

WORK MEETING AGENDA OF THE CITY COUNCIL OF LAYTON, UTAH

PUBLIC NOTICE is hereby given that the City Council of Layton, Utah, will hold a regular public meeting in the Council Conference Room in the City Center Building, 437 North Wasatch Drive, Layton, Utah, commencing at **5:30 PM on August 7, 2014.**

Item:

1. Presentation - Davis County Animal Control and Best Friends Animal Society
2. Presentation - Clearfield/Layton Utah Transit Authority (UTA) Circulator Feasibility Study
3. Update - Antelope Drive Roundabouts and Progress of other Public Works Projects
4. Closed Meeting to Discuss the Purchase, Exchange or Lease of Real Property, Including any Form of a Water Right or Water Shares

In the event of an absence of a full quorum, agenda items will be continued to the next regularly scheduled meeting.

This meeting may involve the use of electronic communications for some of the members of the public body. The anchor location for the meeting shall be the Layton City Council Chambers, 437 North Wasatch Drive, Layton City. Members at remote locations may be connected to the meeting telephonically.

Notice is hereby given that by motion of the Layton City Council, pursuant to Title 52, Chapter 4 of the Utah Code, the City Council may vote to hold a closed meeting for any of the purposes identified in that Chapter.

Date: _____ **By:** _____
Thieda Wellman, City Recorder

LAYTON CITY does not discriminate on the basis of race, color, national origin, sex, religion, age or disability in the employment or the provision of services. If you are planning to attend this public meeting and, due to a disability, need assistance in understanding or participating in the meeting, please notify Layton City eight or more hours in advance of the meeting. Please contact Kiley Day at 437 North Wasatch Drive, Layton, Utah 84041, 801.336.3825 or 801.336.3820.

**LAYTON CITY COUNCIL MEETING
AGENDA ITEM COVER SHEET**

Item Number: 1.

Subject:

Presentation - Davis County Animal Control and Best Friends Animal Society

Background:

Mr. Clint Thacker, Davis County Animal Care and Control Director and Mr. Arlyn Bradshaw of the Best Friends Animal Society, have asked for time on the agenda to talk about the Trap, Neuter, Return (TNR) Program and answer any questions the Mayor and Council may have.

Alternatives:

N/A

Recommendation:

N/A

**LAYTON CITY COUNCIL MEETING
AGENDA ITEM COVER SHEET**

Item Number: 2.

Subject:

Presentation - Clearfield/Layton Utah Transit Authority (UTA) Circulator Feasibility Study

Background:

Mr. Hal Johnson, Manager Project Development of UTA has asked for time on the agenda to present the final version of the Clearfield/Layton UTA Circulator Feasibility Study to the Mayor and Council.

Alternatives:

N/A

Recommendation:

N/A

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EXECUTIVE SUMMARY

Introduction

The Clearfield / Layton commercial core is one of the Wasatch Front's major Activity Centers. It is roughly 21 miles from Downtown Salt Lake – about the same distance as the Sandy to Lehi area, which is booming with high-tech development. Nationally, virtually every urban area larger than the Wasatch Front has seen “Edge City” development, where numerous 4 to 25-story buildings emerge rather quickly along freeways and near major transit stops. Edge Cities on average are about 20-miles away from the region's core CBD.

Edge City development is on the verge of happening in the Sandy area, and with the emergence of Falcon Hill and redevelopment potential, Clearfield/Layton may not be far behind. High-tech firms often report that the presence of excellent transit service is a major factor in their location decisions.

But even with two FrontRunner stops, today's jobs in Clearfield/Layton are inconvenient to access via transit. Freeport has about 8,000 workers and is Utah's largest manufacturing center. Its eastern edge is literally a stone's throw from FrontRunner, but because of tracks, fences, etc., the first safe and legal way to enter Freeport is over a mile's walk. Further, Freeport itself is about 2.5 square miles – not walkable even if the station were right in the middle.

The circulator alternatives recommended later in this report provide potential solutions to the access and mobility challenges in the region. It should be noted, however, that the alternatives considered assumed that north- and southbound FrontRunner trains would meet at the Clearfield FrontRunner Station in order to operate efficiently. It is anticipated that FrontRunner trains will meet at Clearfield at some point, but currently meet at the Layton FrontRunner Station. If trains do not meet at the Clearfield Station, the cost of circulator service increases significantly.

Hill Air Force Base has roughly 20,000 civilian jobs – and most are eligible for federally subsidized free transit passes. The Davis Hospital/Layton Hills Mall area has roughly 10,000 jobs within walkable range of a potential circulator, and Main Street between Clearfield Station and Layton Station also has about 10,000 jobs within walkable range of Main St. Jobs are *close*, but not close enough.

Study Area

Project stakeholders included Clearfield City, Layton City, Weber State University, Freeport Center, Hill Air Force Base, Utah Department of Transportation, Davis County, Military Installation Development Authority (MIDA), Wasatch Front Regional Council, and Utah Transit Authority. The general study area boundaries are 1000 West on the west, Hill Field Road on the east, 800 North on the north, and Layton FrontRunner Station on the south, as shown in the figure on the next page.



Existing Conditions

The Clearfield and Layton metropolitan centers have several large employers or activity centers within 5-10 miles of commuter rail stations. However, only 3% of these jobs are “walkable”, a term which generally refers to destinations within ½ mile of transit stations. Commuting patterns show that Clearfield exports about 9,700 jobs and imports about 14,500 jobs, while Layton exports 23,500 jobs and imports about 19,000 jobs. Travel patterns also show that roughly 2/3 of workers live within 5-7 miles of Freeport Center & Hill Air Force Base, two of the major employers in the region.

By 2040, travel models predict that traffic levels will increase between 20-30% on Antelope Drive, Hill Field Road, and other significant arterials in the study area. Existing transit

service in the region includes 30-minute peak and 60-minute off-peak FrontRunner commuter rail service and 3 existing bus routes: 470 (Ogden-SLC), 640 (Ogden-Layton), and 626 (Roy-Layton) and 627 (Layton-Kaysville). Routes 470 and 640 serve the Clearfield FrontRunner Station, while no buses currently serve the Layton FrontRunner Station.

The WFRC 2040 Regional Transportation Plan (RTP) estimates about 24,000 households and 65,000 jobs exist in the Clearfield-Layton region today; this number is anticipated to grow to 31,000 households and 91,000 jobs by 2040. Transportation improvements include a Bus Rapid Transit (BRT) route that roughly follows the existing Route 470 between Layton and Ogden and an Enhanced Bus route between Layton-Syracuse-Ogden.

Key Problems Identified in the Study Area

Just 3% of jobs are “walkable”: Walkable jobs are those within ½ mile of a transit station.

Poor pedestrian connectivity to Freeport Center: Several jobs are within a walkable distance of Clearfield Station, but the FrontRunner rail corridor currently impedes access to Freeport Center.

Market Distribution: 2/3 of workers are within 5-7 miles of job centers, putting them outside the commuter rail market. Improvements to existing bus service would alleviate this problem.

Jobs/Housing Imbalance: Clearfield & Layton generally export jobs to the Salt Lake area.

Increased Economic Opportunity: Clearfield and other surrounding communities have incomes well below the State average, suggesting the need for more and better job opportunities.

Serious Congestion: Major arterials experience serious congestion and this will likely continue with traffic levels projected to increase 20-30%.

Purpose & Need

Project stakeholders contributed to the development of goals & objectives to be accomplished with this study. The following list summarizes the project purpose & need as defined by the existing conditions:

1. **Improve Last-Mile Connection to Existing Jobs.** An estimated 60,000 jobs are within 2-3 miles of Clearfield and Layton rail stations.
2. **Support Economic Development (Wasatch Choice 2040 Vision).**
3. **Relieve Congestion; Provide Choices.** Circulators will address the growing problem of traffic congestion on major arterials and provide choices for transit-dependent populations.
4. **Respond to Community Requests.** The circulator study came at the request of local municipalities who see a need to provide improved transit service to major employers in the study area.
5. **Provide Cost-effective Solutions.** Select transit alternatives that will achieve high ridership with low initial capital & operating costs.
6. **Expand First-Mile Social Justice Opportunities.** While the main purpose of the study is to transport people to area jobs, a secondary purpose is to serve transit-dependent populations within a walkable distance of circulators and increasing their access to the regional system.
7. **Improve Short Trip Circulation Within Area.** Circulator patrons will have increased access to local destinations besides job centers.

Screening Criteria

The screening of alternatives consisted of an evaluation of both mode and alignment. Each of the project stakeholders provided information about important destinations in the study area, access to employment, and future economic development opportunities. Based on this input, the following screening criteria were developed:

Primary Screening Criteria

1. Reliably match FrontRunner schedules
2. Maximize last-mile access to jobs
3. Good stakeholder & community support

4. Good return on investment
5. Strengthen economic development

Secondary Screening Criteria

1. First-mile social justice
2. Attract intra-area short trip circulation

Alternatives Screening

The circulation technologies in the table below were considered in the initial screening stage of the feasibility study. After evaluating the alternatives, it was recommended that the stakeholders consider the following technologies for near-term implementation: improvements to existing bus service, circulator/shuttle routes, and vanpool/vanshare options. Pedestrian bridges are an expensive capital cost that may not be feasible in the near-term, but should be considered as part of a potential redevelopment of the Clearfield FrontRunner Station site or as funding becomes available.

Technology Option	Study Further	Rationale
Streetcar / Light Rail	No	Insufficient population & employment density
Bus Rapid Transit	Later	Main Street, Route 470 path has potential
Pedestrian Bridges	Yes	There is stakeholder interest in identifying funding sources to install a bridge connecting Clearfield FrontRunner Station and Freeport Center
Local Bus	Yes	Cost-effective method to leverage existing resources
Circulator/Shuttles	Yes	Targeted markets are big enough to support this
Vanshare	Yes	Cost-effective method to enhance mobility

Existing Bus Service

UTA recently completed a Five-Year Service Plan to evaluate current bus service and recommend potential changes to routes within its service area. While this study recommends potential improvements to bus routes, the service plan provides a more detail about changes and improvements in the coming years. This report simply recommends some possible scenarios to consider in addition to recommendations from the Five-Year Service Plan.

Vanpools/Vanshare

UTA maintains a vanpool fleet of over 500 vans. Depreciated vans that are ready to be retired from regional service could be used for vanshare trips, which are typically 5-10 miles. As an example, a vanshare vehicle

can be parked in the Clearfield Station parking lot and can transport Hill Air Force Base employees arriving at the same time on a FrontRunner train. The van would be used to complete the “last mile” of the trip.

Circulators

Circulator routes are geared toward serving a target employment market by providing transit service between employment centers and commuter rail stations. The following routes were considered for potential circulator service:

- A. Clearfield FrontRunner Station to Hill Air Force Base
- B. Clearfield FrontRunner Station to Freeport Center
- C. Clearfield FrontRunner Station to WSU-Davis campus
- D1. Clearfield Station to Layton Hills Mall
- D2. Layton Station to Layton Hills Mall
- D3. Layton Station to Layton Hills Mall via Fort Lane
- D4. Clearfield Station-Layton Hills Mall-Layton Station
- D5. Clearfield Station-Layton Hills Mall-Layton Station w/southern loop
- E. Vanpool/Vanshare for all routes

First level screening was applied to each of these routes based on the screening criteria outlined earlier. The following table summarizes the screening results, with eliminated routes shown in red

Criteria	A	B	C	D1	D2	D3	D4,5	E
Min. Vehicles Required	2	1	1	1	1	1	2	5
Route ID	HAFB	Freeport	WSU-D	C to Mall	L to Mall	Ft Lane	L to C	Vans
1. Reliably Match FrontRunner Schedules	√	√	√	?	?	√	√	√
2. Maximize last-mile access to jobs	High	High	Medium	High	High	Med-Hi	High	High
3. Stakeholder & community support	High	High	High	Medium	Medium	Low	High	High
4. Good return on investment	High	High	Low	High	Med-Hi	Medium	High	High
5. Strengthen economic development	Low	High	Medium	High	High	Low	High	Low

- **Alternative C** does not rank as highly as the others, and this market may also be served by timed connections with a revised Route 627. It may eventually make a good circulator as WSU-Davis develops their build-out plan, and as Legend Hills continues to evolve.
- **Alternative D3** has less return on investment and little community support. The markets it caters to are better served by the other D Alternatives.

Ridership Forecasts

The Wasatch Front Regional Council travel demand model is used to predict actual potential ridership on all UTA bus and rail routes. A potential problem with modeling short routes is that they may inadvertently be penalized by a transfer from train to shuttle. To alleviate this problem, three approaches were used as part of the modeling inputs in order to forecast circulation trips and to help establish a minimum and maximum range of expected ridership.

Methodologies:

1. Assume that riders exiting FrontRunner do not board a shuttle vehicle at all, but instead walk straight to their destination on an intentionally shortened “walk link,” similar to a “moving sidewalk.”
2. Assume that FrontRunner actually drops them off within a short walk of their final destination, thus avoiding artificially shortened walk-links, and also avoiding a transfer to another route.
3. Just model the shuttle as a separate route, then add a “seamless transfer” flag to help the model understand that the timed shuttle transfer is not as onerous as a typical transfer.

Assumptions:

1. Hill Air Force Base patrons have subsidized transit passes to access the entire UTA system. All other trips require standard fares.
2. Circulators operate free of charge, assuming a transfer from FrontRunner or one of the standard bus routes.

		Low Shuttle	High Shuttle	Low FR	High FR
A	Hill AFB	400	500	250	300
B	Freeport	200	300	100	150
C	Legend Hills, WSU-D	75	125	40	80
D1	Clearfield to Mall	250	450	100	190
D2	Layton to Mall	250	400	90	170
D3	Ft. Lane to Mall	150	300	60	120
D4	Layton to Clearfield	400	700	150	300
D5	L to C, w/South Loop	425	750	160	310
E	VanSharing	30	100	30	100

Circulator Route Ridership & Added FrontRunner Ridership

Circulator Ridership:

Circulator and FrontRunner ridership numbers are shown in the table above. Of the concepts studied, the concepts with the best ridership potential are as follows:

- Alternative A Clearfield Station to Hill Air Force Base, which will require two vehicles to operate every 30 minutes, peaks-only.
- Alternative B Clearfield Station to Freeport Center, which will require one vehicle to operate every 30 minutes, peaks-only.
- Alternative D4 Clearfield Station to Layton Station, which will require 2-3 vehicles to operate, and assumes every 30 minutes between 6 am and 6 pm, dropping back to 60 minutes from 6-9 pm.

Preferred Alternatives for Near-term Recommendation

Alternative A: Hill Air Force Base circulator is recommended for immediate implementation and costs are currently being determined by the Ogden Business Unit. Costs for other adjustments to existing service, namely the potential changes to route 470 and the extension of route 627, were not considered by this study and will be determined later as UTA further investigates these options. The other circulator routes recommended by this study are Alternative B: Freeport Circulator and Alternative D4: Layton Circulator. Alternative E: Vanpool/Vanshare is recommended as a feasible option for each of the alternatives mentioned above. Vanpool service can be operated successfully for each route without taking significant ridership from the circulator routes. Costs for the circulator routes are summarized below for convenience.

Operation & Maintenance

Alternatives	Peak Headway	Annual Service	Annual Service Miles	Peak Vehicles	Annual O&M Cost
B	30	1,900-3,800	20,000-29,900	1	\$ 129,000-193,400
D4	30	3,800-8,500	35,000-78,600	2	\$ 226,200-509,000
Additional Circulator Program		5,700-12,300	55,000-108,500	3	\$ 355,200-702,400

*Hill Air Force Base operating currently being developed by UTA Mt. Ogden Business Unit

Capital Costs

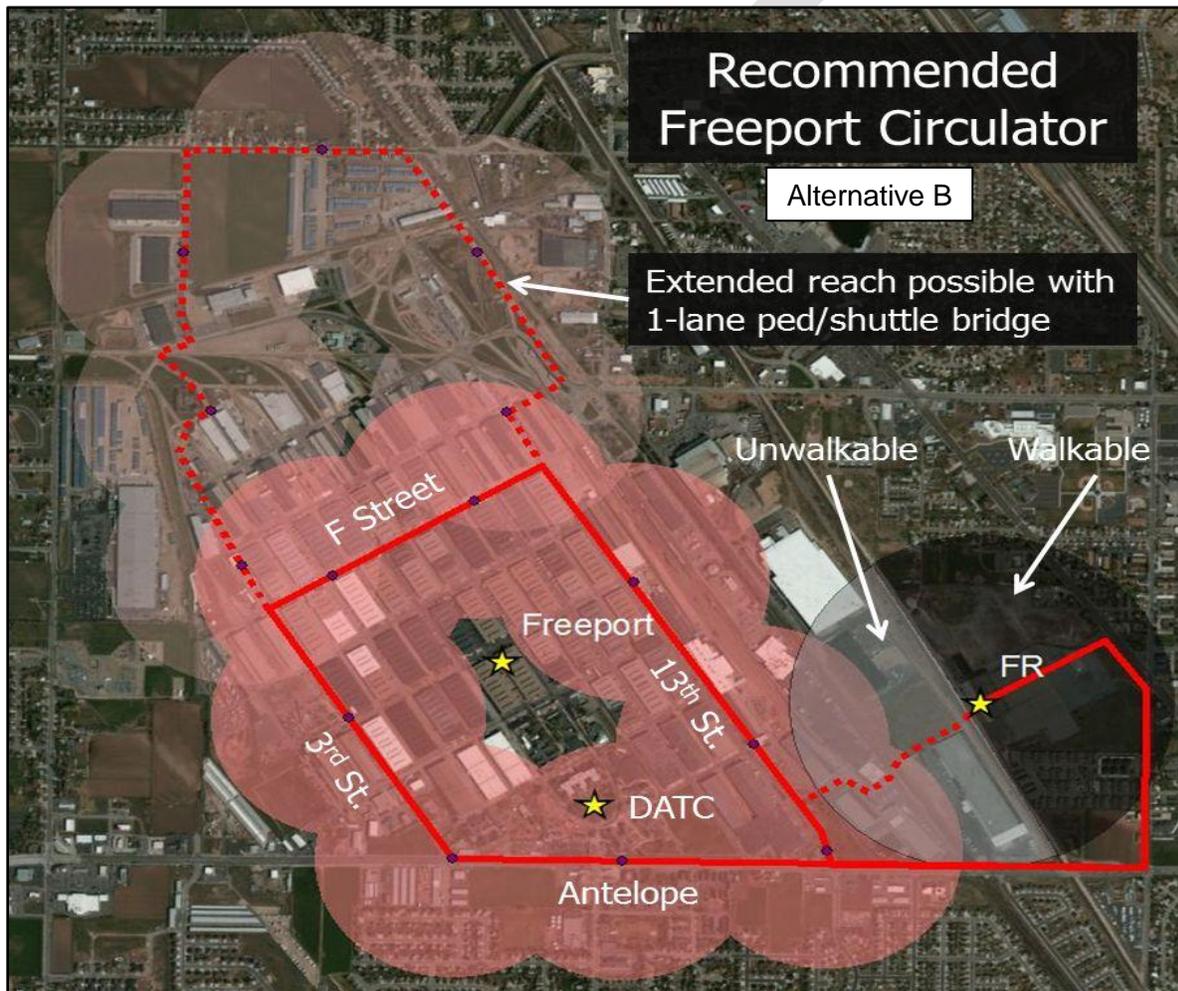
Alternative	Peak Hour Vehicles	Reserve Vehicles	Vehicle capital cost range	
B	1	0.5	\$ 270,000	\$ 375,000
D4	2	1	\$ 540,000	\$ 750,000
Additional Circulator Program	3	1.5	\$ 810,000	\$ 1,125,000

*Hill Air Force Base capital costs currently being developed by UTA Mt. Ogden Business Unit

The operation & maintenance table above shows annual service miles, annual service hours, and a low and high range of annual O&M costs based on the operation of both peak-hour and all-day service. The total service miles are multiplied by a fully allocated cost rate of \$6.48 per mile, which includes the cost of hiring additional operators, administrative staff, employee pensions, and facility upgrades associated with expanding service. Low range operating costs represent weekday 30-minute service from 6-9 AM and 3-6 PM. High range operating costs include the peak-hour service with an additional 60-minute service from 9 AM-3 PM. The capital cost table shows the cost for the initial acquisition of additional vehicles needed to operate the service, based on the latest data available.

Implement Alternative B: Freeport Circulator

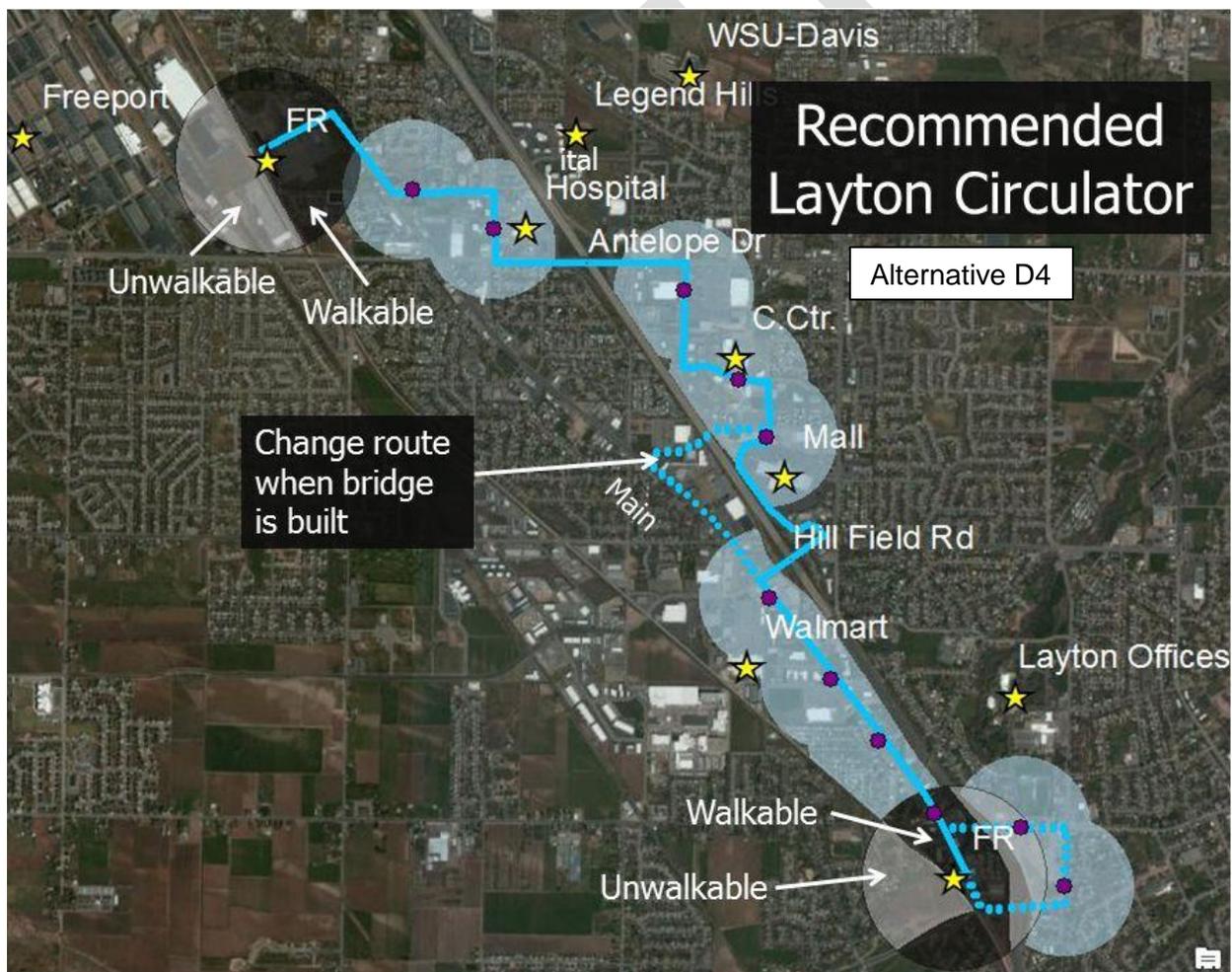
Freeport Center has a concentration of jobs with many employers having defined shift times. The demographic and travel demand data suggest that a circulator timed with FrontRunner service and with connections to/from Ogden will be successful. The map below shows unwalkable areas where a pedestrian bridge would be required and there is stakeholder interest in building a bridge immediately if funding can be identified. Another possible solution is a 1-lane circulator bridge crossing over the tracks that could also double as a pedestrian bridge. This would minimize bridge costs, and would extend the coverage of the circulator route without additional operating costs.



