400 South corridor which is one of the most important arterials in Salt Lake City and the region; and the UTA TRAX Red Line, which serves the University main campus and medical center.

However, as the park, the University, and the region continue to grow, Research Park and its employees are increasingly encountering challenges with regard to transportation to, from, and within Research Park. There are signs its approach to transportation, founded on individualized solutions for the different organizations; easy vehicle access, circulation, and parking; and the spread-out, verdant auto-oriented ethos of the 20th century office park, is outdated and ill-equipped to address the challenges of the status quo and the future.

Our initial understanding of these transportation challenges for Research Park are:

- The vehicular transportation network serving Research Park is congested – along Foothill Boulevard, at Park entry points, and at internal intersections, causing delay and unpredictability for employees and other consequences of stop-and-go driving such as poor air quality and safety concerns.
- Transportation alternatives to private vehicles exist but are not legible, convenient, and in many cases, known-about or safe.
- Limited access points to Research Park exacerbate congestion and lack of transportation options
- Design of vehicular network, traffic levels, and lack of alternative transportation infrastructure have led to safety problems where paths of vehicles, pedestrians, and cyclists meet.
- Research Park is confusing to navigate for all modes.
- Lack of alternatives reinforce the perception that one needs to have a car for non-commute trips within or around Research Park/greater University area.
- Largely due to parking and auto-oriented development type, land is not being used as efficiently as it could be in Research Park.
- There is a lack of efficacy to develop comprehensive transportation solutions at Research Park because each tenant has largely taken an individual approach and the organizational infrastructure for collective building does not exist.
- There is a similar lack of ability to appeal to other entities such as Salt Lake City and UTA because a complete picture of transportation data has not been painted for Research Park.
- Congestion and limited access has affected surrounding communities and projects negatively on Research Park.

Our understanding of the University of Utah's transportation goals for Research Park are:

- Make transportation alternatives more visible and prominent and increase awareness about them.
- Make Research Park's transportation network more legible.
- Make walking and cycling to Research Park destinations safe and convenient.
- Make conflict points between different modes safer.
- Create the ability to make seamless multi-modal trips to Research Park destinations.
- Make transportation alternative commutes financially attractive.
- Improve connectivity within, in, and out of Research Park.
- Move toward collective transportation solutions for Research Park as a whole.
- Reduce non-commute short trips in private vehicles

- Develop transportation solutions that support and benefit from movement toward land use intensification of Research Park.
- Leverage existing regional and local alternative transportation infrastructure in and around Research Park, such as TRAX, the Salt Lake City bicycle network, and Wasatch Foothill trails such as Bonneville Shoreline.
- Reduce impacts of Research Park traffic on surrounding residential communities.

Meanwhile, this study occurs at a time when it can coordinate with others. The University of Utah is developing a new Transportation Master Plan, while a team of jurisdictions and agencies is developing a plan for Foothill Drive, and Salt Lake City is leading a plan for the Transvalley Corridor along 800/900 South and Sunnyside Avenue.

METHODOLOGY

Developing the findings and opportunities for managing transportation demand and addressing the transportation issues of Research Park involved a synthesis of observations of the existing transportation networks in and around the park and extensive consultation with both employers and employees.

Network Analysis

The network analysis involved collecting all available data relevant to Research Park including GIS shapefiles, studies, and plans. The majority of these data came from the University of Utah Planning and Commuter Services, the Research Park Real Estate Development Office, UDOT, Salt Lake City, and the Utah Transit Authority (UTA). In instances when geospatial data were not available—i.e. sidewalk locations, parking lot conditions—new shapefiles were generated using a combination of aerial imagery and field visits. While generally not neglected, Research Park data had heretofore not been consolidated in a single, accessible "location." By doing so, this project has empowered future insights by enabling the juxtaposition of formerly isolated data elements.

The results of the existing conditions assessment is found in maps depicting the key transportation modes within Research Park as well as the vicinity. The maps identify mobility and accessibility issues and assets, as well as potential solutions to these issues.

User Outreach

Over 10,000 full-time equivalent (FTE) employees work within Research Park across the 165 companies, organizations, and university offices. This number does not include daily visitors to these offices, the museum, arboretum, or nearby recreational facilities. To better understand the needs of this large population, the study relied on an extensive user outreach process involving in-person interviews as well as online surveys.

The first step in this process was a survey designed for employers. This survey focused on obtaining high-level data about their entire workforces such as: employee commute time, transportation modes, home zip codes, and any transportation policies that the company provides. A link to the survey was sent out to employers on a contact list managed by the Research Park Real Estate office. We received partial responses from about 80 percent of organizations; approximately a third of the organizations in the park completed the survey.

Additional detailed insights were gained through in-person interviews with company representatives. The results of the employer survey were used to launch these conversations and provide more detailed insights not possible in a survey format. Interview subjects were selected as either representing large employers or unique entities within Research Park. These interview subjects included:

- ARUP Laboratories
- BioFire Diagnostics
- Rockwell Collins
- Natural History Museum of Utah

Not only did interview subjects provide excellent, detailed insight from a management perspective but also personal anecdotes as commuters to Research Park. Interview topics ranged from parking availability to office culture and history. The insights and challenges mentioned in the interviews are incorporated throughout this document and maps.

Questions contained in the employee survey were similar to the previous survey with a greater focus on the individual's experiences and challenges. Invitations to participate in the employee survey were emailed out to the

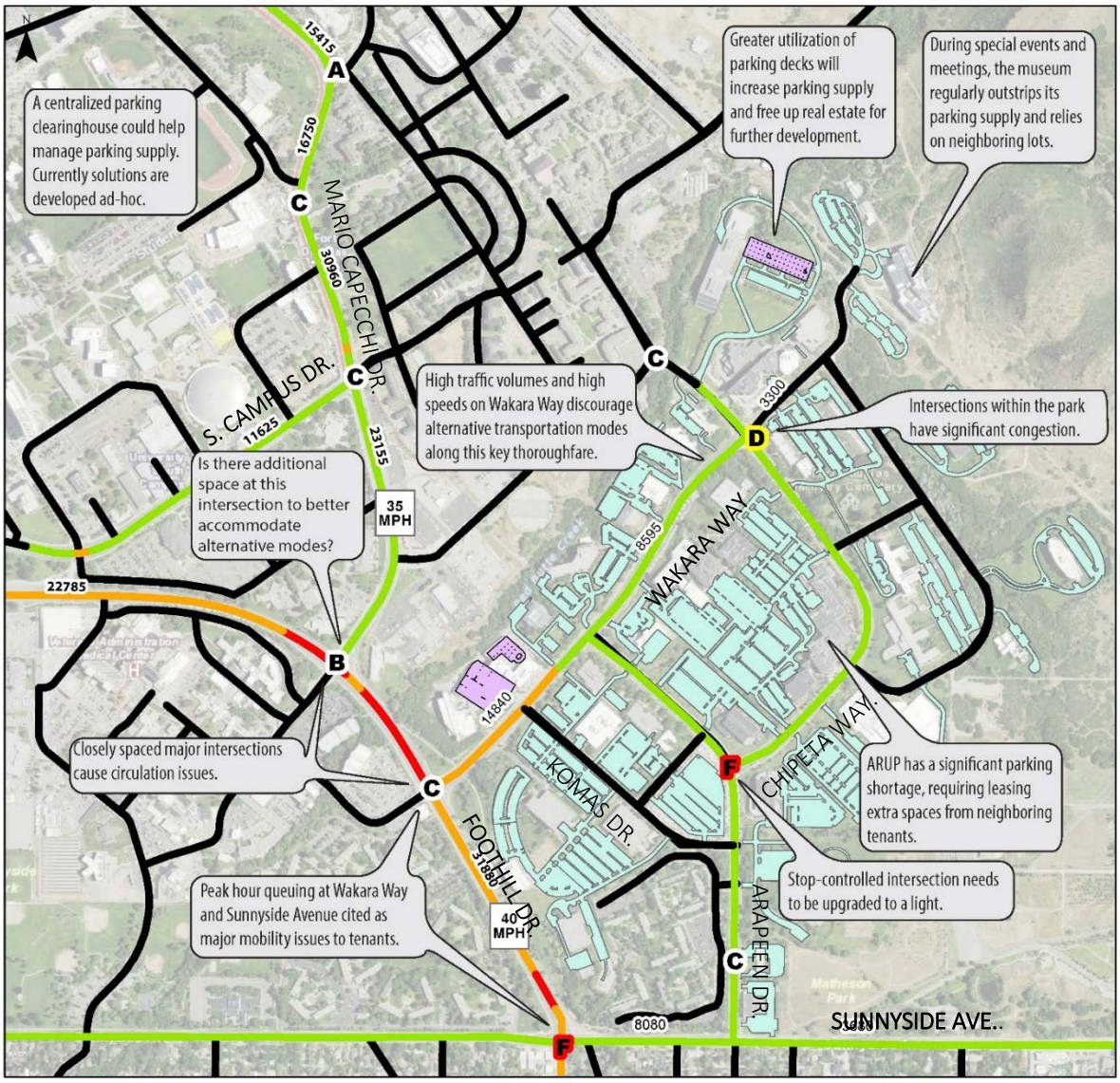
same list as the employer survey. In total, there were 2,048 responses to the employee survey. The enthusiastic response the survey experienced enables excellent insight into the individuals that work or volunteer in the Park.

The results of our outreach efforts revealed that there are roughly defined categories of Research Park employees and visitors with similar needs and face similar obstacles. Processing the expansive results of the employee survey, comprised of "breaking out" the responses into sub-groups based on shared attributes including employment status, if their employer is affiliated with the University, if the commute occurs during peak hours, and broadly where the employee is commuting from.

NETWORKS

Understanding the transportation networks available to Research Park employees is a vital part of analyzing opportunities for managing transportation demand and addressing Research Park's transportation issues. Following are analyses of the networks available to the four major transportation modes, vehicle, transit, bicycle and pedestrian. The assets, challenges, and opportunities of these networks – relative to the opportunities for change in employee travel behavior – are integrated into the Findings section.

The **vehicle network** includes the roadway lanes available to private vehicles as well as parking. Our analysis includes the current level of service provided by this vehicle network.



RESEARCH PARK:
Vehicle Existing Conditions

Number of Lanes
- 2-3 Lanes
- 4-5 Lanes
- 6-7 Lanes
- 8-9 Lanes

Vehicle Parking
- Vehicle Parking
- Parking Structures

Traffic conditions at intersections displayed by letters
A/B = Free-flow traffic
C/D = Denser traffic, congestion begins to form
E/F = Heavy congestion or gridlock

Figure 1: Vehicle network existing conditions

The **transit network** includes the services provided by UTA and the University of Utah shuttle program. We have identified the routes and stops for these services.

