Salt Lake City
TRANSIT MASTER PLAN

2016

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1 INTRODUCTION

1 INTRODUCTION

The Salt Lake City Transit Master Plan is a blueprint for the future of transit in Salt Lake City. The Transit Master Plan emphasizes providing choices in travel and reducing dependence on the single occupant automobile. Numerous Salt Lake City plans in the last decade have identified the availability of safe, high-quality, convenient transportation choices as a critical tool to support achievement of broader outcomes, e.g., health, economic competitiveness, and quality of life. The plan builds on this work and identifies key corridors for high-frequency transit; important intermodal opportunities to significantly enhance linkages between the pedestrian environment and key transit corridors, nodes, and centers; shared mobility options to improve access to transit and serve lower demand neighborhoods and employment areas; and policies and programs that will leverage investments in transit and support transit ridership. The plan builds on the strong partnership between the City and Utah Transit Authority (UTA) and aligns with short- and long-term service design and operating principles.

PROJECT OVERVIEW

The Transit Master Plan helps Salt Lake City and UTA set priorities for the next 20 years and guides decisions about the timing and location of service and capital investments. The planning process included an in-depth analysis of city-wide travel patterns, the existing transit system and projections for future growth, extensive public outreach, and a multi-phased evaluation process to develop a set of recommendations that will guide future transit investment priorities in Salt Lake City.

The Plan was led by Salt Lake City and sought to identify citywide transit needs and investments (rather than focusing on any one neighborhood). It builds on other local and regional planning efforts and was developed in close coordination with UTA, City departments, and regional agencies. The inclusive public process is described below and in Appendix B.

Why a Transit Master Plan for Salt Lake City?

- Increase safe, reliable, and affordable transportation options for city residents
- Foster business relationships and economic development
- Accommodate urban growth in a sustainable, cost-effective manner
- Provide access to jobs, housing, and recreation
- Enhance partnerships with UTA
- Represent the community's ideal network of buses, trains, and streetcars

REPORT ORGANIZATION

The Transit Master Plan is organized into seven chapters (plus appendices) as follows:

Chapter 1: Introduction. Provides an overview of the Transit Master Plan process, including plan goals and objectives. Includes a summary of community input and system gaps identified throughout the planning process.

Chapter 2: Service. Provides recommendations for an expanded frequent transit network (FTN) for Salt Lake City. Components include service design principles, an FTN service level definition, maps, and descriptions of alternative local service models to support the FTN.

Chapter 3: Capital. Analyzes existing and potential transit corridors throughout Salt Lake City to determine their suitability for capital investments and recommends potential transit mode(s) for high-potential corridors identified through the corridor analysis.

Chapter 4: Access to the System. Provides recommendations for improving bicycle and pedestrian access as well as first and last mile connections. Salt Lake City manages the streets that connect people to transit which makes the City a key partner in improving access to the system.

Chapter 5: Program and Policies. Describes a range of programs and policies that can support the Salt Lake City FTN and enhance the usability and attractiveness of the public transit system. Recommendations address information and legibility, education and outreach, fare and pass programs, and parking management.

Chapter 6: Land Use. Provides guidance for community planning and design in the areas surrounding transit stops and stations to support transit-oriented development and the coordination between land use and transit in Salt Lake City.

Chapter 7: Implementation. Provides guidance and suggested phasing for implementing the FTN, capital improvements, and transit-supportive programs and policies. Potential funding sources and service delivery conditions are also discussed.

Appendix A: State of the System Fact Book. Describes the existing conditions for transit, travel demand, and land use patterns that affect the performance of transit in Salt Lake City.

Appendix B: Community Outreach. Summarizes the community outreach conducted throughout the Transit Master Plan process.

Appendix C: Gaps Analysis. Provides an analysis of the transit system gaps identified through the Fact Book analysis and community outreach.

Appendix D: Corridor Analysis Results. Provides results from the corridor analysis that informed Transit Master Plan recommendations.

The Transit Master Plan was developed in 2015 and 2016 using the best information available at the time. The Transit Master Plan is a flexible, "living" document. The City can apply its principles to address changing circumstances and needs, and adapt the plan to integrate the outcomes of other planning processes.

SALT LAKE CITY TRANSIT MASTER PLAN GOALS

The goals and objectives, shown in Figure 1-1 below, were developed through the refinement of goals established by City officials, incorporation of public input, and initial evaluation of the existing system. They support broader community outcomes that are important to Salt Lake City and clearly define all the desired elements for improving the transit system in Salt Lake City. These goals and objectives guided the evaluation of investment options and development of the Plan's recommendations.

Figure 1-1 Salt Lake City Transit Master Plan Goals and Objectives

Goals		Objectives
1	Improve air quality.	Reduce per capita vehicle miles traveled.
2	Increase the number of people riding transit.	Increase transit ridership.
		Make transit useful for more types of trips.
		Improve the competitiveness of transit with auto travel.
3	Provide a complete transit system that supports a transit lifestyle.	Provide reliable, efficient, frequent transit service.
		Provide service on a citywide network that serves a broad range of important community destinations.
		Maintain stable service on the core transit network.
		Provide service on the core transit network during the evening and on weekends to support all types of trips, including work and non-work trips.
		Provide information and maps that make the transit system easy to understand.
4	Provide a safe and comfortable transit access and waiting experience.	Improve bicycle and pedestrian access to transit.
		Improve the transit waiting experience and universal accessibility of stops and stations.
5	Provide access to opportunity for vulnerable populations.	Design a transit network that supports access to jobs, education, daily needs, and services for transit-dependent populations.
		Provide affordable transit options, particularly for low-income households.
6	Create economically vibrant, livable places that support use of transit.	Align transit investments with transit-supportive land use policies and development.
		Catalyze economic development and jobs in Salt Lake City by providing effective transit service that employers, businesses, and the development community can depend upon.

Benefits of an Enhanced Public Transit System

With changes in demographics, socioeconomic conditions, and transportation preferences, there's an increasing need to reassess how transit service can best serve Salt Lake City's residents, employees, and visitors. The Salt Lake City Transit Master Plan sets a vision to improve transit service to best meet changing preferences and future needs.

1 Transit supports our growing population and economy

Expanded transit service is needed particularly during times of peak travel to maintain competitive commute times, retain and attract businesses, and support the efficient movement of freight.

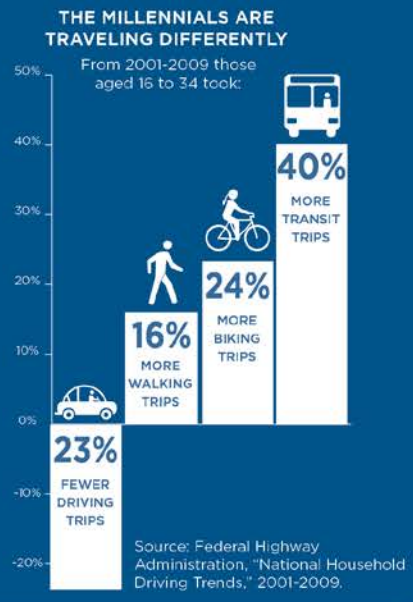
2 Transit carries more people, reducing emissions and improving air quality

On-road transportation accounts for over 15% of total emissions in Salt Lake City. If current trends continue, vehicle miles traveled are expected to increase 1.4% per year.

Source: Salt Lake City Community Carbon Footprint (2010).

3 Transit supports changing transportation preferences

The Millennial generation (approximately those born between 1981 and 1997) is driving less and using transit, biking, and walking more.



Source: Federal Highway Administration, "National Household Driving Trends," 2001-2009.

4 Transit accommodates an aging population of Baby Boomers

As the City's Baby Boomers reach retirement, they will require safe and affordable transit options to stay active and engaged in their communities and access daily services and medical appointments.

Source: 2014 ACS 5-year Estimates and Utah Governor's Office of Planning and Budget

5 Transit provides an affordable transportation option

Salt Lake City residents spend an average of 20% of their household income on transportation; transit provides an affordable option for those that most need it.

20% transportation costs

Source: Housing and Transportation Affordability Index. Transportation Costs as % of Income. http://htaindex.cnt.org/map/"

6 Transit keeps us healthy

Taking transit can help increase physical activity and improve health. The current obesity rate in Salt Lake County is 27%.

Source: Utah Department of Health. Public Health Indicator Based Information System (IBIS). 2016. Retrieved from https://ibis.health.utah.gov/indicator/complete_profile/Obe.html

Source: Besser, Lilah, and Andrew Dannenberg. "Walking to Public Transit: Steps to Help Meet Physical Activity Requirements." American Journal of Preventive Medicine 29:4 (2005): 273-80.

SUMMARY OF COMMUNITY INPUT

The Salt Lake City Transit Master Plan public outreach process engaged a broad and diverse segment of the population. Opportunities for public involvement included: stakeholder interviews, mobile event outreach, public open houses, and online engagement. Public outreach was conducted in all seven Council Districts of Salt Lake City. In addition to the general public, numerous organizations were involved in the planning process, including:

- Breathe Utah
- Crossroads Urban Center
- Envision Utah
- Heal Utah
- Salt Lake County Aging and Adult Services
- Salt Lake City Chamber of Commerce
- Salt Lake City Community Councils
- Salt Lake City Council
- Salt Lake City Downtown Alliance
- Salt Lake City Planning Commission
- Salt Lake City School District
- Salt Lake City Transportation Advisory Board (TAB)
- Salt Lake City's UTA Trustees
- Salt Lake County
- South Salt Lake City
- Sugar House Chamber
- University of Utah
- Utah Department of Transportation (UDOT)
- Utah Transit Authority (UTA)
- Utah Transit Riders Union
- Wasatch Front Regional Council
- Westminster College

An overview of key outreach efforts is provided below; Appendix B provides a detailed summary.

Stakeholder Interviews

The project team met with several key stakeholder groups in the community during spring of 2015 to understand the needs of their organizations and constituencies. Interviews focused specifically on their goals for the Transit Master Plan, issues and opportunities for the current UTA network, level of understanding of the services provided, and any other issues such as accessibility, affordability, etc.

Mobile Outreach Events

To develop a presence in the community, the team conducted 18 mobile outreach events during the summer of 2015. This effort took advantage of existing city-wide and neighborhood events and engaged members of the public that do not traditionally attend open houses.

Over 400 individual comments were collected via comment boards and a mapping exercise that allowed attendees to geographically highlight routes in need of improved service, longer service, or new service. A number of these events used a branded trolley-style bus to allow members of the public to board, interact with members of the project team, and engage in the outreach activities.

Public Open House

On September 23, 2015, a total of 60 people attended a public Open House held at the City Creek Harmons grocery store. The team presented the educational boards from the mobile outreach effort as well as boards that showed key gaps where land use density or demographics indicate a propensity to ride transit, but where there is little transit use.

> "People work on Sunday and late at night, it is difficult to get where we need to go when we cannot rely on the transit system to run at the appropriate times."
>
> - *"Design Your Own Transit System" Survey Respondent*

A total of 64 comments were provided via three "conversation boards"—one for prioritizing goals, one for comments on service design principles, and one for conversation on maps and information, fares, and access and station improvements.

Online Engagement

To engage Salt Lake City residents who were unable to attend one of the in-person public outreach events, the project team developed a project website: SLCRides.org. The website included detailed information about the project, outreach events planned and completed, project reports and documentation, and online community input tools—Open City Hall Questionnaire, Open UTA Questionnaire, and the "Design Your Own Transit System" tool. In addition to the available online community input tools, twenty-two participants wrote direct emails through the SLCRides.org website.

Open City Hall Questionnaire

The Open City Hall online questionnaire asked respondents to identify their top choices regarding key outcomes from the Plan, desired improvements, and "big ideas" related to transit. The questionnaire was available from July 30 to October 1, 2015 through Open City Hall and the project website.

Among the 535 responses, air quality (49%) and transit system convenience and reliability (41%) were identified as the most important outcomes. Pedestrian and bicycle access to stops (28%) was the highest ranking improvement and a citywide network of transit service was the most important big idea.

Open UTA Questionnaire

The Open UTA online questionnaire asked respondents to identify their top choices regarding service improvements, bus improvements, light rail (TRAX) improvements, and FrontRunner improvements. The questionnaire was accessible from UTA's website during the summer of 2015 and closed on October 1, 2015. A total of 461 responses were collected, including 74 from Salt Lake City residents.

> "Buses should run on predictable routes on major streets at closer distance intervals. The city is a grid; the bus system should reflect that. Nowhere in town should be more than one transfer and a short walk away."
>
> - *"Design Your Own Transit System" Survey Respondent*

Bus was identified as the most important mode for improvement (45%), followed by TRAX and Streetcar (35%). Improving service span was the most important bus improvement (50%). Late night service was the most important TRAX improvement (47%) and Sunday service was the top priority for FrontRunner enhancement (59%).

"Design Your Own Transit System" Online Tool

Between November 2015 and April 2016, a "Design Your Transit System" tool was made available to the public on the project website SLCrides.org. Over 1,400 people participated. Input highlighted the key challenges and opportunities to improve the transit system in Salt Lake City. Major findings from this outreach tool are described below.

- **Participants**
  - 1,412 people participated, of which 65% live in Salt Lake City.
  - The online tool reached a wide audience; however, seniors (65 or older), low-income populations (earning less than $35,000 per year), and residents of western Salt Lake City were somewhat under-represented as compared to their share of the general population.
- **Transit Use**
  - 40% of respondents ride transit multiple times per week and 60% ride at least once a month.
  - The top reason cited for riding transit was environmental reasons (25% of respondents).
  - The top reasons for not riding transit more often were related to convenience, with more than 50% of respondents indicating transit takes too long or doesn't go where they need it to go.
- **Service Coverage**
  - The highest-priority destinations to serve were Utah's top job centers (52%) and mixed use and major growth areas (49%). These two destinations were priorities for all groups regardless of frequency of transit use, age, or income.
  - Service to LIMITED neighborhoods[1] was a particular priority for adults 65 or older (2nd most common response) and low income respondents (3rd most common response).
- **Service Periods**
  - Respondents most desired new service in the evening (70%), followed by Saturday service (58%) and finally Sunday service (39%). These priorities were identical, regardless of respondents' frequency of transit use, age, or income.
- **Capital Improvements**
  - The top capital improvement priority was to increase investments in a rail-based system (46%). This was the top priority regardless of frequency of use, age, or income.
  - Responses from Salt Lake City residents were similar to those of all people who responded, though Salt Lake City residents were somewhat more likely to want to increase investment in the bus system.
  - Adults age 45-64, age 65 or older, and low-income respondents were somewhat more likely than other groups to indicate a preference for a bus-based system or incremental improvements to the current system.
- **Other Improvements (to support coverage, service period, and capital investment selections)**
  - Increased investment in access to transit on foot or by bike was the highest priority improvement overall (43%) and for all groups except those age 65 or older.
  - Respondents age 65 and older indicated a preference for investments in benches, shelters, and amenities at transit stops.

[1] Limited neighborhoods are neighborhoods with a high propensity to use transit.

GAPS ANALYSIS

While portions of Salt Lake City are well-served by transit, some portions of the city experience a mismatch in the existing transit supply and current demand, resulting in a "gap." To determine where gaps exist, an analysis was conducted to identify underserved corridors or markets, areas with too much service, and areas ineffectively served by transit.

Key transit service needs and gaps identified in this analysis are highlighted below; the complete Gaps Analysis is provided in Appendix C:

- **Transit service is limited outside of the standard commute.** Frequent service is very limited outside of standard commute times, such as midday, evenings, and weekends. Some areas of the city with high propensity to use transit have a low transit mode share and are not well-served by the existing transit system. For example, of the 44 transit routes that operate in Salt Lake, only about half operate outside commute periods and provide midday service.
- **Transit is not the preferred option.** Six percent of Salt Lake City residents take transit to work; only 2% of all trips are made on transit.
- **Transit boardings outside of Salt Lake City are outpacing boardings inside Salt Lake City.** Total transit ridership on all lines that touch Salt Lake City increased by 28% between 2011 and 2014 whereas boardings in Salt Lake City on these lines only increased by 13%.
- **Bus stop amenities are limited.** There are limited amenities for passengers at bus stops—83% of bus stops do not have a bench or a shelter where people can more comfortably wait for the bus to arrive.
- **Access to transit is a challenge.** Access to transit is challenging in Salt Lake City due to the wide streets and large blocks.
- **System information is limited.** Improved information (maps, online schedules, and trip planning, etc.) is needed to help residents, employees, and visitors understand how to use the transit system.
- **Cost of transit is burdensome for some.** The cost of transit is particularly burdensome on large families, youth, and transit dependent populations—low-income, older adults, persons with disabilities, and zero car households.

COMPLETE TRANSIT SYSTEM

The Salt Lake City Transit Master Plan sets a vision for frequent transit service throughout the city, responding to community and policy direction to improve public transportation for the benefit of all members of the community. However, getting more service to more people is not the only answer. Enhancing transit quality and the transit passenger experience for Salt Lake City residents and workers will take a coordinated, "complete transit system" approach.