Implement Alternative D4: Layton-Clearfield Circulator

The area around and north of the Layton Hills Mall features a rich mix of employers, apartments, hotels, and all-day destinations. Regional travel patterns show that significant numbers of employees are traveling longer distances to reach jobs in Layton. These factors suggest that circulator service will be successful.

Option D4, which connects Layton Station, the Mall area, Davis Medical Center, and Clearfield Station traverses two bottlenecks (the interchanges at Hill Field Road and Antelope Road), but it also serves major existing and proposed developments in Clearfield and Layton. From an all-day ridership generation perspective, Option D4 has the ability to attract more people to use FrontRunner and also to use the circulator for intra-Layton or intra-Clearfield trips. Option D4 needs a new signalized access out of Layton Station in order to operate safely and reliably. The route is shown in the map below.



Mid-Term, Long-Term Vision

The most important immediate need is simply to make better use of FrontRunner and regional bus routes with last-mile connections to the area's abundant but dispersed job base. The business case for a circulator system, as presented in this report, provides ideas for addressing current travel challenges and strengthening the economic development opportunities in this region. Future solutions will require interaction with the project stakeholders to explore potential land use improvements and possible funding opportunities in order to implement the recommendations of this report and encourage smart economic growth.

DRAFT

Section 1

Existing Conditions

Regional “Big Picture”

The Clearfield / Layton commercial core is one of the Wasatch Front’s major Activity Centers. It is roughly 21 miles from Downtown Salt Lake – about the same distance as the Sandy to Lehi area, which is booming with high-tech development. Nationally, virtually every urban area larger than the Wasatch Front has seen “Edge City” development, where numerous 4 to 25-story buildings emerge rather quickly along freeways and near major transit stops. Edge Cities on average are about 20-miles away from the region’s core CBD.

Edge City development is on the verge of happening in the Sandy area, and with the emergence of Falcon Hill and redevelopment potential, Clearfield/Layton may not be far behind. High-tech firms often report that the presence of excellent transit service is a major factor in their location decisions.

But even with two FrontRunner stops, today’s jobs in Clearfield/Layton are inconvenient to access via transit. Freeport has about 8,000 transit-oriented workers and is Utah’s largest manufacturing center. Its eastern edge is literally a stone’s throw from FrontRunner, but because of tracks, fences, etc., the first safe and legal way to enter Freeport is over a mile’s walk. Further, Freeport itself is about 2.5 square miles – not walkable even if the station were right in the middle.

Hill Air Force Base has roughly 20,000 jobs – and most are eligible for federally subsidized free transit passes. Hospital/Mall area has roughly 10,000 jobs within walkable range of a potential circulator, and Main Street between Clearfield Station and Layton Station also has about 10,000 jobs within walkable range of Main. Jobs are *close*, but not close enough.

All told, there are about 60,000 jobs within circulator range, but just 2,000, or 3%, are currently within walkable range of both FrontRunner stations. There is definitely a first mile / last mile problem, and there is an emerging argument for attractive circulation within the area itself.

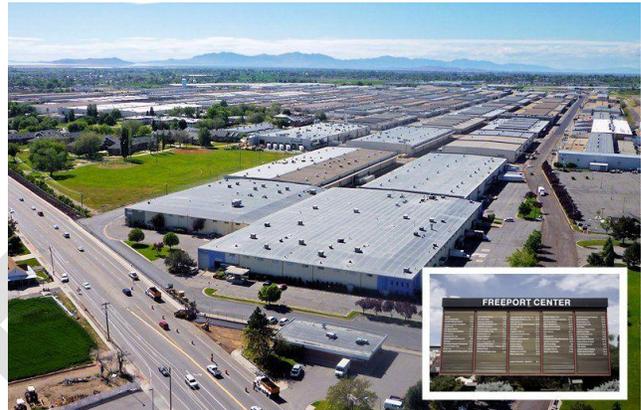


Figure 1.1: Freeport Center in Clearfield; FrontRunner Clearfield Station; Hotel in Layton

Demographics

A summary of key 2010 Census data is shown below. Layton has significantly higher median income than Utah at large, but slightly less than the average for Davis County. Clearfield has significantly lower median incomes than the Utah average, and has a much higher share of lower-income residents and minorities who often rely on transit for basic mobility.

Census 2010 Facts	Clearfield	Layton	Davis	Utah
Population	30,400	68,700	316,000	2.85 M
Median Income	\$ 45,700	\$ 64,700	\$ 69,100	\$ 57,800
Percent in Poverty	18%	8%	7%	11%
Multi-Family Units	35%	17%	16%	21%
Minority Ethnicity	26%	20%	15%	20%

Commuting Patterns, Census Data

The 2010 Census “Journey to Work” data provides excellent insights into where people both live and work. Their website, onthemap.ces.census.gov/, was used to generate the maps in **Figure 1.2**. Out-to-in minus in-to-out = change in daytime population. Clearfield has roughly 16,000 jobs, and Layton has 23,000. Hill is not available, but is known to have about 20,000 jobs. Combined there are almost 60,000 jobs in the three areas. Clearfield’s daytime increase is roughly equal to Layton’s daytime loss, but add in Hill and the overall area probably imports close to 20,000 (less those who live and work on base).

For comparison, Salt Lake imports about 187,000 workers per day, and also exports 39,000 – a net import of 148,000 daily. Sandy, Draper, and South Jordan combined have a total of 75,000 jobs. Their area is positioned south of Salt Lake similar to how ours is to the north. Though 75,000 is more than our study area’s 60,000, our area imports about 20,000 workers per day, where theirs still exports about 10,000, in spite of more overall jobs.

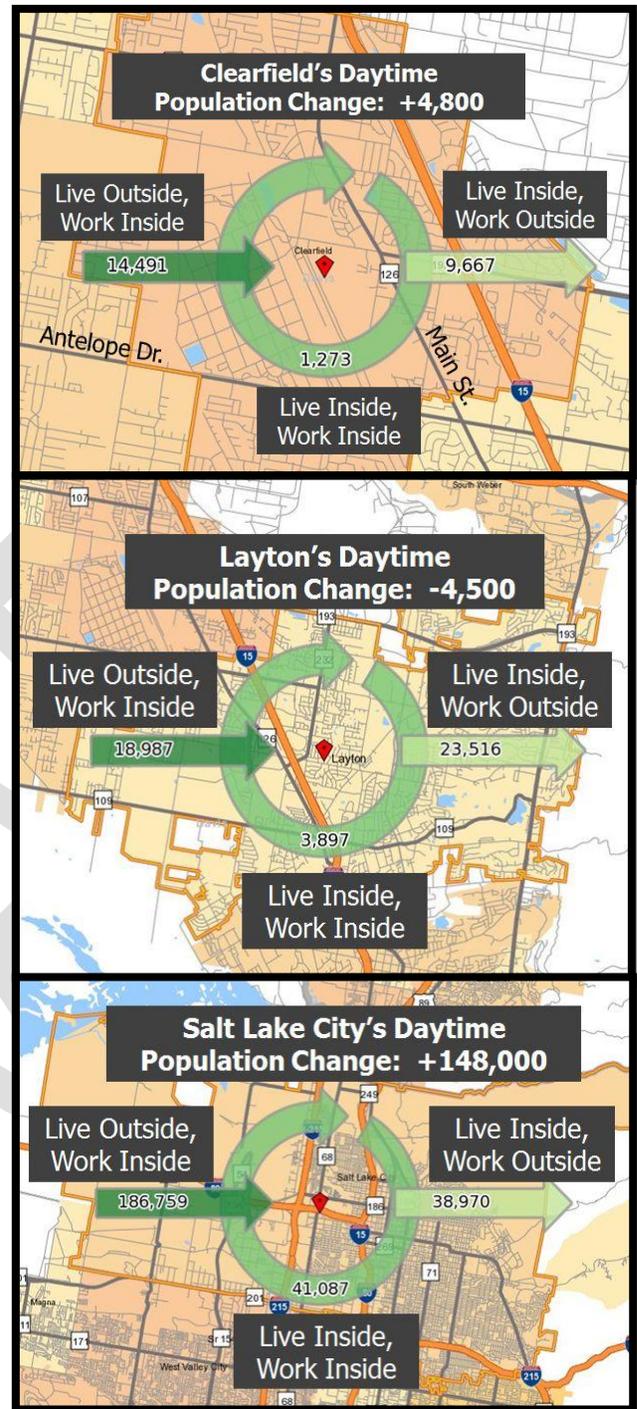


Figure 1.2 2010 Worker flows into, within, and out of Clearfield, Layton, and Salt Lake City. Source: onthemap.ces.census.gov/

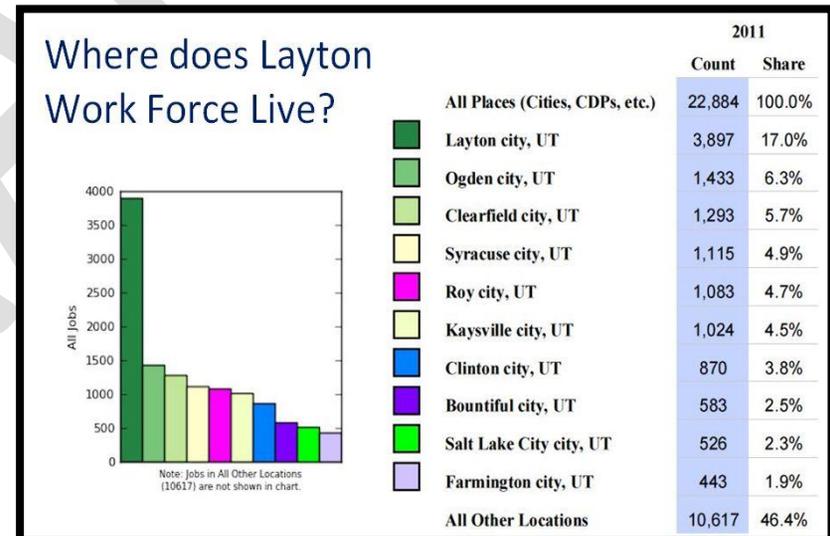
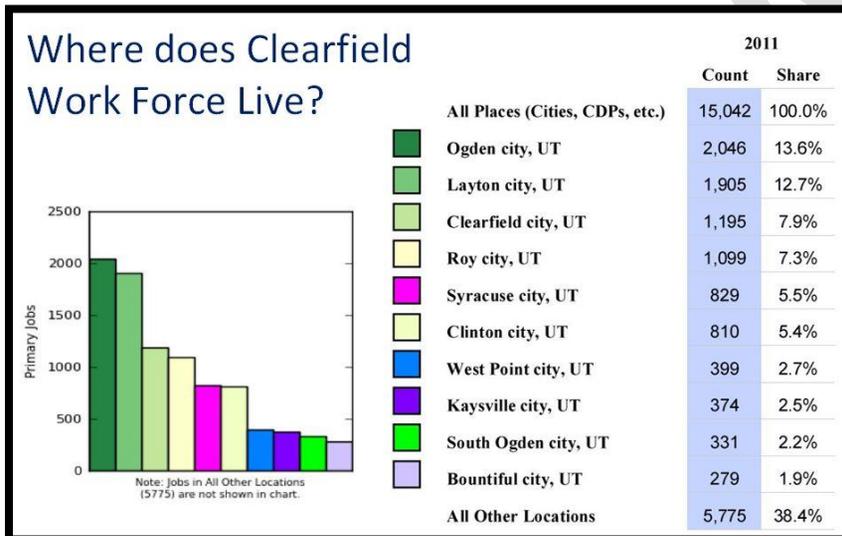
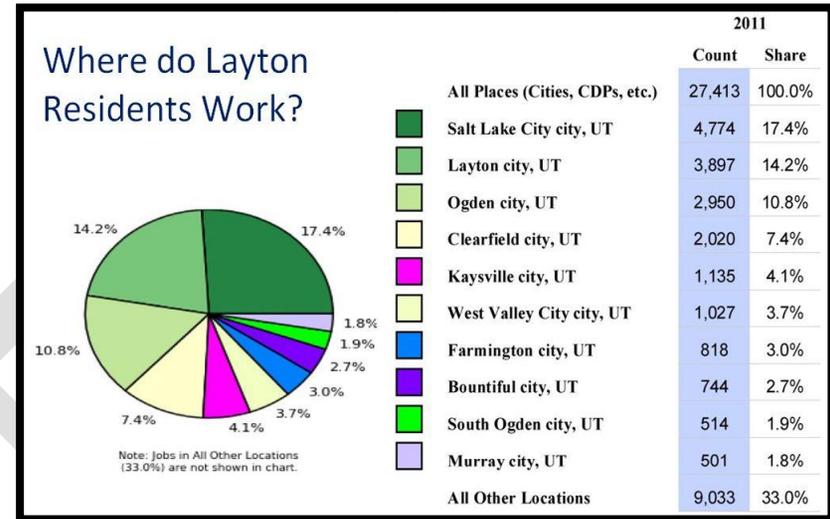
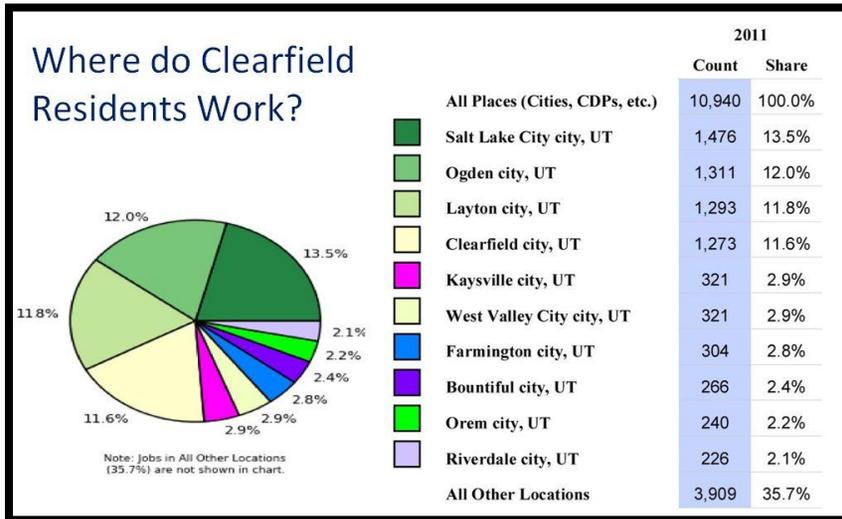


Figure 1.3 Work Force Origins, and Resident Destinations, by city. Source: onthemap.ces.census.gov/

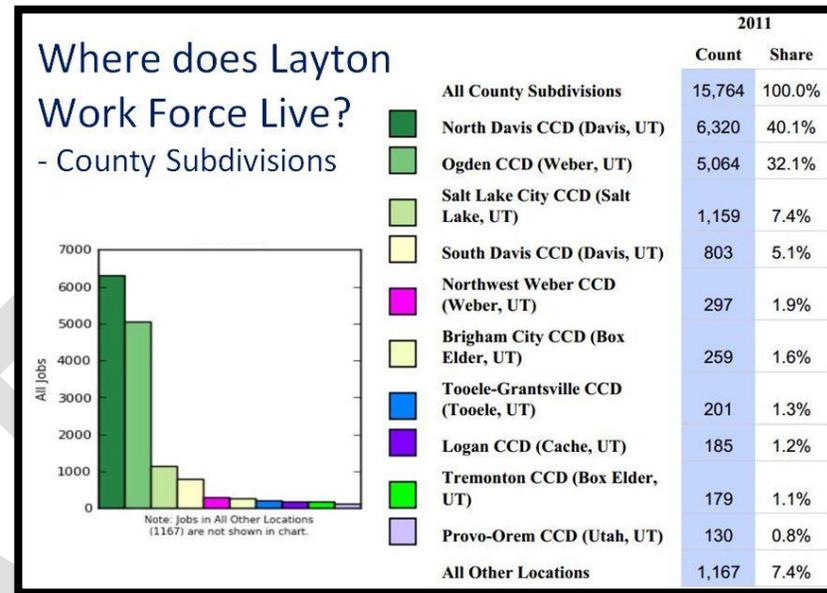
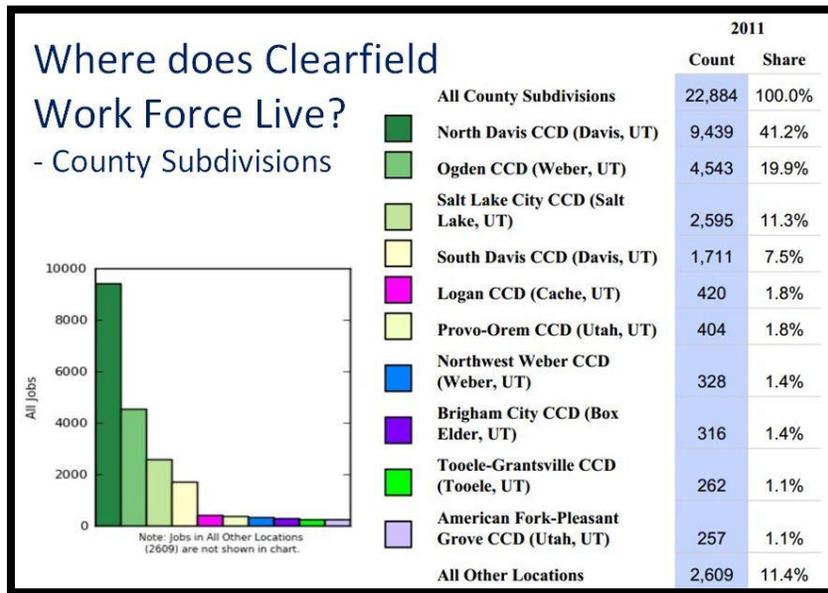


Figure 1.4 Work Force Origins, by Census County Subdivisions. Source: onthemap.ces.census.gov/

The charts in **Figures 1.3 and 1.4** are also from the 2010 Census. Notice that for both Clearfield and Layton, Salt Lake City attracts a higher share of their residents than their own cities do. However first-mile connection to Clearfield/Layton stations will be much less attractive than last-mile distribution from these stations, because most residents will simply use their cars to access free parking at both stations, but workers traveling to Clearfield/Layton via transit will not have cars.

Figure 1.4 shows that 19.9% of Clearfield's workforce and 32.1% of Layton's workforce come from the Ogden area. Roughly 2,600 come to Clearfield from Salt Lake (11.3%), and about 1,200 (7.4%) come to Layton from Salt Lake. Looking at Clearfield and Layton combined, there are close to 1,000 who come from Utah County, and about 500 from Tooele. North of Ogden there are roughly 1,500 from Box Elder and Logan, some of whom might also use park-n-ride lots from the northern-most station.

Employee / Student Zip Code Data

Employee zip code data for Hill Air Force Base and several large firms in the Freeport Center was analyzed. We also obtained student home zip codes for 3,773 Fall Semester students attending at least one class at WSU's Davis campus in 2013.

Firms in Freeport include ATK, Lifetime, Futura Industries, Kelloggs, Malnove, Smith Optics, Sports Molding, and Utility Trailer. These eight firms together supplied zip codes for 3,829 employees, or roughly 48% of Freeport's reported 8,000 employees. Hill AFB's employee record includes 10,530 employees, about half of the roughly 20,000 who reportedly work at the base. This statement from a military website summarizes employment at Hill:

"Hill Air Force Base has grown significantly during the years and has become the leading employer in Utah. The base employs approximately 5,500 active duty, 1,200 reservists, 13,000 federal civil servants and 4,000 civilian contractors." The zip code data we have represents the majority of civil servants.

Figure 1.5 was generated from the zip code data, and represents percentage distributions to the areas depicted. Where the previous Census data suggests that 80-90% of Clearfield and Layton's workforce lives outside each city, the zip code data shows that most don't live very far outside. For both Freeport and Hill, 67% live within 5-7 miles of their work. Beyond that, Freeport and Hill have many more trips from the north than from the south, but WSU's Davis campus has more from the south than the north.

Where do people come from?

First 5 to 7-Miles		
FP	Hill	WSUD
67%	67%	71%

North Side		
FP	Hill	WSUD
25%	18%	10%

South Side		
FP	Hill	WSUD
7%	8%	16%

Source: Employer & Student Zip codes

Freeport



Hill AFB



WSU-D



Figure 1.5 Employee and Student Home Locations

Traffic, Existing and Future

Figure 1.6 shows the 2010 Average Annual Daily Traffic (AADT) for the study area, as published by UDOT. The right side converts key values into average weekday traffic (AWDT), and also posts the growth as currently anticipated by the 2040 travel demand model. Blue areas show the total daily trips generated by these key areas, both now and in 2040 (which subsequently contribute to the total volumes on roadways in red).