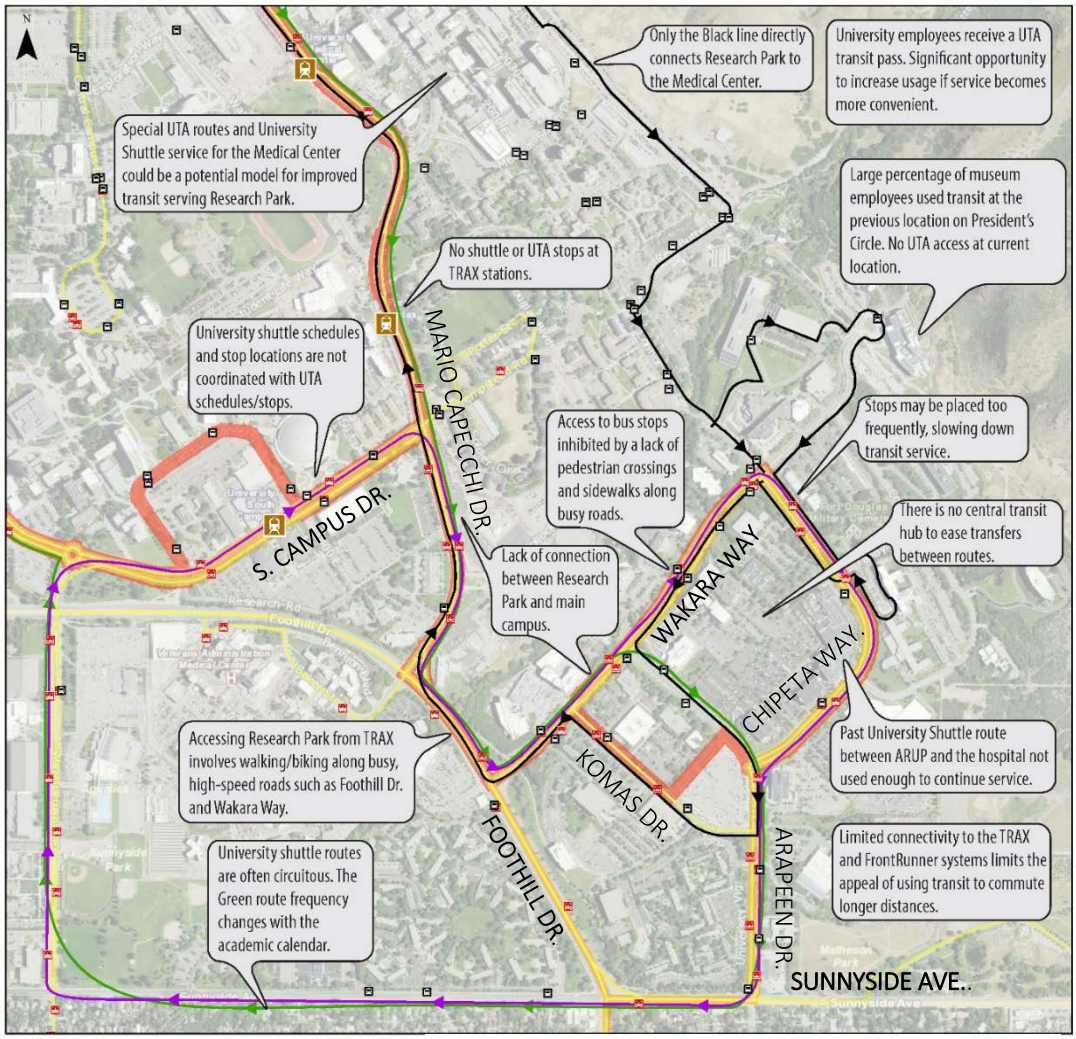


Figure 2: Transit existing conditions

The **bicycle network** includes designated and planned bicycle facilities as well as the compatibility for bicycles of existing streets **and identified barriers to cycling.**

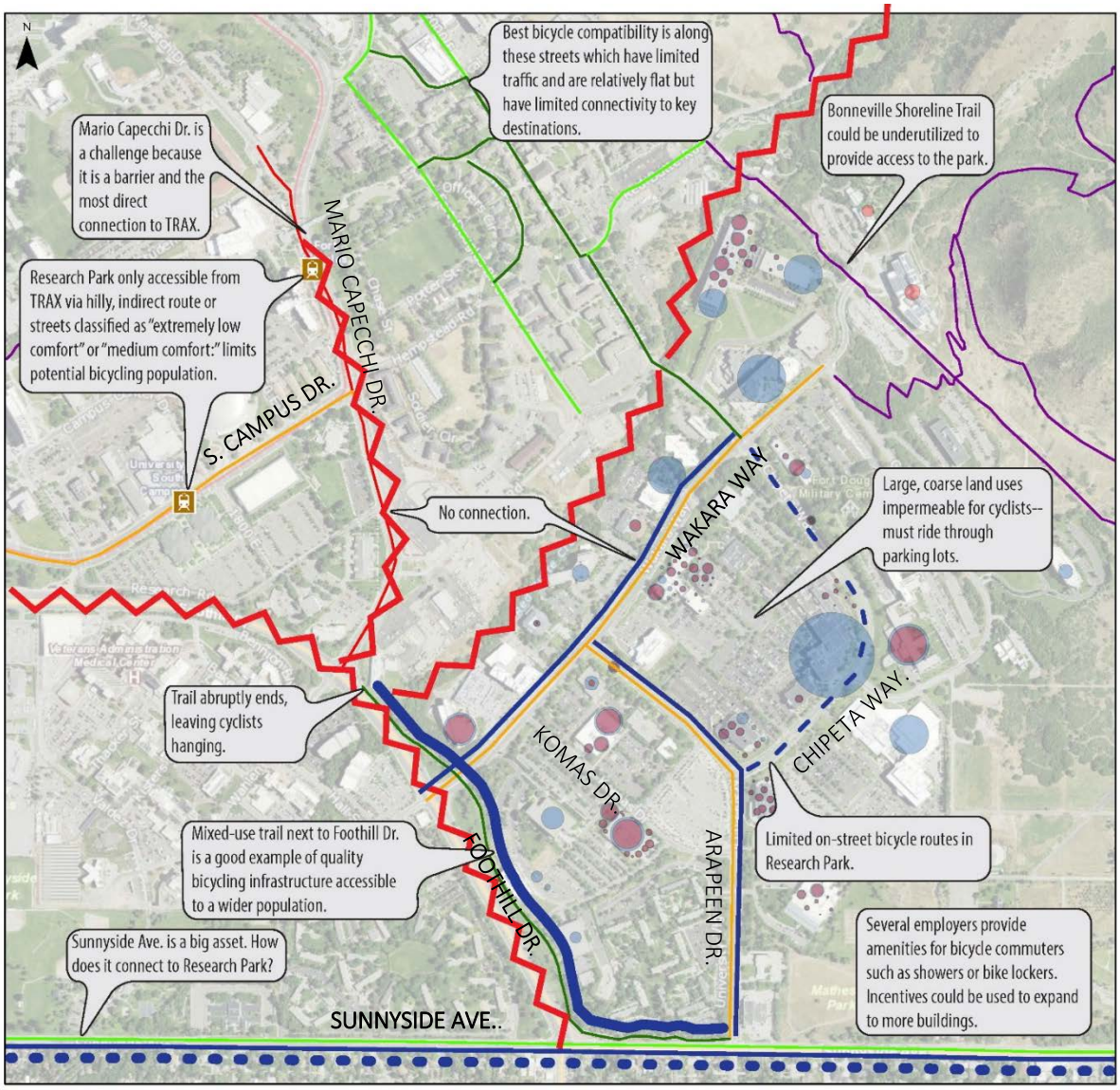


Figure 3: Bicycle existing conditions

The **pedestrian network** includes designated and planned pedestrian facilities as well as identified barriers to walking.

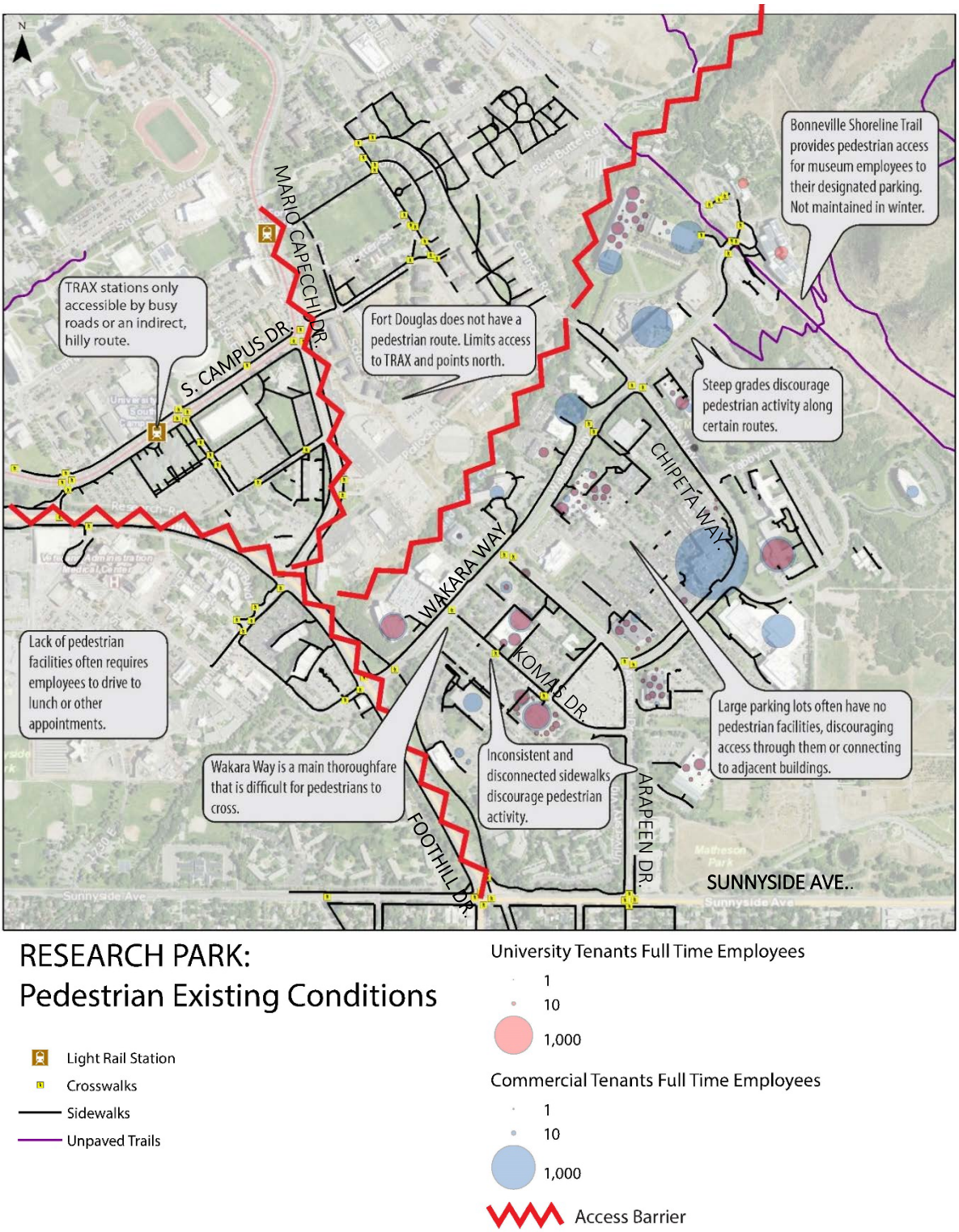


Figure 4: Pedestrian existing conditions

FINDINGS

The findings of the Research Park Transportation Demand Management analysis are presented in three parts: Major themes; overall findings; and findings specific to specific "user-trips."

Major Themes

Collectivize the experience and culture of transportation within Research Park.

Currently, the transportation experience to and within Research Park is highly individualized yet the use of specific transportation corridors to access the park and the concentrations of workplaces within walking distances allows for the creation of a more collective experience emphasizing coordinated parking, a few targeted great transit options, improved offsite park and ride hubs at the head of key corridors and central hubs in Research Park. Even collectivizing the lunch experience could help move things in this direction and change the culture of transportation in the park. Change the culture of transportation within Research Park and surrounding areas (cultural district, Medical Center, Fort Douglas) so that different kinds of trips – commute, lunch, intraday work trips, visits, recreation, are all encouraged by one another to move away from single occupant vehicles. Get more concentrations of people outside visibly walking and bicycling.

Continue to manipulate the economics of transportation in Research Park, and include parking.

For the most people, the decision on how to get from place to place – and especially to commute – is an economic decision. The largest factors tend to be a mix of time and financial cost. Currently, several economic factors influence the choices of Research Park commuters and other travelers. These include gas, roadway level of service, the cost and time of transit. In Research Park, the free transit pass for University employees is a significant economic factor in incenting more transit trips. Also important, currently in Research Park parking is not factored into this cost equation, but we see pricing parking as a vital way to encourage movement away from single-occupant trips to be pursued in concert with the other three themes listed here.

Focus resources to create attractive transportation non-single-occupant vehicle choices on key corridors leading to Research Park.

Travel to and from Research Park is concentrated in a few key corridors. These corridors correlate very closely with the areas from which commuters travel to work: those in Central Salt Lake overwhelmingly use Sunnyside Avenue; those from north of Salt Lake City use 400 South; and those coming from everywhere else use Foothill Drive. The concentrations of travelers on these routes allow the use of economic incentives and operational and capital improvements to leverage the economy of scale and shift more trips along them to other modes.

Improve connectivity for all modes, but especially pedestrians and bicyclists, within Research Park and connecting to key adjacent areas.