What is the "Complete Transit System?"

A Complete Transit System is a unifying concept for complementary transit service quality and land use elements (e.g., service levels and land use policies) and non-service elements (e.g., facilities, pedestrian and bicycle access, etc.) that function together to achieve the desired local outcomes for transit in Salt Lake City.

The Salt Lake City Transit Master Plan provides strategies and recommendations for Salt Lake City to develop a Complete Transit System that:

Prioritizes **expanded frequent transit service** that is fast and reliable, frequent, all day, every day, and permanent.

Improves **transit information and legibility.**

Ensures there is safe and convenient **pedestrian and bicycle access** to transit and from transit to key destinations.

Integrates **on-demand ride services and bikeshare** to serve first-last mile needs and expand service span.

Builds **stops and stations** that are accessible, comfortable, and convenient.

Offers **fare and pass programs** that are flexible and affordable.

Coordinates **land use, parking, and placemaking policies** with transit investments.

Provides **education and outreach** to improve understanding of the transit system.

Implementing the policies, programs, and service improvements that support a Complete Transit System will require a strong partnership between UTA and Salt Lake City. These elements will help the City and UTA fully leverage investments in transit service, maximize the benefits of transit, and bring Salt Lake City closer to meeting the goals set forth in the Transit Master Plan.

2 TRANSIT SERVICE

2 TRANSIT SERVICE

This chapter provides the Salt Lake City Transit Master Plan transit service recommendations. Transit recommendations are grounded in an extensive existing conditions and gaps analysis that informed a detailed evaluation of current and potential transit corridors in Salt Lake City. A multi-faceted public outreach process complemented the technical evaluation and helped validate the recommendations.

A core service element of the Transit Master Plan is an expanded frequent transit network (FTN) for Salt Lake City. The FTN is the City's long-term, 20-year vision for high-frequency transit service corridors in Salt Lake City. The existing TRAX light rail system already provides frequent service; this Plan builds off of this core network by identifying a high-frequency grid comprised of both rail and bus service. Defining an FTN vision allows Salt Lake City to work closely with the Utah Transit Authority (UTA) to set priorities for service provision now and in the future.

This chapter includes the following elements:

- **Service Design Principles.** Principles that can be used to design a network of transit routes that will fulfil the FTN vision.
- **FTN Overview and Service Level Definition**. The definition of the standardized minimum service level that will be provided on all FTN corridors, e.g., frequency, span (hours of operation), and days of service.
- **FTN Vision and Maps.** The vision for where frequent service should be provided throughout the city, including general phasing recommendations.
- **Local Service Network.** Recommendations for the network of local bus routes that provide connections to the FTN.
- **First-Last Mile Service Models**. Examples of alternative service models to improve first- and last-mile connections to the FTN and other transit services.

SERVICE DESIGN PRINCIPLES FOR SALT LAKE CITY

The service design principles below guide the development of the frequent transit network in Salt Lake City. These principles respond to the goals of the Plan, the gaps analysis, and input from stakeholders and the public (described in Chapter 1).

- **Convenient**: Provide frequent, reliable daytime and evening transit service
- **Connected**: Provide simple, citywide connections on a high-frequency network
- **Legible**: Brand the core frequent transit network differently and design for ease of understanding
- **Easy to Use**: Make the transit network easy to access and comfortable
- **Demand Driven**: Invest in transit where overall travel market demand is high
- **Permanent**: Provide stable service that riders and investors can rely on now and in the future

These service design principles inform the frequent transit network recommendations and can inform design of specific transit routes that are developed to fulfil the vision. They also inform the recommendations for capital investments, programs, policies, and other supportive investments which are presented in subsequent chapters.

FREQUENT TRANSIT NETWORK OVERVIEW

What is a Frequent Transit Network?

A frequent transit network (FTN) is a set of designated transit corridors that offer frequent, reliable service connecting major destinations and neighborhood centers seven days a week and in the evenings. The FTN can be comprised of both bus and rail technologies. Regardless of mode, the network should be developed to provide a consistently high standard of capacity, reliability, frequency, and passenger amenities. The FTN should be easy to understand and clearly communicated to riders and non-riders. The FTN is just one element of a complete transit system—other local transit routes would provide well-timed connections to the FTN and additional first and last-mile services would help passengers connect to origins and destinations located beyond a short walking or biking distance of the FTN.

Chapter 4 describes access improvements for people walking and biking to transit. Chapter 5 provides recommendations related to branding the FTN.

Key Performance Characteristics of a Frequent Transit Network

To meet City goals to increase transit mode share and truly support residents' ability to live a car-free lifestyle, a frequent transit network should ideally have the following characteristics:

- **Fast and Reliable**: Operate transit on arterial streets/transit priority streets where it will be most rapid and reliable; make improvements that reduce transit travel time and make it more competitive with automobile travel.
- **Frequent**: Connect major destinations and neighborhood centers with 15 minute or better, all day service. Service that operates every 15 minutes or less is considered the minimum service level that allows people to use transit without consulting a schedule.
- **All Day**: 15 minute or better service frequency between at least 6 a.m. – 7 p.m. on weekdays and Saturdays, with 30-minute service in the evening and on Sundays.
- **Every Day**: 7 day per week service that maintains a basic level of frequent service on weekends.

- **Stable and Permanent**. Once adopted, it is critical that the FTN become a stable, relatively unchanging part of the transit system so that riders can rely on it much as they do the TRAX system.

What Investments are Typically Made on a Frequent Transit Network?

Once the network is defined, coordinated transit service and capital investments, bicycle and pedestrian access improvements, and transit-supportive land use policy changes are needed to fully realize the value of the FTN. A truly effective FTN must be developed as a partnership between the City's multiple departments, the transit agency (UTA), and the private sector. Once the City and its transit partners agree on the definition of the FTN, they can work together to obtain funding and make the improvements necessary to achieve the level of service that is envisioned. FTN investments and supportive policies include:

- **Intersection and Signal Management**: Signal management and right-of-way improvements are a critical component of the FTN. Since these corridors carry the highest volume of transit riders and have the greatest potential to capture more non-auto users, signal management at intersections should favor transit vehicles; moving full, high-capacity buses through congested commercial districts should be balanced with the need for on-street parking to support local businesses; and integrated solutions should be sought to allow transit and bicycles to safely coexist.
- **Transit Lanes**: Providing transit with priority lanes on high-ridership corridors supports investments in frequent service. Where sufficient right-of-way is available in these corridors, dedicating part of the right-of-way to transit is justified based on transit's higher person-carrying capacity. Transit lanes also allow buses to bypass congested areas, making bus travel times shorter and more reliable.
- **Stops/Stations**: The quality of stop and station amenities on FTN corridors is critical. Stops and stations also represent an opportunity to brand the FTN network differently so that the location of high-frequency service is clear to riders.
- **Multimodal Investments**: Coordinated multimodal investments along the FTN provide safe, high-quality walking and bicycling access to stops and stations on the FTN.
- **Land Use**: Zoning and other land use policies must support high frequency service along the FTN. The FTN designates which corridors will have the highest-quality transit service. Land use policies will need to foster transit-supportive land use development along these corridors.

Figure 2-1 summarizes the primary components of an FTN.

See Chapter 3 for further discussion of transit capital investments, and Chapters 5 and 6 for further discussion of stop/station amenities, multimodal investments, and land use policies that support the FTN.

Figure 2-1 Frequent Transit Network (FTN) Summary

Feature	Description
Mode	Any mode that meets the service level definition is considered part of the FTN (e.g., could include TRAX, BRT, Bus Plus/Enhanced Bus[1], Streetcar, etc.).
Span	Operates all day every day (see Figure 2-4 for minimum service level definition).
Frequency	Operates at sufficient frequency for most of the day so that riders don't have to consult a schedule (see Figure 2-4 for minimum service level definition).
Route Spacing	Operates throughout the city on relatively straight, east-west and north-south cross-city corridors spaced approximately every ½ mile so no passenger has to walk more than ~1/4 mile to access the FTN (see Figure 2-6 and Figure 2-7 for FTN maps illustrating recommended phasing).
Branding	The FTN is branded in a clear, easily identifiable, and easily distinguishable way to make it easily recognizable on the street, in print materials, and in online information. This includes stops, stations, vehicles, maps, schedules, wayfinding, and trip planning information. (See FTN branding examples in Chapter 5).
Reliable	Investments are made and service is operated to maximize reliable headways (see capital recommendations in Chapter 3).
Permanent/ Stable	Provides a permanent service option—e.g., residents, businesses, and developers can count on trunk bus lines to remain where they are, just like a TRAX line is permanent.
Stop Spacing	Stop spacing varies depending on mode, but could range from ¼ to ½ mile for bus and ½ to 1 mile for light rail. (See Chapter 3: Capital.)

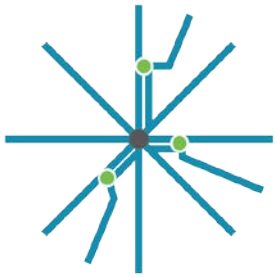
[1] Bus Plus is a proposed network of high-frequency transit service defined in the UTA Network Study (2013). It is referred to as Enhanced Bus in the Regional Transportation Plan (RTP). Bus Plus service would include all of the amenities of Bus Rapid Transit without the exclusive lanes. See Chapter 3 for more details. The State of the System Fact Book (see Appendix A, page 4-33) also summarizes UTA's proposed Bus Plus Network.

FREQUENT TRANSIT NETWORK SERVICE VISION

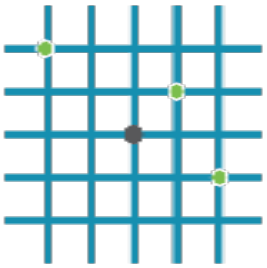
A High-Frequency Grid System for Salt Lake City

There are two primary network designs that most transit systems utilize: radial or grid. Figure 2-2 and Figure 2-3 describe these models and summarize their keys strengths and weaknesses.

Figure 2-2 Basic Transit Network Design Concepts



A Radial (Hub and Spoke) model has a single central transit station that provides access to most, if not all, transit routes. This model provides direct connections to destinations located near the central hub and access to most destinations outside of the hub with a single transfer.



A Grid system provides a more integrated network with multiple options to connect between transit lines. This network requires frequent service to make transfers convenient at major stops or transit centers where lines intersect.

Figure 2-3 Comparison of Transit Service Models

	Radial (Hub and Spoke) Model	Grid Model
Strengths	▪ Easy access to destinations near a central hub in the downtown core ▪ Coordinated schedules where all routes leave the hub at the same time allow access to most other destinations with no more than one well-timed transfer	▪ Can be effective for short trips ▪ Can reduce out-of-direction travel ▪ Can provide good service to a wider range of destinations, including those outside of downtown ▪ Routes can be spaced farther apart; people will generally walk longer distances to frequent service ▪ Concentrating service on direct corridors serving the grid helps provide resources to increase frequency
Weaknesses / Design Considerations	▪ Can increase travel times and out-of-direction travel for trips that don't naturally pass through the hub ▪ Can be inefficient in a city with dispersed major trip generators ▪ As a city grows, maintaining coordinated schedules can result in system inefficiencies	▪ Requires very frequent service to make transfers convenient and avoid long wait times ▪ Routes serving the grid should be designed to ensure that most destinations can be accessed with no more than one transfer

In practice, most transit systems are a hybrid combining elements from both radial and grid network designs. For example, a central transit hub can facilitate well-timed connections to/from regional services while high-frequency cross-town routes support convenient, flexible connections between branches of the

radial network without requiring passengers to travel through the central hub. Developing secondary transit hubs or high-quality major stops where high-frequency lines intersect help facilitate these connections.

Current Salt Lake City Service Model

Salt Lake City's current, centralized hub model is effective for regional connections. However, Salt Lake Central Station is located in an area west of the downtown core that provides good connectivity to commuter rail, but does not have considerable activity or density. Many of UTA's routes currently terminate at Central Station to take advantage of the centralized layover space that is available there. The gaps analysis and public outreach indicated that this creates challenges for people who need to travel to other destinations throughout the city, necessitating multiple transfers and/or indirect trips. Further, requiring routes to go through Central Station despite a lack of demand undermines productivity in some cases.

Recommended Salt Lake City Service Model

Developing a high-frequency network is best suited for Salt Lake City's rapidly growing population and diversifying transit demand needs. Salt Lake City's strong linear street grid is well-suited for a grid-based system. This change could allow for more frequency on heavily used routes and/or offer better service in currently under-served areas where there is demand. However, new layover locations will need to be identified to make this model viable, both to support transfers and for operational reasons (e.g. layover). Potential secondary transit hub locations are discussed in more detail below.

> "Buses should run on predictable routes on major streets at closer distance intervals. The city is a grid; the bus system should reflect that. Nowhere in town should be more than 1 transfer and a short walk away."
>
> - *"Design Your Own Transit System" Survey Respondent*

FTN Corridor Analysis

The Transit Master Plan corridor analysis provided the basis for the FTN recommendations. In addition to the service design principles and FTN performance characteristics described above, factors included:

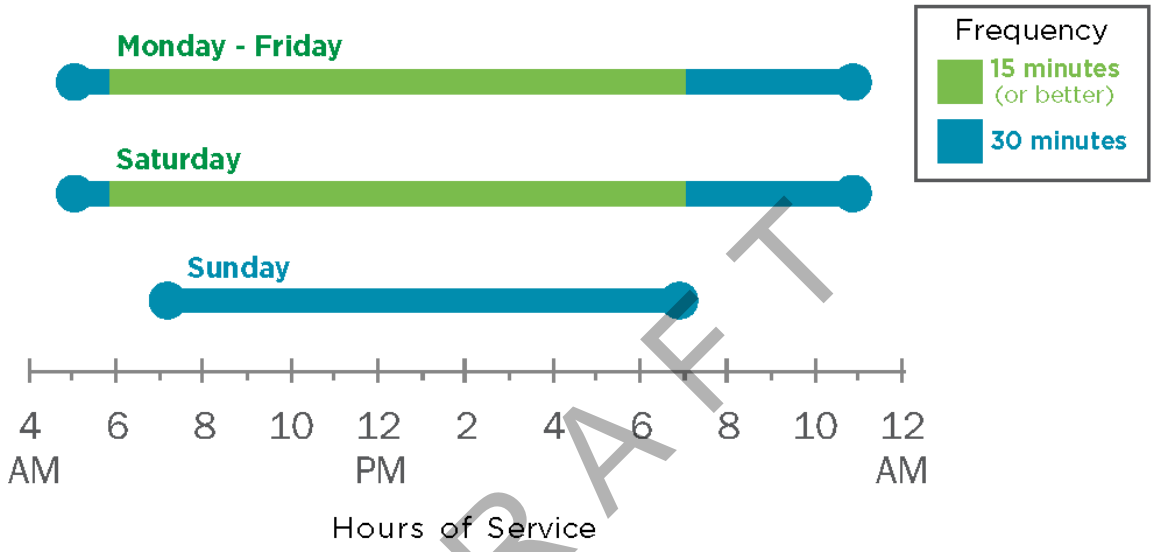
- Population and employment density and industry-standard rules-of-thumb relating transit service frequency to the minimum intensity of land use (e.g., household size, population, and employment) required to support that level of service.
- Service to major activity centers such as the University of Utah, downtown Salt Lake City, or other major anchors or activity centers at one or both ends of a line.
- Spacing between parallel corridors, e.g., approximately a half-mile as described above.
- Access to opportunity for vulnerable and transit-dependent populations

Appendix D provides more detail on the FTN corridor analysis.

Frequent Transit Network Service Level Definition

High-frequency service is critical for a grid-based transit system because riders depend more on transfers to access destinations. Based on the general principles described above, the level of service shown in Figure 2-4 is recommended for the FTN. All designated FTN routes should operate according to these parameters, which were designed to not only be frequent, but also to operate relatively consistently all day, every day. A simple and easy-to-understand service design, along with clear branding, allows riders to use an FTN route without referencing a schedule and provides a level of certainty and reliability on which riders can depend.

Figure 2-4 FTN Minimum Service Level Definition

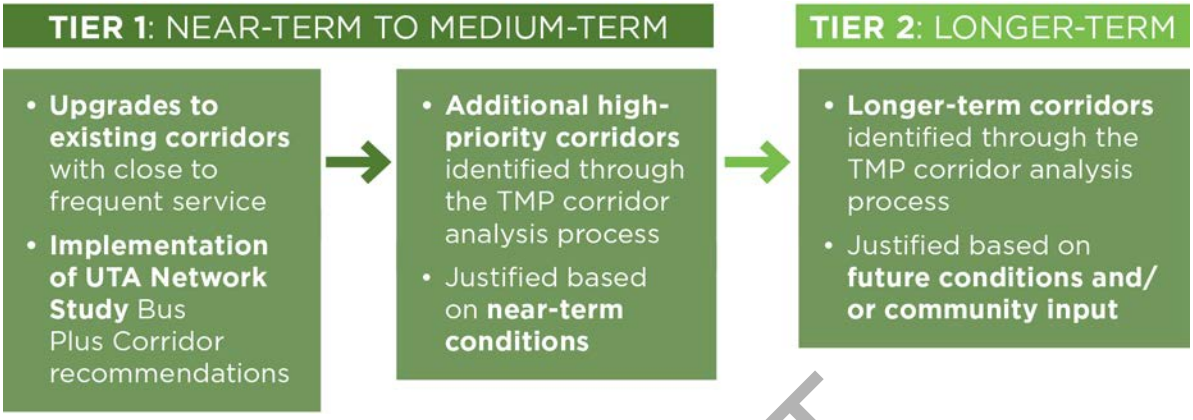


Note: Appendix D provides additional detail on the relationships between land use and frequency.