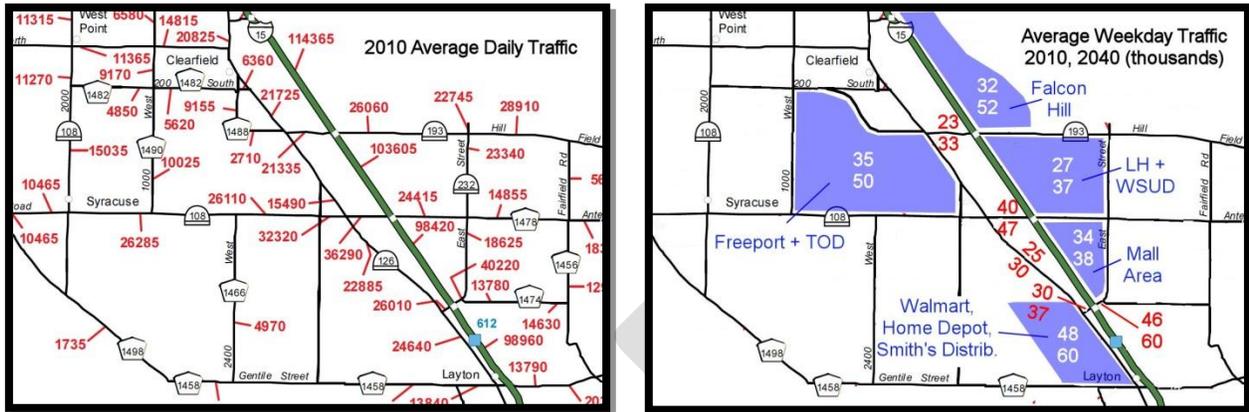


Figure 1.6 Daily Traffic, 2010 and 2040. Source for 2010: UDOT Traffic on Utah Highways. Source for 2040: WFRC travel model

In spite of improvements to SR-193 on the north side of Freeport, and in spite of the new West Davis Freeway, the models predict that traffic levels on Antelope Drive and Hill Field road will still increase between 20-30%. This will only be possible if significant upgrades are made in the area to increase capacity or reduce pressure on these key I-15 interchanges.

Existing Transit Service

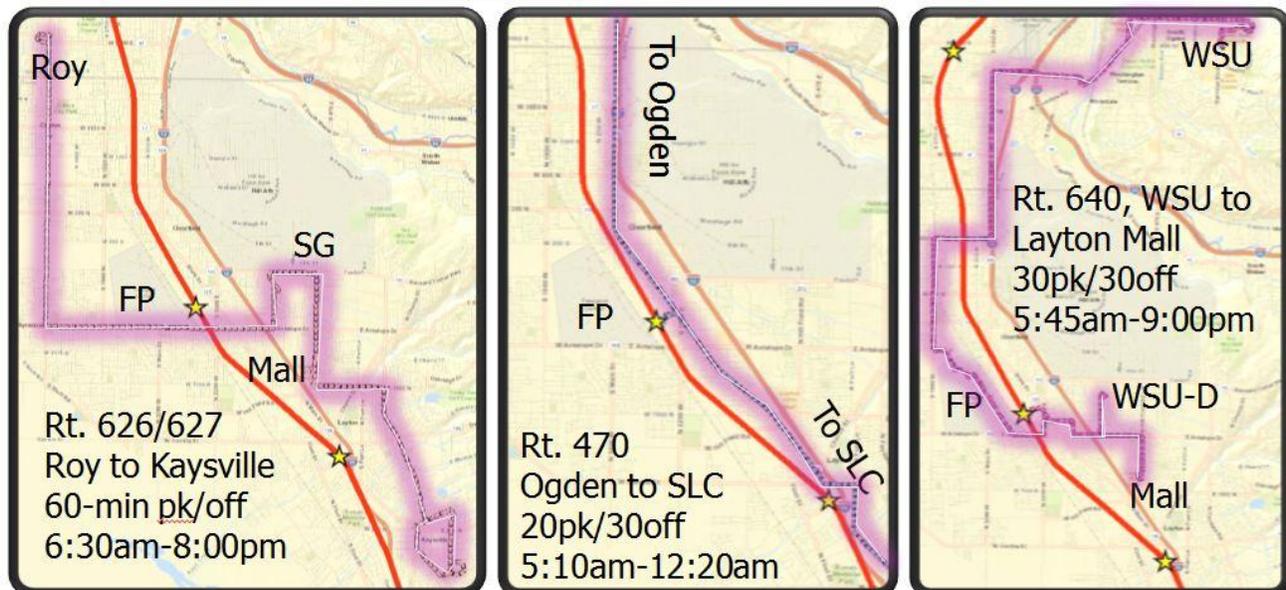


Figure 1.7 Key characteristics of existing major bus routes

FrontRunner operates 30-minute peak and 60-minute off-peak service from roughly 5:30am to Midnight. A few express buses between Ogden and Salt Lake also stop at Layton Hills Mall. In addition, there are three major bus routes serving the area (see routes and key service attributes in **Figure 1.7**). Routes 470 and 640 both serve Clearfield station, while 626 passes by on Antelope Drive but does not stop at the station. There is no bus service at the Layton station.

Route 626/627 collects riders throughout Roy, Clinton, Syracuse, Clearfield, Layton, and Kaysville. It stops at the south entry to Freeport but doesn't enter Freeport, nor does it connect to Clearfield FrontRunner station, though it is close. It serves Layton Hills Mall and the WSU-Davis campus, and also passes by Hill's South Gate, but does not enter.

Route 470 is one of the longest routes time-wise in UTA's system, running from Ogden to Salt Lake on local arterials generally parallel to I-15, and primarily on Main Street / Hwy 89. It's peak service is every 20-minutes, and 30-minutes thereafter. It stops at Clearfield's FrontRunner Station and comes very close to Layton FrontRunner Station via Gentile Street, but does not stop. Because of work done by UTA service planners, Route 470 has achieved an on-time bus reliability of 90% in recent years.

Route 640 starts at Weber State University, traverses Riverdale Road, and proceeds to Main Street in Sunset. It then moves westward to 1000 West then through Freeport in Clearfield, and stops at FrontRunner, WSU-Davis, and terminates at Layton Hill Mall. Thus it connects FrontRunner to a few of the key destinations in this study, and it has 30-minute headways similar to FrontRunner. Connectivity of this route to FrontRunner could be improved with north- and southbound FrontRunner trains meeting at the Clearfield Station.

FrontRunner Ridership

FrontRunner ridership statistics are shown in **Figure 1.8**. With 16 stations, a rank of 1-7 is above average, 8-9 is exactly average, and 10-16 is below average. In most cases, both the Clearfield and Layton stations are very nearly average.

Each station has roughly 100 alightings in morning hours, which is barely below average. But both stations also have an above average number of jobs in the general area, suggesting that few of these jobs are within walkable range of the stations. Clearfield is ranked high for PM return trips. It is unclear why, but could be in part because Freeport has multiple shifts, including graveyard shifts. People could be coming to Clearfield in the early PM hours and still return in late PM hours. Or possibly they come to work in late PM hours and return home the next day in the early AM hours. Summing AM and PM ons, the two stations together have 745 daily boardings in a system of roughly 7,200, or about 10% of the whole system.

ID	Name	AM On	Rank	AM Off	Rank	PM On	Rank	PM Off	Rank
1	Pleasant View	20	16	10	16	5	16	15	16
2	Ogden	150	10	200	4	150	15	470	3
3	Roy	180	8	70	14	280	4	210	12
4	Clearfield	190	7	100	9	180	12	310	5
5	Layton	180	8	100	9	190	9	240	9
6	Farmington	145	11	85	13	190	9	180	13
7	Woods Cross	110	13	110	8	180	12	175	14
8	North Temple	105	14	540	2	500	2	220	11
9	Salt Lake Central	210	5	720	1	790	1	610	1
10	Murray	200	6	320	3	420	3	510	2
11	South Jordan	130	12	130	5	240	7	250	8
12	Draper	90	15	90	11	170	14	170	15
13	Lehi	240	2	90	11	195	8	230	10
14	American Fork	230	3	70	14	185	11	260	7
15	Orem	230	3	120	6	260	5	270	6
16	Provo	340	1	115	7	245	6	410	4
System Totals		2750		2870		4180		4530	

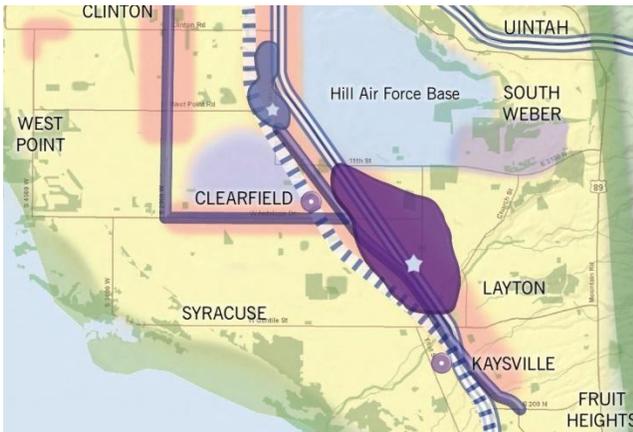
Figure 1.8 FrontRunner 2013 daily ridership at each station
Source: Utah Transit Authority

Plans and Studies

There are several plans and studies for the general area. WFRC’s Wasatch Choice for 2040 vision, Clearfield and Layton’s land use and transportation plans, UDOT and UTA plans, and a Transit Circulation Study completed recently by University of Utah students.

Wasatch Choice for 2040

Figure 1.9 identifies key centers and land use in the area as shown on Wasatch Front Regional Council’s “Wasatch Choice for 2040” vision. The Layton/Clearfield core is a future Urban Center – the highest urban form outside of Salt Lake City itself.



Urban Center

Urban centers are the focus of commerce and local government services benefiting a market area of a few hundred thousand people. Urban centers will be served by high-capacity transit and major streets. They are characterized by two- to four-story employment and housing options.



Floor Area Ratio 0.75 to 4
20 to 100 Housing units per acre



Town Center

Town centers provide localized services to tens of thousands of people within a two- to three-mile radius. One- to three-story buildings for employment and housing are characteristic.



Floor Area Ratio 0.5 to 1.5
10 to 50 Housing units per acre



Station Community

Station communities are geographically small, high-intensity centers surrounding high-capacity transit stations. Station communities vary in their land use: some feature employment, others focus on housing, and many will include a variety of shops and services.



Floor Area Ratio 0.5 to 2.5
20 to 100 Housing units per acre



Figure 1.9 Wasatch Choice for 2040 Vision

The Vision shows that for Activity Center types anticipated for the area, residential projects from here on out would usually be at least 20 units per acre, and perhaps in key locations could be as high as 100 units per acre by the year 2040. Commercial buildings would be of a similar scale.

Currently there is a four-story apartment project immediately adjacent to the Layton Station. It is at 60 units per acre, well within the range predicted for an Urban Center, though both Layton and Clearfield officials anticipate this is likely the upper end of what will occur any time within the next decade or so.

WFRC Demographic Forecasts

The general study area is shown in Figure 1.10. Jobs in each zone are shown for 2010 and 2040.

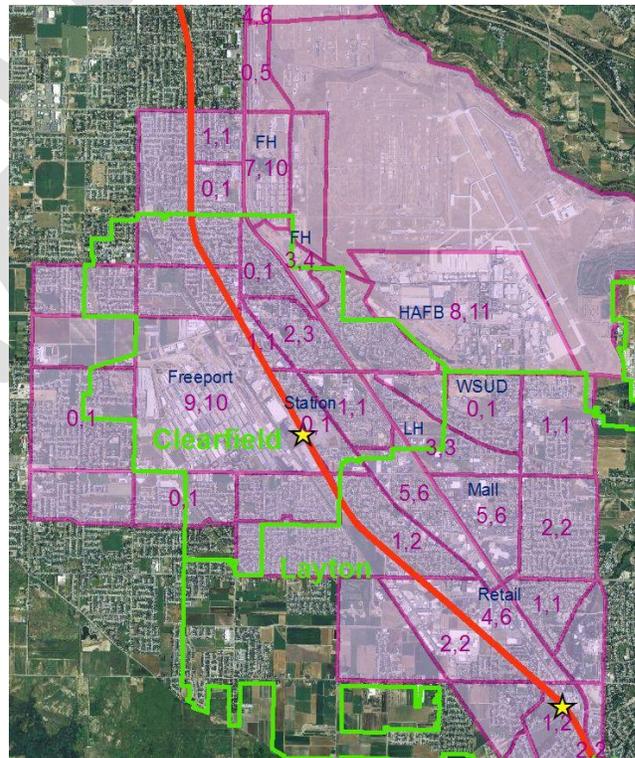


Figure 1.10 WFRC estimate of existing and future jobs.

"9,10" = 9,000 jobs in 2010, and 10,000 in 2040.

Notice that Freeport Center and immediate surroundings are labeled “9,10” which means about 9,000 jobs in 2010, and 10,000 jobs by 2040. This increase of just 1,000 by 2040 may well be too low, given open land on Antelope Dr. and near SR-193.

The city and stakeholders in the area should review these zones closely and think about whether the growth shown matches their plans and expectations for 2040 or not. 2040 jobs will not affect this study’s recommendations for short-term circulation, but it will definitely affect long-range recommendations, as well

as long-range traffic forecasts used by UDOT and other agencies for a myriad of purposes.

Overall, WFRC estimates there are about 24,000 households and 65,000 jobs within the selected zones today. This matches well with the Census estimate of 60,000 within similar boundaries. WFRC estimates that the same zones will have 31,000 households and 91,000 jobs by 2040, but these future numbers could easily be higher if key zones have been underestimated.

Regional Plans

WFRC maintains a 2040 Regional Transportation Plan, which represents the current consensus between UDOT, UTA, and Municipalities regarding their intended program of emerging projects. The maps in **Figure 1.11** show planned highway and transit projects in the area. On the highway side, SR-193 is shown and has recently opened as a 5-lane arterial with a bridge over the railroad tracks.

Stakeholders anticipate this road will serve well as a truck route for the Freeport Center, though it is also clear that many Freeport trucks connected to southern Freeport businesses will still prefer Antelope Drive. There are also both long term and short term interchange improvements at Antelope Drive and Hill Field Road.

On the transit side, a BRT line is planned that roughly follows the existing Route 470 via Main Street/Hwy 89 until it goes north of 600 North in Sunset when it crosses to the east of I-15 and serves the

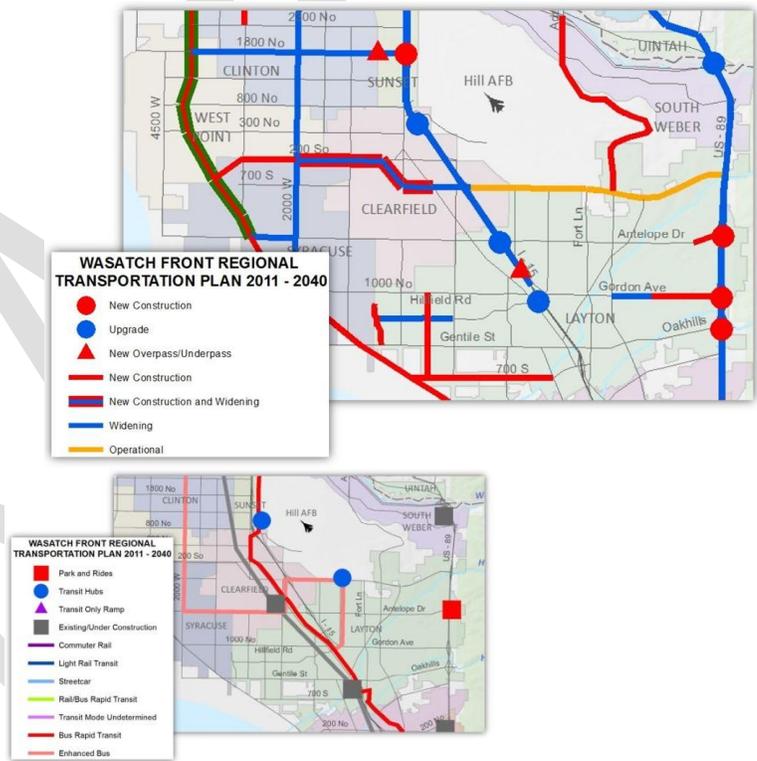


Figure 1.11 WFRC Long Range Highway and Transit Projects

Falcon Hill development. In addition, they show an “Enhanced Bus Route” (BRT-lite) that would serve Layton Hills Mall, Hill South Gate, Clearfield Station, Antelope Drive, and 2000 West.

University of Utah Study

Students at the University of Utah recently studied the Clearfield and Layton Stations, and recommended the five circulation routes shown in **Figure 1.12**. These routes served as a starting point to the transit alternatives presented in this study and should be considered preliminary.

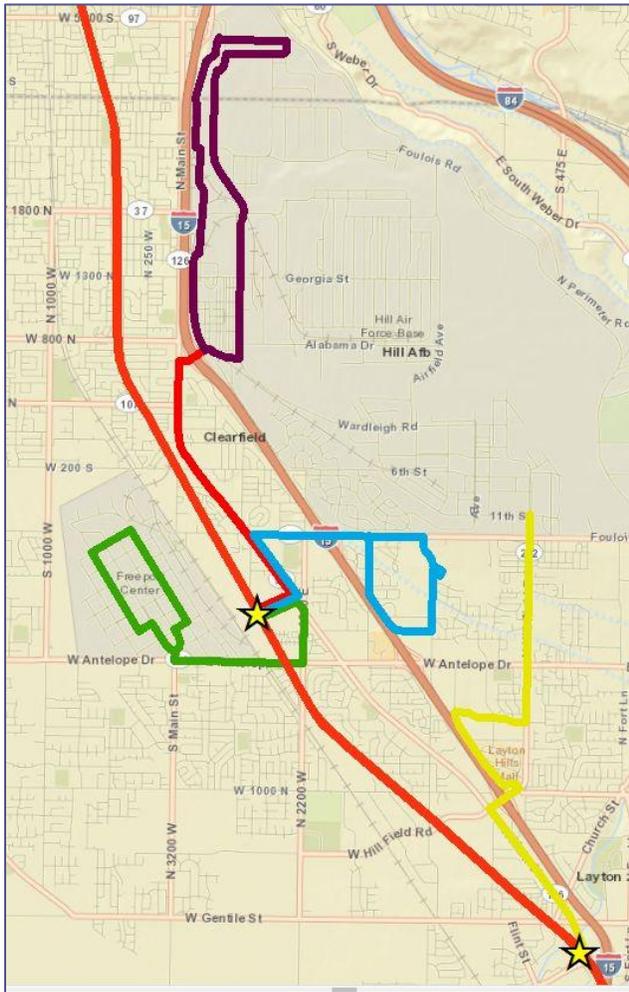


Figure 1.12 University of Utah recommended circulation routes

Community Land Use Plans

Current zoning maps from both Clearfield and Layton are shown in **Figures 1.13** and **1.14**, along with highlighted areas showing existing and emerging areas of interest relevant to potential transit circulation.