Research Park was designed as a classic mid-to-late 20th century business park, where buildings are connected to individual parking lots and little else, and non-auto transportation modes are largely not factored into the design. The sidewalk network is utterly disconnected and parking lots stand in the way of most pedestrian routes. In addition, Research Park is poorly connected for all modes to all adjacent areas. Effects of this external disconnection include concentration of traffic at the few vehicle entries and the difficultly of walking or biking to key outside destinations such as the main U of U campus and the Medical Center, as well as TRAX light rail stations.

Overall Findings

Commute behavior

Research Park employees largely commute at the peak time.

Approximately 78 percent of Research Park employees commute at peak times, defined as 7 to 9 a.m. and 4 to 6 p.m.

Research Park commutes are significantly longer than the average metro region commutes.

The average AM commute time to Research Park is 28.4 minutes, PM is 32.2. There doesn't appear to be a significant difference between peak and non-peak commuters' average commute times. We are not exactly sure why this is.

Time is the dominant factor for Research Park commuters in how they choose their mode and route, though other factors exist.

Generally about 80 percent say time is the biggest factor, but the other 20 percent shifts within the different groups – some say cost others say quality of life issues.

Commute behavior is largely dependent on a few key characteristics of the employee – location of their home, whether or not they work for the University, and whether they commute in the peak times.

These factors have led us to define 7 user groups for the commute. Figure 5 demonstrates the differences in mode share for these different groups. The next section of the report explores the opportunities for addressing the transportation needs and demand of these individual user groups.

Vehicle commutes are focused on a few key streets.

Foothill Drive, Sunnyside Avenue, and for those coming from the north, 400 South, are by far the dominant streets used by commuters. As is explored in the User Trips section, these routes are closely linked with travelers coming from different segments of the metropolitan region.

Parking is easy to find.

Despite the anecdotal evidence from some employers about tightening parking supply, nearly 3 in 4 (72 percent) survey respondents said parking was "very easy" to find.

The vehicle congestion on popular corridors like Foothill Drive does not deter people from driving on them.

Use of Foothill during peak versus non-peak commute times is roughly the same. About 84 percent of Salt Lake Valley commuters coming from outside of Salt Lake City use Foothill despite the congestion.

The commute is a challenge for recruiting.

Employers say the long, often-congested commute to Research Park is an obstacle to luring talent to companies in the park.

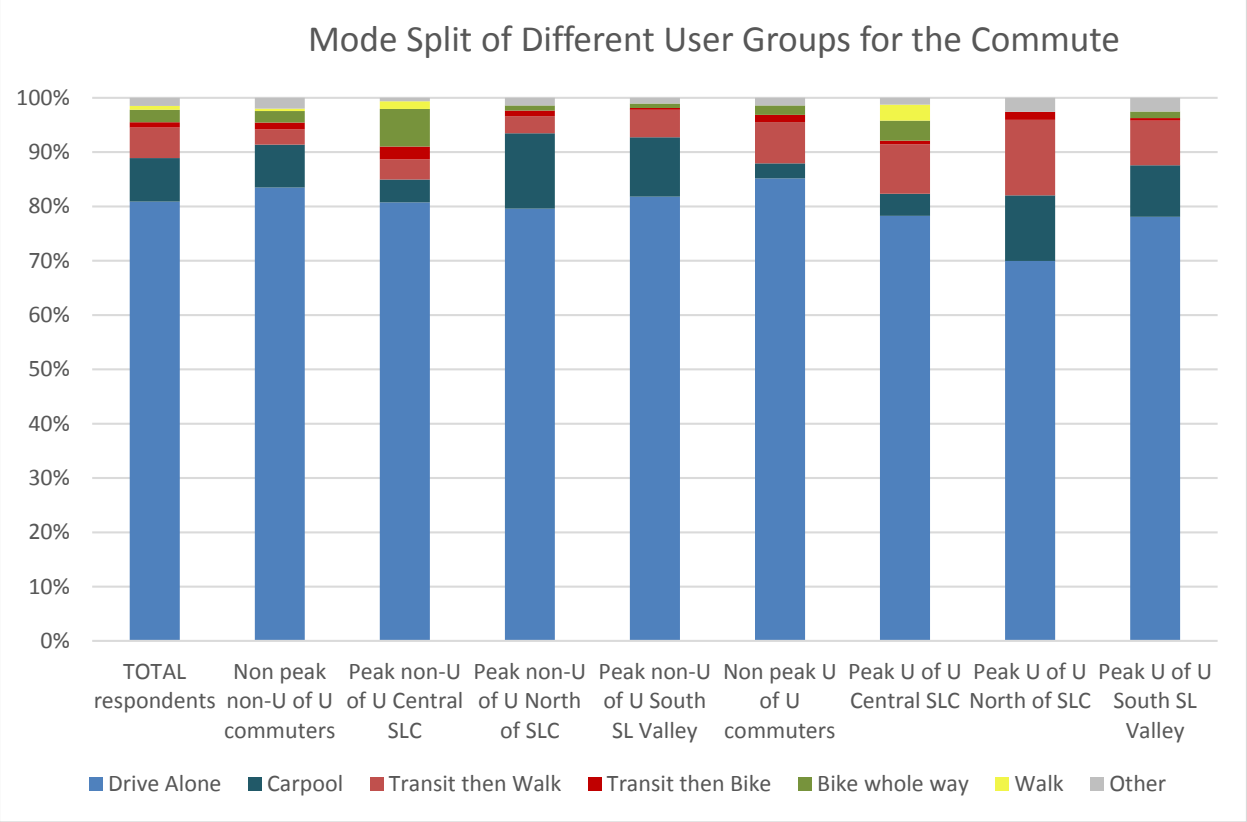


Figure 5: Mode Split of Different User Groups for the Commute

Intra-day trip behavior

The vast majority of Research Park employees eat within their work but when they leave for lunch they drive.

87 percent bring lunch from home or eat within their place of work. For those who do not, 71 percent drive to lunch outside the park, with the rest walking or biking to lunch within the park. In general, non-U of U workers are more likely to stay and eat within work, perhaps because of the prevalence of cafeterias. Few commercial lunch options exist in the park and even fewer just outside it. 25 percent say more lunch options in Research Park would make them walk or bike to lunch.

Intraday work trips numerous and are concentrated in a few key destinations.

High numbers of trips occur between Research Park and the main U of U campus (24 percent go at least 3-4 times per week), the U Medical Center (20 percent of respondents go there at least 3-4 times a week), downtown Salt Lake City (14 percent go 3-4 times a week), and other Research Park destinations. These add up to some 12,000 daily trips to these locations.

Many of the intraday work trip destinations are very close but employees drive there.

Only 13 percent of trips to the U main campus or Medical Center are by transit. 62 percent of trips to the main U campus are by single-occupant vehicle. Nearly half of all trips within Research Park are drive-alone. Network factors could be influencing this, including poorly connected sidewalks, circuitous shuttles, and the barriers of Red Butte Creek and Fort Douglas.

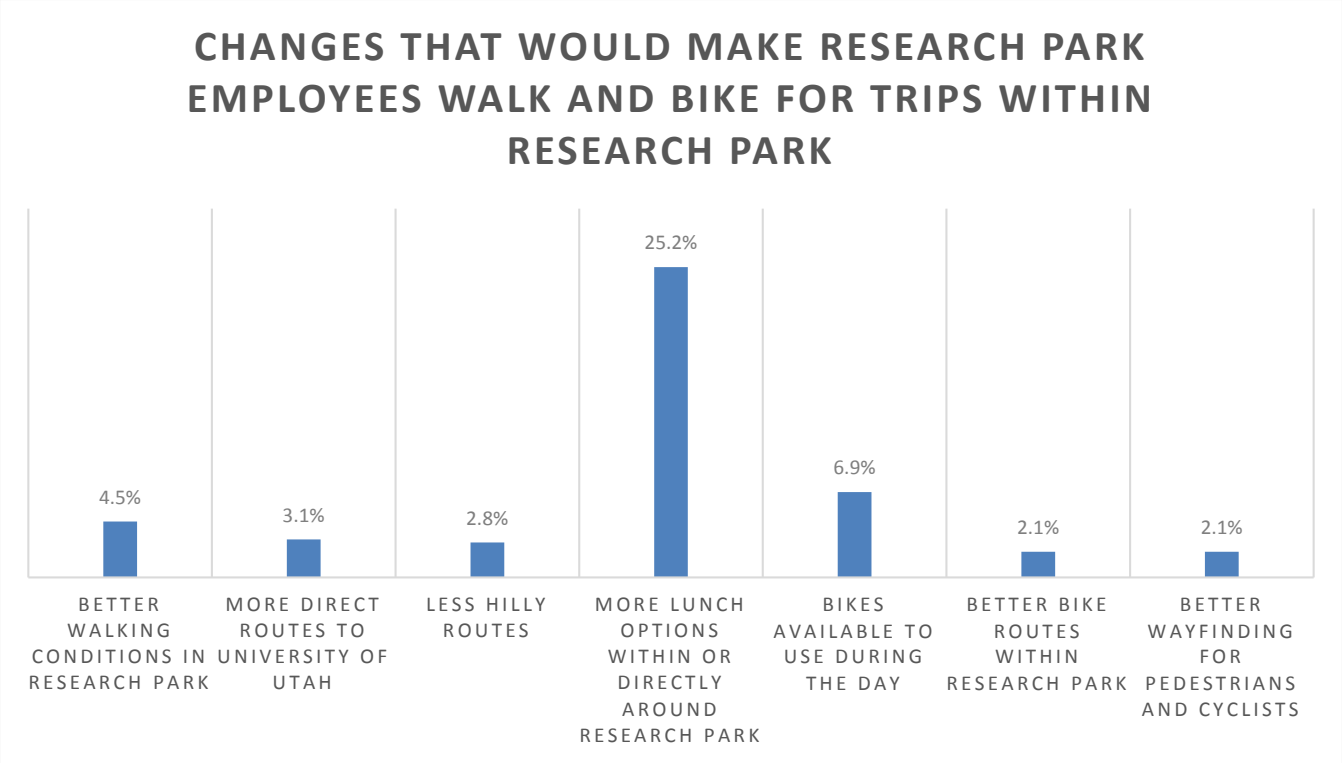


Figure 6: Changes that would make Research Park employees walk and bike for trips within Research Park

Transportation issues

Roadway congestion and time are the biggest problems faced by Research Park commuters.

40 percent said congestion and 30 percent said time.

Cost is a significant issue for specific groups.

While only 7 percent say cost is the biggest transportation problem they face, this could translate to 700 people. Cost is a bigger issue for non-U of U employees – 1/3 said it was a factor in not taking transit. Cost is also a major issue among specific geographic groups, such as those living north of Salt Lake Valley.