Frequent Transit Network Recommendation and Phasing

The FTN is a long-range vision that is intended to be phased in over time, as described in Figure 2-5. UTA currently has plans to provide frequent service consistent with the above definition on its Core Service Network, although the specific corridors that will comprise this network are not yet finalized.

Figure 2-5 Phasing Approach for the FTN*



* Note: Some existing corridors have frequent service (at least every 15 minutes) on weekdays during the day (peak periods and midday), but do not meet the FTN service level definition later in the evening or on weekends.

> "Ideally I'd like a transit system that is everywhere, all the time, but until that happens, I'd like people to get used to taking transit, which I think would require very, very frequent service in key areas."
>
> - *"Design Your Own Transit System" Survey Respondent*

FTN Phasing Maps

Figure 2-7 illustrates phased implementation of the corridors that are recommended to create a grid-based FTN in Salt Lake City. The lines on these maps do not represent individual routes, but rather provide a sense of the quantity, structure, and geography of coverage that Salt Lake City envisions for the future FTN.

Tier 1 FTN Corridors – Short-Term Implementation: Figure 2-6

The recommended Tier 1 FTN includes two categories of corridors:

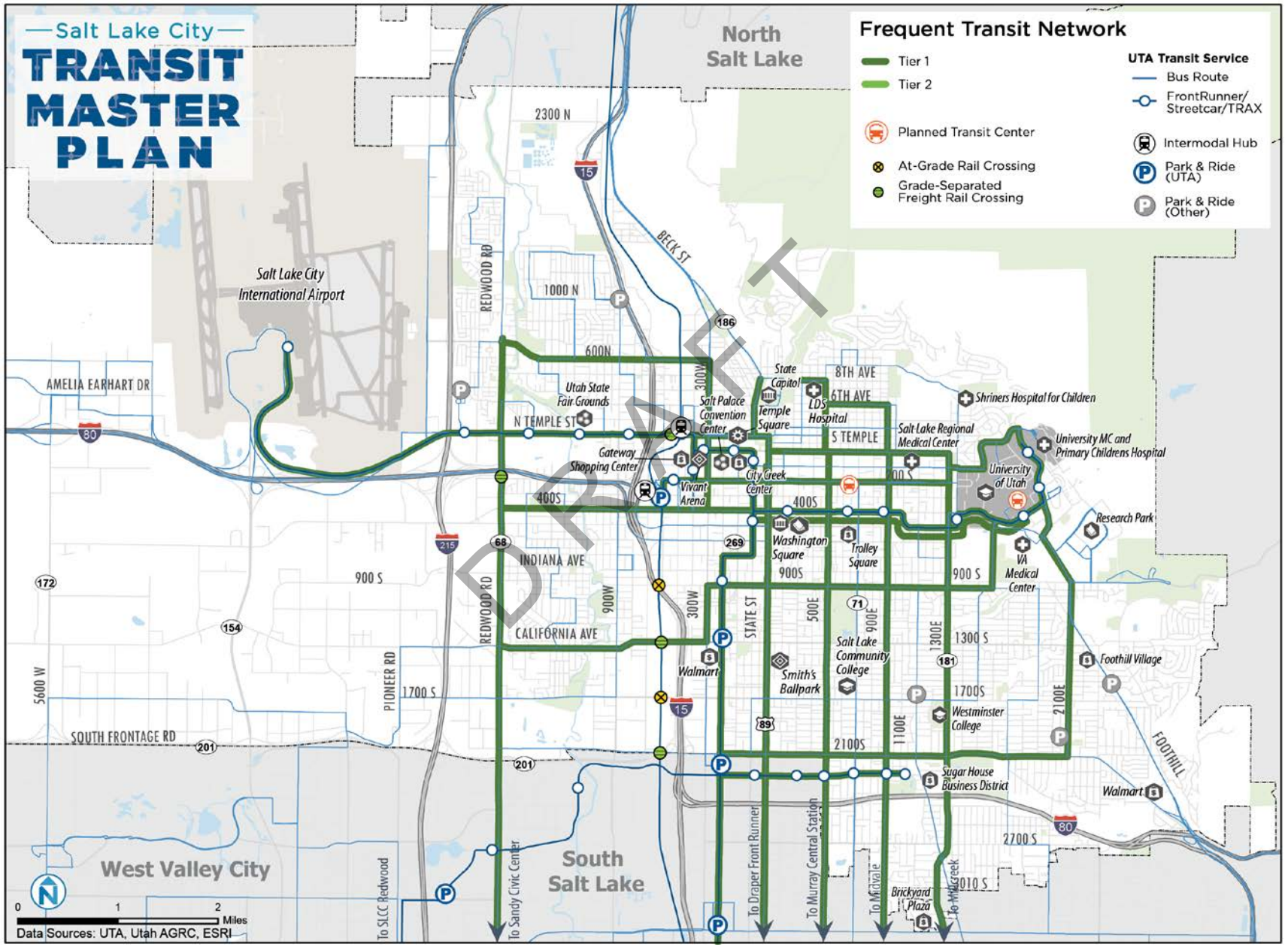
1. **Existing and planned corridors** where UTA already operates or plans to implement frequent service. These include the Bus Plus Corridors recommended in the UTA Network Study (2013) that were incorporated into the Regional Transportation Plan (2015) as Enhanced Bus corridors and are also supported by the Transit Master Plan evaluation and outreach process.[2]
   - **200 S** performed strongly in the Transit Master Plan analysis and is recommended as a primary east-west transit corridor for bus (and potentially future bus rapid transit and/or streetcar) service between downtown and the University.

[2]UTA plans to designate a Core Network of routes that will have frequent service, but this network had not yet been finalized by the time Salt Lake City's Transit Master Plan was completed in fall 2016.

- **State Street, 500 E, 900 E, and 1300 E.** Combined with existing TRAX service in the 200 W corridor, frequent bus service on State Street, 500 E, 900 E, and 1300 E would provide north-south connections with approximately half-mile spacing between southern city limits and downtown, as far east as the University of Utah.
- **North and South Temple Streets** also performed strongly in the Transit Master Plan analysis, and in conjunction with frequent service on 200 S and existing TRAX service in the 400 S corridor, would provide quarter-mile spacing for frequent service through downtown.
- **2100S/2100E**. This east-west and north-south corridor (currently served by Route 21), provides a connection between the Central Pointe TRAX Station and the University along the southern and eastern edges of the frequent grid.
- **Redwood Road**. While it lacks the density of other corridors, Redwood Road is an important, continuous street for transit in west Salt Lake City. It would run along the western edge of the recommended Salt Lake City FTN and would be linked with additional east-west FTN corridors.

2. **Additional high-priority corridors** that go beyond existing plans for frequent service (UTA Network Study, Regional Transportation Plan, etc.). These corridors provide the following enhancements to the existing or planned frequent service network:
   - **Provide additional east-west cross-town connections**
     - **400 S.** This corridor would connect Redwood Road to the University of Utah.
     - **1300 S / 900 S**. This corridor would begin to build out the east-west frequent service grid between the TRAX line along 400 S and southern city limits. Due to an at-grade railroad crossing on 900 S, this corridor transitions to 1300 S between 300 W and Redwood Road. (At-grade freight railroad crossings can cause significant transit delays and bus bunching, especially for high frequency service.) In the long-term, it is assumed that a separated crossing could be implemented on 900 S (see Tier 2 FTN map).
   - **Extend north-south corridors to better serve major activity centers and neighborhoods north of downtown**
     - **State Street**. Extend north-south frequent service to the State Capitol.
     - **500 E and 900 E**. Extend north-south frequent service to the LDS Hospital and into the Avenues neighborhood.
   - **Provide better connectivity in Rose Park and Fairpark neighborhoods**
     - Provide frequent service on 200 W and 600 N that connects these two neighborhoods to downtown Salt Lake City. These neighborhoods show high propensity to use transit, but are not well served currently.

Figure 2-6 Frequent Transit Network Vision: Tier 1

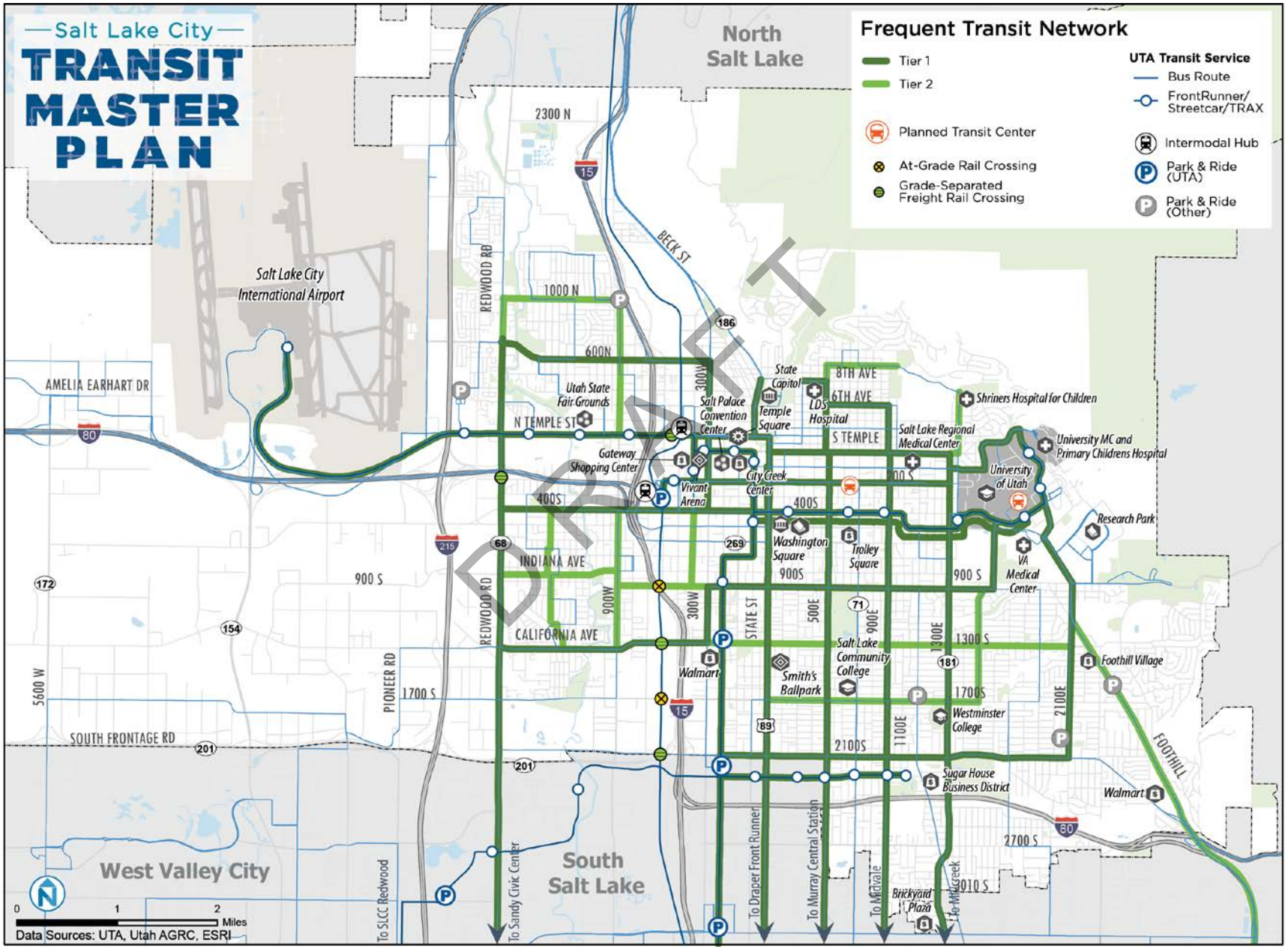


Tier 2 FTN Corridors – Longer-Term Implementation (Figure 2-7)

Proposed Tier 2 corridors recommended for implementation in the longer-term are illustrated in Figure 2-7. These corridors complete the FTN vision of a well-defined transit grid with approximately half-mile spacing in the portions of Salt Lake City where existing or future land use supports this level of service. The following Tier 2 recommendations build upon earlier service enhancements:

- **Implement additional east-west cross-town corridors to provide approximately half-mile spacing between frequent east-west corridors**
  - **900 S and 1300 S.** Assuming a grade-separated railroad crossing has been developed on 900 S, both corridors would have frequent service between Redwood Road and 1500 E.
  - **1700 S.** Frequent service between State Street and the University (including 1500 E).
- **Extend north-south corridors to better serve major activity centers and neighborhoods north of downtown**
  - **11th Avenue and 1200 E.** Additional frequent service to Shriners Hospital and the Avenues neighborhood.
- **Enhance service to Rose Park and Fairpark neighborhoods**
  - Provide frequent service on additional corridors, assumed to be 900 W and 1000 N.
- **Enhanced service on regional access corridors**
  - **Foothill Drive.** Foothill Drive is an important corridor for regional access to Salt Lake City as well as a local corridor through the city's eastern neighborhoods. The City, UTA, University of Utah, UDOT, and other partners are working on an implementation strategy for transportation and other enhancements for the corridor.

Figure 2-7 Frequent Transit Network Vision: Tier 1 and Tier 2



FTN Access

Figure 2-8 illustrates a quarter-mile walking (network) distance from the completed frequent transit network vision. A quarter-mile is a rule-of-thumb for the minimum distance people are willing to walk to access transit, although people will typically walk longer distances to high-quality service.

By 2040:

- Approximately **73% of current residents** would be within walking distance of a frequent transit route.
- Approximately **73% of current jobs** would be within walking distance of a frequent transit route.

Figure 2-9 illustrates the recommended FTN in relation to populations with a high-propensity for transit use, including low-income households, households without access to a vehicle, seniors, and persons with disabilities.

As described in the Local Service Network section below, it is important to emphasize that local bus routes would continue to serve parts of Salt Lake City that are not served by the FTN. In addition, the Transit Master Plan recommends that the City implement first-last mile strategies to enhance access to the frequent transit network

FTN Implementation Case Studies

In many cities, frequent transit service is implemented incrementally, while branding these services as a high-quality frequent service *network* is often undertaken later. Chapter 5 highlights the branding aspects of two such cities – Minneapolis and Portland. Chapter 7 describes the process that the City of Seattle used to fund targeted increases in King County Metro service levels to expand frequent service provided in the city. In Houston, as described below, the transit agency undertook a more comprehensive restructuring to expand the frequent service network.

Houston METRO

The Metropolitan Transit Authority (METRO) in Houston, TX recently transformed its bus network from a low performing limited network to a more expansive frequent network. The new network—launched in August 2015—was designed to enable anywhere to anywhere travel with a single fast connection.

Houston has experienced decades of decentralized urban growth; however, most bus lines terminated in one small section of the downtown core, where only 25% of the region's jobs are located. Without increasing operating costs, METRO was able to restructure the Houston bus network to:

- Increase the share of METRO's resources focused on maximizing ridership from 55% to around 80%
- Expand the reach of frequent service
- Expand weekend service, especially Sunday service[1]

To achieve this, METRO removed duplicative and low-demand routes. A small number of existing riders (0.5%) were negatively impacted, as they were no longer located within a quarter-mile of bus service.[2]

Within the first month of the new service, weekend ridership dramatically increased, especially on Sundays. Daytime and evening service levels on weekends are now almost identical to service on weekdays. Ridership in the first month slightly decreased, which is commonly observed with any major service change but by the third month of service, local ridership increased by 8%.[3]

1 Jarrett Walker. Houston: Great Ridership News on the New Network. 28 October 2015 Human Transit Blog. Retrieved from http://humantransit.org/2015/10/houston-good-ridership-news-on-the-new-network.html

2 Jarrett Walker. Houston: Transit Reimagined. 9 May 2014 Human Transit Blog. Retrieved from http://humantransit.org/2014/05/houston-a-transit-network-reimagined.html

3 Laura Bliss. How Houston's Bus Network Got Its Groove Back. 5 April 2016. City Lab. Retrieved from http://www.citylab.com/commute/2016/04/how-houstons-bus-network-got-its-groove-back/476784/

Houston Frequent Network – Before Change

Houston Frequent Network – After Change

Houston transformed its bus network from limited span and frequency (above) to an expansive high frequency network (below).