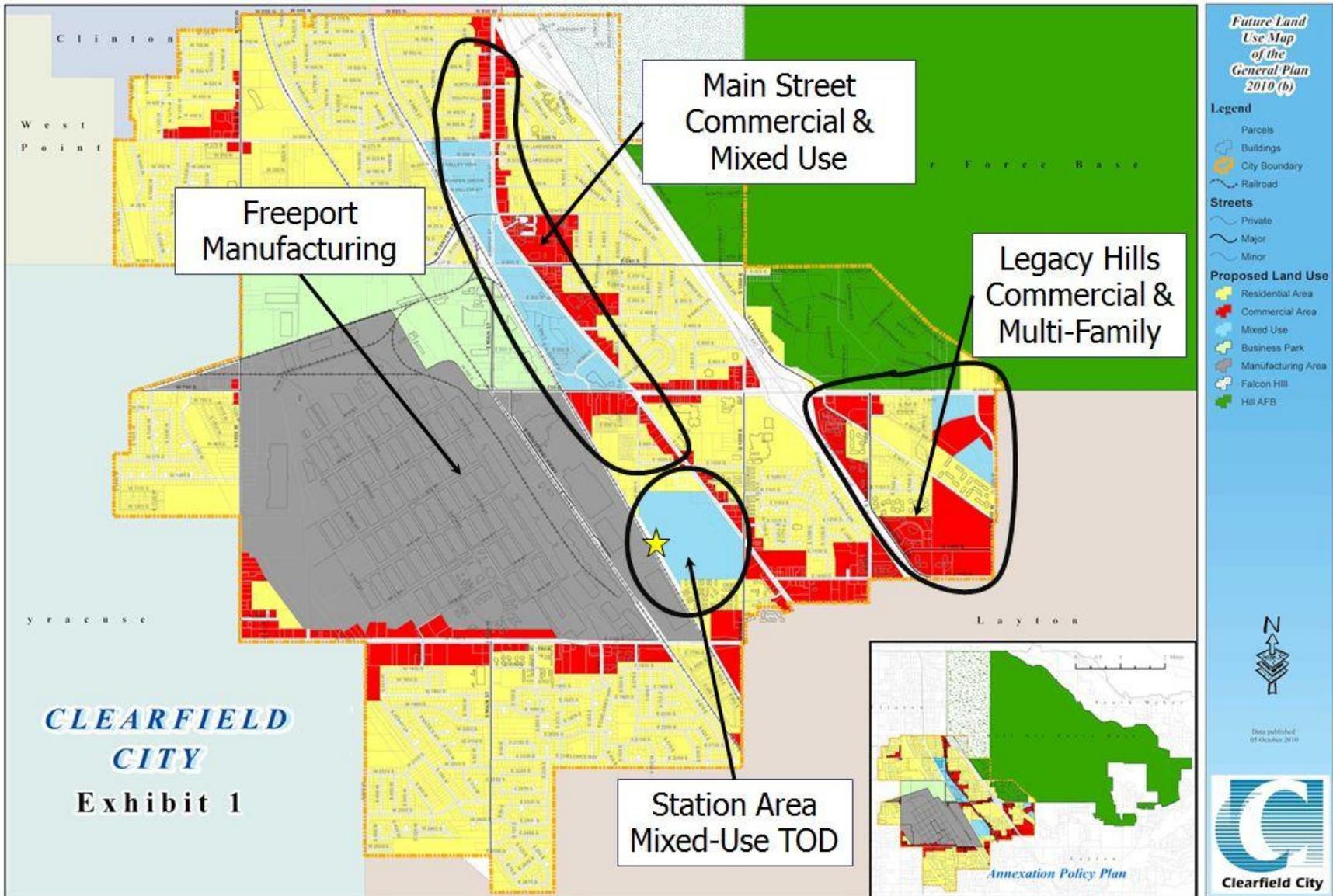


Figure 1.13 Clearfield Future Land Use Map

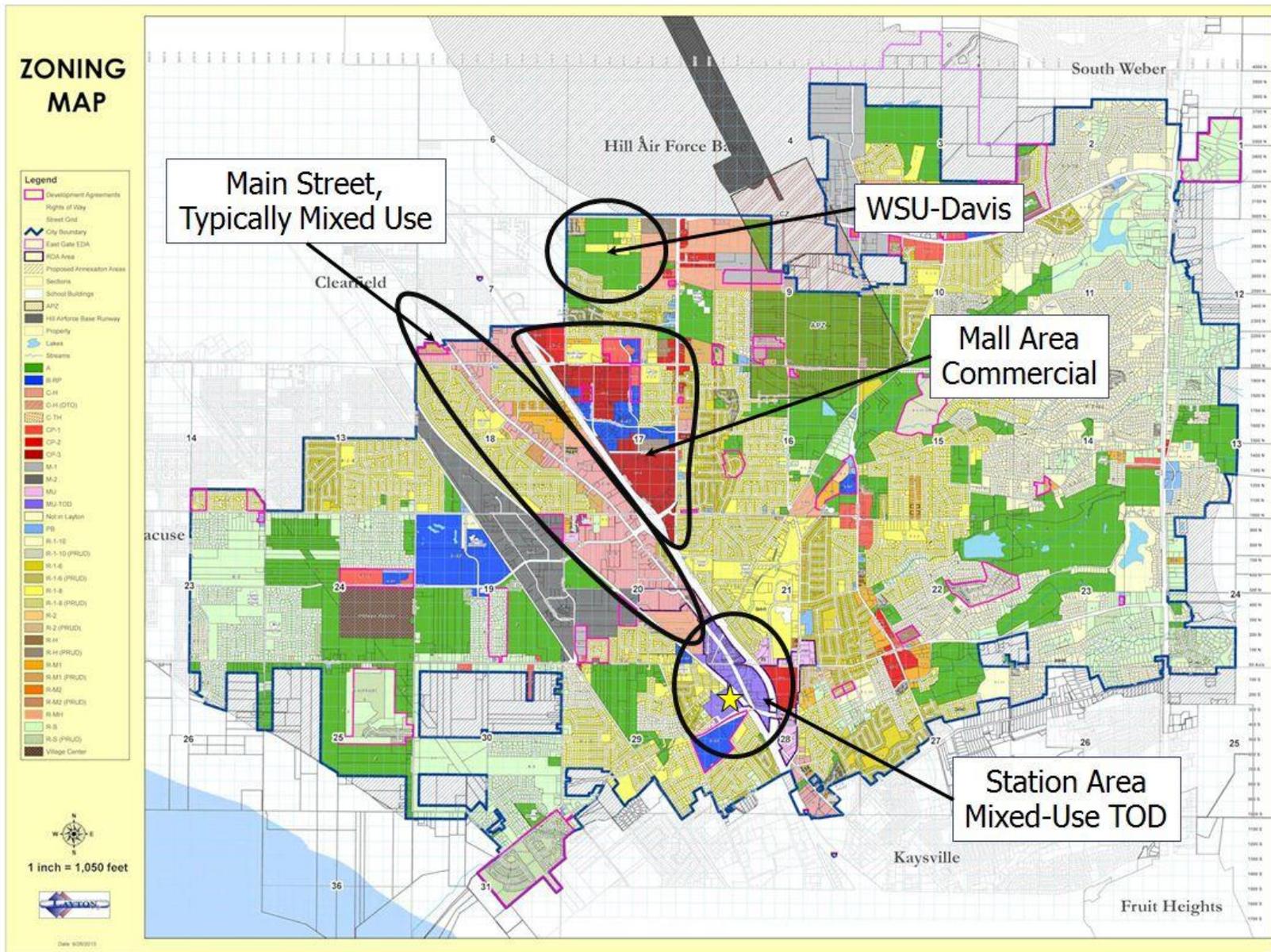


Figure 1.14 Layton Current Zoning Map

Summary of Existing Conditions

Just 3% of Jobs are “Walkable”

The Wasatch Choice for 2040 identifies six regionally significant “Urban Centers” along the I-15 / FrontRunner corridor outside of Downtown SLC. From south to north, these are Provo, Lehi, Sandy, Midvale, Layton/Clearfield, and Ogden. All of these are eventually expected to have high enough densities to warrant circulation for origins and destinations completely contained within each Urban Center.

Today, there are roughly 60,000 jobs within a 2-3 mile radius of the Clearfield and Layton stations, but each station has roughly just 1,000 jobs within a half-mile walk of that station. 2,000 out of 60,000 is about 3%.

Poor Pedestrian Connectivity

A few more jobs could be better connected if a concerted effort is made to create walk easements for shorter paths. The most prominent example is Freeport, where a grade-separated walkway westward across FrontRunner and freight rail tracks would bring perhaps another 2,000 jobs within a half-mile walk, where today there are just 1,000.

Existing Routes Lack Seamless Transfers

Today’s Route 470 and 640 each serve the Clearfield station, and have headways that match or exceed FrontRunner for most of the day (generally 30-minutes). These routes should help connect FrontRunner patrons with some of the areas 60,000 jobs, but because Clearfield is a mid-way stop for both routes, exiting FrontRunner patrons will experience wait times averaging 15-minutes, and may wait up to 30-minutes occasionally – a significant reliability issue that will deter all but the most dependent prospective riders.

“Almost” Connections

Route 470 does not connect to Layton station, but it comes very close and seemingly could be adjusted to do so without major capital expense. Route 626/627 currently serves WSU-Davis, Hill’s South Gate, and Layton Hills Mall. It comes close to Clearfield Station via Antelope Drive, and also comes relatively close to Layton station. It seemingly could be adjusted to serve one or both stations. But with 60-minute peak and off-peak headways, it would also need at least 30-minute peak-period service before it could be relied on for any significant last-mile distribution from FrontRunner.

Market Distribution

Roughly two thirds of the area’s 60,000 jobs are filled by workers who live within a 5-7 mile radius of FrontRunner stations, and these are effectively ineligible as candidates as Rail-to-Shuttle patrons, unless UTA were to implement a competitively low fare for “one stop hops” via FrontRunner. But many of these two-thirds may still make bus-to-shuttle transfers if these shuttles create good connections with existing bus routes that bring people to the stations from nearby suburbs.

The last third, or 20,000 workers, are at least two stations beyond the study area and hence would be more willing to pay today’s FrontRunner fare if there were a good last-mile connection to their job. This last third of workers is more heavily weighted to the north than the south.

Jobs/Housing Imbalance

While Clearfield, Layton, and Hill together tend to import workers to an excess of jobs, the North Davis overall is seriously imbalanced, generally exporting workers to jobs in the Salt Lake area. In spite of being a significant Activity Center, both Clearfield and Layton have more of their residents working in Salt Lake City than work in their own cities. There is a need for infrastructure that not only supports existing

jobs, but also helps increase the odds that new jobs will emerge in the area.

Need for Economic Opportunity

Layton's residents enjoy household incomes generally above the state average, but Clearfield's incomes are well below the state average. Many other communities in north-west Davis and Weber are also well below the state average, and have a high poverty rate, which all suggests a need for more and better job opportunities. A need for social justice opportunity is present for those who are reliant on walking, biking, and transit to access job opportunities.

Aging Commercial Development

Main Street and a number of other streets in the area have a high number of buildings that are worn out and ripe for redevelopment. A vision for transit and other Complete Street investments could help accelerate positive redevelopment.

Serious Congestion

While congestion is not a significant problem across most of Layton and Clearfield, it is a very serious problem primarily on east-west arterials that connect to I-15. Hill Field Road, Antelope Drive, and 650 North all challenging locations today, let alone in the future as more development occurs. SR-193 (700 South) isn't too bad today, but it also will likely get worse as it takes on more truck traffic and as western and Falcon Hill development occurs. There is also significant congestion across the general area near I-15 and Main Street.

Growing Transit Need; Lack of Transit Choices

Both locally and nationally, there are many trends that suggest transit will see ever increasing market shares – if it is available. Retiring baby boomers, and ever-expanding senior longevity, mean that many more people will still need mobility long after it is no longer safe for them to drive.

While transit travel time is almost always longer than auto times even in congestion, smart phones and tablets are making it much easier for people to use that time productively. Hence more are discovering that “loss time” is actually greater in cars than in transit. Young professionals are also forming families much later, and hence are more likely to want to live in multi-family environments “where the action is” even if they have money to afford suburban homes.

This summary of existing conditions helps highlight some of the needs in the area that can potentially be improved by transit-supportive actions in the study area.

Sources for Demographic Information: 2010 Census; WFRC population/employment forecasts. Zip code of origin for workers obtained from HAFB and multiple businesses in Freeport Center.

Section 2

Purpose and Need

With the existing conditions well understood, it is easier to identify needs for improving existing transit, and also needs that additional or modified transit could help address.

Goals and Objectives

The goals for proposed action should emerge directly from observed needs. Given the defined needs detailed in Existing Conditions, and summarized in this section, here is the following summary of goals and objectives that transit alternatives should address.

1. Improve Last-Mile Connection to Existing Jobs
2. Expand First-Mile Social Justice Opportunities
3. Improve Short-Trip Circulation Within Area
4. Support Economic Development (2040 Vision)
5. Relieve Congestion; Provide Choices
6. Respond to Community Requests
7. Provide Cost-Effective Solutions

Transit Related Needs

1. Improve Last-Mile Connection to Existing Jobs

A circulator's coverage area is defined by what it can reach if it must meet every train. As a general rule, most land uses within a 2-3 mile circular radius of the station will fit within a 22-minute route (the maximum drive time for matching with 30-minute trains).

Of the jobs that are within this 2-3 mile radius of Layton and Clearfield stations, only about 3% of those are also within walkable range of the stations. Circulators could function as a "moving sidewalk" – effectively bringing many more of the

area's 60,000 jobs within "walkable" range of FrontRunner stations.

2. Expand First-Mile Social Justice Opportunities

Lower income citizens and minorities tend to have less access to automobiles, and are hence more dependent on jobs and services they can reach by walking, biking, or transit.

Even if the main purpose of circulators is to distribute those who exit FrontRunner to area jobs, a secondary benefit, and hence a secondary purpose, is that those who live within walkable range of these circulators can also use them to reach FrontRunner and travel to destinations elsewhere – greatly expanding their opportunities.

For those with access to vehicles, first-mile access is less critical than last-mile distribution, because in most cases patrons will simply drive to the park and ride lots rather than ride the circulator. But first-mile access is critical for those who do not have vehicles. Clearfield and the mixed-use areas in Layton both have above average numbers of citizens in these categories.

3. Improve Short-Trip Circulation Within Area

While the main initial goal is to extend the reach of FrontRunner, service can also potentially be used simply for intra-area circulation. This opportunity will become more and more important in the future, as congestion on area streets increases, and as densities and the mix of uses also is expected to increase. Good intra-area service will also help provide basic mobility for lower-income residents, seniors, and others who cannot or do not want to drive.

4. Support Economic Development as shown in Wasatch Choice for 2040 Vision

The Vision shows this area as an "Urban Center." Ogden is the only other urban center north of Downtown SLC. At roughly 20-miles north of

SLC, the area is positioned for rapid development as an Edge City. Plans at Falcon Hill suggest that transit-oriented densities could eventually exist in the area.

An early commitment to quality FrontRunner connections can potentially impact development patterns by sending a message through the development market that quality transit circulation is a permanent and reliable feature. It has been well reported that Adobe, EBay and other high-tech firms selected their Utah locations in part because of nearby connections to quality transit. Further, if municipalities make progress toward attractive multi-modal streets, all of this can help catalyze mixed use development which will help people adopt transit-oriented lifestyles.

5. Relieve Congestion; Provide Choices

Today there is serious congestion primarily on arterials that connect to I-15, and this congestion is only expected to get worse. But without visible, quality transit, auto travel is the only realistic choice. There is growing need for transit to help transport aging seniors. And since wireless technologies also make it possible to be productive while traveling, this should encourage more people to use their cars less. Thus a valid need in the area is to relieve congestion in part by providing the public with attractive, realistic alternatives.

6. Respond to Community Requests

Region-wide, UTA has received many requests for transit circulators aimed at better connecting TRAX and FrontRunner with job anchors that are beyond the walkable reach of nearby stations.

Locally, UTA has been approached by Clearfield City, Layton City, and major employers in the region to improve transit circulation to and from FrontRunner stations. These many grass-roots

requests are evidence of unfilled needs, and hence a valid goal of this effort is to identify cost-appropriate strategies for responding to these requests.

7. Provide Cost-Effective Solutions

Selecting transit options that are too expensive relative to increased ridership potential invariably means that the community will wait perhaps many decades for implementation. Thus there is a need to match the cost of proposed actions to the likely benefit, as measured by new riders and other above needs. Alternatives that achieve good ridership with low initial capital cost and low operating cost will be competitive immediately, and have a good chance of being implemented as soon as funds can be secured.

Alternatives that require more substantial investment to attract even more riders could still be cost-competitive in later years relative to projects already on the Regional Transportation Plan, and if so there will then be a good case to add them to the RTP at the next opportunity.

The next project phase will explore screening criteria designed with the goals in mind, and also explore reasonable transit alternatives for testing against the screening criteria.

Section 3

Screening Criteria

System design should balance between identified needs and achievable resources. Thus to aid in designing and selecting alternatives, the following screening criteria are proposed.

Primary Criteria

1. Reliably match FrontRunner schedules
2. Maximize last-mile access to jobs
3. Good stakeholder and community support
4. Good Return on Investment
5. Strengthen Economic Development

Secondary Criteria

6. First-mile social justice
7. Attract intra-area short trip circulation

Primary Screening Details

1. Reliably match FrontRunner schedules

Selected routing plans must meet the trains with seamless transfers. FrontRunner operates at 30 minute peak headways and 60 minute off-peak. To match 30-minute trains, a circulation route must be reliably drivable in no more than 22 minutes. The last 8 minutes helps ensure they will get back to the station with a few minutes to spare, gives operators a short break, and provides a few minutes for transferring passengers to board after the train has left.

If desirable destinations cannot be reached within 22 minutes, then A-train, B-train operation could be an option, where each shuttle meets every other train, then runs a 45-50 minute route. FrontRunner has 60-minute mid-day service, which in this scenario would allow one of the shuttles to stop during those hours.

2. Maximize last-mile access to jobs

Selected routes should have stop opportunities that allow for a high number of jobs to be reached by foot ideally within a quarter-mile of the stop.

3. Good stakeholder and community support

Selected alignments and service characteristics need to gain the support of affected communities and major stakeholders. Routes should try to serve destinations that are important to community objectives.

4. Good Return on Investment

This is usually measured in boardings per dollar invested, where dollars is a function of both capital and operating and maintenance costs. Within the context of this feasibility study, both ridership estimates and cost estimates will be somewhat generalized. As far as circulators go, streetcars usually achieve the most total riders, but they are also prohibitively expensive within the present context, so only rubber-tire, low capital options will be considered at least for near-term concepts.

5. Strengthen Economic Development

The Wasatch Choice for 2040 Vision anticipates that the Clearfield/Layton/Hill area will and should emerge as a very strong Urban Center in coming decades. The easiest first thing that transit can do in supporting that vision is simply to better connect more people to more jobs. But if communities can create an attractive multi-modal environment, then in time the emerging transit system will be very impressive and can serve as a catalyst for attracting high-paying jobs and impressive private investment.

Secondary Screening Details

1. First-mile social justice

Virtually everyone needs last-mile distribution, but most people have good first-mile access to FrontRunner because they have cars available and there is ample parking at virtually all stops. However, not everyone has good first-mile access, so circulation routes that can also serve high-densities of lower-income residents is a great benefit that should be considered. In addition to accessing regional transit, such routes can also help provide intra-area circulation to these same residents.

2. Attract intra-area short trip circulation

While the primary need expressed by cities, major employers, and UTA is to create good last-mile distribution strategies that can generate more FrontRunner ridership, it would be good if the same circulators could also attract riders who are just trying to go to lunch, or run errands, etc. The more reliable and attractive it is for short-trips, the more it can help attract economic development, relieve local congestion, and provide realistic alternatives to automobile travel.

Section 4

Alternatives Screening

Creating a Toolbox of Mobility Choices

The existing conditions section outlines the transportation challenges faced by both Layton and Clearfield. A wide variety of options exist to enhance mobility within the communities themselves as well as to/from regional facilities such as FrontRunner.

There are multiple common transit technologies used for circulation in the United States. After an examination of travel markets and population and employment densities, local buses, dedicated circulators, and vanshare are the practical options today. In general, a minimum of at least 20 employees per acre or 20 units per acre must be within walking distance of the entire corridor for fixed-guideway services to be considered.

Pedestrian bridges have potential to enhance station area connectivity, particularly between Clearfield Station and the Freeport Center. A pedestrian bridge could put more than 2,000 jobs within walking distance of Clearfield Station. A bridge is an expensive capital project, but there is significant stakeholder interest to pursue this option as an immediate solution. It should be considered as part of potential redevelopment of the Clearfield Station TOD site.

The following sections detail options to maximize mobility in Layton and Clearfield using the following modes and technologies.

- Existing bus service
- Potential circulator/shuttle routes
- Vanpool/vanshare options

Alternatives are not mutually exclusive as improvements vary significantly in terms of benefits and costs.

Technology Option	Study Further	Rationale
Streetcar / Light Rail	No	Insufficient population & employment density
Bus Rapid Transit	Later	Main Street, Route 470 path has potential
Pedestrian Bridges	Yes	There is stakeholder interest in identifying funding sources to install a bridge connecting Clearfield FrontRunner Station and Freeport Center
Local Bus	Yes	Cost-effective method to leverage existing resources
Circulator/Shuttles	Yes	Targeted markets are big enough to support this
Vanshare	Yes	Cost-effective method to enhance mobility

Figure 4.1: Circulation technologies that are and are not viable in Clearfield / Layton at present.

Enhancing Existing Bus Service

UTA is currently finalizing a Five-Year Service Plan, which is considering changes to existing routes in the Ogden business unit. All of the routes in this study area are under review, and recommendations from this circulator study are being coordinated with changes to the overall Weber/Davis network.

Vanpools vs. Vanshare

Existing Vanpool Program

UTA manages a vanpool program with a program manager and support specialists as well as marketing, accounting and maintenance support staff. UTA does not subsidize individual vanpools; however, the Federal Commuter Tax Benefit allows employers to provide their employees with up to \$245 per month tax-free for vanpool fares.

UTA's vanpool fleet includes a combination of over 500 minivans and vans with seating capacities of up to 15 passengers. To sign up for a vanpool, individuals call UTA, tell them about their needs and UTA will either place them in an existing vanpool or, if no vanpool is operating and there are at least five on a waiting list, a new vanpool will be formed. The average mileage for a vanpool is 1,700 per month, or about 40 miles per one-way trip. Each vanpool has two drivers, plus a bookkeeper. Drivers are allowed 50 personal miles per month. Fares include fuel, maintenance, and insurance. They are based on mileage, not passengers, so fares may fluctuate as membership changes.

Major employers often develop and sustain successful vanpool programs over time via email/breakroom advertisements and word-of-mouth marketing as satisfied customers share their experiences with colleagues. As a result, new vanpools form as each fills up.

Potential Vanshare Program

Where vanpools do not involve any transfers to/from a UTA route, vansharing requires patrons to ride FrontRunner to the station closest to their destination, where the group then transfers not to a circulator, but instead to a van reserved for them in the park and ride lot. Where the average vanpool travels 40 miles per day, the average vanshare vehicle will likely travel only 5-10 "last-miles" per day. Thus the vehicles for vanshare are typically fully depreciated vehicles from the regular vanpool program. In addition, much like a vanpool, several passengers in the group of riders must be qualified to drive the vehicle.

These examples illustrate the difference. With today's vanpool program, a group of Hill Air Force Base employees from Utah County all drive to any convenient park-and-ride lot in Utah County then travel to Hill together in the van. With vanshare, the group need not all be from Utah County. It is sufficient that they simply all arrive at the destination station at roughly the same time (as in cases where NB and SB trains are designed to arrive at roughly the same time).

They would then transfer to a vanshare vehicle parked overnight at Clearfield Station and drive to their final work destination. In the afternoon, the pattern would be reversed, with the vanshare vehicle driving the group back to Clearfield Station to catch Frontrunner.

King County Metro in Seattle, WA and Pace in suburban Chicago, IL both use vanshare programs to extend the reach of the local commuter rail system. Thirteen different Vanshare groups in Seattle are currently looking for additional riders, divided among 3 different stations.

UTA has recently started a pilot program with an employer to test a vanshare type program. If successful, a similar program should be examined for the Layton / Clearfield area. Vanshare is studied later

in this document as Alternative E in Figure 4.4, and is also advanced as a recommendation in Section 6.



Figure 4.2 Vanshare last-mile connections from rail station

Potential New Circulator Routes

The following descriptions and graphics detail potential circulator/shuttle route alignments for several key markets within the Clearfield/Layton area. Each one of the alignments was designed to connect FrontRunner service with a major destination, or several destinations. Original assumptions were that

Alternative A - Hill Air Force Base

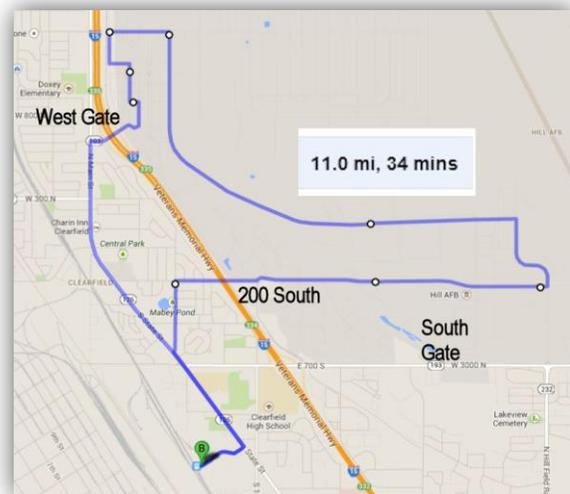
This alignment option connects Clearfield Station with Hill Air Force Base. The route serves both the South Gate area as well as the administrative offices near the West Gate. The route may work best by avoiding congestion at the south gate and instead using an I-15 underpass at 200 South. Any option to HAFB will require operating two shuttles (each meeting every-other train), but the market is likely large enough to support both. This is one option for internal circulation, but actual routing is being determined by UTA and HAFB together.

See concept on-line at <http://goo.gl/maps/DjhJ8>

FrontRunner was going to shift where north and southbound trains meet from Layton Station to Clearfield Station, perhaps as soon as 2014. This is still the ultimate plan, but UTA is still reviewing the feasibility of doing this soon due to potential track limitations.