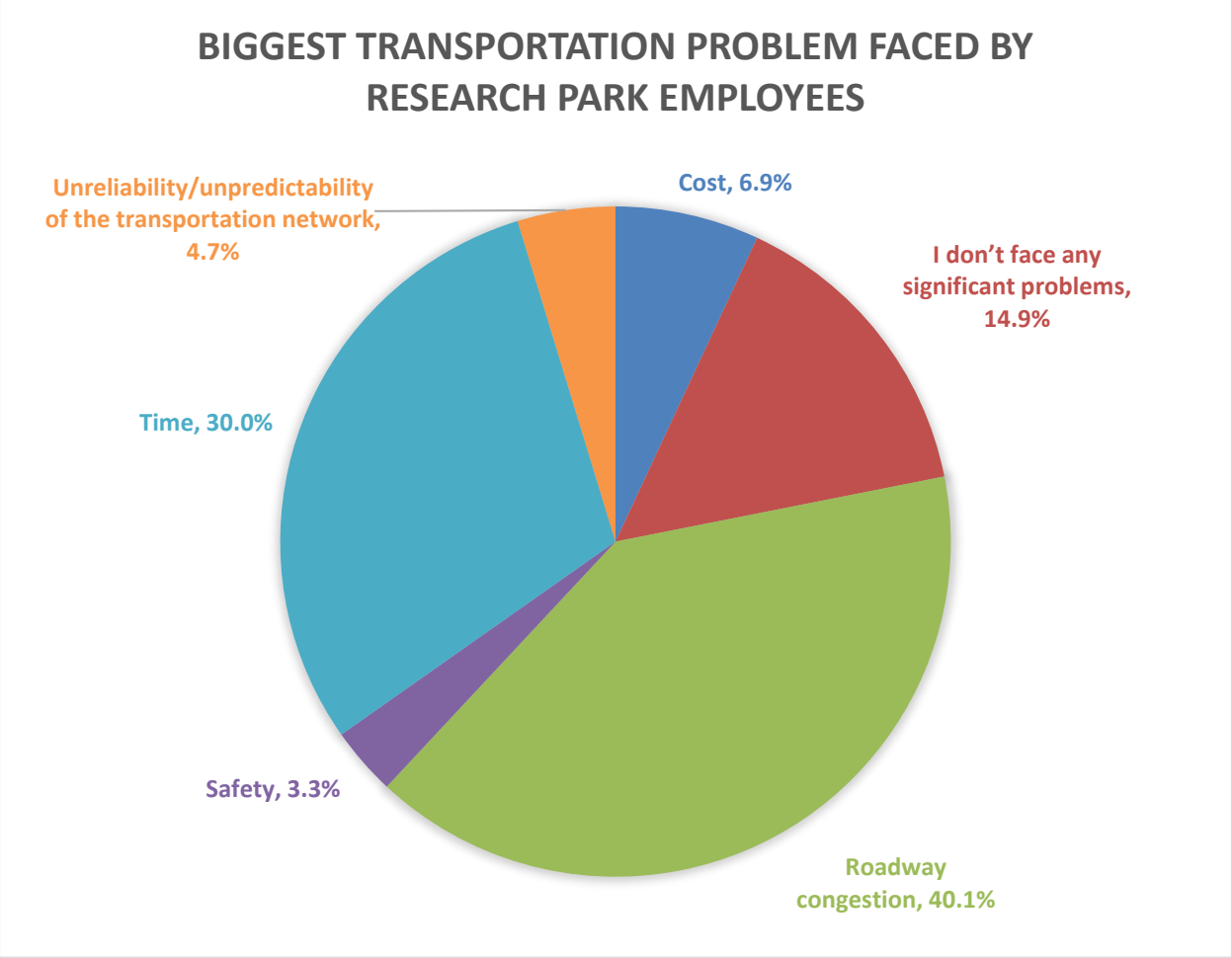


Figure 7: Biggest transportation problem faced by Research Park employees

Transportation programs

Not all commuters are aware of programs and even fewer use them.

In general about half of non U of U employees are aware of transportation programs but about 1 in 10 use them. In general about 3/4 of U employees are aware of transportation programs but about 40 percent use them.

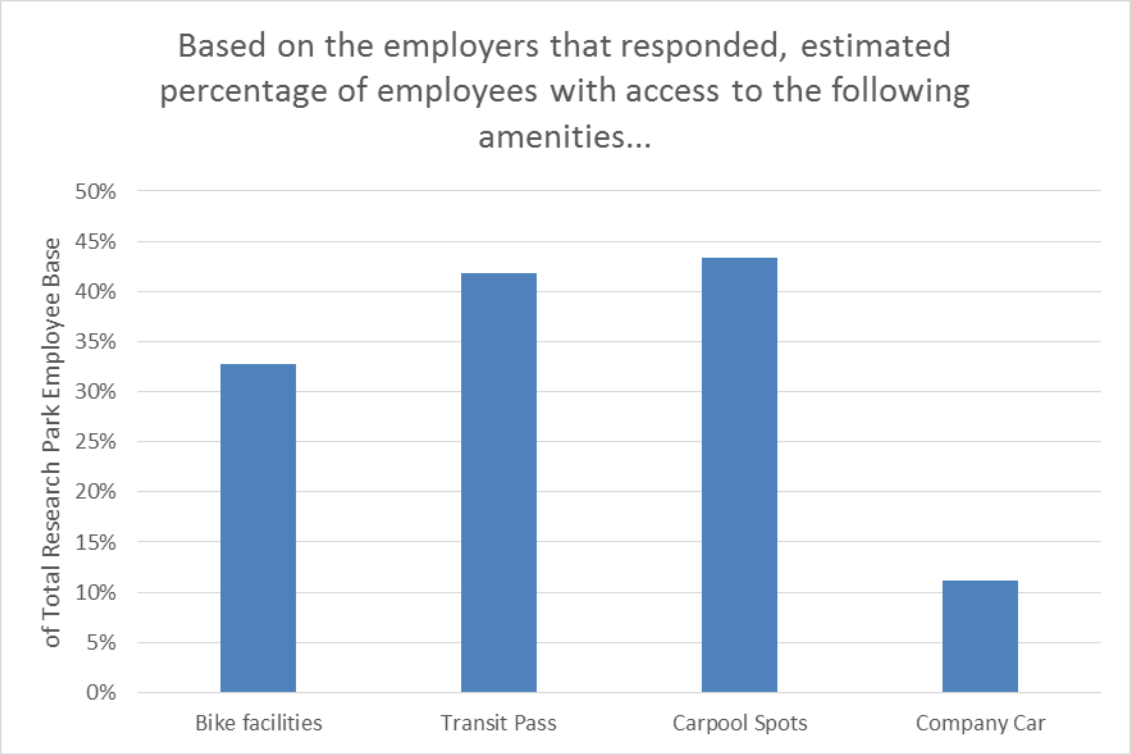


Figure 8: Percentage of Research Park employees with different types of transportation benefits through their employer

General vehicle findings

The lack of entry points to Research Park leads to the concentration of traffic along a few major corridors and intersections.

Drivers can enter Research Park only at three points, and only two are easily accessible from major streets, which helps to concentrate traffic at the Wakara/Foothill, Sunnyside/Arapeen, and Foothill/Sunnyside intersections.

Many traffic failures are internal to Research Park.

Two of the worst intersections at peak times are Arapeen / Chipeta (failing at LOS F) and Wakara / Chipeta (close to failing at LOS D). These congested intersections reflect roughly 7,500 workers arriving and leaving at the same time with limited entry / exit points to Research Park, with a coarse network within the park as well.

Foothill Drive occupies a dominant place in Research Park vehicle commutes.

7 in 10 Research Park drivers use Foothill Drive. This was significantly higher for non-U of U employees.

Overall, parking is easy to find for employees.

Despite the concern expressed by employers over parking, especially as some employers grow rapidly, in the survey nearly 3 in 4 people identifying as drivers (72 percent) said parking was “very easy” to find.

Carpooling is a popular option among those with longer commutes.

The length of commutes, congestion, and uniformity of routes have led to 8 percent of trips to be taken by carpool, and up to 14 percent of trips for specific groups.

General transit findings

Research Park employees are open to taking transit.

While the overall transit mode share of commute trips taken by survey respondents was 6.4 percent, a larger segment of Research Park employees identify as transit riders. Roughly 1 in 5 survey respondents identified as a “transit rider,” in their commute highest in U of U employees from north of Salt Lake City where it was a third. In general, higher with U of U employees. Only 10 percent say they would not take transit. This contrasts to some degree with anecdotal information form some of largest non-University employers who describe a lack of interest among employees in taking transit.

The free U of U transit pass makes a difference.

Comparable U peak commute groups are 5 to 10 percentage points higher than non U groups.

Research Park transit riders do not favor one transit stop, station or hub.

There was no single popular transit stop or station among transit riders. South Campus TRAX station is the most popular station, with nearly 1 in 5 transit riders using it. Research Park bus stops were the most popular stop choice overall with 25 percent of riders using them.

Transit is too far from home and/or work for Research Park employees.

Roughly half of survey respondents identifying as transit riders said the biggest problem with transit access is the length of the route to transit, while 52 percent of all survey respondents said either that transit not close enough either to where they live or work was the limiting factor for their choice of not taking transit.

TRAX access in particular is difficult.

Access from the TRAX stations at the U is confusing, indirect, inconvenient, and unsafe.

Transit is not direct enough for Research Park employees.

The most popular improvement that would make people take transit was fewer or no transfers. With time being the most important mode choice factor, for many employees, especially those in Salt Lake Valley, there was no time-effective or direct transit option to Research Park.

Neither the UTA nor U of U campus shuttle network is optimized for Research Park.

Long distance commuters are more likely to take the campus shuttle as a first or last mile solution, but the shorter distance commuters tend not to take it. In addition shuttle stops may be too closely spaced, slowing down the service; stops are distributed evenly over the park, and do not always match where large numbers of employees are clustered.

The appeal of transit also largely depends on the location of a use within Research Park.

For example, Natural History Museum employees likely constitute a large portion of this group but have no good way of accessing transit. Employers say east side locations are bad for transit service.

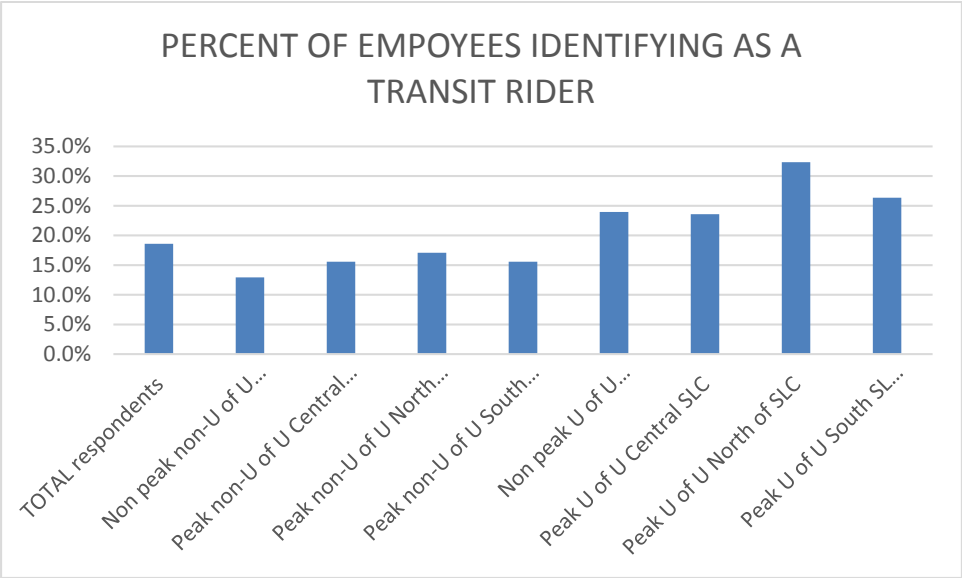


Figure 9: Percent of employees identifying as a transit rider

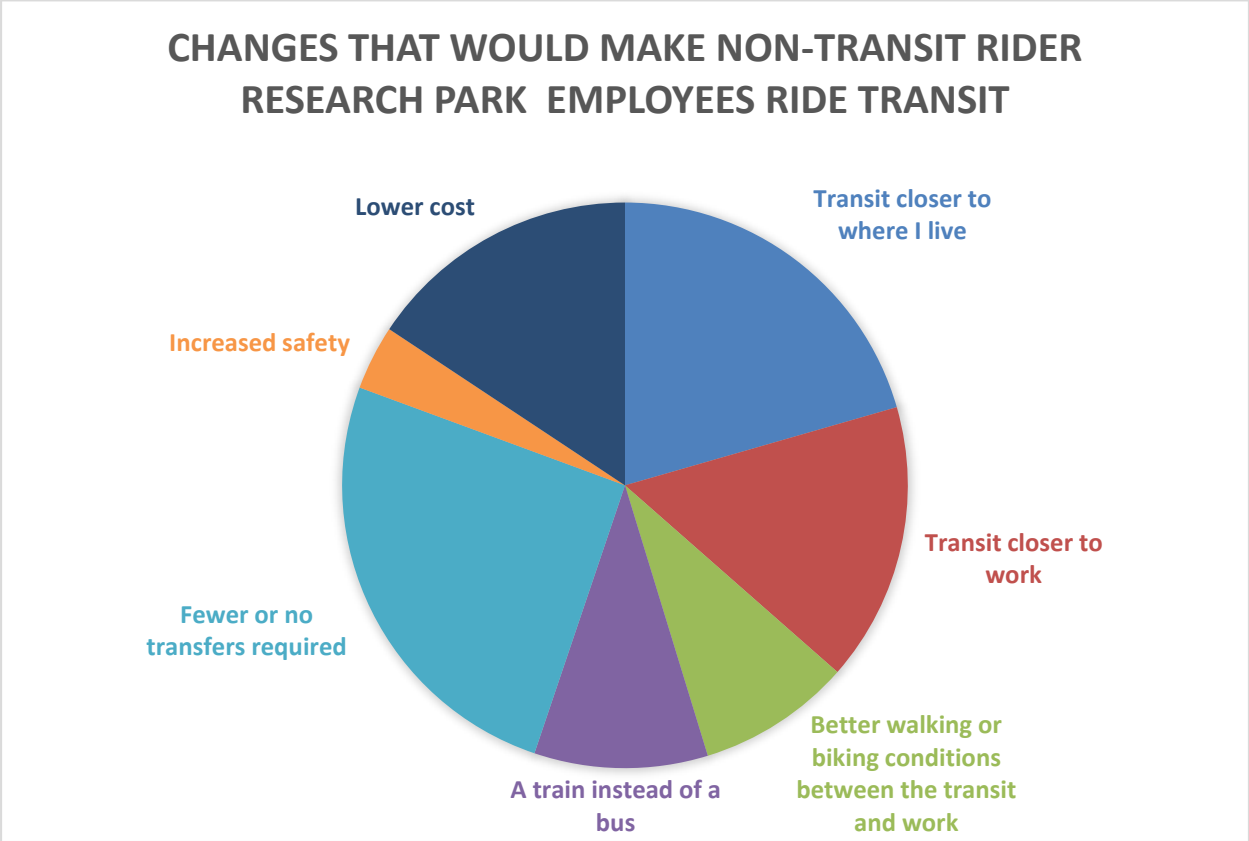


Figure 10: Changes that would make non-transit rider Research Park employees ride transit