Source: Human Transit, Jarrett Walker

Figure 2-8 Frequent Transit Network Vision: Tier 1 and Tier 2 Quarter-Mile Walk Access

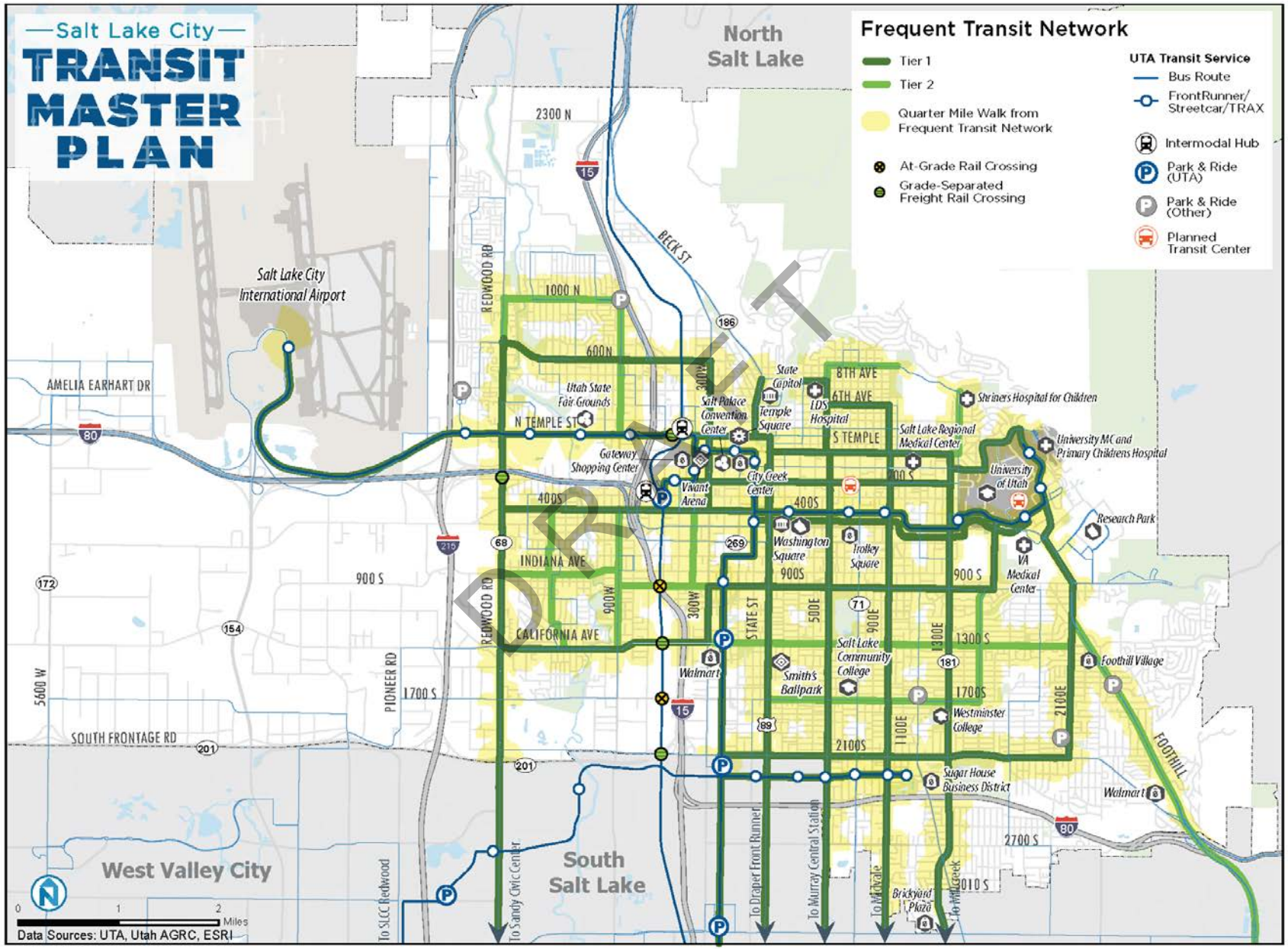
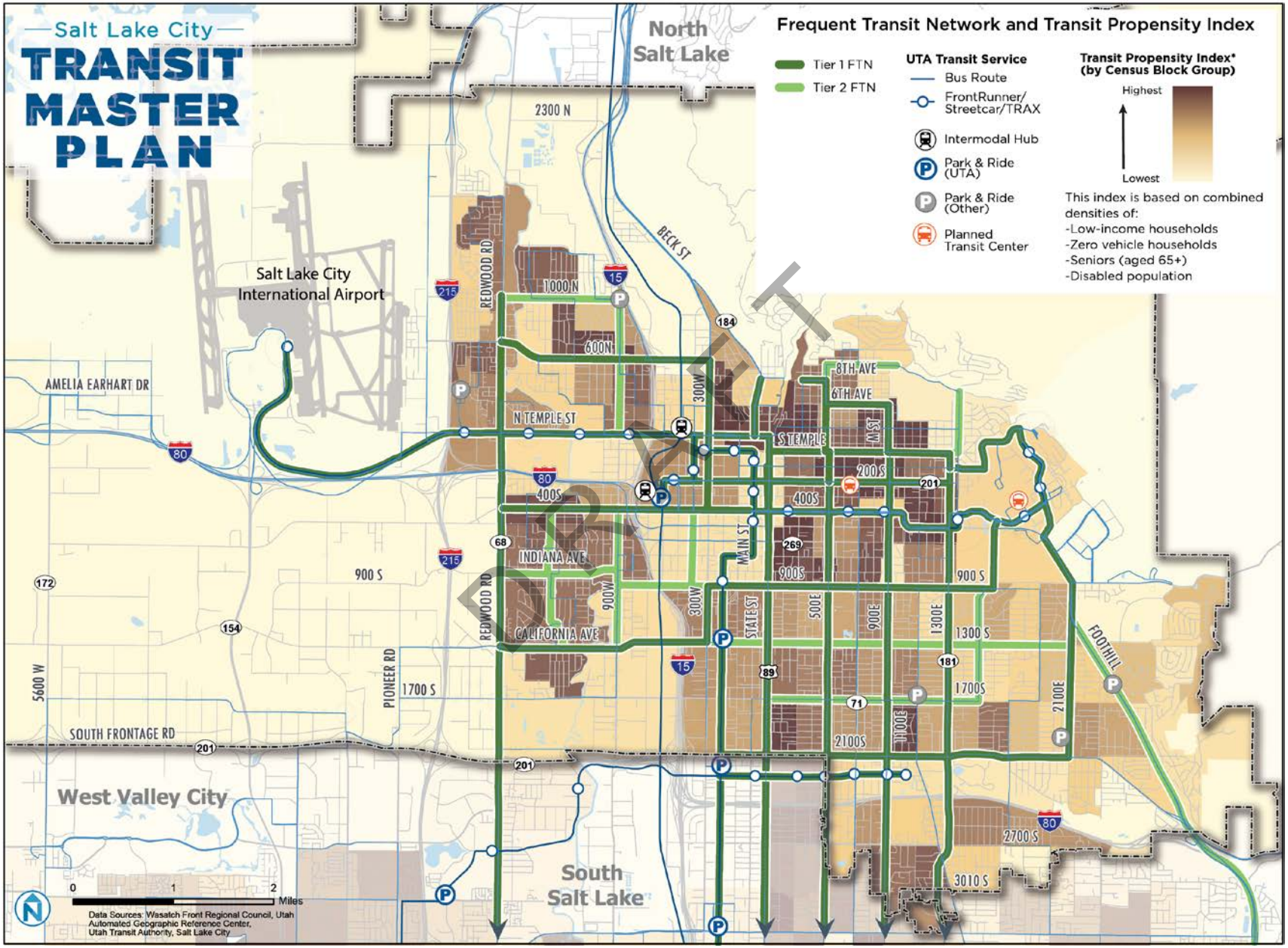


Figure 2-9 Frequent Transit Network Vision: Tier 1 and Tier 2 with Transit Propensity Index



FTN Branding

Based on outreach findings, the current UTA frequent transit network branding is not readily visible to the average rider. UTA's current service types are not defined primarily based on frequency, but on a combination of service qualities including purpose, stop spacing, and frequency, e.g., types include local, shuttle, flex, commuter, express, and fast bus. UTA is rolling out Bus Rapid Transit lines outside of Salt Lake City and "Core Service"—branded high-frequency services with improved reliability, a higher level of stop/station amenities, and protection from service cuts to provide customers with the same guarantee of permanence associated with TRAX. UTA's Core Service would likely be largely consistent with the FTN corridors recommended in the Transit Master Plan.

Branding for the FTN should be coordinated with UTA's roll out of branded Core Service.

> Chapter 5: Supportive Programs and Policies provides a more detailed discussion of service branding, including examples of frequent transit network branding in other cities.

Proposed Secondary Transit Hubs to Support Grid System

Salt Lake Central Station, located on the west side of downtown Salt Lake City on 600 W between 200 S and 400 S, is the city's primary intermodal transportation hub. It connects TRAX, FrontRunner, numerous bus routes, and interstate coach services like Amtrak and Greyhound. However, Salt Lake Central requires out-of-direction travel for some bus routes and is therefore not optimal as a downtown layover location for these routes. In addition, its bus layover facilities are at capacity and cannot accommodate additional bus service at peak times.

Source: Flickr Matt' Johnson

The concept of developing additional transit centers and layover facility locations has been studied in the past, although locations previously studied in downtown are no longer available. Proposed locations identified as part of the Transit Master Plan analysis include:

- **East Downtown, vicinity of 200 S and 700 E.** An additional, centrally-located facility would support current, high transit demand in east downtown and provide additional layover capacity to support implementation of the FTN. A high-frequency bus service grid would in-turn make transfers at a secondary transit center more convenient.
- **The University of Utah campus**. The University of Utah is one of the city's largest trip generators. However, UTA does not currently have dedicated layover facilities on the campus and existing facilities lack capacity to expand service to/from the University.

The areas stretching from downtown to the University of Utah are the most common origins/destinations for trips in Salt Lake City. Corridors serving these proposed transit hub locations (including Route 2 along 200 S) have some of the highest bus ridership in Salt Lake City. In addition, routes operating on 500E and 900E could benefit from close proximity to an east downtown transit hub. With implementation of the FTN, increased ridership on these routes and corridors would be better served with these additional transit hubs. Finally, creating more layover space for UTA buses is a major factor in enabling additional transit service to be provided in Salt Lake City, including implementation of the envisioned FTN network.

LOCAL SERVICE NETWORK

The FTN is designed to serve long, direct citywide corridors. This includes TRAX light rail, Bus Rapid Transit, and other frequent bus modes that are oriented to serve longer-distance trips and have a longer spacing between stops. Local transit service extends the reach of transit to neighborhoods and employment areas that are not within walking distance of the frequent transit network. While the FTN serves long, citywide corridors, other local service is designed to connect neighborhoods and employment areas to the FTN. Traditional fixed-route local bus service and first-last mile services are recommended to extend local transit access in Salt Lake City.

This chapter focuses on local service strategies. Other strategies to provide "first-last mile" access to transit are discussed in Chapter 5: Access. These include car share, park-and-rides, bicycle sharing, and secure bicycle parking.

Local Fixed-Route Transit Service

Local fixed-route bus service that connects to the FTN and provides neighborhood circulation is an equally important element of the complete transit system. Coverage rather than speed is the goal for the local network. Stop spacing as close as 600 feet can be acceptable in some cases. As with the FTN, transit access improvements are critical to maximizing usefulness of the local services and providing equitable access to transit service for all populations.

The local network that feeds the FTN is not a key focus of this plan since the City's limited transit resources will be focused on the development of the FTN. However, the City should support UTA actions to:

- Maintain a basic or "lifeline" level local service to within ½ mile of most residents. This level of service is defined by a minimum of 60-minute frequency for 12 hours per day. If a route cannot support this level of service, then alternative local service models should be considered to provide access to a FTN station. Alternative service models can also be considered to provide access to the FTN during early morning or later evening hours when basic local service does not operate.
- As the FTN is implemented, the local service network should be adjusted to ensure it complements and supports new frequent services.

There are a variety of additional approaches that Salt Lake City could promote to complement the frequent transit network. The remainder of this chapter describes these strategies.

First-Last Mile Services

The "first-last mile" concept was informed by findings in the UTA First/Last Mile Study (2016) and recognizes the need to get people to and from the transit system efficiently in areas that lack sufficient density, demand, or street connectivity to justify providing FTN or even a basic level of traditional local fixed-route service, as defined above. Public outreach efforts for this plan have identified a significant need for improved first and last-mile connections in Salt Lake City.[3]

Where Could First-Last Mile Services be Used?

The gaps analysis conducted as part of the State of the System Fact Book (Appendix C) identified geographic areas and times-of-day where parts of the city lack convenient or any access to transit service. The recommended FTN would help meet these needs; however, first-last mile services could be used to provide cost-effective access to the FTN in parts of the city where geographic or temporal gaps would

[3] UTA conducted a First Mile/Last Mile Study in 2016, but this system wide study only covered TRAX stations in Salt Lake City.

remain. Figure 2-10 illustrates conceptual zones where first-last mile services could be explored. These include:

- Western Salt Lake City, west of Redwood Road or I-215 (primarily employment-oriented demand)
- University of Utah Research Park (primarily employment-oriented demand)
- Southeast Salt Lake City, including the East Bench (primarily residential)
- Glendale/Poplar Grove neighborhoods (primarily residential)
- Rose Park/Fairpark neighborhoods (primarily residential)
- Northern part of Greater Avenues neighborhood (primarily residential)

These conceptual zones were defined based on a quarter-mile walking distance of the recommended FTN, illustrated in Figure 2-11. The defined zones include areas that would be served by Tier 2 FTN corridors, which may only be implemented in the longer-term time frame.