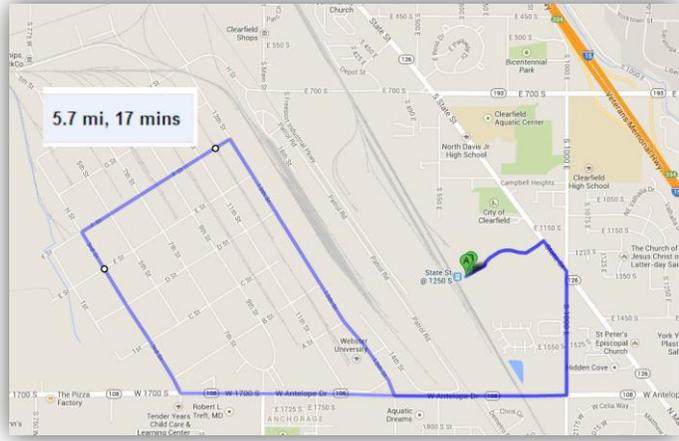
Without timed transfers between north and southbound FrontRunner trains at Clearfield Station, circulators will not attract as many riders as predicted in this study. The market size from Ogden is generally stronger, but incentive to ride FrontRunner from the south is stronger because the journey is longer. Therefore this study is uncertain which connection will gain more riders, and defers to UTA to decide in the event that shuttles cannot connect to both directions simultaneously.

All of the circulator options assume rubber tire technology. Mileage and times are as reported from Google Maps. Shuttle times will certainly be somewhat higher, and should be tested before implementation.



Alternative B - Freeport Center

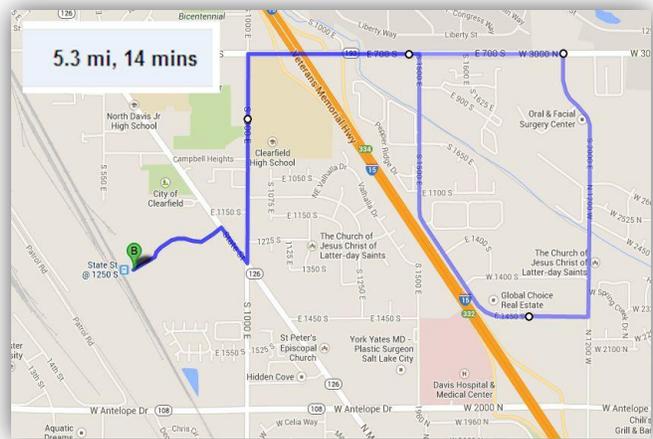
This alignment connects Clearfield Station with Freeport Center. The proposed routing from Clearfield Station would use State Street, 1000 E, Antelope Drive, 3rd Street, F Street, 13th Street, and return. This alignment has little congestion and can be completed with a single driver in less than 25 minutes round trip. The preferred routing option would be to have a pedestrian bridge connecting Clearfield Station with Freeport Center, then a route within the business park.



Concept sketch: <http://goo.gl/maps/lePuk>

Alternative C - WSU – Davis Campus

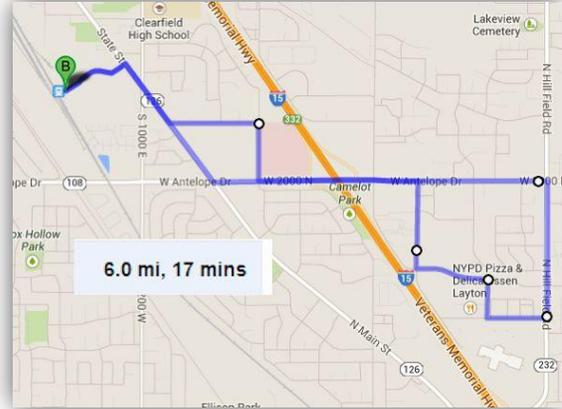
This alignment option connects Clearfield Station with WSU-Davis. It avoids the congestion on Antelope Drive, and also will provide service to two call centers, each employing 1,000 persons. The proposed routing would use 1000 E, 700 S, University Parkway, Legend Hills Drive, and return, passing by a number of large apartment complexes, providing 1st mile access to FrontRunner. This alignment can be completed with a single driver in less than 25 minutes round trip.



Concept Sketch: <http://goo.gl/maps/KA7pe>

Alternative D1 - Layton Hills Mall / Conference Center, via Clearfield Station

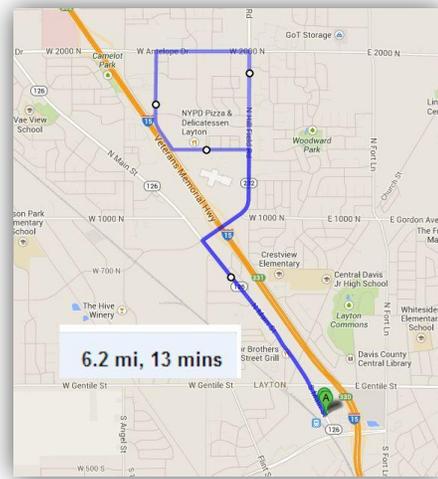
This alignment option connects Clearfield Station with Layton Hills Mall and Davis Conference Center. It also serves the Davis Hospital. The proposed alignment would follow State/Main Street, 1450 S, Antelope Drive, Layton Hills Parkway, 1425 N, Hill Field Road, and then return. Where there is little congestion, this alignment can be completed in less than 25 minutes round trip, but until Antelope Drive is improved, it most likely will require two drivers at peak times, where each matches every-other train.



Concept Sketch: <http://goo.gl/maps/pD5Ae>

Alternative D2 - Layton Hills Mall / Conference Center, via Layton Station/State St

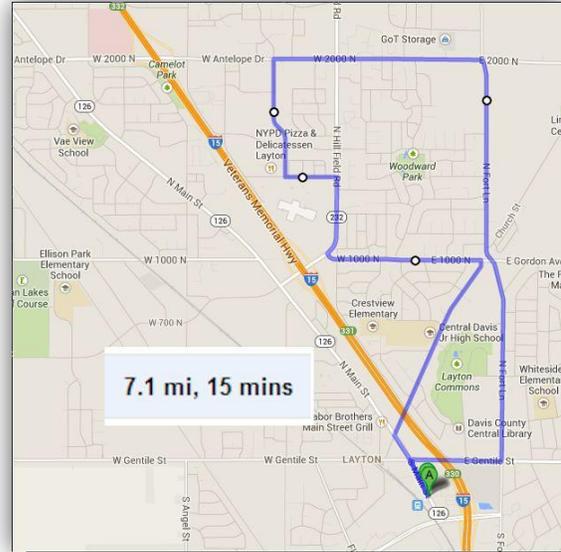
This alignment option connects Layton Station with Layton Hills Mall and Davis Conference Center. The proposed alignment would follow Main Street in Layton, Hill Field Road, Antelope Drive, Heritage Park Boulevard, 1425 N, and then return via Main Street. This alignment can be completed in less than 25 minutes round trip, although congestion on Hill Field Road may make it difficult to stay on schedule. Changes to access to Layton Station may be required to accommodate this alternative.



See concept sketch on-line: <http://goo.gl/maps/sOMm8>

Alternative D3 - Layton Hills Mall / Conference Center, via Layton Station/Ft. Lane

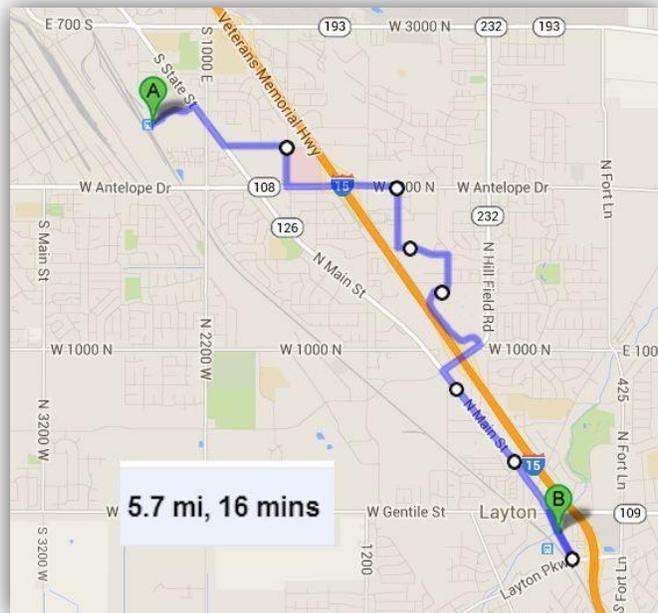
This alignment option connects Layton Station with Layton Hills Mall and Davis Conference Center via Fort Lane. This alignment connects more residential density with FrontRunner and avoids the congestion at the I-15/Hill Field Road interchange. The proposed alignment would follow Main Street, Gentile, Fort Lane, Antelope Drive, Layton Hills Parkway, 1425 N, Hill Field Road, Antelope Drive, traverse the mall area, then 1000 North to Church Street, and back on Main Street. This alignment can be completed in less than 25 minutes round trip. Changes to access to Layton Station may be required to accommodate this alternative.



See concept sketch on-line at <http://goo.gl/maps/8Tlfz>

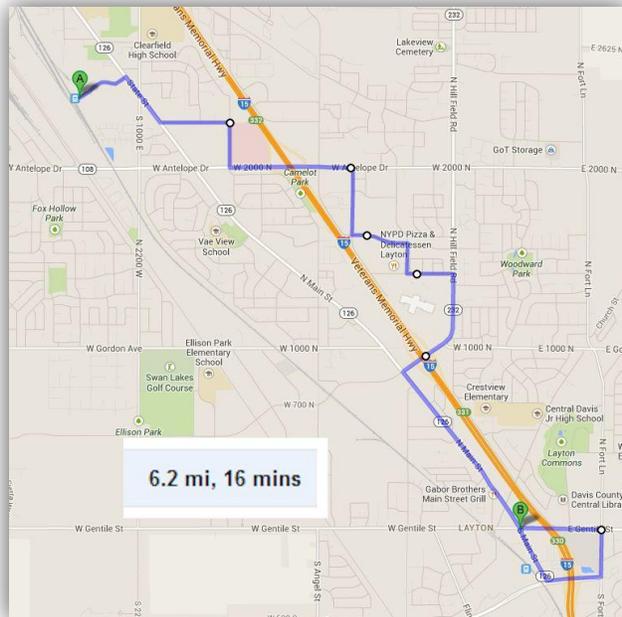
Alternative D4 - Layton Hills Mall / Conference Center, via Both Stations

This alignment combines D1 and D2 into one route that connects Clearfield Station to Layton Station, and also serves most of the big all-day and commuter destinations in Layton and Clearfield. It also serves Davis Hospital, Layton Hills Mall, and the Davis Conference Center. From Clearfield Station, the proposed alignment would follow State Street, 1450 S, Antelope Drive, Heritage Park Boulevard, Layton Hills Parkway, the ring road within Layton Hills Mall, Hill Field Road, Main Street and terminate at the northern park-n-ride lot for Layton Station. Because time is tight, the shuttle would not wait for any trains at Layton Station, but would instead return immediately back to Clearfield via the same path. The round trip exceeds 25 minutes and hence requires two drivers. In congested times it can even exceed 60 minutes.



Alternative D5 – Same as D4, but with Southern Loop

This alignment is identical to D4, but includes a loop on the south end helping shuttles to return northward without need for a new signal at the Layton park and ride lot. Southbound shuttles would turn into the station, then turn right out of the station, and return north via Layton Pkwy, Fort Lane, Gentile, then Main. This loop is preferred by Layton City over Alt D4 in part because it accesses redeveloping land just east of I-15, and helps connect their city offices to FrontRunner. The city drove this route in both peak and off peak conditions, and estimated a round trip of 67 minutes in peak, and 44 minutes off-peak, allowing 3 minutes for 9 stops, and 20-seconds per stop. Their peak run was during the height of the Christmas shopping season. Once UDOT makes improvements to Hill Field Road and Antelope, this route most likely can work reliably with just two drivers. Otherwise it will require more.



See concept sketch on-line at <http://goo.gl/maps/ES0XE>

Cost Estimates

A spreadsheet was developed with the length of each route, and assumptions of the time required to traverse each route in the 3-hour peak service during the morning and evening and off-peak service during the rest of the day, to determine annual miles, service hours, and costs required to operate the route. Assumptions for hours of operation were also made, and it was assumed that all routes would operate 253 weekdays per year, but not on Saturday and Sunday.

The tables in **Figure 4.3** show the daily trips and revenue hours; a low and high range of annual O&M costs, based on the operation of both peak-hour and all-day service; and initial vehicle acquisition costs. Peak hour service is defined as service offered during commute times, generally from 6-9 AM and 3-6 PM for purposes of this study. The total service miles are multiplied by \$6.48 per mile* (obtained from internal UTA sources), resulting in a conservative annual O&M cost estimate. Low range operating costs represent weekday 30-minute service from 6-9 AM and 3-6 PM. High range operating costs include the peak-hour service just mentioned with an additional 60-minute service from 9 AM-3 PM. Capital expenses assume that vehicles will cost between \$180,000 and \$250,000 each for the smaller buses envisioned for circulator service.

Vanshare may require administrative investment to organize a region-wide program, but should enjoy relatively little ongoing capital and maintenance expense, if retiring vanpool vehicles are utilized, and if patrons themselves pay the operating costs.

Low Range Operating Costs

Alternative	Peak Headway	Annual Service Hours	Annual Service Miles	Peak Vehicles	Annual O&M Cost*
A	Service attributes being determined now for Spring 2014.				
B	30	1,900	20,000	1	\$ 129,000
C	30	1,900	19,000	1	\$ 122,200
D1	30	1,900	21,000	1	\$ 138,000
D2	30	1,900	22,000	1	\$ 140,300
D4	30	3,800	35,000	2	\$ 226,200

High Range Operating Costs

Alternative	Peak Headway	Non-Peak Headway	Annual Service Hours	Annual Service Miles	Peak Vehicles	Annual O&M Cost*
A	Service attributes being determined now for Spring 2014.					
B	30	60	3,800	29,900	1	\$ 193,400
C	30	60	3,800	28,300	1	\$ 183,300
D1	30	60	3,800	31,900	1	\$ 207,000
D2	30	60	3,800	32,500	1	\$ 210,400
D4	30	30	8,500	78,600	2	\$ 509,000

*Rate includes fully allocated costs, including additional operators, administrative staff, employee pensions, facility upgrades, etc.

Capital Cost Estimates

Alternative	Peak Hour Vehicles	Reserve Vehicles	Vehicle capital cost range	
A	Vehicle needs being determined now for Spring 2014			
B	1	0.5	\$ 270,000	\$ 375,000
C	1	0.5	\$ 270,000	\$ 375,000
D1	1	0.5	\$ 270,000	\$ 375,000
D2	1	0.5	\$ 270,000	\$ 375,000
D4 Peak Hour	2	1	\$ 540,000	\$ 750,000
D4 All Day	2	1	\$ 540,000	\$ 750,000

Daily Trips & Revenue Hours

Peak Hour Service

Alternative	Weekday Span (Hours)	Peak Headway	Round Trip Miles	Daily Trips	Daily Revenue Hours	Weekends?
A	Attributes being determined now for Spring 2014					
B	6-9am, 3-6pm	30	5.7	12	6	No
C	6-9am, 3-6pm	30	5.4	12	6	No
D1	6-9am, 3-6pm	30	6.1	12	6	No
D2	6-9am, 3-6pm	30	6.2	12	6	No
D4	6-9am, 3-6pm	30	10	12	6	No

All-Day Service

Alternative	Weekday Span (Peak Hours)	Weekday Span (Non-Peak Hours)	Peak Headway	Non-Peak Headway	Round Trip Miles	Daily Trips	Daily Revenue Hours	Weekends?
A	Attributes being determined now for Spring 2014							
B	6-9am, 3-6pm	9am-3pm	30	60	5.7	18	12	No
C	6-9am, 3-6pm	9am-3pm	30	60	5.4	18	12	No
D1	6-9am, 3-6pm	9am-3pm	30	60	6.1	18	12	No
D2	6-9am, 3-6pm	9am-3pm	30	60	6.2	18	12	No
D4	6-9am, 3-6pm	6am-9pm	30	30	10	27	27	No

Figure 4.3 Annual operating costs, initial capital costs, and potential revenue hours of various alternatives.

Applying Initial Screening Criteria

Each of the alternatives was compared to the following screening criteria approved by stakeholder committee members. A discussion of each criteria, and how each option fared, follows.

1. Reliably Match FrontRunner Schedules

All circulator routes were designed to operate in a clock-faced manner, meaning a vehicle is deployed every 30 or 60 minutes. A clock faced running time is important as FrontRunner operates either every 30 or 60 minutes, and connections to the train are one of the key markets for any of these circulators.

According to UTA's plans, Clearfield Station will eventually be where north and southbound trains will meet every 30 minutes during peak times and every hour during non-peak times. Timed meets for circulator services to both north and southbound trains are thus assumed at Clearfield Station. Circulator services to Layton Station will not have timed connections to trains in both directions after this eventual change.

Initial estimates suggest that all of the alternatives can reliably match trains, often with just one driver, and those that would require two or more drivers appear that they may have sufficient demand to warrant additional vehicles.

2. Maximize Last Mile Access to Jobs

Virtually all designed shuttle services have a major employer or employment site anchoring the route. The only exception is Alternative C, which has a primary market of WSU-Davis. This destination will be large soon, but is relatively small today. Hill Air Force Base, Freeport Center, and the area in Layton surrounding the Convention Center all have sufficient employment density to support circulator service.

3. Good Stakeholder and Community Support

Each of the alternatives was described to the Project Advisory Committee. Certain alignments generated more feedback than others in both a positive and negative manner. The alignments with the highest support from the Project Advisory Committee were Alternative B to the Freeport Center and Alternative D4, which combines Alternatives D1 and D2. Alternative D3, which follows Fort Lane, received the least support.

4. Good Return on Investment

This criteria measures how much investment must be made to cater to a market. Hill Air Force Base, Freeport Center, and the area surrounding the Layton Convention Center have the employment density necessary to support shuttle services. The Freeport circulator, Alternative B, requires only one vehicle to provide 30-minute service at peak times only, and hence should have a very good return on investment.

The Hill circulator, Alternative A, will require two vehicles at peak times, and likely no service in off-peaks. But it should also have good return on investment for three primary reasons: 1) Hill is much larger than Freeport; 2) most Hill employees should qualify for free transit passes; 3) if buses enter the base via 200 South, then they should enjoy a significant advantage over cars waiting at other entry gates.

All of the D's (Mall area) require at least two shuttle vehicles, and D4/D5 may require three vehicles, at least while there is serious interchange congestion. Thus the D Alternatives have a higher level of both capital and operating investment, but they serve a significant all-day market and should still prove successful. The Legend Hills/WSU-D circulator, Alternative C, has ridership potential far less than the other options as it does not yet have as large of a ridership generator.

5. Strengthen New Economic Development

This is an estimate of the alternative’s ability to grow and improve over time, and foster new development – especially business development. Will it serve areas that are currently ripe for mixed-use redevelopment? Are there opportunities for enhanced bus features? Are there many opportunities for new employment? Will it help communities “sell themselves” to businesses they are courting?

This measure is subjective, and results represent professional opinion as well as the opinions of key stakeholders. Hill is rated low in this regard, primarily because growth on the base is generally insensitive to enticements. However a shuttle to Falcon Hill would help strengthen economic development there, and may be appropriate within a decade or so as more development comes on-line. Freeport has some further development potential, but is considered

medium rather than high because its potential is industrial rather than mixed-use. The shuttle to WSU-Davis is also generally medium, because growth at the college will occur regardless of transit. The historic retail areas that coincide with D1-D5 rate high, largely because they are currently ripe for infill and redevelopment and hence have great opportunity for upgraded multi-modal street design and a mix of transit-oriented uses. Circulators in these areas can help attract new growth that may have otherwise not come, and influence it to be less auto-dependent.

Figure 4.4 summarizes the initial screening criteria, with specific alternative names for convenience (Clearfield station to the mall area, Layton to Mall, Mall via Fairfield, and Layton to mall to Clearfield).

ALTERNATIVES CONSIDERED

Criteria	A	B	C	D1	D2	D3	D4,5	E
Min. Vehicles Required	2	1	1	1	1	1	2	5
Route ID	Hill Air Force Base	Freeport Center	WSU-Davis	Clearfield Station to Mall	Layton Station to Mall	Ft Lane to Layton Station	Layton Station to Clearfield Station	Vanpool
1. Reliably Match FrontRunner	✓	✓	✓	?	?	✓	?	✓
2. Maximize last-mile access to jobs	High	High	Medium	High	High	Med-Hi	High	High
3. Good stakeholder, support	High	High	High	Medium	Medium	Low	High	High
4. Good return on investment	High	High	Low	High	Med-Hi	Medium	High	High
5. Strengthen Economy	Low	High	Medium	High	High	Low	High	Low

Figure 4.4 Primary screening criteria applied to alternatives

Based on the initial screening criteria, two alignments were removed from further consideration:

- **Alternative C** does not rank as highly as the others, and this market may also be served by timed connections with a revised Route 627. It may eventually make a good circulator as WSU-Davis develops their build-out plan, and as Legend Hills continues to evolve.
- **Alternative D3** has less return on investment and little community support. The markets it caters to are better served by the other D Alternatives.

Section 5

Ridership Forecasts

Background

The Wasatch Front Regional Council maintains a travel demand model, which predicts actual potential ridership on all UTA bus and rail routes, and has been used extensively in predicting rail ridership as part of the federal New Starts process. While this model is generally used for longer routes, it can also be used to estimate shorter circulation routes, but care must be exercised.

A potential problem with modeling short routes is that they may be inadvertently penalized too much by the transfer from train to shuttle. The model has a built-in “transfer penalty” that is intended to discourage transfers between random route crossings. Often would-be patrons do not know about such random crossings, and hence will not ride because they are unaware of the transfer opportunity. Or if they are aware, they realize they may wait a long time for the transferring vehicle to arrive.

With dedicated shuttles that depart as soon as FrontRunner patrons have boarded, transfers are far less onerous. You are virtually at your destination, and shuttles are more like “moving sidewalks” than second-halves of a complex journey.

Methodologies

There are three methods of forecasting circulation trips in the WFRC model:

4. Assume that riders exiting FrontRunner do not board a shuttle vehicle at all, but instead walk straight to their destination on an intentionally shortened “walk link,” similar to a “moving sidewalk.”

5. Assume that FrontRunner actually drops them off within a short walk of their final destination, thus avoiding artificially shortened walk-links, and also avoiding a transfer to another route.
6. Just model the shuttle as a separate route, then add a “seamless transfer” flag to help the model understand that the timed shuttle transfer is not as onerous as a typical transfer.

All three approaches were used here to help establish a minimum and maximum range of expected ridership.

The modeling assumes that patrons to Hill Air Force Base will have transit passes based on the present-day fare structure used by UTA. All other destinations require patrons to purchase passes if their trip involves either FrontRunner or one of the standard bus routes.