General bicycle findings

Relatively high rate of bicycling for the commute

Roughly 1 in 10 identifies as a cyclist in their commute, much higher than rates of cycling in Salt Lake City or the Wasatch Front.

Cyclists tend to reach Research Park from Sunnyside and access it from the south.

Chipeta, Sunnyside and Arapeen are the most popular cycling streets. This may be in contrast to Foothill and Wakara, which received lower percentages.

Bike facilities exist, but still low bike compatibility

There are bike facilities within and leading to Research Park but streets with bike facilities are still evaluated as "low comfort," likely due to traffic issues.

Best bike compatibility is disconnected from Research Park

Streets in Fort Douglas are highly compatible for bicycles but are not the focal point for commuters and are disconnected from much of the Research Park network.

Lack of employer facilities

Few Research Park U of U departments seem to have official bike parking or showers available, however, anecdotally, employers say some new facilities will have racks and showers.

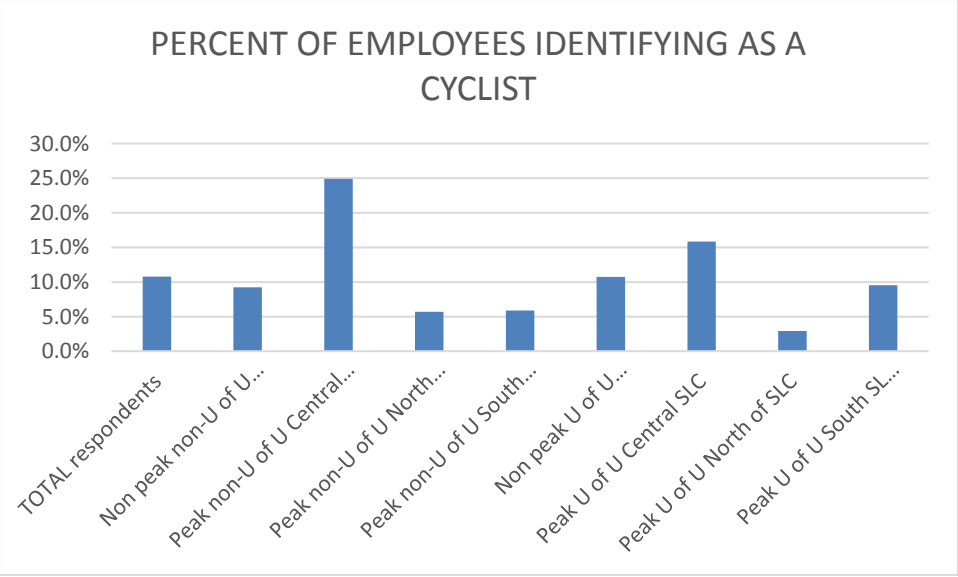


Figure 11: Percent of employees identifying as a cyclist

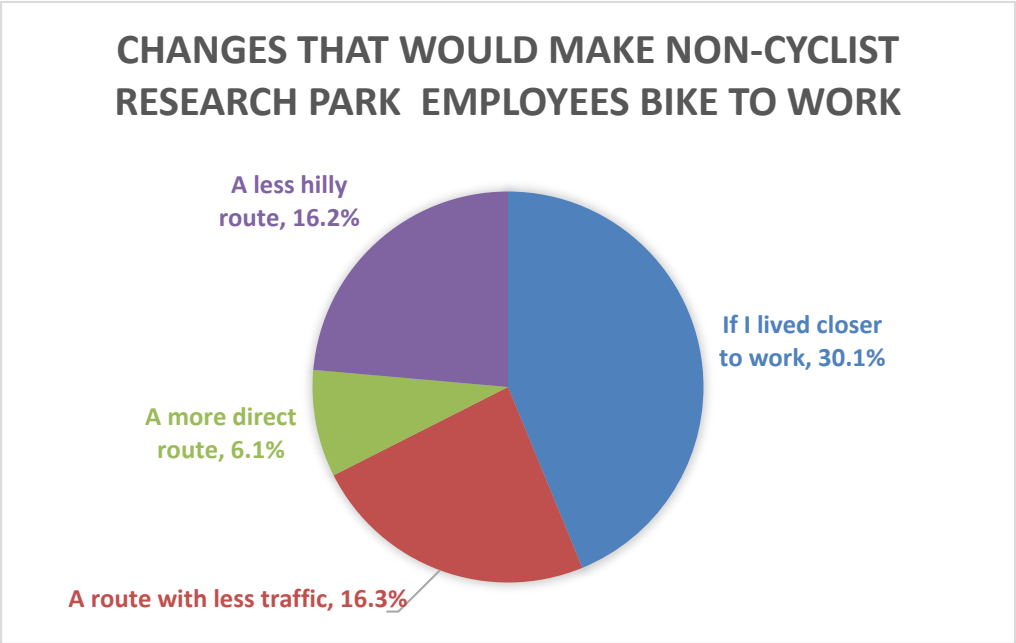


Figure 12: Changes that would make non-cyclist Research Park employees bike to work

General pedestrian findings

There is a relatively high rate of walking happening as part of the commute.

14 percent of workers identify as a pedestrian in their commute, while 6 percent of commutes involve walking, mostly walking from transit (excluding walking from parking lots to front doors of buildings).

Wakara Way is a double-edged sword for pedestrians.

They need to use it for lack of other streets but the congestion and lack of facilities makes it unappealing as a route.

Congestion creates safety problems for walkers.

The pinch points and congestion for vehicles at peak hours – and the vehicle-oriented design of the Park - create safety hazards for pedestrians and cyclists accessing transit stops. Even walking to stops a few hundred feet away can be daunting because of walking routes through parking lots and across busy streets.

Walking from adjacent areas is challenging.

Walking to Research Park from the main University of Utah campus is both confusing, inconvenient, and unsafe.

A minority of trips within Research Park are made on foot.

Only 41 percent of intra-day work trips within Research Park are made by foot. These trips are challenged by a poor and disconnected pedestrian network.

Opportunities

As was stated earlier, four major themes for action emerge from our findings. To recap, they are:

- Collectivize the experience and culture of transportation within Research Park
- Continue to manipulate the economics of transportation in Research Park, and include parking.
- Focus resources to create attractive transportation non-single-occupant vehicle choices on key corridors leading to Research Park.
- Improve connectivity for all modes, but especially pedestrians and bicyclists, within Research Park and connecting to key adjacent areas.

The following opportunities "flesh out" these themes in more detail to provide overall opportunities. For opportunities tailored to specific groups and trips to, from and within Research Park, see the "User Trips" section.

- Develop a transportation management group to coordinate Research Park transportation issues and programs, and to pool the resources of the University and employers to create common transportation demand management programs and resources for employees.
- Coordinate a parking strategy. The perception of parking as a limited amenity stems from the individualized approach to providing parking. More coordinated parking would balance out different peaks of use, improve traffic flow, address pedestrian and bicyclist safety issues, and provide better information about the utilization of parking. While some larger employers are forced to lease parking from others, in general, employees say there is enough parking, so sharing a collective supply could help everyone.
- Consider the pricing of parking: the free, easy to find parking appears to be a factor in employees' commute decisions; the lack of a price of parking distorts the true costs of single occupant vehicle trips to this regionally important and concentrated employment center. Putting a price on parking would shift more trips to transit, as long as alternative transportation options improve. Pricing parking must be undertaken in coordination with other strategies.
- Make a collective decision to cap parking as growth occurs. As Research Park grows, one easy way to limit transportation demand for single occupant vehicle trips is to begin reducing or eliminating the amount of new parking provided.
- Consider developing one central transit hub with good pedestrian access and wayfinding to it, as well as bicycle parking and commercial/food aspects.
- Improve key transit routes tailored to the geographic groups. These include:
    - 228
    - 473/455
    - TRAX Red Line
- Provide key missing/lackluster routes tailored to the geographic groups –
    - Sunnyside/800 S
    - East bench to south
    - Dedicated space on Foothill
- Consider a circulator shuttle just within Research Park or hitting main campus and Medical Center to capture more of the approximately 10,000 trips a day occurring among these places.
- Distill and relocate both UTA and campus shuttle stops to where concentrations of employees are located; coordinate UTA and shuttle service at the same stops.
- Improve and connect pedestrian infrastructure within Research Park. Connect segments of sidewalk and develop a plan for a connected network of primary pedestrian routes into and through the park, and improve the quality of these routes.
- Create a basic pedestrian route to / through Fort Douglas to Medical Center / Main Campus; currently there is no dedicated pedestrian infrastructure making this basic connection.

- Make more and better pedestrian connections out of Research Park, especially to Medical Center and main U of U campus.
- Develop a transit pass program for non- U of U commuters – the survey shows that the pass program makes a difference.
- Focus resources on serving the largest employers in Research Park – ARUP, Biofire, etc., with transit, carpool, bicycling, pedestrian infrastructure.
- Focus on the needs of the 25 percent of employees who commute at peak time, work for a non- U of U employer, and live in Salt Lake Valley outside of Salt Lake City – and are extremely likely to drive on Foothill Drive.
- Leverage Hive Pass program: Promote it to the nearly 30 percent of Research Park workforce living in Salt Lake City, and explore expanding the Hive Pass to Salt Lake workers.
- Develop flat bike routes among Research Park and key adjacent destinations such as main campus and Medical Center.
- Promote and enable biking to transit as a way to extend range of transit services; provide more secure bike parking in Research Park, perhaps in a potential transit hub.
- Develop better driving routes from central Salt Lake City neighborhoods via main U of U campus and Medical Center to remove pressure from limited park access points.
- Redevelop adjacent areas in a way that creates more gateways to Research Park and removes pressure on key streets such as Foothill and Sunnyside.
- Add more food services to Research Park, especially in a concentrated "center," which could be located at a potential transit hub.
- Blend together the cultural district and Research Park, perhaps so that they share the potential transit hub.
- Consider more mixing of uses in future development plans for Research Park.
- Consider operational changes in Research Park such as signalizing the intersection on Arapeen and Chipeta, which is currently failing in the peak.
- Extend Arapeen across Red Butte creek and on to South Campus light rail station – this connection would help vehicles as well as pedestrians and cyclists.
- Consider developing a pedestrian and bike path along Red Butte creek as an alternative to Wakara and a connection to points west under Foothill; could be part of Transvalley Corridor network.
- Develop more end-of-trip bike infrastructure such as bike parking/storage and showers, in largest employers and for collective use of Research park workforce.
- Target marketing/promotion of pass and other programs to specific groups and how the programs would benefit them.
- Leverage the openness to alternative transportation (only 10 percent would not consider transit). Promote alternative transportation commutes in conjunction with other strategies listed here.