Figure 2-10 First-Last Mile Service Zones

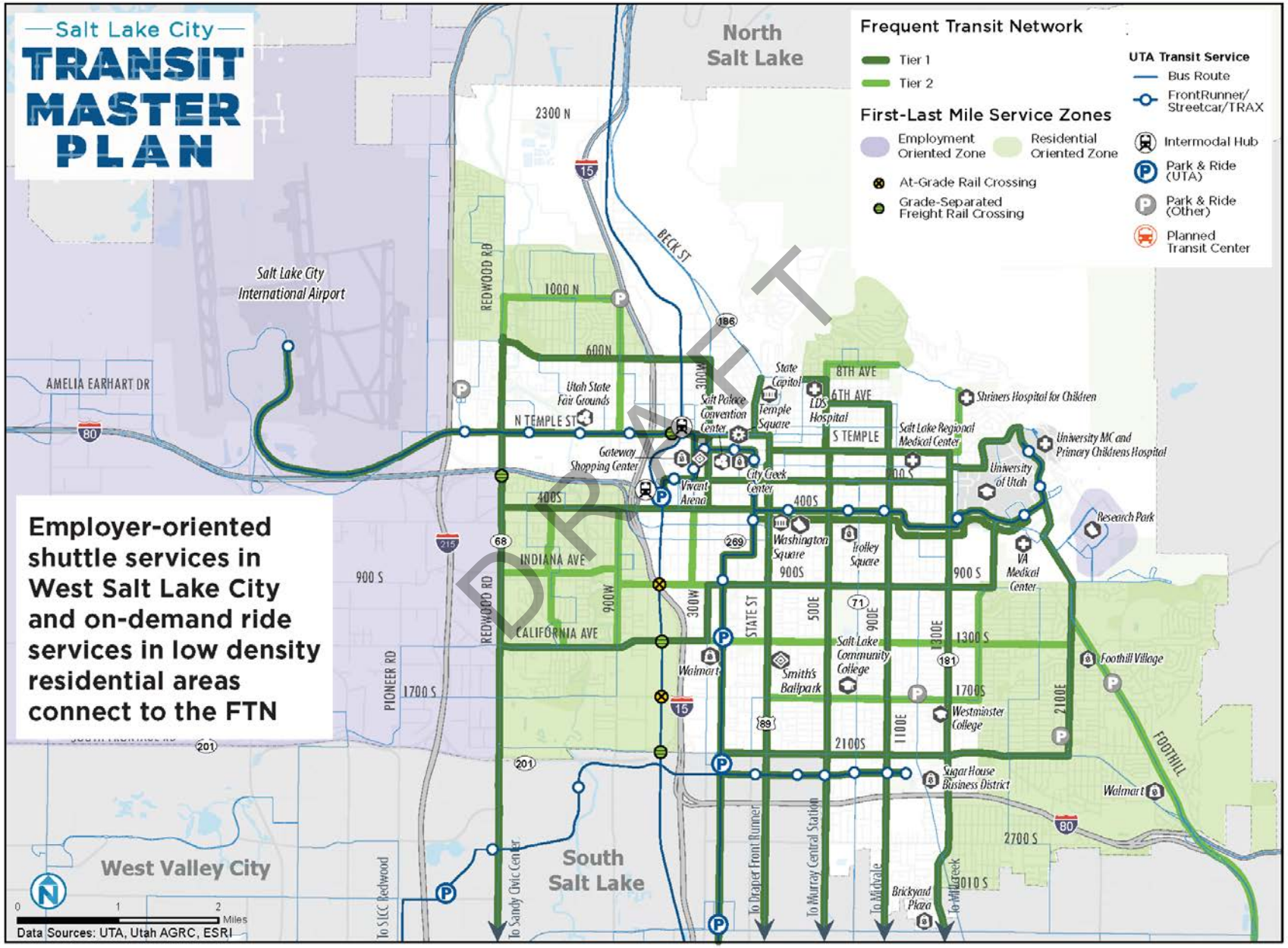
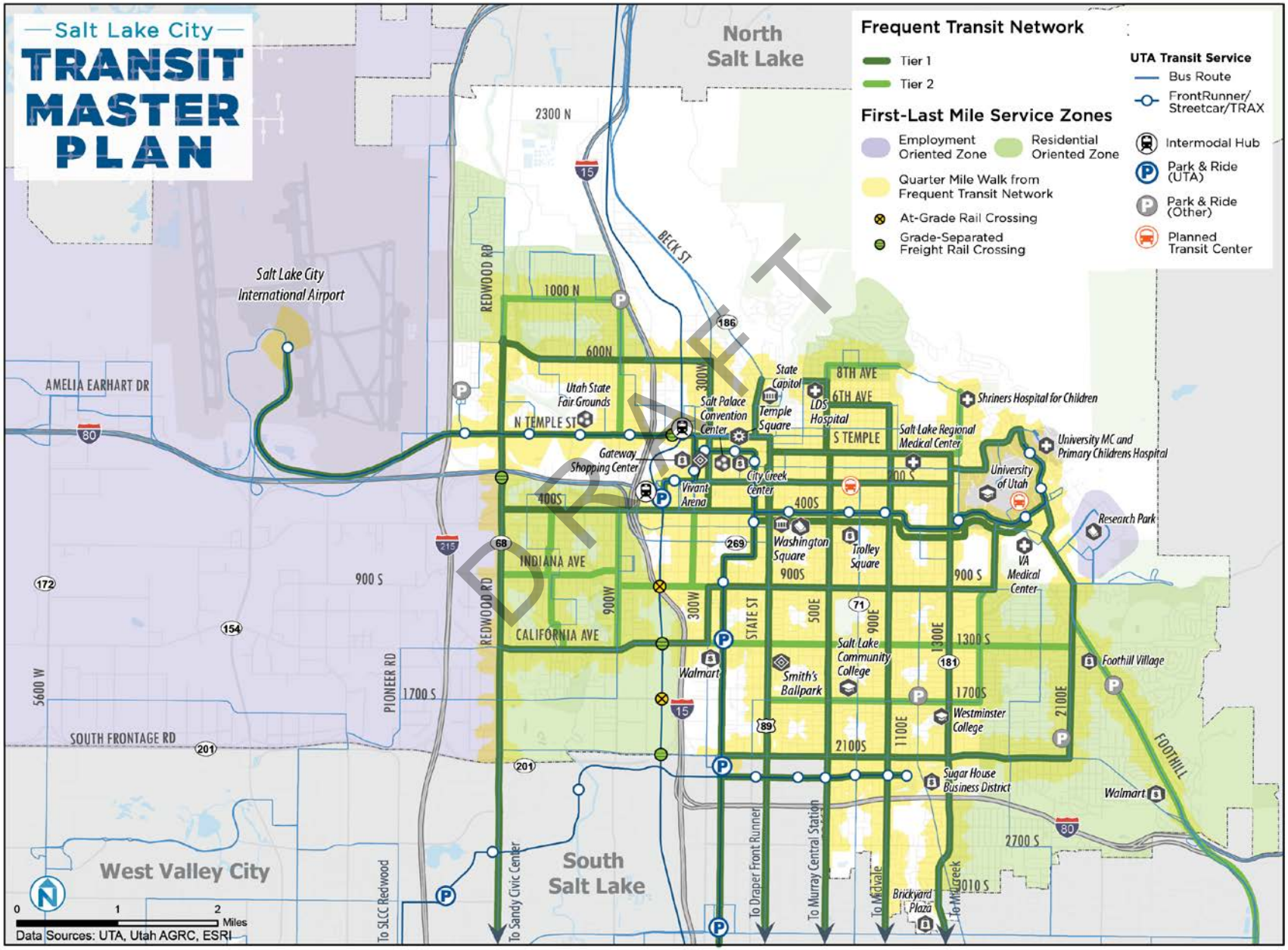


Figure 2-11 First-Last Mile Service Zones with Quarter-Mile Walking Distance from FTN



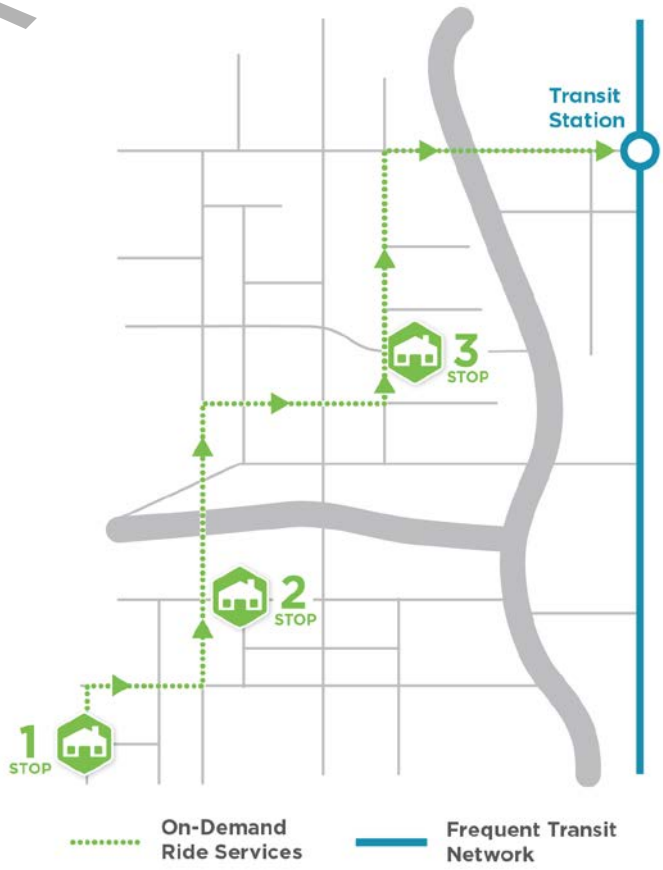
How Do First-Last Mile Services Work?

The graphics below illustrate how first/last mile services could be implemented to extend the reach of transit service for both employment areas in west Salt Lake City and residential neighborhoods by enabling seamless connections to the frequent transit network.

1. Employment Areas: Employers beyond the reach of transit in industrial areas in West Salt Lake City can partner to fund a shared shuttle service. Shuttle schedules would be coordinated with employee working hours and serve one or more major transit stations.

2. Lower-Density Residential Areas: Some neighborhoods in Salt Lake City lack sufficient density or demand to make it cost-effective to provide FTN and/or local service but still have important transit needs. On-demand ride service companies, such as Lyft and Uber, can provide cost-effective demand-responsive shared ride service in these areas. They can also help meet citywide needs to connect to the FTN outside of local transit operating hours. The City and UTA would partner with these companies to provide a discounted fare on trips to transit stations or other identified neighborhood destinations such as a grocery store. For example:

- A resident eligible for a discounted trip requests an on-demand ride from their home.
- The on-demand ride service company schedules a shared ride to/from designated transit stations or neighborhood services.
- The resident uses the FTN to travel to/from their destination.



First-Last Mile Strategy Success Factors

Factors that contribute to success for these local service strategies should be considered as these approaches are implemented. Alternative local services should strive to achieve the following:

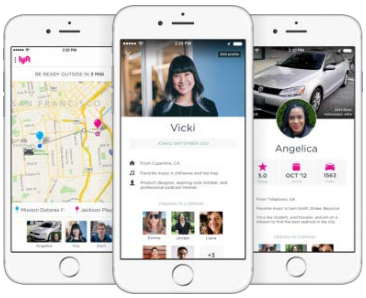
- **Ensure cost effectiveness.** Target popular origins and destinations that will allow the service to reach critical mass rather than having underutilized capacity.
- **Connect to existing services.** Integrate and coordinate effectively with other transit services to ensure the service will successfully provide a first-last mile connection.
- **Leverage partnerships.** Developing the service as a partnership, between multiple public agencies or between public and private organizations, can distribute management and operation of the service as well as associated costs.

Examples of First-Last Mile Services

This section provides specific examples of first-last mile services that have been developed around the country to extend the reach of transit service. These types of services fall into two general categories:

- **Community shuttles** to complement fixed-route transit service. These shuttles can serve **fixed-routes** or may provide service **on-demand**. Shuttles can be operated by transit agencies, non-profits, or public-private partnerships. Shuttles may also be sponsored by major employers or a Transportation Management Association (TMA) to connect major employment areas to transit service.
- **On-demand ride services** companies offer on-demand, point-to-point transportation that passengers can use to access the frequent transit network. These companies use an online-enabled application or platform to enable booking a trip on a computer or smartphone. This means that a ride can be summoned easily when and where transit is not available. The difference between on-demand ride services companies and taxis is that passengers are connected to drivers who use their personal vehicles rather than those owned by the taxi company. Uber and Lyft are currently operating in Salt Lake City.

Source: Ride Connection



Source: Lyft

Figure 2-12 summarizes characteristics of these types of services. Successful case studies of each type of strategy are detailed in subsequent sections.

Figure 2-12 First-Last Mile Service Strategy Characteristics and Applications

	Distance	Service Type	Schedule	Service Span	Origins and Destinations	Operator
Fixed-route community shuttles	Short	Fixed-route	Scheduled time points	Limited to fixed-route community shuttle schedule	Specified locations	Public with possible support from private
On-demand community shuttles	Medium or Long	Demand response	By request Availability based on-demand	Limited to on-demand community shuttle schedule	Defined by service area	Public with possible support from private
On-demand ride services	Short or long	Demand response	By request Availability based on-demand	24 hours a day/ 7 days a week	Defined by service area	Private with possible support from public

Fixed-Route Community Shuttle Case Studies

Fixed-route community shuttles, sometimes described as neighborhood circulators, are used effectively in some cities to serve short trips within communities, feed major transit routes (e.g., rail, BRT, or frequent bus service), shopping, employment, and other activities. Community shuttles often use smaller-capacity vehicles, such as 20 to 25 passenger mini-buses, to provide local transit service in lower-density residential neighborhoods or areas of challenging topography that are more difficult to serve with conventional fixed-route transit service. Some communities have maximized the cost-effectiveness of this model through special contracted rates for community shuttle operators (e.g., Vancouver BC case study) or services operated by non-profits (e.g., Ride Connection case study).

Shuttle Bug–Chicago, IL

Source: TMA of Lake-Cook

In operation since 1996, the Shuttle Bug program offers convenient door-to-door and fixed-route service from Metra Commuter Rail stations to employer sites on accessible Pace buses. The program is a public-private partnership between the TMA of Lake Cook (covering the Chicago suburbs of Buffalo Grove, Deerfield, Glenview, Northbrook, Des Plaines, Lake Forest, Lincolnshire, Mettawa, and Riverwoods in Cook and Lake County, Illinois), Pace Suburban Bus, Metra Commuter Rail, and local area businesses.

Regular fare is $2.00 per trip, but employees of member businesses ride free with a company-issued Ventra card.[1] Currently, there are 14 routes connecting about 40 companies with eight Metra stations and serving about 1,200 daily trips.[2] While operations are managed entirely by the Lake Cook TMA, operational costs are shared by Pace, Metra, and area businesses. Funding sources include federal grants, local municipal funding, state funding, foundation funding, and private contributions. Companies contribute funds based on ridership as well as company headcount.

By sharing operating costs and leveraging private-public partnerships, the Shuttle Bug program has become nationally-recognized in successfully providing a first-last mile solution as well as numerous benefits to participating employers.

Ride Connection–Portland, OR

Ride Connection is a non-profit, community service organization in the tri-county area of Portland, Oregon that is mostly focused on meeting the transportation needs of older adults and people with disabilities. The organization is made up of a network of over 30 agencies, providing a variety of transportation services such as Community Connector Shuttles for rural communities where regular fixed-route transit service is limited or unavailable.

Source: Ride Connection

Open to the general public, Community Connector Shuttles are currently available in the cities of Tualatin (Tualatin Shuttle), Forest Grove (Grovelink), and Hillsboro (North Hillsboro Link). These shuttles are intended to provide transportation for commuters to and from TriMet stations, including WES Commuter Rail in Tualatin, TriMet (regional transit operator) Line 57 in Forest Grove, and Orenco Station in Hillsboro. Ride Connection operates Community Connector shuttles, providing drivers, vehicles, and scheduling. Planning for a Community Connector shuttle includes close coordination with communities being served as well as collaboration with TriMet.[3]

Ride Connection receives funding from a variety of sources, including federal and state grants from the Oregon Department of Transportation, TriMet, private foundation grants, and corporate and individual donations. Programs are largely supported through volunteer hours—including volunteer drivers—who are typically members of the community recruited by Ride Connection. Success of these shuttles has been possible by targeting specific communities and connecting directly to regional transit service.

TransLink–Vancouver, BC

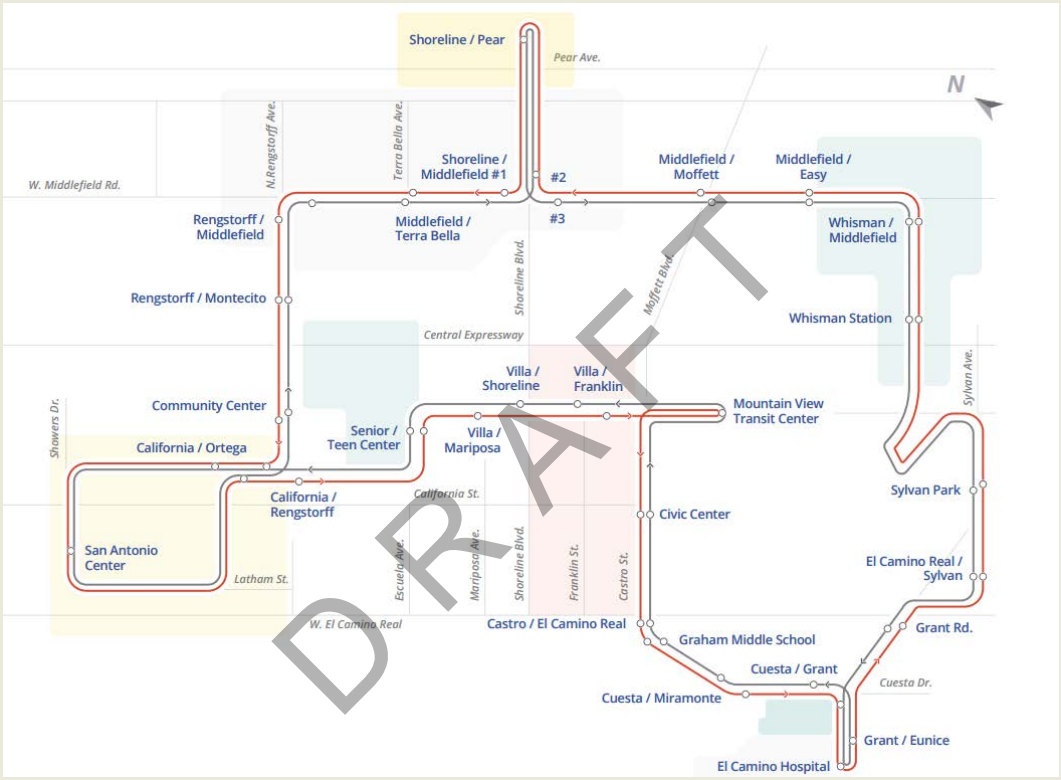
TransLink, the transit provider for the Vancouver BC region, has a community shuttle program that serves a number of neighborhoods in the city of Vancouver and communities in outer suburban areas. Shuttle routes were created to provide more economical transit service to low-ridership areas but have been implemented in a variety of operating environments from quiet suburbs to dense, urban areas. Coast Mountain Bus Company (CMBC)—a wholly-owned subsidiary of TransLink—operates the shuttles. Routes complement downtown transit service, provide feeder service from outer neighborhoods to downtown-bound rail or BRT service, and operate as circulators within the University of British Columbia (UBC) campus.