Results of All Alternatives

Figure 5.1 shows the estimates of daily boardings by route. High and low ranges were selected based on modeling results of the three methods of using the WFRC model, with consideration of experiences on routes with similarities, and market origin-destination data.

The table also shows an estimate for increased FrontRunner ridership associated with that particular circulator. Not all of the trips on the circulators are direct transfers from FrontRunner. Many are transfers from other buses, and in some cases, especially the mall options, riders are internal to the route (i.e., not transfers).

		Low Shuttle	High Shuttle	Low FR	High FR
A	Hill AFB	400	500	250	300
B	Freeport	200	300	100	150
C	Legend Hills, WSU-D	75	125	40	80
D1	Clearfield to Mall	250	450	100	190
D2	Layton to Mall	250	400	90	170
D3	Ft. Lane to Mall	150	300	60	120
D4	Layton to Clearfield	400	700	150	300
D5	L to C, w/South Loop	425	750	160	310
E	VanSharing	30	100	30	100

Figure 5.1 Expected ridership ranges on circulators, and associated increases in FrontRunner ridership. Ridership estimates created using multiple strategies in WFRC travel model. Assumes simultaneous arrival of NB and SB trains at Clearfield Station. Expect ridership to drop by 25-35% in cases where you must choose to meet either NB or SB train, but do not have resources to meet all trains from both directions.

Forecasts assume that shuttles to Hill, Freeport, and Layton Hills Mall would only cover peak periods. Demand at the mall area is more spread out through the day, so D1-D5 assume 30-minute peak service and 60-minute off-peak. VanSharing assumed to occur throughout the day (i.e., whenever enough schedules match up for a pool).

In the case of the mall, there are multiple routes to reach the area that all have advantages and shortcomings. D1-D3 have shorter round-trip lengths than D4-D5, possibly reducing the need for an additional driver, but also get significantly less riders, and likely will still require two drivers during peaks due to congestion around interchanges. D3 avoids the congestion, and could potentially be operated even during peaks with just one driver. But it also bypasses many of the jobs along the way to the mall, and has little support as a long-term option. Still, depending on funding, this could be a reasonable first step.

D5's southern loop was suggested by Layton and helps the route avoid the need for a traffic signal at Layton Station. It also connects the station area to a planned grocery store, and almost connects to Layton city offices, though that site is significantly beyond the typical ¼ mile walk-shed. Most likely the loop will add 4-6 minutes of time to a typical trip. The time for D4 is already challenging. If the added time would require deployment of another vehicle, then the additional

coverage and minor increase in ridership may not be worth it, as the increase in operating cost could easily pay for a match with UDOT on installing a signal at Layton Station. But if the loop does not add an additional vehicle, then the loop could be worthwhile. For now, this study assumes that the best option will be to first pursue D4 and attempt to get a traffic signal installed. See Appendix A for issues involving this potential signal. Then consider D5 if there ends up being excessive layover time to kill.

Alternative E, Vansharing, was not modeled in the WFRC model. Instead estimates are assumed based on experiences at similar Commuter Rail stations elsewhere in the United States.

Summary of Most Effective Alternatives

Of the concepts studied, the concepts with the best ridership potential are as follows:

- Alternative A Clearfield Station to Hill Air Force Base, which will require two vehicles to operate every 30 minutes, peaks-only.
- Alternative B Clearfield Station to Freeport Center, which will require one vehicle to operate every 30 minutes, peaks-only.
- Alternative D4 Clearfield Station to Layton Station, which will require 2-3 vehicles to operate, and assumes every 30 minutes between 6 am and 6 pm, dropping back to 60 minutes from 6-9 pm.

Figure 5.2 takes the recommended circulator routes directly from the previous table, but also highlights the overall ridership boost to both the bus and FrontRunner systems expected as a result of implementing just the three preferred circulators and the vanshare program.

		Low Shuttle	High Shuttle	Low FR	High FR
A	Hill AFB	400	500	250	300
B	Freeport	200	300	100	150
D4	Layton to Clearfield	400	700	150	300
E	VanSharing	30	100	30	100
	Totals	1000	1600	500	900

Figure 5.2 Same as Figure 5.1, but focusing only on circulators recommended by this study for near-term implementation. The System Totals row shows how many riders could be expected on all circulators if operating simultaneously, and also the expected boost to FrontRunner daily riders.

Section 6: Near-Term Recommendations

Background

Of the various alternative options, some appear to meet the purpose and need for action very well even today. Others will eventually be good investments and help drive economic development, and finally some can be dropped in light of better choices. This section elaborates on concepts from the toolbox of options that would be immediately successful and should move forward. Recommendations include vanshare service, new circulator service, and making

adjustments to existing local service. These should be regarded as recommendations and any implementation of service or route changes will be determined by UTA.

Alt E: Implement VanSharing

In order to maximize the utilization of FrontRunner, UTA should consider implementing a full Vanshare type program that would supplement the existing vanpool program. The program should be modeled on the existing employer vanpool program that UTA is piloting.

Target markets for Vanshare services include Alternative A: Hill Air Force Base, Alternative B: Freeport Center, and Alternative D4: Layton Circulator. **Figure 6.1** is from King County Metro in the Seattle area, and shows the station the van departs from, general destination, departure and return time, as well as contact info of the primary driver. Prospective patrons can also join or start a new waiting list if there are at least five patrons who meet at the same time and have the same general destination.

VANSHARE COMMUTER VANS

Contact the driver for fare information and seat availability. For more information about vanshare visit: <http://metro.kingcounty.gov/commutervans>

Origin	Destination	Work Hours	Name	Email	Phone
Bremerton/Vashon Island					
Vashon Island Ferry Terminal	Vashon - Sungard	7:15am - 4:15pm			
South King County					
Kent Sounder Station	Kent - Digital Control	7:30am - 4:30pm			
Kent Sounder Station	Kent - Sysco	7:00am - 5:30pm			
Tukwila Sounder Station	Renton - City of Renton	7:45am - 4:30pm			
Tukwila Sounder Station	Renton - Puget Sound ESD	7:15am - 4:15pm			
Tukwila Sounder Station	SeaTac - Port of Seattle	7:30am - 6:00pm			
Tukwila Sounder Station	Renton Defense Contract Agency	7:30am - 4:00pm			
Tukwila Sounder Station	Tukwila - BECU	8:00am - 5:00pm			
Tukwila Sounder Station	WSDOT - Corson	6:00am - 4:30pm			
Seattle					
Seattle-King Street Station	Seattle-Cascade Designs	7:30am - 4:00pm			
Seattle-King Street Station	Seattle - Casey Family Program	7:45am - 4:45pm			
Seattle-Colman Dock	Seattle-Children's Hospital	8:00am - 4:30pm			
Seattle-King Street Station	Seattle-Children's Hospital Admin	8:00am - 4:00pm			
Seattle-King Street Station	Seattle - Swedish First Hill	8:00am - 4:30pm			
Seattle-King Street Station	Seattle - Swedish Cherry Hill	6:30am - 3:00pm			
Seattle-Colman Dock	Seattle - Zymogenetics	7:30am - 4:15pm			

Hidden for Privacy

Figure 6.1 Example of vanshare contact list from Seattle.

Alt A: Implement Hill AFB Circulators

Multiple factors suggest that circulator service to Hill Air Force Base will be successful, including:

1. 20,000+ employment base
2. Potential for transit passes provided by the military

Circulator service onto Hill Air Force Base presents a branding opportunity as well. For instance, a unique look such as a “wrap” on the transit vehicles showing the new F-35 jets could generate additional interest in using the service.

Survey work completed on Hill Air Force base suggests that both the South and West gate areas would be supportive of service, and that the ridership split at each gate would be about 50/50. So UTA is planning to implement two circulators serving Hill in the spring of 2014, one for each area. The specific

routing on-base is still being worked out by UTA and Hill Air Force Base representatives, but **Figure 6.2** shows the routing options currently favored as of January 2014, along with ¼ mile walk distances that would have access to likely stops.

The circulator service will be closed door between Clearfield Station and the base, and checking for base identification to pre-screen all riders can help speed the route and gate access process. All stops for these circulator routes will be on Hill Air Force Base.

Even though NB and SB trains will not arrive simultaneously at Clearfield Station this year, UTA still intends to dedicate a shuttle to each arriving train because the potential to serve a large market of Air Force Base employees is so great. This will result in roughly double the cost that would occur under simultaneous arrival, but UTA wants the initial roll-out at Hill Air Force Base to benefit from the best possible service.

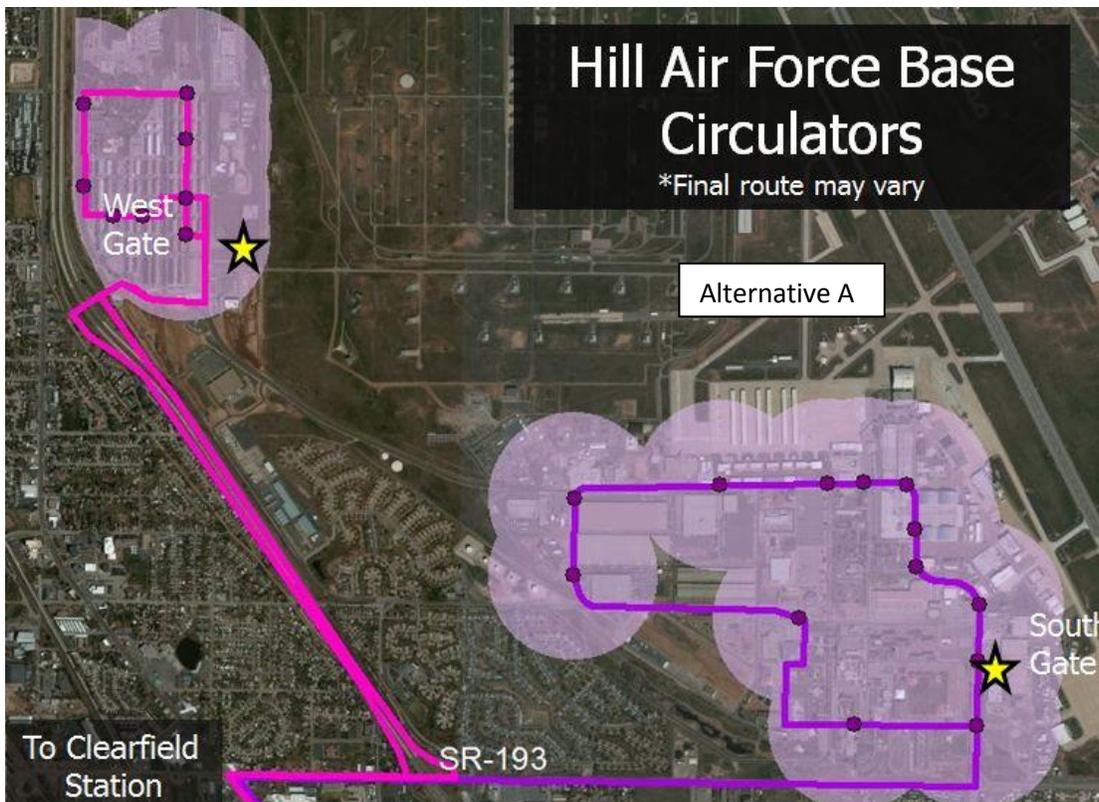


Figure 6.2 UTA intends to use two circulators, one for South Gate and another for West Gate, starting Spring of 2014. Final routing and stops may vary slightly from what is shown here.

Alt B: Implement Freeport Circulator

Freeport Center has a concentration of jobs with many employers having defined shift times. The demographic and travel demand data suggest that a circulator timed with FrontRunner service and with connections to/from Ogden will be successful. Given the residential location of many Freeport Center employees, a good connection with Route 470 will be a key to success for the Freeport Circulator.

Figure 6.3 shows the recommended route for the circulator. The figure also shows in black the areas that have walk access to the FrontRunner station, and in grey the area that would have walk access if there were a pedestrian bridge over the tracks.

The ideal solution would be to build a pedestrian bridge connecting the Clearfield FrontRunner Station and Freeport Center. The merits of such a bridge have already been discussed and there is stakeholder interest in funding this concept immediately. Another idea that has been discussed is to construct a 1-lane bridge over the tracks for the circulator, that could also double as a pedestrian bridge. This would minimize bridge costs, and would extend the coverage of the circulator route without

additional operating costs. The extended coverage area is shown as a red dashed line below.

An alternative option is to provide circulator service to supplement Route 640 service and put 80% of Freeport Center employees within a 0.25 mile walk of service. Based on the peak nature of travel to Freeport Center, circulator service is initially anticipated to operate every 30-minutes between 6:00 am to 9:00 am and between 3:00 pm and 6:00 pm. This would cost approximately \$129,000-\$193,400 annually and require one vehicle if NB and SB trains arrive together. If trains don't match, it will require either two vehicles (doubling the cost), or a decision to match fewer trains.

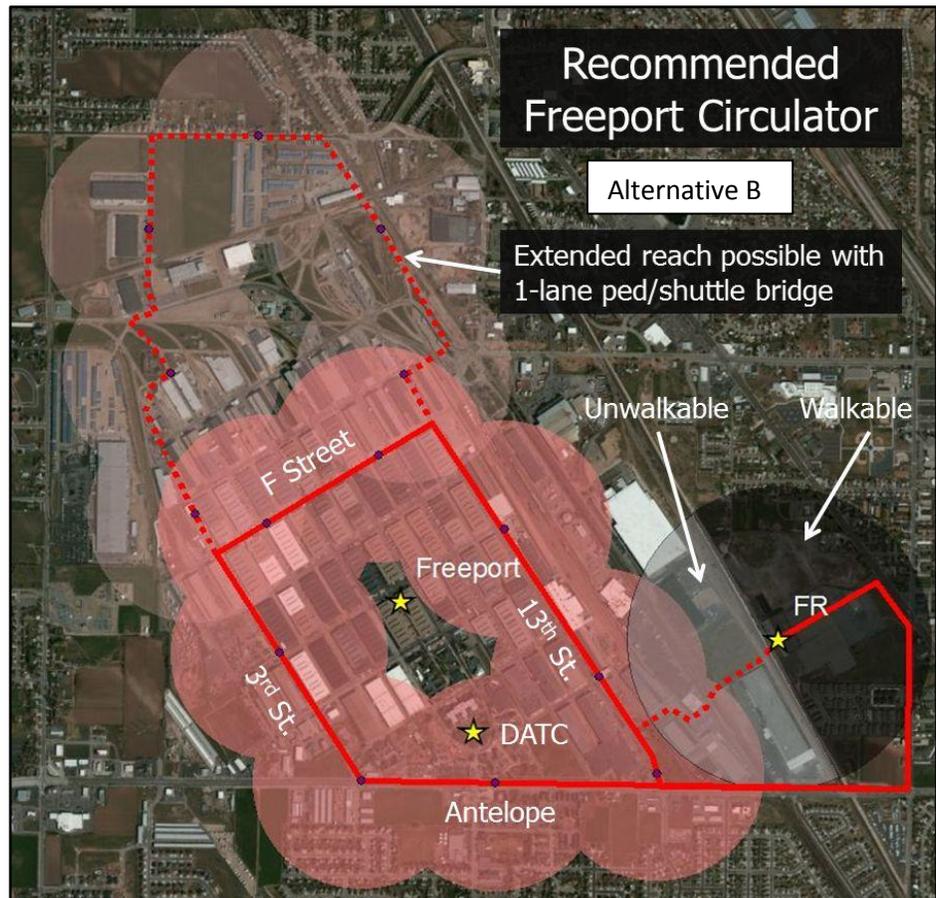


Figure 6.3 Recommended routing for Freeport Circulator. Also shows areas that are currently unwalkable, but would become walkable if a pedestrian bridge can be built. If the pedestrian bridge can also accommodate 1-lane for the shuttle, then the shuttle could reach much further into developing areas.

Alt D4: Implement Layton Circulator

The area around and north of the Layton Hills Mall features a rich mix of employers, apartments, hotels, and all-day destinations. Regional travel patterns show that significant numbers of employees are traveling longer distances to reach jobs in Layton. These factors suggest that circulator service will be successful.

Recommended Alternative: Option D4, which connects Layton Station, the Mall area, Davis Medical Center, and Clearfield Station traverses two bottlenecks (the interchanges at Hill Field Road and Antelope Road), but it also serves major existing and proposed developments in Clearfield and Layton. From an all-day ridership generation perspective, Option D4 has the ability to attract more people to use FrontRunner and also to use the circulator for intra-Layton or intra-Clearfield trips. Option D4 is recommended, provided that UTA and Layton can successfully negotiate with UDOT for a new signalized access out of Layton Station in order to operate safely and reliably (See Appendix A for details).

Other Alternatives Considered: Multiple options for circulator service exist to serve the area. From a reliability perspective at this time, Option D1, which connects Clearfield Station with Layton Hills Mall will likely suffer from severe congestion on Antelope Drive. Access at Layton Station and the notoriously congested Hill Field Road / I-15 interchange make Option D2, which is a stand-alone service from Layton Station to the Layton Hills Mall area infeasible until after UDOT redesigns the interchange area.

Option D5 is similar to Option D4, but with the addition of a loop on Layton Parkway, Fort Lane, and Gentile. The loop is introduced to mitigate the need for a signalized access at Layton Station, and also to pick up two more stops east of I-15. Yet, it adds between 4-6 minutes of travel time. Based on run time data which was collected during peak times, Option D5 would consistently have insufficient recovery time during the PM peak to operate the route with two vehicles every 30-minutes. D5 could work later, if enough development occurs east of I-15, and if congestion at the two interchanges can be reduced.

Figure 6.4 shows the route for D4, as well as the D5 extended loop on the south, and a mid-term route change that would use a new bridge over I-15 between Hill Field Road and Antelope Drive. The bridge is on the recently amended Regional Transportation Plan for phase I before 2020. Quarter-mile walk distances from likely stops are also shown. If the service is ready to deploy before a signal can be obtained, then a temporary terminus at the northern park-n-ride lot for Layton Station can be used, providing the vehicles are small enough to make turning movements within the parking lot.

Peak hour service would be beneficial for employees in the area, but given the shopping and tourist opportunities, this route would likely be more successful as an all-day service. All day service is recommended for a minimum span of 15 hours from 6:00 am to 9:00 pm. Depending on the service chosen, this would cost approximately \$226,200-\$509,000 annually and would require a minimum of two vehicles.

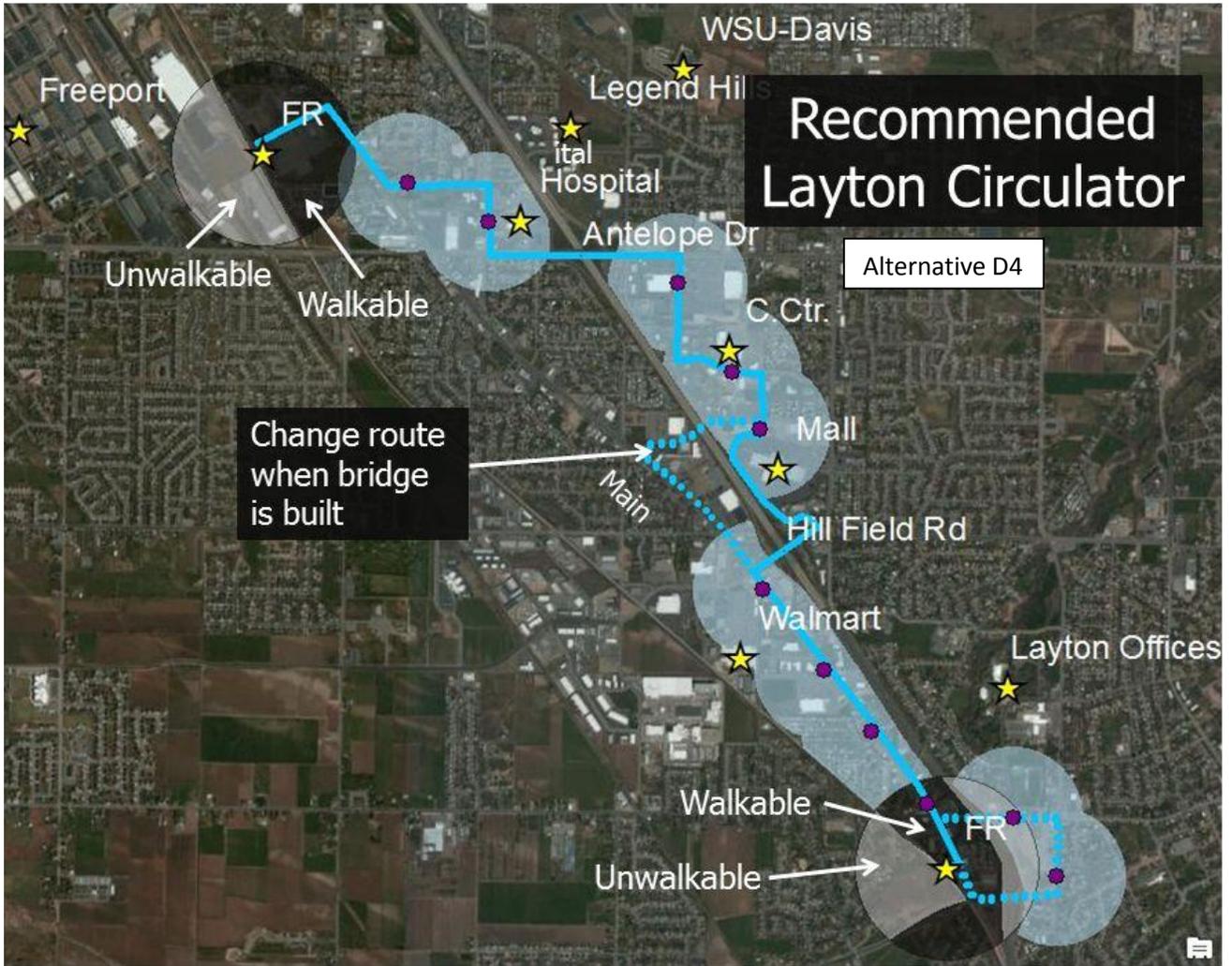


Figure 6.4 Alternative D4, with an optional southern loop if it can be operated without adding significantly to operating costs.

Adjustments to Existing Fixed-Route Service - Route 470

There are several opportunities to adjust existing service so that it better connects FrontRunner with destinations in Layton and Clearfield. UTA is already considering several such changes as part of their Five-Year Service Plan, and coordinating these concepts closely with this study.

Figure 6.5 shows the quarter-mile coverage area from stops along 470. The route runs from Ogden to SLC, and currently operates on approximately 30-minute headways most of the day. The Five-Year Service Plan recommends changing this route to run from Ogden to Layton, terminating it at the Layton Walmart in the short-term, then eventually at the Layton FrontRunner Station, if a signal can be installed there. UTA is still evaluating these terminus options. A separate route 480 would then also be created running from SLC to Clearfield Station. 470 and 480 would overlap between Layton and Clearfield Stations. Initial modeling results suggest that the overall net effect of increasing this service would be positive. Based on consultations with UTA, the proposed Route 470 / 480 recommendations require substantial public input and customer education process, as well as additional study.