User-Trips

In order to articulate potential solutions to transportation problems in Research Park, we divided up the park's transportation activity into distinct "user-trips." User-trips are a defined trip taken by a set of people with common relevant characteristics. To develop these user-trips for Research Park, we first distinguished among different types of trips: Commutes, lunch, intra-day work trips, and visits. For commute trips, we further distinguished:

- whether or not the commuter traveled at one or both of the peak times, defined as 7 a.m. - 9 a.m. and 4 p.m. – 6 p.m.;
- was affiliated with the University of Utah; and
- where they live, i.e., where they are traveling from on the commute. We divided up all greater Wasatch Front metro area Research Park commuters into three geographical areas based on the most likely routes to Research Park. We predicted that while central Salt Lake City commuters would have a range of options, those coming from north of Salt Lake would be tied together by their likely use of surface streets to get to Research Park, while those coming from south, east, and west of Salt Lake would likely use Foothill Drive to access Research Park.

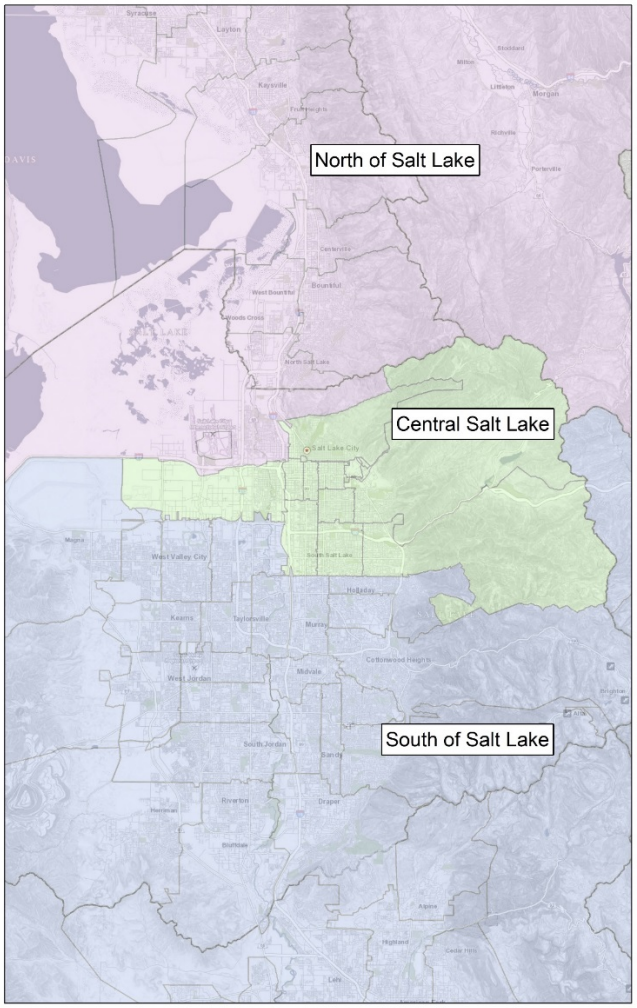


Figure 13: Geographical areas of commuters defining user trips.

For this study, based on these distinctions, we defined 11 user-trips. They are:

- Full-time employee peak hour commute by University of Utah-affiliated employee from central Salt Lake City
- Full-time employee peak hour commute by University of Utah-affiliated employee from north of Salt Lake
- Full-time employee peak hour commute by University of Utah-affiliated employee from Salt Lake Valley outside of Central Salt Lake City, and points south, east, and west
- Full-time employee peak hour commute by non-University of Utah-affiliated employee from central Salt Lake
- Full-time employee peak hour commute by non-University of Utah-affiliated employee from north of Salt Lake Valley
- Full-time employee peak hour commute by non-University of Utah-affiliated employee from Salt Lake Valley outside Salt Lake City, and points south, east and west
- Off-peak hour commute by employee or volunteer
- Intra-day work trip within Research Park
- Intra-day work trip to key out-of-park destination
- Lunch trip by Research Park employees
- Visit to Research Park

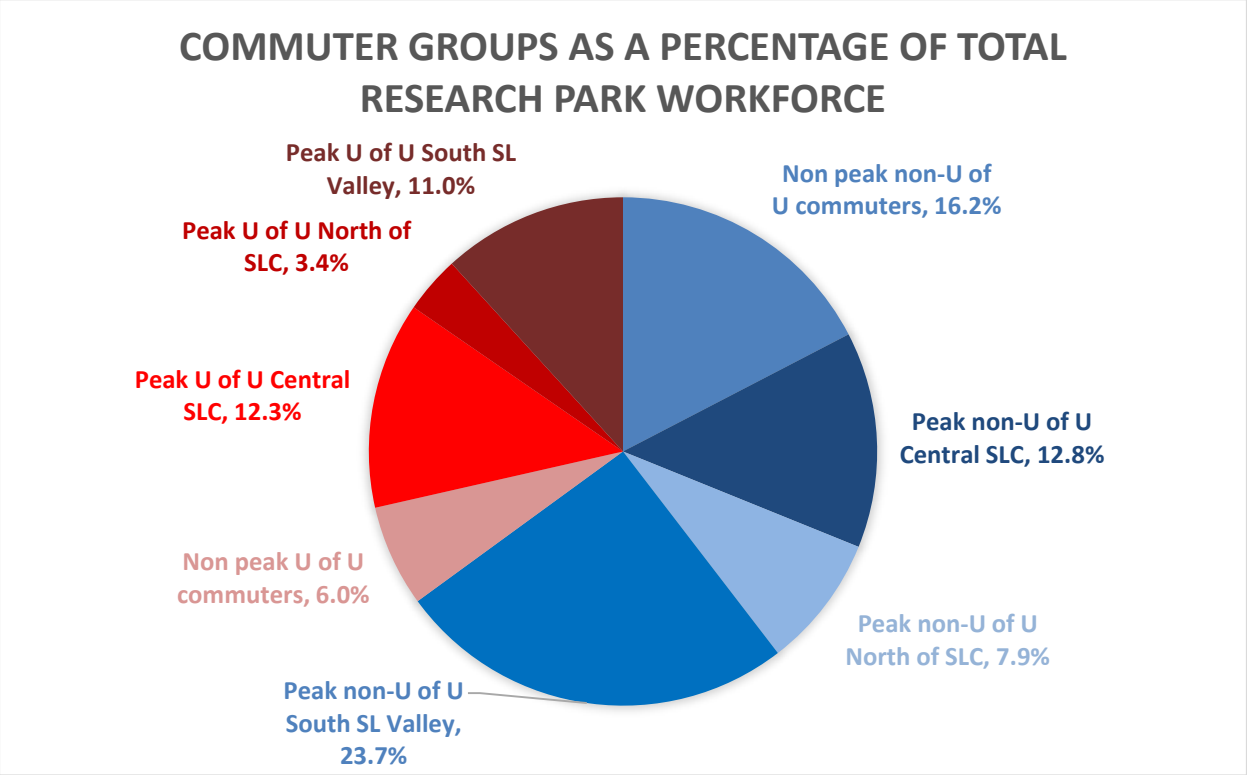


Figure 14: Commuter groups as a percentage of total Research Park workforce, based on survey results

The following discussions of each user trip build on the general findings discussed above to offer a more streamlined analysis of the opportunities to manage transportation demand in Research Park.

Full-time employee peak hour commute by University of Utah-affiliated employee from central Salt Lake City

Approximate number of weekday round trips: 1,135

Timeframe: 7 a.m. - 9 a.m. / 4 p.m. – 6 p.m.

User-trip overview: This is a significant portion of peak commuters. 43 percent of U of U commuters are coming from this area. While vehicle commutes are shorter, cheaper, and easier to avoid traffic, this commute is also attractive for transit and bicycling because of the relatively high amount of options within Salt Lake City (transit and bicycling) and the shorter distance (bicycling). The members of this group all have transit passes, making taking transit more economically viable.

Assets:

- **High transit mode share**: 10 percent take transit (nearly double the overall Research Park average), and nearly 1 in 4 identify as a transit rider. Over 90 percent of transit riders in this group walk once they arrive in the station.
- **Range of transit options**: Generally this area of commute origins has relatively good transit options – TRAX red line direct trips and local buses going to the U or Research Park. The campus shuttle, 228, TRAX Red Line, and Route 21 are the most frequently used transit for this group, all capturing 25-35 percent of this group's riders.
- **U transit pass**: The U of U transit pass makes transit economically attractive and creates the potential for more riders.
- **High bike mode share**: Nearly 4 percent bike to work, the highest of the peak commute U of U user groups. 15 percent identify as cyclists. As a group Central Salt Lake City has the highest cycling rate but the U of U group is much less than the non-U of U.
- **Most likely to be pedestrian**s: This group had the highest rate of identifying as a pedestrian of any group (22 percent). Few are able to commute to work by walking in Research Park, but this is likely the group to do it – for those who live in East Bench neighborhoods or students counted in the FTEs could likely walk from student housing on campus.
- **Bike**-transit combination: Although few in this group bike to transit, it (especially TRAX) could be a good alternative to the car (and the hills up to Research Park) for this group, with the free transit pass.
- **Short distances to work**: Distances within 5 miles create potential for bicycling and even pedestrian commutes – 3 percent of this group walk to work, but this may reflect students.
- **Low commute time**: This group had the lowest overall commute time (16 minutes); over 50 percent are within 10 to 20 minutes.
- **Social conscience**: 1 in 10 identified societal or environmental concerns as the dominant factor in mode choice, much higher than any other group.
- **Sunnyside concentration**: There is a concentrated focus on Sunnyside Avenue for this group, allowing for the possibility of leveraging that concentration to better alternative transportation choices on this corridor. Cycling for this group is concentrated on Sunnyside Avenue, with nearly 70 percent of Central Salt Lake cyclists using this street; most seem to bike up Sunnyside to Arapeen and turn into the park.

Challenges:

- **Short, easy commutes**: Short distances and range of routes to Research Park make driving an easy option for many in this group. This group faces the fewest transportation problems and may be hard to push toward alternative solutions – however, it still must face the congestion at the entry to and within the park the other commuters do.
- **Still face congestion at entry**: Despite the short commutes, these commuters will still face challenges accessing Research Park via the limited number of access points.

- **Bus route termini**: Most of the local bus transit routes available to Salt Lake commuters end at the University of Utah, not Research Park. The potential for a one-seat trip directly to Research Park is less likely.
- **Sunnyside congestion**: Over half of this group takes Sunnyside Avenue and contribute to that street's congestion. Sunnyside-Foothill intersection is running at LOS F.
- **Few good bike routes**: Even for this group, there are few good bike routes - Sunnyside is the dominant choice because few others exist. The steep climbs necessary for most commuters to reach their jobs in Research Park will always be an obstacle to a bike commute.

Opportunities:

- Extend local bus routes from nearby, relatively dense Salt Lake City neighborhoods directly to Research Park – even if it means reducing number of stops.
- Create transit gravity by building a Research Park Hub that could lead more local routes to connect to Research Park directly.
- Create a transit route on 800 South/Sunnyside Avenue as part of the Transvalley Corridor that would connect directly to a Research Park hub.
- Develop better driving routes from central Salt Lake City neighborhoods via main U of U campus and Medical Center.
- Promote biking to transit as a way to extend the transit system for this group. The transit-bike mode share for the non-U of U central SLC group provides a goal.
- Improve pedestrian and bicycle access from TRAX – primarily South Campus station – to Research Park.
- Improve bicycle connectivity to Research Park from central Salt Lake neighborhoods via main campus and medical center.
- Leverage environmental/societal inclination and transit pass to increase transit ridership.
- Improve Sunnyside Avenue bike corridor, the most popular bike route of this group – which makes the Transvalley project very relevant to Research Park.
- Extend the U of U shuttle system into neighborhoods.

Full-time employee peak hour commute by University of Utah-affiliated employee from north of Salt Lake

Approximate number of weekday trips: 356 round trips

Timeframe: 7 a.m. - 9 a.m. / 4 p.m. – 6 p.m.