For the Vancouver region, community shuttles have proven to be a lower-cost option for providing transit services to underserved areas. Operating cost per service hour is about 36% lower for CMBC-operated shuttles than regular bus service, and about 54% lower for contracted shuttle service. This is partially due to lower labor costs, as community shuttle drivers are part of a separate component of the bus union and have a different motor vehicle licensing requirement since no air brakes are used in shuttle vehicles. Additionally, these shuttles tend to travel shorter distances, reducing maintenance costs. Overall, the program has been impactful in providing a link from outer suburban communities to central transit service more cost-effectively than conventional fixed-route service.[4]

Mountain View Community Shuttle–Mountain View, CA

The Mountain View Community Shuttle circulates throughout the City of Mountain View, connecting residences, offices, park and recreational facilities, medical services, shopping centers, and entertainment venues. Currently still a pilot program, the service was developed as public-private partnership between the City of Mountain View and Google.

This fareless service operates Monday through Friday between 10 a.m. to 6 p.m. and between 12 p.m. and 8 p.m. on weekends and holidays. Two routes—one clockwise and one counterclockwise—serve the same loop and operate at a frequency of approximately 30 minutes. Transit connections are available to the regional commuter rail (Caltrain), employer commuter shuttles, Santa Clara Valley Transportation Authority (VTA), and other Mountain View shuttles provided by the local Transportation Management Association, mvgo.[5]



Source: City of Mountain View

Google is funding the pilot program operating costs for two years. The purchase of four new all-electric buses—produced by Motiv Power Systems—was made possible through California Energy Commission (CEC) grants.[6] Ridership for the service has continued to increase since the launch of the service in January 2015. The service captured 3,393 riders in the first month of operation but monthly ridership for all of 2015 was an average of 8,089 with a total of 97,079 riders. Ridership for January through March of 2016 totaled 30,977 riders, a 60% increase from the same months in 2015.[7]

1 Ventra Cards is a fare payment system for Chicago Transit Authority (CTA) and Pace.

2 TMA of Lake-Cook. About the Shuttle Bug Program. 2016. Retrieved from http://tmalakecook.org/shuttle-bug/about-the-shuttle-bug

3 Ride Connection. Retrieved from https://rideconnection.org/ride/services/community-connectors

4 SDOT. Transit Master Plan Appendix D: Community Shuttles. April 2012.

5 Mountain View Community Shuttle. Retrieved from https://mvcommunityshuttle.com/

6 Stephen Hall, 9 to 5 Goggle. Google Launches 100% electric, WiFi-powered Mountain View Community Shuttle Program. January 2015. Retrieved from http://9to5google.com/2015/01/13/google-mountain-view-community-shuttle/

7 Mountain View Community Shuttle. Operational Statistics Summary. March 2016. Retrieved from https://mvcommunityshuttle.com/statistics/

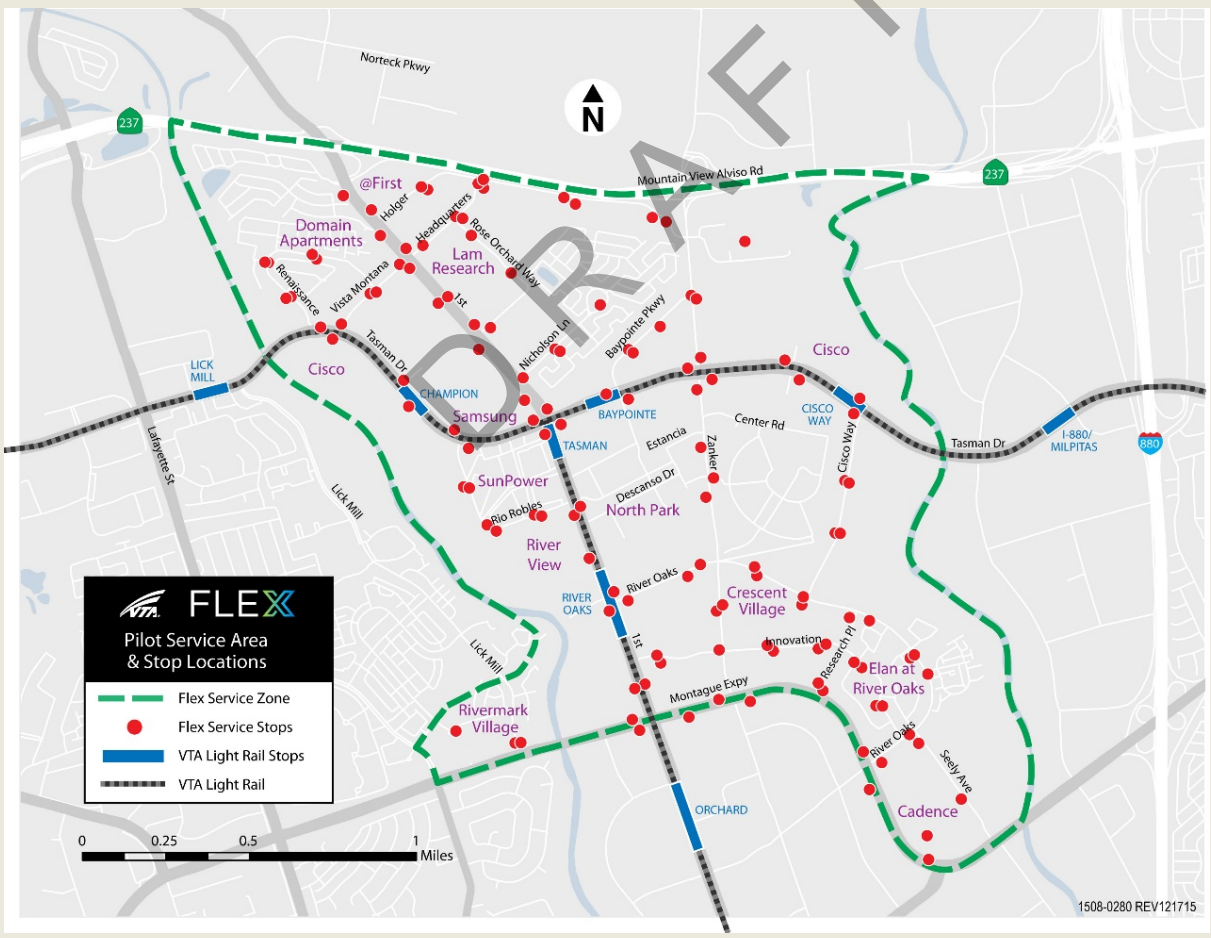
On-Demand Shuttle Case Studies

On-demand shuttles, operated by a public or private entity, provide a flexible end-to-end or first-last mile transit option that is often more cost-effective than fixed-route service. This type of service could be considered to serve employers in Western Salt Lake City.

VTA FLEX–San Jose, CA

In January 2016, Valley Transportation Authority (VTA) began a new pilot program in North San Jose, called FLEX, which offers on-demand transit service between regular transit stops and high-density employment centers and/or retail centers.

FLEX is not a fixed-route service and does not make scheduled stops. It operates in a 3.25 square mile service area that surrounds VTA's Tasman Light Rail Station. Travelers can request a ride using their smart phone or on the VTA website. A driver is then dispatched to pick up the passenger, who is provided with directions to the pick-up location. Other riders with similar travel destinations are picked up and dropped off during the course of the ride. Although the wait time is dependent on the number of trip requests at the given time, the software interface provides an estimated arrival time based on the driver's GPS location and trip load.[1]This service is still in the pilot phase but has received positive feedback from users, who have experienced shorter travel times to and from VTA light rail stations.[2]



Source: Santa Clara Valley Transportation Authority

RTD Call-n-Ride–Denver, CO

The Regional Transportation District (RTD) runs Call-n-Rides for 21 service areas in the Denver region. Passengers can request a ride up to two hours in advance by directly calling the driver's cell phone. Advanced reservations (up to 2 weeks ahead of time) can also be made via the RTD Call-n-Ride website. Some Call-n-Ride service areas also provide scheduled stops, where riders can wait to be picked up and then be dropped off anywhere within the service area. Additionally, some communities have coordinated with RTD to provide deviated fixed-route service to better meet the needs of the community.[3]

Funding for the service is primarily by federal grants and RTD's operating budget but many local partners also help fund the service in their area. Call-n-Ride has been a successful first and last mile connection to other RTD services and final destinations. RTD service standards specify Call-n-Ride areas to be between four and 10 square miles with two to four persons per acre and one to three employees per acre. Productivity of Call-n-Ride services typically ranges from about three (minimum standard) to 10 daily boardings per revenue hour. Productivity in the range of four to six boardings per hour is considered to be successful.

RTD Call-n-Ride for the City of Golden includes a fixed-route deviated service.

Source: City of Golden

Sources:

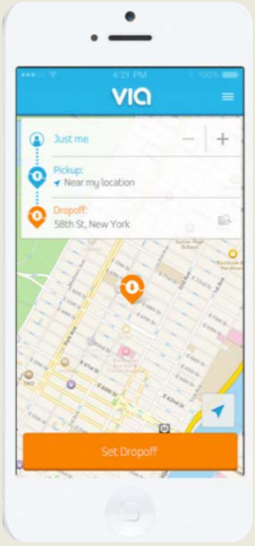
1 VTA. FLEX. 2016. Retrieved from http://www.vta.org/getting-around/vta-flex

2 Five Stars for FLEX!. January 2016. Retrieved from http://www.vta.org/News-and-Media/Connect-with-VTA/Five-Stars-for-FLEX#.VwrW3RMrL-Y

3 City of Golden. Community Call-n-Ride Bus. Retrieved from http://www.cityofgolden.net/live/transit-services/community-call-n-ride-bus/

On-Demand Ride Services Case Studies

On-demand ride services refers to on-demand, point-to-point transportation services that are scheduled and paid for using an online-enabled application or platform, such as smart phone apps (e.g., Uber and Lyft). Unlike taxis, passengers are connected to drivers who use their personal vehicles rather than vehicles associated with a company. These companies tend to cater to individuals traveling across town or to the airport but some are specifically designed as a carpool service. Some services are also catering to older adult populations by partnering with third party internet providers. These partnerships allow people without access to a smart phone to request a ride via the internet instead via a smart phone. Transit agencies, employers, and communities are also beginning to use these companies to serve first and last-mile gaps in the transportation system.



Source: Via

Via–Chicago, IL and New York, NY

Via is a privately-operated on-demand ride service company that transports multiple passengers heading in the same direction. The service is available in Chicago and New York City. Users can access the service via a smartphone app where they enter their origin and destination and are then directed to a nearby pick-up location. Passengers are dropped off close to their final destination. Riders who pre-pay for their ride are charged a flat fee of $5. Riders who choose not to pre-pay incur a $2 surcharge. This service operates in dense areas of Chicago and New York, strategically targeting first and last-mile connections for transit users within the service area.[1]

Split–Washington, DC

Split operates an on-demand ride service to multiple passengers traveling in the same direction in central Washington DC, including first- and last-mile connections for transit users. Users must access the service via a smartphone app where they enter their origin and destination and are then directed to a nearby pick-up location. Riders are charged a $2 base fare and $1 per extra mile but are able to split the fare with other riders, making the cost more affordable.[2]

SunRail Uber Partnership–Altamonte Springs, FL

The City of Altamonte Springs is the first city in the country to subsidize Uber rides to and from transit stations. Uber users starting or ending a trip at the Altamonte Springs SunRail station receive a 25% discount on their fare. Additionally, users traveling anywhere within the city limits via Uber have 20% of their fare paid for by the city. The city hopes that this pilot program will encourage SunRail ridership, reduce traffic congestion, and provide a more affordable travel option for all residents and visitors. Users must access Uber using the mobile app and enter a promo code to receive the discount on their ride.[3]

Lyft's Friends with Transit Campaign

Source: Lyft

According to Lyft, 25% of its riders use the service to connect to public transit. Lyft is beginning a campaign to bridge the first and last mile gap, connecting its service with transit. In October 2015, Lyft began its first official partnership with a transit agency, Dallas Area Rapid Transit (DART). The partnership allows users to access Lyft as a transportation option within DART's mobile application. Through the application, users are able to view the location of Lyft vehicles and request a ride, enabling an on-demand ride service. Lyft and DART made an agreement that lets users get $5 off their first ten Lyft rides.

Other Partnership Examples

Source: Livable City

Jurisdictions and agencies across the country are beginning to coordinate with on-demand ride services companies in a variety of ways, ranging from software collaborations to allocation of passenger loading space at transit stops (or other designated zones) to subsidies. In addition to Lyft (above), **DART** also partnered with Uber and Zipcar to connect mobile apps. Users who access the DART GoPass app have direct access to Uber, Lyft, and Zipcar mobile applications. DART riders still have to arrange and pay separately for the ride share service.[4] **A San Francisco non-profit, Livable City**, partnered with Lyft to designate loading zones for rideshare users at the San Francisco regional commuter rail (CalTrain) station to promote the connection between ridesharing and transit.[5,6] **Livermore-Amador Valley Transit Authority (LAVTA)** in California is pursuing a subsidy program with Lyft to promote demand-responsive ridesharing as an alternative to low-performing LAVTA routes that provide access to Bay Area Rapid Transit (BART) stations. **The Denton County Transportation Authority (DCTA)** in Texas is also in the process of providing subsidies for first and last mile trips made with Uber.[7]

1 Via. 2015. Retrieved from http://ridewithvia.com/

2 Split. 2016. Retrieved from http://split.us/

3 Veronica Brezina, Click Orlando. Altamonte Springs Uber discounts begin. March 2016. Retrieved from http://www.clickorlando.com/news/altamonte-springs-becomes-first-us-city-to-partner-with-uber-hopes-to-increase-sunrail-ridership

4 Bill Zeeble, Kera News. DART Works With Lyft, Uber, Zipcar To Ease Your Trip. October 2015. Retrieved from http://keranews.org/post/dart-works-lyft-uber-zipcar-ease-your-trip

5 11th Hour Project. December 2015. Retrieved from http://www.11thhourproject.org/press/the-11th-hour-project-announces-winners-of-the-just-transit-sf-challenge-de

6 Livable City. Curbing the CalTrain Cluster. December 2015. Retrieved from http://livablecity.org/curbthecluster/

7 Bj Lewis, Dallas Morning News. DCTA plan to add options. May 2015. Retrieved from http://www.dallasnews.com/news/community-news/lewisville-flower-mound/headlines/20150531-dcta-plans-to-add-options.ece

Applicability of First-Last Mile Service Types and Case Studies to Salt Lake City

Services similar to those described in the above case studies are recommended to improve local transit connections to the retail/employment centers and residential areas in Salt Lake City as identified above. Each of the case studies targets connections to a retail/employer oriented area, a residential-oriented area, or both. Figure 2-13 summarizes the target markets for each of the case studies.

Figure 2-13 Summary of Target Areas for First-Last Mile Service Types and Case Studies

Service Type	Case Study	Retail/Employer Oriented	Residential Oriented
Fixed-Route Community Shuttle	Pace Shuttle Bug	X	
	Ride Connection Community Connector		X
	TransLink Community Shuttles		X
	Mountain View Community Shuttle	X	X
On-Demand Community Shuttle	VTA FLEX	X	
	RTD Call-n-Ride	X	X
On-Demand Ride Services	Via	X	
	Split	X	
	On-Demand Ride Services Partnership (Various)	X	X

Non-vehicular connections, such as bike share, can also serve as a viable option for improving connections to transit. Bicycle/pedestrian first-last mile strategies are described in Chapter 4.

SUMMARY OF RECOMMENDATIONS – SERVICE IMPROVEMENTS

The following table outlines specific service improvements that are recommended in the Transit Master Plan. High priority strategies are highlighted in blue.

Figure 2-14 Service Improvement Recommendations

Recommendation Category	#	What is the recommendation?	Why do it?	Who is responsible?	When should it happen?*
Frequent Transit Network (FTN)-Tier 1 Existing/Planned	2.1	Develop an FTN in a phased approach. Implement high priority corridors for Salt Lake City that are already identified in the UTA Network Study and supported by the Transit Master Plan analysis and outreach.	Existing corridors in with strong ridership and conditions that will merit FTN status.	**Lead:** UTA **Support:** City	Near-Term
Frequent Transit Network (FTN)-Tier 1 Transit Master Plan Recommendations	2.2	Develop an FTN in a phased approach. Implement highest priority corridors for Salt Lake City beyond those already planned by UTA.	Tier 1 corridors have conditions now or in the near-term that will merit FTN status.	**Lead:** UTA **Support:** City	Near-Term to Medium-Term
Frequent Transit Network (FTN)-Tier 2 Transit Master Plan Recommendations	2.3	Develop an FTN in a phased approach. Implement longer-term priority corridors for Salt Lake City beyond those already planned by UTA.	Tier 2 corridors are projected to have conditions that merit FTN status in the future. The implementation of the FTN will serve long, direct citywide corridors.	**Lead:** UTA **Support:** City	Long-Term
New Transit Hubs	2.4	Construct additional transit centers in the vicinity of 200 S and 700 E and on the University of Utah campus.	To support current transit demand and the development of the high-frequency grid network.	**Lead:** UTA **Support:** City, University of Utah	Medium-Term
Local Service Network	2.5	As the FTN is implemented, adapt local routes to support the FTN. Maintain a basic or "lifeline" level local service to within ½ mile of most residents (a minimum of 60 minute frequencies for 12 hours per day) or consider an alternative service model.	A complete transit system requires local coverage-oriented routes (or alternative services) that provide connections to the FTN and neighborhood circulation.	**Lead:** UTA **Support:** City	Ongoing

1 Uber for Business and Lyft for Work allow companies to set up a specific business account for their employees to request and pay for rides seamlessly within the organization. These services also include ridesharing functions.