Figure 6.5 Coverage areas of Route 470/480, assuming changes currently under consideration within UTA are eventually implemented.

This route is on the Regional Transportation Plan for eventual upgrade to BRT, and implementing the changes considered in the UTA Five-Year Service Plan suggests that the 470 will attract enough riders to eventually qualify for upgrade to BRT with the assistance of federal Very Small Starts funds. However such funds could probably not be pursued until after the changes are made, since qualifying projects must have at least 3,000 riders per day on the route, and ridership will not be known until after the change. It will take more time and analysis to determine how best to proceed with potential changes to route 470.

Adjustments to Existing Fixed-Route Service - Route 627

UTA is also considering extending route 627 to Clearfield Station. It currently starts in Kaysville and terminates at WSU-Davis. **Figure 6.6** shows a recommended path for the extended route in orange. The “short-cut” marked by the yellow dotted line shows how it could be modified if an access to the college can be created from Hill Field Road. A campus of 12,000 students, many of whom will live to the south-east, would benefit from an access via Hill Field Road. However such an alignment could have impacts to existing neighborhoods and ultimately the merits of such an access needs to be decided and resolved by Layton and WSU-Davis together. This study merely points out that if such a connection existed, it may allow UTA to improve service to the campus with less annual operating costs.

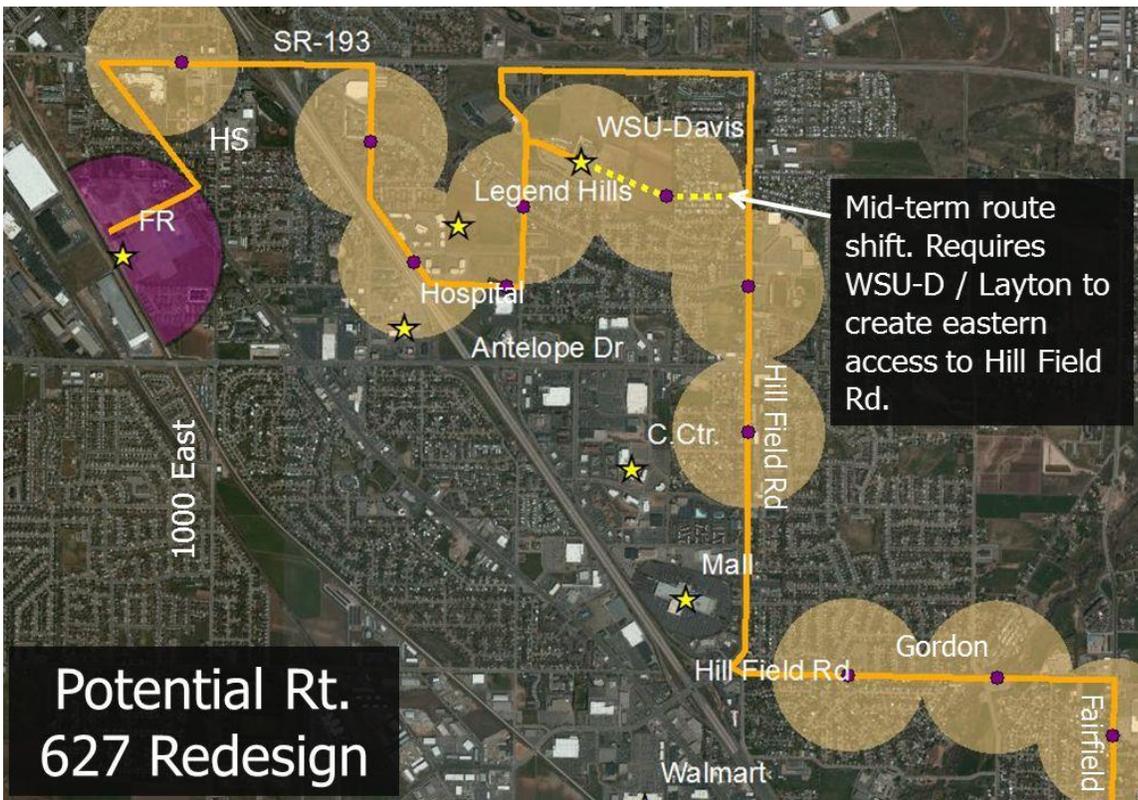


Figure 6.6 Potential changes to Route 627, which currently terminates at WSU-Davis but would instead be extended to Clearfield Station via Legend Hills.

Summary of Overall Short-Term Recommendations

Figure 6.7 is an overview of how a comprehensive circulation system would work, if all of the following can be implemented in the short-term:

- Two Hill AFB Shuttles (A1 & A2)
- Freeport Shuttle (B)
- Layton – Mall – Clearfield Circulator (D4)
- Route 470/480 modifications
- Route 627 (long-term, see earlier)
- Vanshare at stations (not shown)

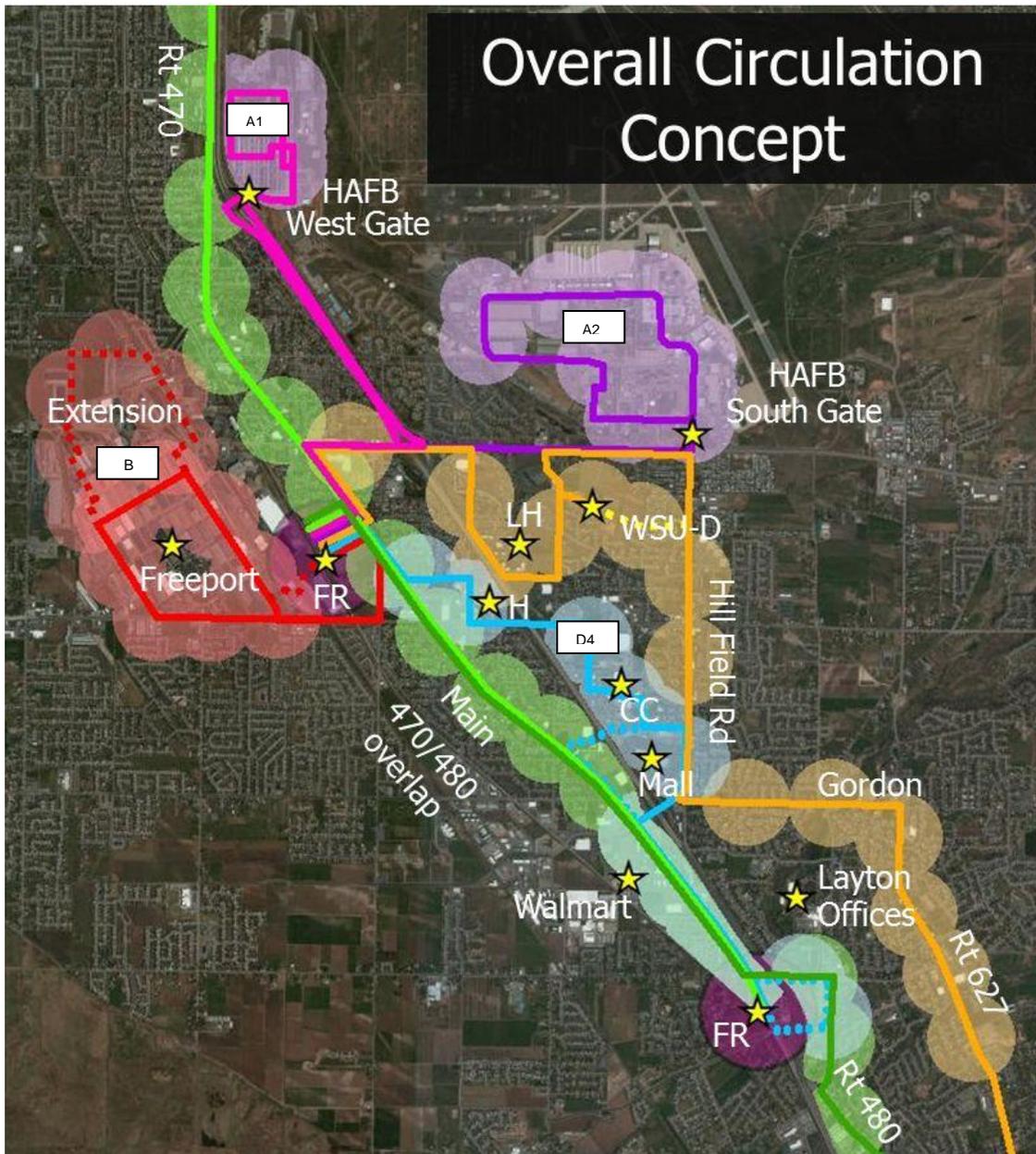


Figure 6.7 Overview of full circulation strategy

Summary of Freeport and Layton Circulator Costs

Costs for the Hill AFB service are currently being determined by the Ogden Business Unit, and they are confident they can operate this service with existing funds. Costs for other adjustments to existing service, namely the route 470/480 changes and the extension of 627, were not considered by this study and will be determined later as UTA further investigates these options. The only other service recommended by this study is the Freeport and Mall-area circulators. Costs for these are taken directly from Figure 4.3 earlier, but summarized here for convenience.

Operating Cost Range

Alternatives	Peak Headway	Annual Service	Annual Service Miles	Peak Vehicles	Annual O&M Cost
B	30	1,900-3,800	20,000-29,900	1	\$ 129,000-193,400
D4	30	3,800-8,500	35,000-78,600	2	\$ 226,200-509,000
Additional Circulator Program		5,700-12,300	55,000-108,500	3	\$ 355,200-702,400

Capital Cost Range

Alternative	Peak Hour Vehicles	Reserve Vehicles	Vehicle capital cost range	
B	1	0.5	\$ 270,000	\$ 375,000
D4	2	1	\$ 540,000	\$ 750,000
Additional Circulator Program	3	1.5	\$ 810,000	\$ 1,125,000

Daily Trips & Revenue Hour Range

Alternative	Weekday Span (Peak Headway)	Weekday Span (Non-Peak Headway)	Peak Headway	Non-Peak Headway	Round Trip Miles	Daily Trips	Daily Revenue Hours	Weekends
B	6-9am, 3-6pm	9am-3pm	30	60	5.7	12-18	6-12	No
D4	6-9am, 3-6pm	9am-3pm, 6-9pm	30	30	10	12-27	12-15	No
Additional Circulator Program	-	-	-	-	-	24-45	18-27	No

Section 7: Mid-Term, Long-Term Vision

Background

The most important immediate need is simply to make better use of FrontRunner and regional bus routes with last-mile connections to the area’s abundant but dispersed job base. But for as many jobs as are reachable by the proposed circulation strategy, the North Davis area in general is a bedroom community.

The Wasatch Choice for 2040 vision was shown earlier as **Figure 1.9**, and is repeated again here as **Figure 7.1**, to emphasize that the community wants the core commercial areas of Clearfield and Layton to evolve over time into a full Urban Center of significantly higher density than exists today. And while the vision includes a mix of uses, the regional need is for as many good, high-paying jobs as possible, which will greatly reduce the need to commute to Salt Lake for employment. That in turn reduces region-wide congestion.

As noted in the beginning, the area between Layton Station and Falcon Hill is roughly 21 miles north of Downtown Salt Lake – the typical distance at which Edge Cities with high-rises of 10-20 stories tend to emerge in metro areas around the country. But while there is ideal geographic positioning for growth, the area suffers from hindrances to growth. There is relatively little open land, so most of the growth potential lies in redevelopment, which is more difficult.

The core commercial areas and corridors are generally older and developed somewhat haphazardly, which creates a perception of widespread blight, and that also impedes new premium development. There is serious congestion concentrated around I-15 interchanges, which also makes it hard to see how much more development could be accommodated even if there were no other hurdles.



Urban Center



Urban centers are the focus of commerce and local government services benefiting a market area of a few hundred thousand people. Urban centers will be served by high-capacity transit and major streets. They are characterized by two- to four-story employment and housing options.

Floor Area Ratio 0.75 to 4
20 to 100 Housing units per acre



Town Center



Town centers provide localized services to tens of thousands of people within a two- to three-mile radius. One- to three-story buildings for employment and housing are characteristic.

Floor Area Ratio 0.5 to 1.5
10 to 50 Housing units per acre



Station Community



Station communities are geographically small, high-intensity centers surrounding high-capacity transit stations. Station communities vary in their land use: some feature employment, others focus on housing, and many will include a variety of shops and services.

Floor Area Ratio 0.5 to 2.5
20 to 100 Housing units per acre



Figure 7.1 Wasatch Choice for 2040 Vision

Aim for 8-F's

This section highlights the business case for circulators and a few ideas that will help this unique service emerge as a pillar that underpins the Vision.

This study recommends following “8F's” when designing a transit circulation system that can support and catalyze Economic Development by attracting choice riders for both local and regional travel trips. In many cases it will be impossible to achieve all eight, but the more the better. The 8F's are summarized first, then discussed briefly as applicable to this study.

1. **Frequent** – Vehicles come so often that no one needs to bother with a schedule.
2. **Familiar** – No need to research routes. “You Are Here” signs & route branding do the job.
3. **Fare** – In most cases, free fare is essential for attracting short-trip circulation.
4. **Fast** – If possible, reduce time spent at stops or in congestion, to attract more riders.
5. **Focus** – Avoid trying to serve too much. Simple routes are better routes.
6. **Fun** – Cool vehicles/stops; creative marketing – the little things that remove stigmas.
7. **Flexible** – Rubber-tire routes are easy to adjust if necessary.
8. **Frugal** – Lower cost per mile = more miles of service! (i.e. Frequency)

Frequent – All circulators recommended in the short-term would have 30-minute frequency, clock-faced with timed connections to FrontRunner. While this is steady and reliable, it is not frequent enough to attract many short, spontaneous trips. If Route 470 changes to 15-minute service, then it will be attractive for short circulation trips. When resources allow, the Layton-Mall-Clearfield connector should also be boosted to 15-minute service, provided that some of the other F's are included.

Familiar – UTA buses are everywhere, and when people see a typical bus, they have no idea where it came from, where it is going, or how often it comes by. Few choice riders ever research bus routes and schedules, but they won't need to if routes can be well branded. For the Hill AFB shuttle, consider wrapping those vehicles with an F-35 fighter, or some other flight-related icon associated with Hill. For Freeport and the Mall, work to get some of the larger businesses to sponsor the vehicle and wrap the vehicle with their logos and maybe some of their products or services. As a mid-term improvement, invest in the more popular stops with architecturally pleasing shelters, benches, and amenities. This way, when people see the mall shuttle pass by their job-site, which is not near the mall, they become passively aware of an opportunity to go to lunch near the mall.

Fares – Serious consideration should be given to making circulators fare free right from the beginning.

There are several reasons for this recommendation.

Fares due to circulators will primarily be collected via FrontRunner or other regional bus routes, since a majority of circulator passengers will likely be transferring from elsewhere, so their transfer would generate no additional fare anyway.

Logan, Utah has several short, free routes. Their system attracts almost double the riders of comparable fare-based systems.

This suggests that a fare free circulator will attract a high number of riders who are not transferring from rail or bus, but simply using it as a moving sidewalk for daily activities that are too far to walk to, but not so far that they wouldn't drive if not for the fact that the trip is free.

A fare free circulator will attract significantly more patrons, particularly for Alternative D4/5 that connects Layton and Clearfield Stations. The free access for shopping and short intra-area trips can be touted by the cities' economic development divisions as they court businesses and multi-family projects to the area.

Not having a fare makes the circulator attractive for residents making short trips such as grocery shopping or retail trips. Even nominal fares will preclude nearly all such trips. A free service could lead to instances of retail patrons parking once and using the circulator in Layton, which can help address congestion. It will also get new Layton and Clearfield patrons accustomed to UTA's service, and in the long run that can entice them to pay for their longer trips.

Since circulators are primarily a short transferring service, there is very little potential to capture much additional revenue from patrons who are not transferring. In this case, the costs associated with fare collection and accounting systems could well exceed the additional revenue, while at the same time repelling potential riders.

The Regional Vision anticipates that Urban Centers will have a highly diverse mix of uses, and there will be a strong need to make short, spontaneous trips via transit circulators. But few will make such "moving sidewalk" trips unless the fare is effectively free. For all of these reasons, consider making these circulators simply free of charge.

Fast – When congestion has traffic crawling, there is a strong incentive to use transit – unless transit is also crawling in congestion. Anything that speeds things up will equate to higher ridership. Ideas include smaller minibuses or midi-buses that accelerate and handle better; eliminating fare boxes which delay vehicles as they wait for payment; installing queue jumpers or exclusive guideway through the worst congestion.

On this last point, Route 470 on Main Street is the route most likely to qualify for the federal assistance to be upgraded to Bus Rapid Transit, which by definition is *faster!*

Focus – The recommended routes are generally well focused on the markets they serve. The most circuitous route is D4/D5, but this is mainly because available roadways are themselves circuitous.

Fun – Try to acquire vehicles that stand out from the normal fleet and create a sense of class. Use marketing and branding techniques that remove stigmas and help create a positive, memorable experience. Boulder, Colorado is a good example of what can happen when "Fun and Familiar" combine. Using their same routes and vehicles, they simply branded their vehicles as "Hop, Skip, Jump, and Dash" where before they were known only by their number. Their transit agency believes this was the single largest factor in nearly doubling of ridership. See their Fun story at <http://vimeo.com/12472216>.

Flexible – All of the routes proposed here can easily be adjusted as funding allows, or as new major trip generators emerge.

Frugal – In any complex system, there will be some aspects that create higher return on investment than others. Every opportunity should be weighed against other opportunities, seeking to maximize customer satisfaction per dollar spent, or boardings per dollar invested – "bank for buck." The routing plan outlined herein along with mid-term upgrades leverages a major investment in rail and can help attract new businesses, all with a fairly modest investment. Combined with the vanshare program that can use fully depreciated vans, this overall circulation system should be well worth the investment.

Place Making Innovative Intersections

Transit-Oriented Development is attracted to multi-modal streets, and Clearfield and Layton can do a lot to send a message to the development community that their older, auto-oriented areas are transitioning into rejuvenated premium places.

Utah is leading the nation with the development of innovative intersections, such as Continuous Flow Intersections, Thru-Turns, and Diverging Diamond Interchanges. All of these concepts reduce congestion by routing left-turns in a way that will not require a dedicated left-turn phase at major signals. Most of the more popular designs are ill-suited to multi-modal environments, but some designs are highly compatible and can likely help catalyze mixed use development.

Figures 7.2 – 7.4 were developed to show how the intersection of Antelope Drive and Main Street could look if it were reconfigured as a combination “Bowtie / Quadrant Intersection.” Two ellipses on Main help define the gateway of a unique Place. The interior of the Bowties can be used as a transit station for Route 470 as well as for other routes. Northbound to Westbound vehicles would first travel through the intersection, then make a U-turn, and then make their way to Antelope Drive.

Quadrant Intersections include “backage roads” that allow left turning vehicles to go behind development rather than clog up the main intersection. Both the Quadrant and Bowtie are potentially possible at this site, and it is not necessary to do both in order for it to work well.

The overall effect is that existing congestion at this site will be virtually eliminated. It does create out-of-direction travel for left-turning motorists, but it is easy to demonstrate in simulation software that even these people will save a lot of time.

Multimodal benefits include the ability to eliminate the left-turn median, and instead have a planted median or dedicated transit way. There are also fewer conflicts for pedestrians at the main intersection, and pedestrian refuge in the median. The ellipses force traffic to slow as it enters this sensitive space, but on average traffic travels faster since it is not congested. And because the intersection is no longer congested, city councils can feel good about approving higher-density development, and the associated increase in trips it generates.

Figure 7.4 shows how transit stations could occupy the center of the ellipse, and the scale of development the resulting intersections may be able to support.

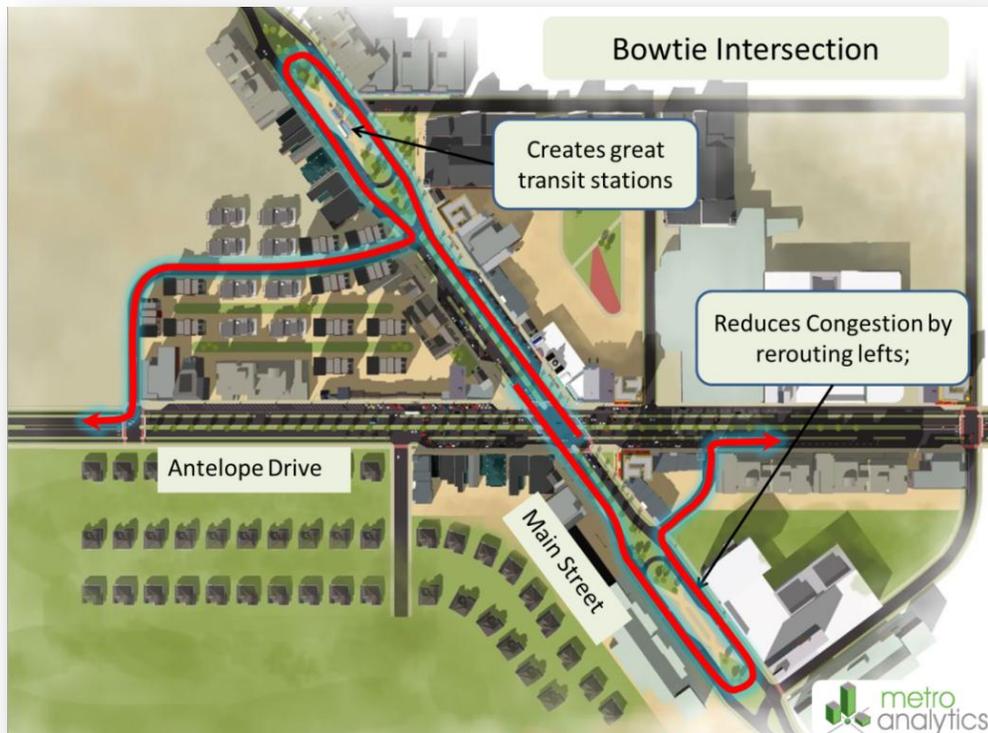


Figure 7.2 Bowtie Intersection concept at Antelope Drive and Main

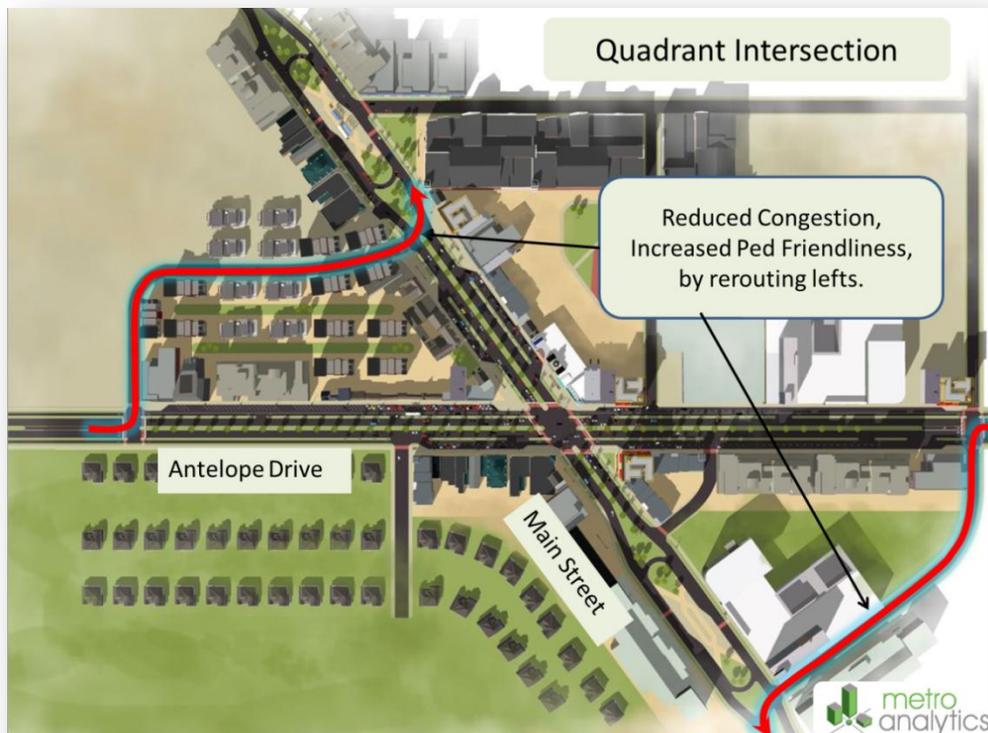


Figure 7.3 Quadrant Intersection movements, combined with Bowtie



Figure 7.4 3D view of Bowtie concept, showing transit station inside the ellipse.