User-trip overview: This isn't a large group but has some interesting transportation characteristics. Its mode split tends toward alternative modes - it has the lowest "drive alone" share, one of highest carpool shares (along with other "north" group), and by far the highest transit share of 15 percent. At the same time, this group has the highest average a.m. commute time (43 minutes, 15 minutes more than average) and p.m. commute time (47 minutes, also 15 min. more than average) Nearly 1 in 3 have a commute time in the p.m. of over an hour. Roughly 3 in 4 drivers in this group use 400 South and access the park by Wakara Way. Cost is a significant factor in choice of mode for this group.

Assets:

- **High carpooling rate**: 12 percent of trips made by this group are by carpool.
- **High transit ridership:** 15 percent of trips by this group are by transit. A third call themselves transit riders for the commute, and Only 6 percent of this group said they would not take transit, the lowest of any group.
- **Dominant transit route:** The 473 is dominant route (used by 73 percent of transit riders in this group), with 455 also popular (36 percent).

- **Use of campus shuttles and Research Park stops:** This group has a high use of campus shuttles (23 percent). This group has the highest rate of using bus stops within Research Park.
- **Transit passes: The** U of U transit pass makes transit economically attractive and creates the potential for more riders.
- **Transit coupled with walking**: One of highest rates of walking (21 percent); Walking is largely walking from/to transit.
- **Concentration of commuters along one route**: 75 percent of drivers use 400 South and 82 percent use Wakara Way. All likely use I-15 or Legacy Parkway.
- **Openness to using alternative routes into Research Park**: A relatively large portion of drivers use Fort Douglas Blvd. and Capecchi. (16 percent)

Challenges:

- **Long, difficult route to work**: The group must contend with long distances around the mountain and through downtown Salt Lake City, reflected in the high commute time.
- **Lack of good direct fast transit route**: Despite the relatively high transit ridership, it could be higher with a more direct transit route; the 473 takes a winding route to Research Park. 50 percent say fewer transfers would make them take transit.
- **Connection to the rail network**: Although FrontRunner is a fast rail transit alternative along the spine of the Wasatch Front north of Salt Lake, there is no direct connection between FrontRunner and Research Park. Meanwhile, relatively few use TRAX red line (18 percent) because of a good connection from north of Salt Lake to the front door of Research Park.
- **Not cyclists**: Bicycling does not make sense for this group. It has the lowest rate of cycling (2.6 percent); 50 percent said they would not bike.
- **Lack of use of employer programs**: The major program for this group is the U's transit pass program. This group is largely aware of the program – at 86 percent, it has the highest awareness - but only 40 percent take advantage of the programs.

Opportunities:

- Promote and facilitate carpooling through the University and/or UTA.
- Create more carpool infrastructure such as centralized carpool parking.
- Leverage carpooling proclivity to promote UTA vanpools.
- Consider carpool rendezvous point at central Davis County location
- Leverage the high transit ridership of this group to streamline service -
    - Streamline 473 to access Research Park directly and faster – 73 percent of transit riders using it.
    - Consider direct FrontRunner – Research Park express bus or University shuttle
- Reduce commute time of transit to attract more and more riders.
- Promote biking to transit to extend transit range.
- Promote U transit pass program in terms of advantages for this group – cost effectiveness, productivity on a long commute, etc.
- Improve pedestrian connectivity within Research Park (from bus stop to place of work), especially Wakara and Chipeta.

Full-time employee peak hour commute by University of Utah-affiliated employee from Salt Lake Valley outside of Central Salt Lake City and points south, east, and west

Approximate number of weekday trips: 1,153 round trips a day.

Timeframe: 7 a.m. - 9 a.m. / 4 p.m. – 6 p.m.

User-trip overview: This large group behaves generally as an average of the entire group of Research Park commuters, but the defining characteristic is the extreme use of Foothill Drive. 83 percent of this group's drivers use Foothill Drive. Because of the availability of the free transit pass, this group has above average ridership of transit (8 percent of trips), the focal point of which is the TRAX Red Line.

Assets:

- **Concentration of transit riders on the Red Line** – 62 percent of transit riders use it. The most popular TRAX stop is South Campus. Meanwhile, 17 percent identify as commute pedestrian (higher than average)
- **Concentration of travelers on Foothill** – 83 percent of drivers in this group use Foothill, which creates congestion, but also a potential market for a shift to carpooling or transit.
- **High use of campus shuttles**: This group has the highest rate of using campus shuttles – approximately 50 percent of transit riders use the shuttles.
- **Transit pass**: Availability of the transit pass pushes this group's transit usage (8 percent of commute trips) to above average for Research Park.

Challenges:

- **Foothill drive congestion**: Because over 4 in 5 drivers use Foothill, the congestion on this corridor is the major factor affecting their commutes.
- **Longer than average commute time**: 35 minutes (AM) and 39 minutes (PM).
- **Last mile**: Accessing work from the TRAX stations (South Campus is the most popular) is difficult, and commuters seem to end up walking on Foothill to get to Wakara.
- **Lack of good Eastside transit option**: There is no fast, direct north-south transit option from East side communities to reach Research Park.
- **Transit not close to where people live**: **Group wants transit closer to where they live (36 percent)**
- **Difficult bicycle options**: barriers to cycling to the south of Research Park. Half of cyclists in this group use Foothill Drive.

Opportunities:

- Create good fast north-south transit service along the east bench, including way to bypass traffic on Foothill.
- Streamline shuttles from TRAX South Campus and other stations to Research Park.
- Improve pedestrian connections from TRAX South Campus. This group has the highest use of Red Line and a desire to make transit closer to work.
- Promote cycling as an extension of transit, a way to get transit "closer to where I live," cited by 37 percent of this group as a reason they didn't take transit.
- Better park and ride opportunities in SL Valley communities.
- Make transit closer to workplace – make transit feel closer to places of work.
- Improve Wasatch Drive bike route to connect through zoo or golf course into Research Park, to get cyclists off Foothill.
- Improve alternate routes besides Foothill
- Improve carpooling on Foothill – consider park and ride at Parley's area.

Full-time employee peak hour commute by non-University of Utah-affiliated employee from central Salt Lake

Approximate number of weekday trips: 1,347 round trips a day.

Timeframe: 7 a.m. - 9 a.m. / 4 p.m. – 6 p.m.

User-trip overview: This is a larger group than the U of U central Salt Lake commuters, but a smaller portion of the overall non-U of U "pie." Similar to their U of U counterparts, this group has shorter, cheaper, and easier commutes with a wider array of routes available. However, this group tends more toward bicycling as an alternative rather than transit, which makes sense given the lack of a U transit pass. This group uses transit less than the average Research Park worker and, however it has the highest rate of taking transit then biking (2.3 percent) and of biking the whole way (7 percent of trips, equaling nearly 100 full-time bike commuters). It is possible that biking is the low cost alternative for this group where for the U workers it was transit.

Assets:

- High rate of bicycling: Highest Transit then bike (2.3 percent) and Highest bike the whole way (7 percent). 25 percent of workers in this group identify as cyclists – nearly double U of U Central SLC counterparts.
- Openness to bicycling: Among those who don't bike to work, this group is most likely to be open to biking to work
- Range of transit options: Generally this area of commute origins has relatively good transit options – TRAX red line direct trips and local buses going to the U or Research Park. The campus shuttle, 228, TRAX Red Line, and Route 21 are the most frequently used transit for this group, all capturing 25-35 percent of this group's riders.
- Short distances to work: Distances within 5 miles create potential for bicycling and even pedestrian commutes.
- Low commute time: This group had the lowest overall commute time (16 minutes); most are within 10 to 30 minutes. They are the least likely to say "time" is the biggest driver of mode choice.
- 228 Route: About half of transit riders in this group take the 228 route, which runs south on Foothill Drive to Holladay and Murray.
- Sunnyside concentration: Like the U of U Central Salt lake City workers, there is a concentrated focus on Sunnyside Avenue for this group, allowing for the possibility of leveraging that concentration to better alternative transportation choices on this corridor. Cycling for this group is concentrated on Sunnyside Avenue, with nearly 70 percent of Central Salt Lake cyclists using this street; most seem to bike up Sunnyside to Arapeen and turn into the park.
- Large clusters of employees: The non-U of U employees in Research Park aggregate into many very large employers, which creates the opportunity to leverage these concentrations with transportation programs and services.
- Open to overall experience: Somewhat similar to the U of U central Salt Lake City commuters, this group is most likely to say their mode choice is driven by the overall experience – 7 percent chose this answer. This could be the reason for large bike mode share.

Challenges:

- Transit is a tough sell: With the lack of a pass program, it is hard to compete with car for these commuters. Overall less likely to take transit than average worker – in contrast to Central SLC U of U employees. About 8 points lower on "are you a transit rider" question.
- Lack of Sunnyside route: As for the U of U Central Salt Lake City group, Sunnyside Avenue constitutes the most important corridor for drivers and cyclists, however there is no transit route along this street to Research Park to compete with the other modes.
- Easy parking: For this group, easy to find free parking creates a barrier to transit use as much as anything else. While the congestion experienced by other geographical groups demonstrates the costs of a vehicle commute to a crowded regional employment center, this costs is hidden for more local commuters, largely because of the free parking.

- **Lowest commute times:** How does one compete with the short vehicle commutes that still contribute to the congestion and parking issues in Research Park?
- **Limited bicycling routes**: Nearly 2/3 of cyclists use Sunnyside while only 30 percent of cyclists take Wakara Way or Foothill.
- **Bicycling barriers**: For those open to bicycling to work but not yet doing it, the biggest thing that would make them bike to work is less traffic and less hilly routes.
- **Parking supply for larger clusters:** Despite the ease of finding parking for workers today, fast-growing companies that dominate the non-U of U portion of Research Park say they are concerned about running out of parking supply.
- **Lack of pedestrians:** Despite the proximity to Research Park, this group has a low rate of identification as a pedestrian.

Opportunities:

- Best opportunities for cycling: This group cycles the most; improving the whole cycling trip from beginning to end may get more commuters to join.
- Highest group saying overall experience is influencing their choice – could appeal to a good transit ride or bike ride.
- Improve safety and experience of alternative modes locally within Salt Lake City, especially adjacent to Research Park.
- Improve Route 228: a popular transit route for local Salt Lake employees
- Create transit route on Sunnyside going through the heart of Salt Lake City and going right to Research Park.
- Target largest employers to promote bike commutes.
- Target large employers to promote transit.
- Extend U shuttle into key neighborhoods.
- Create better bike route from north and west, involving U of U streets.
- Price parking to make auto commute less attractive – the ease of short drive and parking attracts this group to drive, but their single occupant trips still create the same problems as other groups.

Full-time employee peak hour commute by non-University of Utah-affiliated employee from north of Salt Lake Valley

Approximate number of weekday trips: 828 round-trip commutes.

Timeframe: 7 a.m. - 9 a.m. / 4 p.m. – 6 p.m.

User-trip overview: This group is much bigger (nearly three times the size) than the U of U commuters from north of Salt Lake City. While it faces many of the same struggles (it has the longest commute time of any non-U of U group), it behaves in different ways. In contrast to the U commuters form north of Salt Lake, this group rides transit at a below Research Park average rate, instead increasing its carpool rate to 14 percent of trips, the highest of any group. This group is most likely to say that cost is important – 13 percent say it is the biggest factor for their mode choice, and this group is most likely to cite cost as the most significant barrier to taking transit.

Assets:

- **High carpooling rate**: 14 percent of commute trips are made by carpool, speaking to the costly and long yet uniform route to Research Park around the mountain and through downtown Salt Lake City.
- **Concentration of commuters along one route**: Like with the U of U north of Salt Lake commuters, most drivers use 400 South and Wakara Way. All likely use I-15 or Legacy Parkway.

- Large clusters of employees: The non-U of U employees in Research Park aggregate into many very large employers, which creates the opportunity to leverage these concentrations with transportation programs and services.

Challenges:

- Long, difficult route to work: The group must contend with long distances around the mountain and through downtown Salt Lake City, reflected in the high commute time.
- Transit is not an attractive option: The cost and time taken by transit, as well as the lack of a good rail option, conspire to reduce the attractiveness of transit to these commuters.
- Commute time: 17 percent of this group have a commute of over an hour.
- Low pedestrian rate: This group is not used to walking because of low alternative transportation use rate.
- Cost conscious: Cost is an issue for these commuters more than anyone else
- Lack of use of programs: Even without the U of U's free transit pass program, non-U of U employers still offer a variety of transportation TDM programs. This group appeared to be far more aware of programs their employers offered and more likely to take advantage of these programs but still 40 percent of these commuters did not know about the programs and 86 percent did not take advantage of them.