*Note: Near term = within 2 years; medium term = 3-5 years; long term = 6-10 years. Chapter 7: Implementation will provide corridor-level phasing guidance.

High priority strategies

Recommendation Category	#	What is the recommendation?	Why do it?	Who is responsible?	When should it happen?*
First-Last Mile Service Strategies	2.6	Consider implementing an employer-oriented community shuttle pilot program to serve employment sites in western Salt Lake City.	Employers beyond the reach of transit in industrial areas can fund a shared shuttle service from major transit stations to help retain and attract employees. Partnerships across multiple employers can be particularly cost effective.	Lead: UTA Support: City, local businesses, employers, University of Utah	Near-Term
First-Last Mile Service Strategies	2.7	Develop pilot programs and/or partnerships with private or non-profit transportation providers, including on-demand ride services companies such as Lyft and Uber, to fill in spatial and temporal gaps in transit service. This includes first-last mile connections generally, shift workers, off-peak entertainment, etc.	Some neighborhoods in Salt Lake City lack sufficient density or demand to justify providing FTN or local service but still have transit needs. Citywide, there are transit needs outside of transit operating hours. On-demand ride services companies can provide a cost-effective demand-responsive service to areas beyond the reach of transit.	Lead: City Support: UTA, private or non-profit service providers, on-demand ride services companies	Near-Term
First-Last Mile Service Strategies	2.8	Conduct outreach to employers in need of last mile connections to educate them on the opportunity to fund last mile trips for their employees using tools like Uber for Business and Lyft for Work[1]	Employers may be beyond the reach of the FTN in industrial areas, such as western Salt Lake City; by partnering with on-demand ride services companies, employers can facilitate employees taking transit to work	Lead: City Support: On-demand ride services companies, employers	Near-Term
Other	2.9	Foster creation of a Transportation Management Association (TMA) comprising west Salt Lake City employers.	Such an organization can help the City and UTA develop alternative, multi-employer first-last/mile services in west Salt Lake City.	Lead: City Support: UTA, employers and local businesses	Near-Term

1 Uber for Business and Lyft for Work allow companies to set up a specific business account for their employees to request and pay for rides seamlessly within the organization. These services also include ridesharing functions.

*Note: Near term = within 2 years; medium term = 3-5 years; long term = 6-10 years. Chapter 7: Implementation will provide corridor-level phasing guidance.

High priority strategies

3 CAPITAL

3 CAPITAL

This chapter defines the capital elements of the Salt Lake City Transit Master plan, which include investments in transit corridors and facilities. The capital recommendations will support implementation of the frequent transit network (FTN) by enabling transit to run faster and more reliably and improving facilities to make it more comfortable and convenient to access transit.

CAPITAL INVESTMENT PRINCIPLES/FRAMEWORK

The City's goals (see Chapter 1) prioritize operating and capital investments that increase the number of people riding transit; improve air quality; connect transit-dependent populations with jobs, education, and services; and create economically-vibrant, livable places. Transit capital investments help Salt Lake City accomplish these goals by making transit travel highly efficient and reliable, treating transit as a priority in the street rights of way, and developing safe and comfortable transit access and facilities.

The following principles were used, along with the Transit Master Plan's analysis of current and potential transit corridors, to guide where Salt Lake City should prioritize capital improvements to make service faster and more reliable.

- **Ridership potential—**enhanced transit experience for existing riders and attract new riders
- **Cost-effectiveness—**investment per passenger (accounting for corridor length)
- **Land use—**corridor land use (including density, street connectivity, etc.) that supports a particular mode or level of investment
- **Corridor conditions—**Potential (need) for travel time savings and right-of-way opportunity or constraint

The assessment of capital priorities also documents alignment between existing UTA, Wasatch Front Regional Council and City plans and priorities, Transit Master Plan goals, and public input received through the plan's outreach process.

TRANSIT MODES AND AMENITIES

UTA provides a variety of transit modes in Salt Lake City including bus, streetcar, TRAX light rail, and FrontRunner commuter rail. Figure 3-1 describes characteristics of transit modes already operated by UTA and others recommended in this plan that do not currently operate in Salt Lake City:

- **Enhanced Bus**. Enhanced Bus uses features like transit signal priority (TSP) or queue jumps to help buses avoid delay at traffic signals and bypass congestion. Figure 3-3 illustrates typical features of corridors. The UTA Network Study (2013) recommended a set of these corridors (referred to as Bus Plus), including many of the FTN corridors identified in Chapter 2 and the Transit Master Plan priority corridors discussed in this chapter.

- **Bus Rapid Transit (BRT).** UTA operates one BRT line outside of Salt Lake City and there are several proposed BRT projects in the UTA service area. BRT includes the features of Enhanced Bus, but is distinguished by dedicated lanes to provide fast, reliable travel times. It is often described as light rail with rubber-tire vehicles.
- **Community Shuttle**. Community shuttles are flexible services designed to meet specific transit market needs. The employer shuttles recommended in Chapter 2 are a form of community shuttle service. Other types of community shuttles may be appropriate to meet future potential needs in Salt Lake City. Key success factors for Community Shuttles include large trip generators and well-defined markets.

Figure 3-1 Salt Lake City Existing and Recommended Transit Modes

Mode	Recommended Service Level (Frequency)	Existing and Planned Services	Photo	Access: Station Spacing [1]	Vehicle Features / Capacity	Running Way Features	Station Amenities [2]
Commuter Rail	▪ 30 minutes	▪ Provo– Central Station - N. Temple – Ogden	 Source: Flickr Paul Kimo McGregor	5-10 miles	▪ Locomotive pulls variable number of coach cars with 100-135 seats each ▪ FrontRunner capacity currently at 500	▪ Grade-separated running-way	▪ Fully-featured stations ▪ Enhanced fare collection ▪ Real-time information
TRAX Light Rail	▪ Frequent Service (15 min. or better all day – see Chapter 2)	▪ Red Line: South Jordan - Downtown - University of Utah ▪ Blue Line: Draper, Sandy - Downtown ▪ Green Line: West Valley - Downtown - Airport	 Source: Nelson\Nygaard	½ - 1 mile	▪ 400 (assumes 4 cars with up to 100 person capacity) ▪ Branded vehicles	▪ Dedicated running-way ▪ Transit signal priority (TSP) for entire corridor	▪ Fully-featured stations ▪ Enhanced fare collection ▪ Real-time information
Streetcar		Existing S-Line Planned S-Line Extension Planned Downtown Streetcar	 Source: Nelson\Nygaard	¼ - ⅓ mile	▪ 100 (assumes 1 car) ▪ Branded vehicles	▪ Mixed-traffic (could use exclusive or semi-exclusive running way in congested corridors)	▪ Fully-featured stations ▪ Enhanced fare collection ▪ Real-time information
BRT		None in Salt Lake City One line (outside of Salt Lake City): UTA MAX between Magna, the West Valley Central TRAX Station, and the Millcreek TRAX station in South Salt Lake	 Source: UTA	⅓ – ½ mile	▪ 40-90 (articulated) ▪ Branded vehicles	▪ Dedicated running way in congested corridors ▪ Transit signal priority (TSP) for entire corridor	▪ Fully-featured stations ▪ Enhanced fare collection ▪ Real-time information

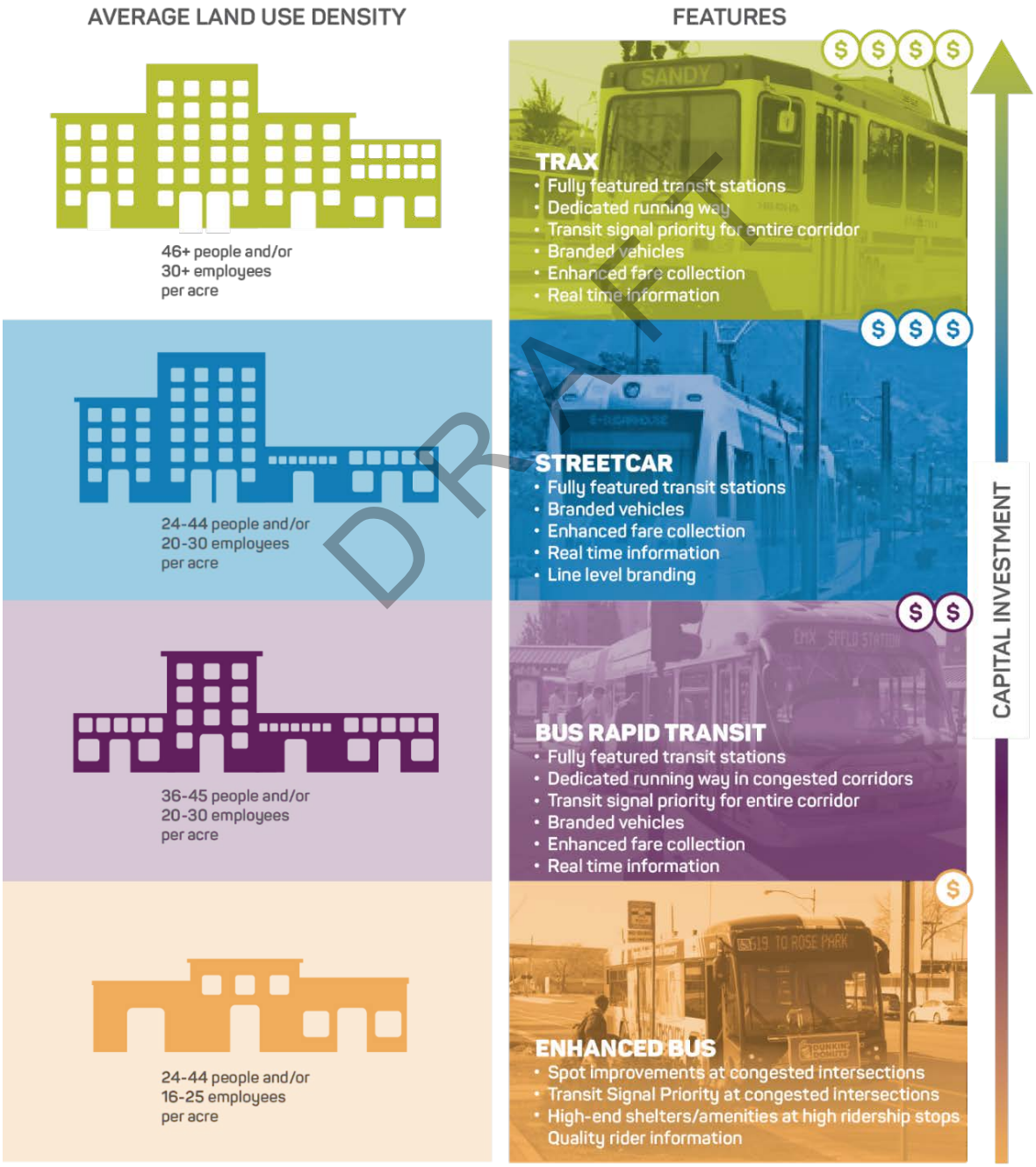
Mode	Recommended Service Level (Frequency)	Existing and Planned Services	Photo	Access: Station Spacing [1]	Vehicle Features / Capacity	Running Way Features	Station Amenities [2]
Enhanced Bus		None in Salt Lake City Planned corridors include Bus Plus Corridors identified in UTA Network Study (see Figure 3-8)	 Enhanced bus stop in Glendale, CA. Source: NACTO	¼ - ½ mile	▪ Typically 40 foot bus ▪ 40-60	▪ Similar to BRT, but without dedicated lanes ▪ Spot improvements and/or TSP) at congested intersections	▪ High-end shelters and amenities at high ridership stops ▪ Quality rider information
Local Bus	30 or 60 minutes	21 local routes within Salt Lake City	 Source: Nelson\Nygaard	⅛ – ¼ mile	▪ 40-60	▪ Typically runs in mixed-traffic	▪ Prioritized based on ridership thresholds (see Chapter 6)
Community Shuttle	30 minutes (may be limited to peak hours)	None in Salt Lake City Employer shuttles are recommended to serve employment areas in west Salt Lake City	 Community Shuttle in Portland, OR. Source: Wikimedia Steve Morgan	Variable fixed-stop spacing based on land use, or on-demand	▪ 15-30 ▪ Minibus or small standard bus	▪ N/A	▪ Branded signage

[1] See Figure 3-4 for additional detail on stop spacing. [2] Additional detail on recommended station amenities is provided in Chapter 6.

Transit Modes, Features, and Supportive Land Use

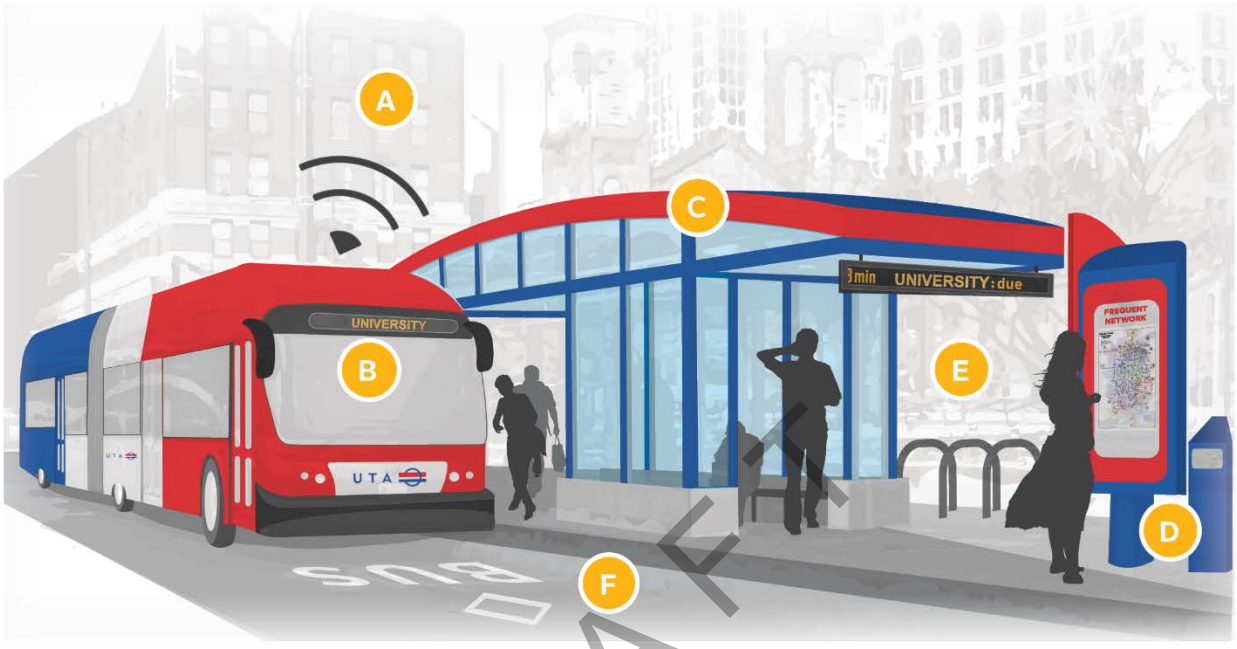
Land use density and transit service should be developed in concert to ensure their mutual benefit and success. High-quality transit modes that provide frequent service and a high-level of amenities require supportive land use to generate enough riders to be cost-effective. As shown in Figure 3-2, light rail and streetcar services require a relatively high density of population and jobs to warrant their higher passenger-carrying capacity and capital cost. BRT and Enhanced Bus service have a lower capital cost, operating cost, and passenger carrying capacity than rail and can be successful with a more moderate level of density. In addition to population and employment density, street connectivity and safe pedestrian and bicycle access are also important to support ridership across all modes.

Figure 3-2 Salt Lake City Transit Modes, Land Use Conditions, and Capital Features



Two proposed transit modes for Salt Lake City are Enhanced Bus and Bus Rapid Transit (BRT). The main difference is that BRT includes dedicated lanes. Both types of bus service make transit run faster and more reliably and provide high-quality amenities at bus stops and stations. Figure 3-3 highlights the key elements of these types of high-quality bus corridors.

Figure 3-3 Elements of High Quality Bus Corridors



A TRANSIT SIGNAL PRIORITY

Intersection improvements including transit signal priority (TSP) allow buses to bypass congestion. TSP gives buses earlier and/or longer green lights.

B BRANDING AND VEHICLES

Unique designs make buses and stations more visible, raising awareness and increasing customer expectations for higher levels of service.

Marlijn van Exel, Flickr

C ENHANCED STATIONS

Enhanced amenities include raised platforms, off-board fare payment, real-time arrival information, larger shelters, bike parking, and other passenger amenities.