Upgrade 470 to Enhanced Bus or BRT

With the exception of short-term operating dollars through CMAQ funding, there are no federal funds available for enhancing short circulation routes. Even CMAQ funding may not be available to help cover up to three years' worth of operating costs if it has already been programmed by WFRC for other projects. Federal funding is available through the Very Small Starts program, with up to \$3-million per mile for use to upgrade capital facilities and buses on high capacity transit routes, including bus rapid transit routes.

"Very Small Starts" projects must have at least 3,000 boardings per day in a corridor to be eligible. The proposed Route 470, which will have a focus on Washington Boulevard, Riverdale Road, and Main Street, has the ridership potential today to achieve this. This study supports the recommendations of the UTA Five-Year Service Plan to split 470 into both 470

and 480, then operate the new 470 at 15-minute headways. It is anticipated this route will achieve ridership that would warrant Federal investment to attract even more riders.

The federally-assisted upgrades would allow both Clearfield and Layton to enhance the pedestrian experience on Main Street that could in turn attract and influence Transit-Oriented Development for which the corridor is ripe today. Given that 470 is already on regional plans for upgrade to BRT, this study recommends that UTA implement the 5-year plan for this route as soon as possible, so that the most productive section can start acting more like BRT right now. Then as soon as possible, the affected cities should work with UTA to submit a Very Small Starts application, and line up funding for the local match. A strong effort today could help this project arrive for construction in perhaps 5-10 years.

Route 470 can also easily be adjusted to serve Falcon Hill, which plans to add more than 10,000 jobs. This will add another long-term market that will cement Route 470's transition from a local bus route to a Bus Rapid Transit route. When the street network allows, and when new development warrants the change, 470 should be relocated from Main Street near Sunset to the east side of I-15 to instead serve Falcon Hill. Then 470 will connect Falcon Hill to FrontRunner at Clearfield Station as well as connect Ogden directly to Falcon Hill with a quick connection.

Funding Ideas

The new circulators will add operational costs in the range of what was shown in **Figure 4.3**. And if federal funding is pursued for upgrading Route 470, it will require a significant local match. There are many ways to generate such funds, but here are a few common ideas to consider:

1. **Efficiency:** Are there places that could be cut back to create room for circulators?
2. **Business Sponsorship:** Contact businesses to be served and see if they will fund a portion of operating cost in trade for service and exposure.
3. **Ecopasses:** Will more businesses sign up if these routes serve their employees and customers?
4. **CMAQ:** Talk to WFRC about getting the first three years funded through this federal start-up source.
5. **Special Use District:** Add a transit circulation fee to areas that are well served. Maybe use proceeds to fund Ecopasses for businesses in the district.
6. **Sales Tax:** Is there a chance the community could get behind a general sales tax to fund these as well as other projects?
7. **Gas Tax:** Lobby to have a small percentage of future tax dedicated to alternative mobility.
8. **Freeway Congestion Pricing:** It will be years before this is politically feasible, but if it ever occurs, lobby to dedicate proceeds to alternatives to freeways.

Potential Trail, Pedestrian Bridge

While the primary focus of this study has been motorized circulators, that does not preclude investigating non-motorized concepts that could leverage the investment in FrontRunner. A pedestrian bridge over the tracks accessing Freeport has been discussed earlier and is a project that should be pursued through both local and regional plans.

Vehicle and Branding Considerations

Normally vehicles used for last-mile distribution to jobs outside the region's Central Business District need not be full size buses because patrons arriving on any given train to suburban job destinations are not so overwhelming as to warrant full-size vehicles. That appears to be the case here. So if possible, start with minibuses or midi-buses, then when demand warrants increase to full size.

Smaller vehicles can also make it easier for the public to perceive that this is a unique kind of service – a true intra-area circulator rather than a standard long-haul route. Different styling, unique paint, and wraps that reveal destinations the vehicle is serving all help create Familiarity, Focus, and Fun that is essential for attracting choice riders. If a strategy can be found to also make the vehicles Fare Free, then they will truly stand out as intra-area shuttles designed to aid those who wish to “live, work, shop, and play” all within the same Activity Center – a major goal of the Wasatch Choice for 2040 Vision.

But in addition to small and different, they should also convey a sense of class, fun, roominess, comfort, and easy on/easy off to remove stigmas. Cutaways are not recommended. Low-floor vehicles are highly recommended. The next page demonstrates a few vehicles that exhibit a wide range of attractive circulator attributes.

Vehicles with Attractive Circulator Attributes



The Van Hool A300K is a 30-foot mid-sized vehicle, compared to 40-foot standard buses. UTA already has many Van Hool vehicles, which may facilitate maintenance since mechanics are already familiar with Van Hool. Made in Belgium, these are not Buy America compliant, but many are in the United States anyway.



Eldorado manufactures a 30-foot mid-size called EZ Rider II in Riverside, California. The vehicle shown has a BRT-type appearance. Interiors can be arranged in dozens of ways, but usually accommodate around 20-26 seated passengers with spaces reserved for wheelchairs.



Composite Mobility is a Dutch firm that builds a low-floor minibus from light-weight composites that make the body corrosion-proof. It is about 23 feet, and can seat up to 22 with another 13 spaces for standing. It is popular for shuttle circulation, but also as inner-city freight transport (i.e., UPS), airport shuttles, and even as special-duty ambulances.



Hino Motors is a division of Toyota, which produces this low-floor mini named the "Hino Poncho." Seating is limited to around 13 passengers, but can accommodate about 20 more standing. It is a Fun vehicle that could work well as a high-frequency circulator, but may prove too small for peak transfers from FrontRunner. It is based in Japan and may not be available in the United States.



The Mercedes Sprinter has seating for up to 18, but not much for standing. It is not a low-floor vehicle, but it is stylish, fuel efficient, maneuverable, and lower cost than many other options.

Top-10 Reasons Clearfield / Layton Circulators Will Be Good For Business

The Utah Transit Authority recently completed FrontRunner – a major commuter rail line running from North Ogden to Provo. This line, combined with the Trax light rail lines, gives huge numbers of commuters a way to avoid growing congestion, and that in turn has helped bolster the region’s economy and greatly improved our image among companies seeking to expand or relocate in the region. A number of high-tech firms consistently report that the option for their workforce to travel by transit was a significant part of why they chose Utah.



FrontRunner is “close to” nearly 60,000 jobs in the Clearfield/Layton area, but only about 3% of those jobs are within walking distance of the stations. With the proposed circulation system, about two-thirds of jobs move to within a quarter-mile of FrontRunner access.

#10 Freeport Center: the lynchpin of Northern Utah’s manufacturing economy, with room to grow.

#9 Hill Air Force Base: Over 20,000 jobs for the local economy.

#8 Tech-Magnets: High-tech and office-oriented firms are acutely sensitive to transit, and the area needs far more of these types of firms.

#7 Location, Location, Location! Geographically, Layton and Clearfield are ideally positioned for impressive high-density development.

#6 Timing is Right: Huge numbers of parcels are ripe for redevelopment, and prospective developers and businesses can be attracted in part by quality transit.

#5 Quality Development: Without better transit, the second wave of development will be more intensely auto-oriented than the first, exacerbating existing congestion.

#4 Seniors Need it! The emerging wave of seniors need transit circulation to avoid driving in unsafe, “white knuckle” conditions.

#3 Juniors Love it! Many from the rising generation are very willing to live in urban environments and use transit. They can text!

#2 Shoppers Will Love it! Historically, few shoppers take transit for short trips. But there is a strong and growing market of shoppers who will if the service is Frequent, Familiar, Free, and Fun.

#1 Perception is Reality! Rail transit has greatly boosted the region’s image as a mobile, high-quality place to live and do business. Circulation helps tell key businesses that the community is committed to helping them succeed!



Appendix A

Layton Station Access

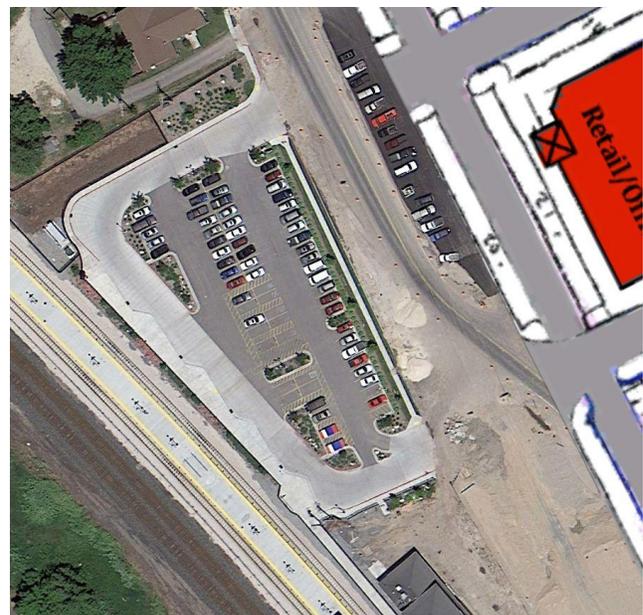
Existing Conditions

These figures show the Layton Station area just before construction on Main and Layton Parkway was completed. The park and ride lot has two accesses including a full movement access on the north end and a right-in/right-out access on the south end. The parking lot has a supply of approximately 60 stalls and has four “saw tooth” bays for buses to pick-up and drop-off passengers with right-side loading/unloading.

The north driveway has a break in the median that allows cars to turn left, but buses cannot safely turn left, and so this station currently has no bus service partly due to the challenging access. A traffic signal would make bus service more practical.

The distance between Gentile Street and Layton Parkway is approximately 1,750 feet, or a third of a mile. The North UTA Access is located almost exactly halfway between Gentile Street and Layton Parkway. The South UTA Access is located less than 600 feet north of Layton Parkway. The most ideal location for a traffic signal from Main Street’s perspective is half-way between existing signals, or the north park and ride access. But this would require significant redesign of the park and ride lot, since it is currently designed for buses to exit on the south. So the ideal signal location from the UTA perspective is on the south.

The AADT on Main Street adjacent to the UTA lot is approximately 21,000 vehicles per day. The Access Classification is Access Category 5, which typically requires minimum signal spacing of one-half mile, though UDOT frequently grants variances if the circumstances warrant such. But because the lot is small, none of the volume-based warrants would be met at this time.



Future Development

Significant future development is anticipated in this area, and an overlay of preliminary development concept sketches is shown which would include retail, office, residential, and lodging land uses. The area is zoned as “Mixed-Use, Transit Oriented Development” which has the highest densities allowed anywhere within Layton. A residential project of 60 units per acre is currently being constructed north of the UTA lot. Emerging development will significantly increase egress/ingress traffic directly east of the park and ride lot, and most likely generate enough traffic to warrant

signalization. This development would also increase pedestrian activity in this area.

Recommendations

Because of the need for a safe bus egress and the high vehicle and foot traffic expected from pending development, a signal between Gentile and Layton Parkway may eventually be warranted. A signal at the southern access would be preferable for UTA, given that it requires little modification of the existing parking lot.

UDOT may not approve any signal, but in the event that they would only approve the northern signal (because it is the mid-way point), this would require significant costs to adjust the park and ride lot.

As the bus sawtooths are currently configured, buses enter at the North Access and exit at the South Access. If the north access becomes signalized, then the site would need to be reconfigured to allow buses to exit from the north. Several options that could accommodate this are as follows (including advantages and disadvantages):

1. Re-configure saw-tooth loading areas to east side of circulation road. Buses could then enter at the South Access and exit at the North Access. This would require a pedestrian crosswalk from the loading/unloading area to the terminal area.
 - **Advantages:** No changes to parking area.
 - **Disadvantages:** Added vehicle/pedestrian conflicts; entering buses can only be routed from north.
2. Re-configure parking area to provide a turn-around for buses to exit at the North Access.
 - **Advantages:** No changes to sawtooth area.
 - **Disadvantages:** Landscaping and parking reductions required to accommodate turn-around; short throat length at North Access would frequently block buses and vehicles exiting from east parking module.

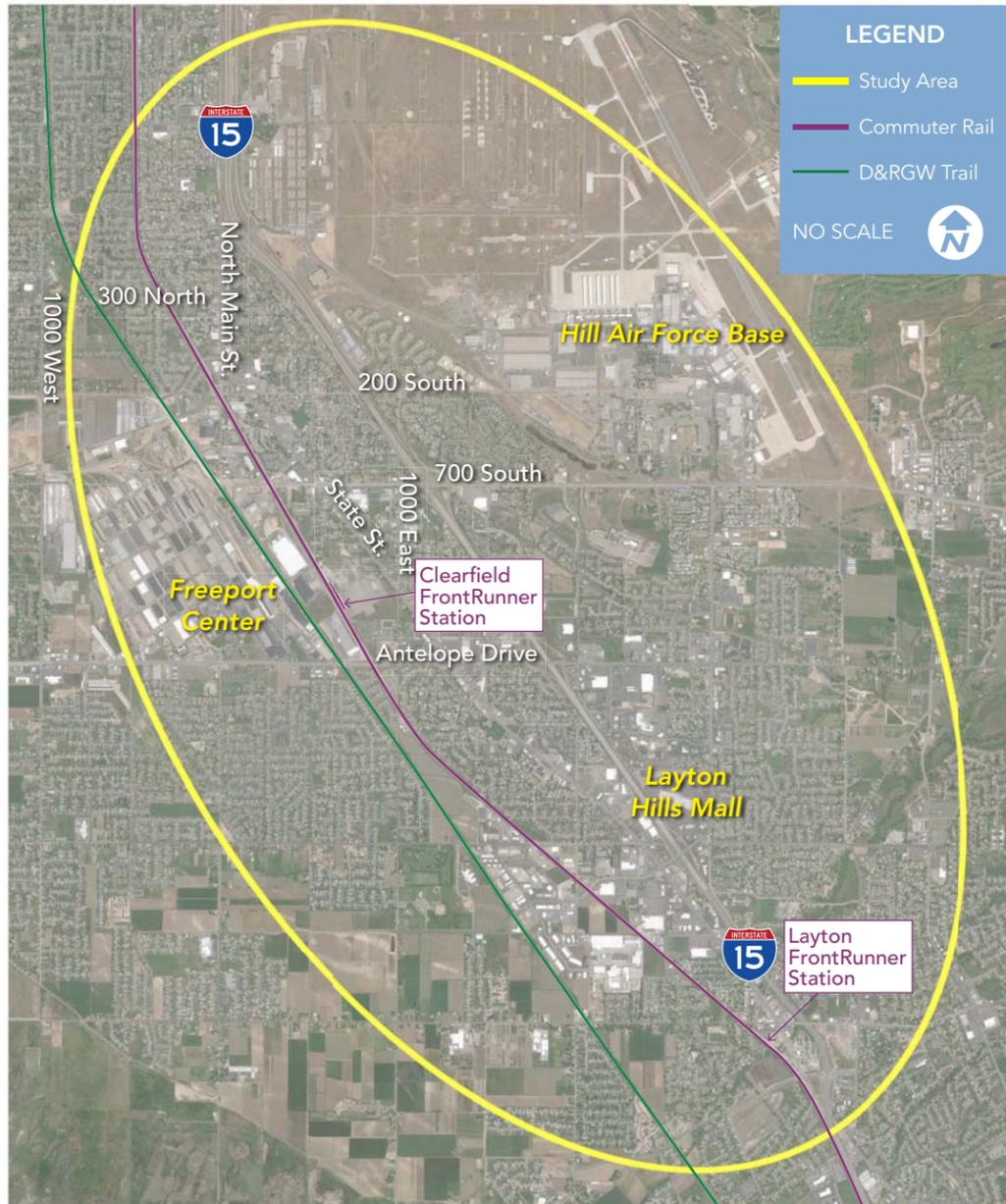
3. Re-configure parking area to provide a turn-around for buses to exit at the North Access and close the South Access.
 - **Advantages:** No changes needed to bus loading area; additional area for lost parking available on south end of lot
 - **Disadvantages:** Short throat length at North Access may occasionally block buses and vehicles exiting from east parking module.
4. Re-configure parking area to provide a turn-around for buses to exit at the North Access and eliminate two of the saw-tooth loading areas and convert to ADA parking and/or bike lockers.
 - **Advantages:** South Access can remain open for secondary access; buses can be re-routed to west parking aisle and not be blocked to get to the egress road.
 - **Disadvantages:** Just two of four sawtooths remain, though this may be fine if connecting routes are few.

Although closing the South Access would eliminate secondary access to the site, the closure could be used as a compromise with UDOT in trade for allowing signal spacing that is less than UDOT would prefer.

Many of these options would probably reduce the amount of parking available here somewhat. Given the level of development potential in the general area, and the already limited parking, UTA and Layton may also want to consider eventually constructing a parking garage to replace this surface lot. Perhaps a development impact fee or a special use district fee could help generate funds for a garage that could then serve for park and ride access, as well as for general parking needs in the area.

Project Purpose

Complete last mile travel between FrontRunner and regional employers.



Identified Needs

- » Access from transit stations to nearby employers
- » Pedestrian connection to Freepoint Center
- » Fill transit service gaps
- » Attract economic growth

Key Issues and Opportunities

- » Military base access
- » Pedestrian barrier to Freepoint Center
- » Bus access to Layton FrontRunner station
- » Layton economic and tourism growth

Circulator Evaluation Criteria

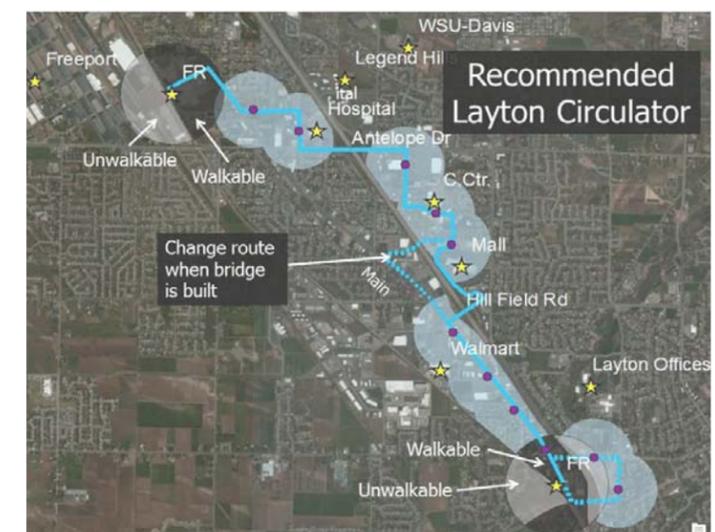
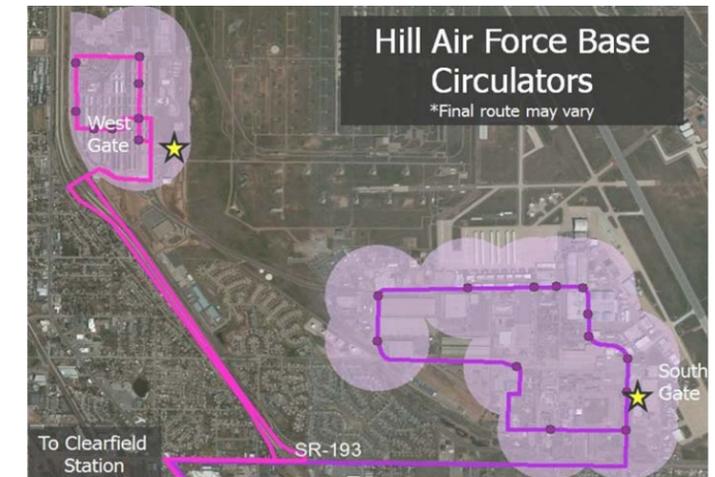
- » Match FrontRunner schedule
- » Maximize job access
- » High ridership
- » Cost effectiveness

Layton/Clearfield Growth Projections

Year	2010	2040
Jobs	65,000	91,000
Housing Units	24,000	31,000
Traffic Increase	---	+ 30%

Daily Ridership Projections

Route	Circulator Ridership	FrontRunner Increase
Hill AFB	400-500	250-300
Freeport Center	200-300	100-150
Layton to Clearfield	400-700	150-300
Totals	1000-1500	500-900



**LAYTON CITY COUNCIL MEETING
AGENDA ITEM COVER SHEET**

Item Number: 3.

Subject:

Update - Antelope Drive Roundabouts and Progress of other Public Works Projects

Background:

N/A

Alternatives:

N/A

Recommendation:

N/A

**LAYTON CITY COUNCIL MEETING
AGENDA ITEM COVER SHEET**

Item Number: 4.

Subject:

Closed Meeting to Discuss the Purchase, Exchange or Lease of Real Property, Including any Form of a Water Right or Water Shares

Background:

N/A

Alternatives:

N/A

Recommendation:

N/A