Opportunities:

- Work with largest employers to promote more carpooling – formalize carpooling systems.
- Work with largest employers to make transit cheaper.
- Streamline transit options from north of Salt Lake, whether 473/455 and Front Runner connection.
- Create cost incentives for carpooling and transit.
- Promote telecommuting because of long commutes.

Full-time employee peak hour commute by non-University of Utah-affiliated employee from Salt Lake Valley outside Salt Lake City and points east, south and west

Approximate number of weekday trips: 2,489 round trips a day.

Timeframe: 7 a.m. - 9 a.m. / 4 p.m. – 6 p.m.

User-trip overview: This is by far the largest group of commuters; it is over twice the size of most other groups and about 25 percent of the Research Park workforce. Like its U of U counterpart, the most dominant trait of this group is its use of Foothill Drive – 84 percent of drivers use it. This group has a mix of transportation characteristics – while transit use is average for Research Park, rates of carpooling are high (11 percent of trips). In some senses it behaves like the north of Salt lake group without the extreme difficulty of that commute. Perhaps because of the challenges on Foothill Drive, this group is most likely to choose roadway congestion as its biggest transportation challenge (55 percent chose it), and time as the major factor in their mode choice.

Assets:

- High rate of carpooling: Carpooling is popular among this group, with 11 percent taking
- Openness to transit: Transit is average – 5 percent of trips – but this group is open to using transit if circumstances change. Only 10 percent say they would not take transit to work.
- Concentration of travelers on Foothill – 84 percent of drivers in this group use Foothill, which creates congestion, but also a potential market for a shift to carpooling or transit.
- Large clusters of employees: The non-U of U employees in Research Park aggregate into many very large employers, which creates the opportunity to leverage these concentrations with transportation programs and services.

Challenges:

- Roadway congestion: 84 percent of drivers use Foothill Drive, which is congested at several major intersections. 55 percent of this group cites roadway congestion as their biggest transportation problem.
- Lack of transit pass: This group is overall slightly less likely to be a transit rider (16 percent as opposed to 19 percent on average). This is 10 percentage points lower than U counterparts.
- Lack of good transit options on east side: TRAX red line is dominant transit route, which caters to west side or central valley – nearly half of transit riders take it. 228 and campus shuttle also popular.
- Lack of transit near home: This group wants transit closer to where they live and fewer or no transfers – these are as or more important as cost.
- Little biking: Either biking the whole way or biking with transit, very few trips occur by bicycle. This group identifies as a cyclist half the rate as average.
- Alternative routes ineffective: Other vehicle routes into Research Park through U of U seem to be of little use to these commuters.

Opportunities:

- Leverage very dominant commute pattern – 84 percent of 2,500 people taking Foothill to the same place, but driving alone.
- Collectivize whole experience of especially this commute, especially from mouth of Parley's Canyon along Foothill to places of work.
- Create better park and rides – both in valley and right at beginning of Foothill
- Promote biking to transit to put transit stops in range of people's homes.
- Promote flexible work schedules.
- Create more variable message signs for Foothill.
- Work with largest employers to promote more carpooling – formalize carpooling systems.
- Work with largest employers to make transit cheaper.
- Find faster transit option on Foothill – especially compared to vehicles.
- Incent carpooling within companies and park-wide.
- Create cost incentives for carpooling and transit
- Improve access from Red Line from Research Park.
- Even without pass, cost is not biggest factor – convenience is: Get transit closer to where people live and work – with direct no transfer route; focus on biggest employers.

Off-peak hour commute by employee or volunteer

Approximate number of weekday trips: 2,337 round trips a day.

Timeframe: Round the clock outside of the peak commute times.

User-trip overview: This group includes all employees commuting outside of the peak times and constitutes roughly a quarter of the Research Park workforce. In many ways, this group behaves the same as the peak group – the transit mode share for both U of U (8.4 percent) and non- U of U (3.9) non-peak commuters are comparable to the peak commuters in those categories. People are still taking transit in the off-peak. In addition, non- U of U non-peak commuters carpool at a relatively high rate (7.7 percent), and the peak commuters show one of lowest rate of identifying as a driver. The average off-peak commute times are also roughly average for all employees – 26 - 30 minutes. And, generally, peak vs. non-peak doesn't substantially affect people's choices on what streets to drive on

However, off-peak non-U of U commuters are almost twice as likely to cite cost as the biggest transportation problem than peak commuters and less likely to cite congestion. It is possible that they take transit for cost

reasons rather than time/congestion reasons. Also, despite similar behavior, off peak non-U of U commuters are less likely to take advantage of any employer programs (96 percent do not); U of U off-peak commuters are about the same as the peak commuters.

Assets:

- **A sizeable bloc**: 25 percent of the Research Park workforce are in this group.
- **Less roadway congestion**: Not traveling at the peak hour means the key streets used by Research Park commuters – Foothill Drive, Sunnyside Avenue, 400 South, are cleared up for faster traveling.
- **People still taking transit even off-peak**. The transit ridership rates for this group are comparable to peak commuters. Most popular transit for off-peak riders is Red Line; off-peak U of U workers tend to favor the Medical Center station. Only 12 percent of non-peak non-U of U commuters said they would not consider taking transit.
- **More comfortable walking**: There is a consistent higher preference for walking and biking on Research Park streets for non U of U off-peak commuters versus peak commuters – For example, Wakara (52 percent walk on it versus 44 percent overall), Chipeta (61 versus 42 percent); Arapeen (39 percent versus 25 percent).

Challenges:

- **Limitations of transit schedules**: Many transit services are geared toward the peak commute times.
- **Personal safety**: Off-peak transit riders are concerned about personal security at about twice the rate of peak transit commuters (11 percent).
- **Difficult parking at U**: Parking is more difficult to find for these commuters (non- U of U) Off-peak U of U commuters say parking is "difficult" to find at twice the rate of peak commuters (12 percent). For U commuters this dynamic is reversed.

Opportunities:

- Make transit cheaper – cost appeals to this group.
- High rate of walking – improve pedestrian accessibility. Off peak commuters help activate the campus at non-commute times.
- Shared parking – in a larger pool, more parking availability – U of U and non- U of U could complement one another.
- Shift more of the workforce into this group.

Intra-day work trip within Research Park

Approximate number of weekday trips: 4,000

Timeframe: All day

User-trip overview: We estimate from survey results that approximately 4,000 trips occur among different Research Park employers on a daily basis. Some 30 percent of employees are going to another Research Park destination every day or nearly every day. These trips are intrinsically within walking distance – Research Park is only a mile by a half-mile, and most uses exist within a half mile of one another. This means that, for any trip, the distance itself is easily walkable. However, nearly half of trips within Research Park are made by single-occupant car. The reasons for this likely include the poor pedestrian network, the ease of finding parking, and the slopes within the park.

Assets:

- Walking distance: These trips are intrinsically within walking distance – Research Park is only a mile by a half mile, meaning that any distance is walkable (even though the pedestrian infrastructure may not exist or be of poor quality).

Challenges:

- Driving habits: Nearly half of all intra-Park trips are drive alone.
- Poor pedestrian network: The sidewalks and other pedestrian infrastructure connecting Research Park buildings is fragmented, inconsistent, and disconnected.
- Steep grades: In particular, the lack of sidewalks going up hills is a barrier to more walking for these short trips.
- Ease of finding parking: According to survey respondents, parking is very easy to find, so a person leaving a parking spot would not worry whether she will find on at her destination or upon her return to her place of work.
- U shuttle is not optimized to serve these trips

Opportunities:

- Create a better, more connected pedestrian network, especially in the center.
- Consider a circulator just within Research Park or to med center or main campus too
- Better connect key concentrations of employees to each other via walking and transit.
- Create a bike share within Research Park.

Intra-day work trip to key out-of-park destination

Approximate number of weekday trips:

- Medical Center: 3,000
- U of U main campus: 3,000
- Downtown SLC: 2,500

Timeframe: All day

User-trip overview: Work-related trips to key destinations out of Research Park appear to be nearly as numerous as those within Research Park. The most popular destination is the U of U main campus – 24 percent of Research Park employees go at least 3-4 times per week. Meanwhile, 20 percent of respondents go to the Medical Center at least 3-4 times a week. And 14 percent of employees go 3-4 times per week to downtown Salt Lake City.

Two of these destinations – the main campus and the medical center are adjacent to Research Park and many trips to them are within a mile, yet the barrier of Red Butte Creek and Fort Douglas prevent straightforward access – by any mode – to these destinations. It's possible to wind through in a few locations, but wayfinding is difficult and the barrier appears to lead to a high rate of driving alone to these destinations – 62 percent of trips to the U main campus are by single occupant vehicle. While many trips to main campus are likely too long for walking, only 13 percent of the trips occur by transit. This adds up to a lot of use of the major streets surrounding Research Park such as Foothill Drive. Meanwhile 70 percent of trips to downtown Salt Lake City are by single occupant vehicle.

Assets:

- Concentrated destinations: Lots of trips to key concentrated destinations (Med Center, Main Campus, Downtown Salt Lake City)
- Walking or biking distance: Two of these destinations are adjacent and many trips are likely within a mile, meaning opportunities for walking or bicycling

Challenges:

- Circuitous shuttle: The campus shuttle routes serving Research Park are likely too circuitous and do not make sense overall for travel between these destinations. For example, the black shuttle is one way.
- Unclear whether better routes would help: Only 3 percent of survey respondents said that more direct routes could make them walk for these trips. However, only 16 percent said they would not bike or walk for these short trips and other fixes (better bike routes, less hilly routes, better wayfinding) were equally unpopular.

Opportunities:

- Flex schedule/route research park circulator
- More direct shuttle connections to main campus/med center (6,000 trips a day)
- Shuttle to downtown SLC – 2,500 trips a day
- More direct walking route across Red Butte creek can reduce distance traveled by pedestrians substantially.
- More straightforward bicycling route to Medical Center and to main campus
- Potential bike share program: 7 percent of employees who currently do not bike for these trips say bikes available for their use would make them bike.
- Create central transit hub in Research Park.
- Make parking spots harder to come by so people are more likely to take transit or walk.

Lunch trip by Research Park employees

Approximate number of weekday trips: 10,000 potential trips

Timeframe: lunch hour

User-trip overview: In Research Park, the trip to get lunch is largely a non-trip. The vast majority of Research Park employees bring lunch from home or otherwise eat in their place of work. U of U employees' lunch behavior is slightly different – they are more likely to drive to lunch outside Research Park.

25 percent of survey respondents say more lunch options in Research Park would make them walk or bike to lunch; this could create more of an atmosphere of walking and biking on the park campus.

Assets:

- Bikers bike to lunch: The group with the largest bike mode share (non U of U, Central SLC) is far more likely to bike to lunch within Research Park.

Challenges:

- Few lunch options within Research Park
- Few lunch options adjacent to Research Park

Opportunities:

- Create more lunch options within Research Park or in the cultural district, preferably all concentrated together to emphasize hub and collectivization of transportation in Research Park.
- The group with the highest rate of bicycling is also twice as likely to bike to lunch within Research Park – if alternative mode commutes increase, likely non-auto trips to lunch will too.

Visit to Research Park

Timeframe: All day

User-trip overview: Visits comprise a substantial number of trips for a few key Research Park uses such as the Natural History Museum, Red Butte Gardens arboretum. These trips also include outpatient visits to locations such as the Orthopaedic Center.

Assets:

- Visits largely occur outside of the peak hour.

Challenges:

- Difficult to move these trips to transit due to transit inaccessibility of the key destinations (museum and arboretum) and the scattered times of the visits.
- Large events can tax parking supply.
- Uses are generally isolated so that it is difficult to chain or enrich recreational visits with additional amenities (except in the case of the café in the museum).

Opportunities:

- A Sunnyside transit corridor could provide access to the cultural district.
- Provide transit access to Museum and arboretum
- Extend visits with addition of food
- Chain trips together among cultural district attractions
- Better north south circulation among the attractions.
- Use transit hub to benefit these visitations as well.
- Wayfinding