D ENHANCED FARE COLLECTION SYSTEMS

Off-board fare collection using ticket vending machines, card readers, and other tools at stations allow passengers to load without waiting in line to pay their fares.

E BIKE PARKING

Bike parking and GREENbike bike share at stations increase the reach of transit.

Wikimedia Commons, Jim Henderson

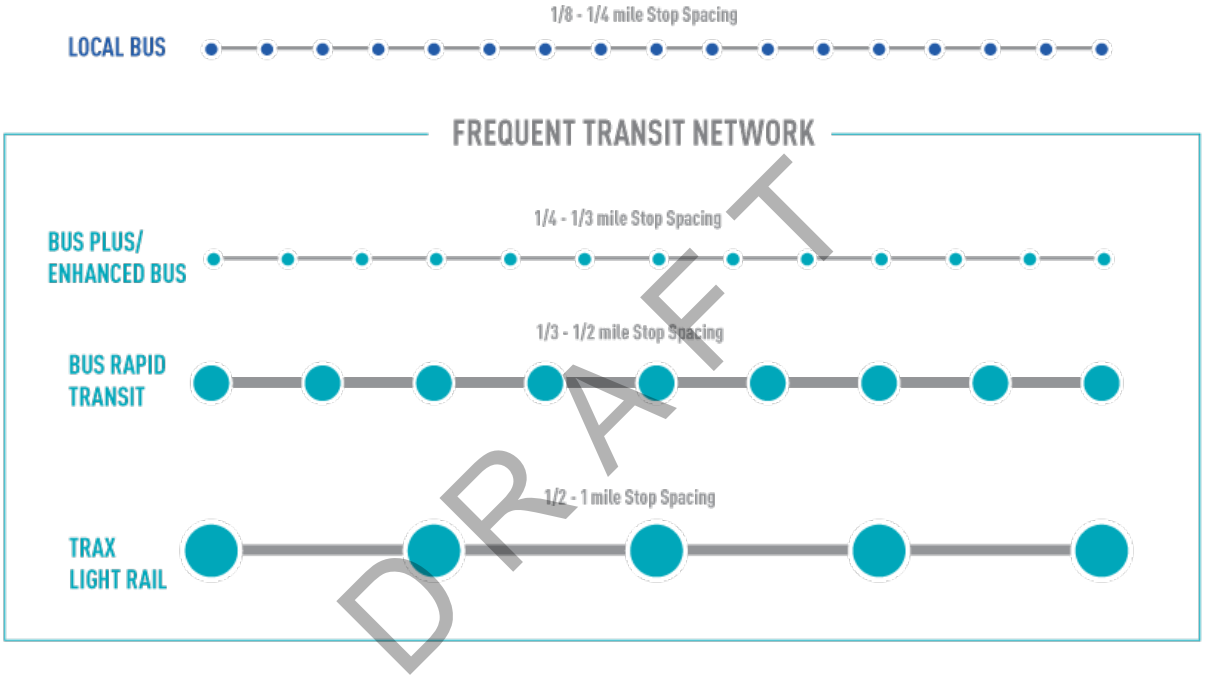
F RUNNING WAY IMPROVEMENTS

Could include bus-only lanes that separate transit from traffic and are clearly marked or queue jumps.

Stop Spacing

Stop spacing refers to the distance between stops on a transit route or corridor. The number of stops is a tradeoff between access and speed. A shorter distance between stops increases access to a transit line, but reduces speed. This tradeoff often varies by mode, as shown in Figure 3-4. Access is a priority for local service — stops can be spaced as close as ⅛ mile apart. Services along the FTN, however, place a greater emphasis on speed. Bus Rapid Transit and Enhanced Bus corridors that serve relatively straight corridors across the city should have longer stop spacing. Higher-quality stops spaced ¼ to ½ mile apart on average mean that few passengers have to walk more than about ¼ mile to a stop along these corridors. TRAX serves longer-distance regional connections and therefore has longer stop spacing. In areas with dense destinations, such as downtown, FTN stop spacing can be more frequent.

Figure 3-4 Stop Spacing Guidelines by Mode



Stop Spacing Case Studies

Reducing the number of stops on a route can result in significant actual and perceived time savings along a route, particularly where spacing is less than every 1,000 feet. Savings can range from 5 to 20% of the total running time on a route.

- **Seattle, WA:** King County Metro designed RapidRide stops to be about a half-mile apart. Stops are between 500 and 1,000 feet apart in some downtown locations. Metro does not operate parallel local service along RapidRide corridors, although some route segments have other local service.
- **Kansas City, MO.** Kansas City Area Transportation Authority MAX BRT service has quarter-mile average stop spacing. KCATA phased out local underlay service on its Main Street BRT line; most passengers were boarding at BRT stations.

Bus-Rail Integration

Transit agencies use various techniques to integrate bus and rail services to improve the passenger experience. Because UTA operates both rail and bus services, Salt Lake City does not have some of the inter-agency coordination challenges that exist in other cities, such as fare integration. Opportunities to improve bus-rail integration in Salt Lake City include timed connections, signage and wayfinding, shared stops, and transit information.

- **Timed Connections.** Bus and rail schedules can be coordinated to enable efficient connections for key travel patterns served by bus and rail modes.
- **Signage and Wayfinding.** Maps and wayfinding signage can be designed to help passengers easily navigate between bus and rail stops. In Portland, OR, TriMet uses both techniques to facilitate bus and light rail transfers along the 5th/6th Avenue Transit Mall.
- **Transit Information.** Real-time information displays and apps can help passengers decide or make connections between modes. TriMet shows both bus and light rail arrival at Orange Line stations. In Minneapolis, Metro Transit's app directs riders to the closest bus and rail stops based on their GPS location.
- **Shared Platforms.** Shared bus and streetcar stops enable convenient transfers and may allow passengers to take either mode for some trips. Station platforms can be designed to accommodate both bus and rail vehicles. Key design considerations include platform height, which needs to accommodate wheelchair ramps, and providing sufficient platform length to avoid delays. Buses and streetcars share stops in Minneapolis and Portland.

Wayfinding on the Portland Transit Mall.

Source: TriMet

Metro Transit app identifies bus and rail stops.

Source: Metro Transit

Transit Master Plan Transit Corridor Analysis

Figure 3-5 illustrates a set of transit corridors that were evaluated to inform the frequent transit network (Chapter 2) and the capital recommendations provided in this chapter.

- Phase I of the evaluation analyzed current and/or potential arterial roadway segments, created using logical breakpoints (e.g., key intersections).
- Phase II of the evaluation analyzed the corridors, or combinations of segments, shown in Figure 3-5.
- For the purposes of evaluation, all corridors were assumed to use a bus mode and operating characteristics (service span and frequency).
- The metrics analyzed in Phases I and II included:

Phase I and II

- Existing ridership
- Transit Propensity Index (TPI)
- Land use density current (population and employment)
- Land use density future (population and employment)
- Lack of access to a vehicle

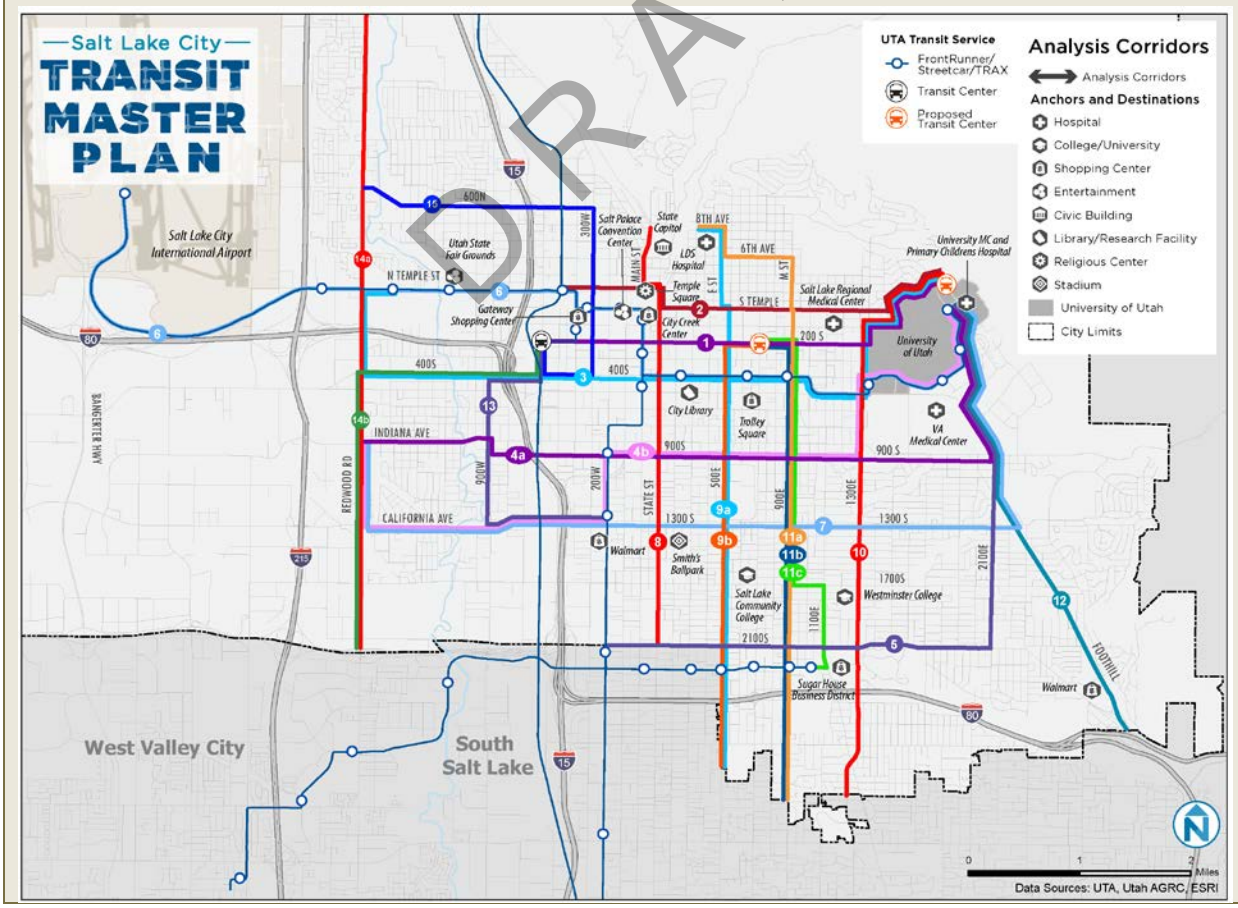
Phase II Only

- Anchor/generator strength and accessibility
- Potential for travel time savings and/or improved reliability
- Ridership potential (current and future year)
- Redevelopment Potential
- Cost effectiveness

- Additional considerations related to capital investments included corridor right-of-way and congested/uncongested travel time.

Appendix D provides additional detail on the evaluation.

Figure 3-5 Phase II Corridors



TRANSIT CORRIDORS

The Transit Master Plan corridor analysis, which was used to develop the recommended frequent transit network, was also used to develop priorities for capital investments in transit corridors. This section addresses three categories of corridor projects:

- **Transit Master Plan Priority Corridors.** High priority corridors for the City to support with capital investments in transit speed and reliability improvements and amenities. The plan includes an assessment of viable mode(s) for these corridors.
- **Additional Corridors Aligned with the Plan's Goals.** Additional corridors planned by UTA or the City and supported by the Transit Master Plan.
- **Other Capital Projects.** Additional corridors planned by UTA or others, but with more of a regional emphasis and not necessarily supported by the Transit Master Plan analysis.

Transit Master Plan Priority Corridors for Capital Investments

Transit Master Plan capital investment recommendations support investments in frequent service and long hours of operation on key travel corridors and help address challenges identified through the plan's gaps analysis.

Figure 3-6 illustrates Salt Lake City's highest priorities for transit corridor capital investments, including facilities and corridor management strategies that enhance transit speed and reliability and amenities that improve passenger comfort. These priorities are grounded in the plan's transit corridors analysis (see sidebar above) and an assessment of high performing corridors based on the capital investment principles defined above. In many cases these corridors are aligned with and support the recommended FTN described in Chapter 2. Figure 3-7 identifies these corridors in a table along with an assessment of compatible modes. A first step in developing capital improvements on these corridors would be to conduct a more detailed corridor study to refine the mode, specific alignment, and design.

- **200 S**. 200 S is a key east-west transit corridor for bus (and potentially, future Bus Rapid Transit and/or streetcar) service between downtown and the University. Following the City and UTA's previous capital investments in improved amenities the corridor saw an increase in transit ridership. Developing 200 S as a major transit corridor is envisioned as an initial implementation priority for the City and UTA.
- **North-south corridors.** Several Enhanced Bus corridors are recommended to create a north-south transit grid with approximately half-mile spacing between corridors, including the existing TRAX line in the 200 W corridor. These corridors extend from southern city limits through the downtown core to major destinations further north, including the State Capitol, LDS Hospital, and into the Avenues neighborhood.
  - **State Street.** An Enhanced Bus corridor or Bus Rapid Transit on State Street, currently served by UTA route 200, would connect to the State Capitol.
  - **500 E and 900 E.** Enhanced Bus corridors on 500 E and 900 E would extend beyond the downtown core to serve the Avenues neighborhood, including LDS hospital. One or both corridors would serve a recommended transit center in the vicinity of 200 S.
- **400 S**. A continuous east-west bus corridor along 400 S would connect Redwood Road and the University. A bus corridor along 400 S would run parallel to TRAX between Main Street and the University.
- **900 S and 1300 S/California**. Continuous east-west cross-town bus corridors in the center of the city would provide service to the Poplar Grove and Glendale neighborhoods, link major retail centers along 300 W, and help develop the frequent service grid. (An at-grade freight railroad

crossing currently precludes using 900 S as a continuous bus corridor; freight crossings can cause significant transit delays and bus bunching, especially for frequent service. In the near-term, the recommended FTN corridor could connect 1300 S/California and 900 S using 300 W. In the long-term, this plan supports providing a grade-separated crossing on 900 S that would enable continuous frequent transit service on this corridor).

- **North/South Temple.** A combination of N. Temple and S. Temple Streets is recommended as a continuous east-west bus corridor, supporting development of the frequent service grid. N and S Temple, 200 S, and 400 S provide east-west corridors approximately a third-mile apart (i.e., less than a quarter-mile walk) through downtown and connecting to the University.
- **Redwood Road.** Redwood Road is a significant regional and local transit corridor on the western side of the city. It has an important role connecting neighborhoods with high transit propensity to the frequent grid, including recommended east-west FTN corridors. Redwood Road also serves employment areas west of Redwood Road, between I-80 and south city limits, that are expected to grow in the future. This corridor is recommended as an Enhanced Bus corridor.
- **Foothill Drive**. Foothill Drive is an important regional and local transit corridor serving the University, Research Park, and Medical Center, and serving neighborhoods in the southeastern part of the city. Current land use patterns and accessibility are challenging to serve effectively with local transit service. This corridor is recommended as an Enhanced Bus corridor, including treatments to optimize transit travel in the congested peak travel periods. The Foothill Drive Corridor Study was completed in 2008; the City, UDOT, UTA, the University of Utah, and other partners are currently (2016) conducting an Implementation Strategy for the corridor.

Additional Local and Regional Capital Investment Priorities

UTA and Salt Lake City have already developed plans for a subset of the corridors included in the Transit Master Plan analysis and identified as Salt Lake City's priorities for transit corridor investments. These corridors were not directly included in the plan's mode assessment because they emerged from local or regional plans that have already conducted a detailed study to refine the preferred transit mode for the corridor. This section identifies additional priority capital investments and assesses how well additional planned projects align with Salt Lake City's transit investment priorities, based on the capital investment principles identified above.

Additional projects supported by Salt Lake City include:

- **TRAX improvements including the Black Line** and other downtown network enhancements. These enhancements would resolve capacity issues necessary to enable direct TRAX service between the Airport and the University, two of Salt Lake City's major travel demand generators.
- **Extended Enhanced Bus or BRT corridors south of Salt Lake City limits**, e.g., on State Street, 500 E, and 900 E.
- **Additional Enhanced Bus corridors** consistent with the UTA Network Study and the Regional Transportation Plan, e.g., on 1300 E (including south of city limits) and 2100 E/2100 S.
- **400 West (South Davis Corridor)**, where a locally preferred alternative has been selected, with BRT through South Davis County and Enhanced Bus in the 400 W corridor. In addition to improving regional connections to Salt Lake City, this project could provide infrastructure that would support additional Enhanced Bus service to the University of Utah.
- **Downtown Streetcar connecting to the University of Utah.** The Transit Master Plan corridor analysis supports transit investments in a downtown streetcar including a connection to the University. The analysis showed strong demand for east-west travel between Downtown and

University of Utah. The locally preferred alternative includes portions of 200 S (west of W Temple Street), 100 S, and S Temple Street. An additional consideration for the project could include coordination with the plan's recommendation to develop a transit center in the vicinity of 200 S and 500 E.

Figure 3-6 Transit Master Plan Priority Corridors for Capital Investments

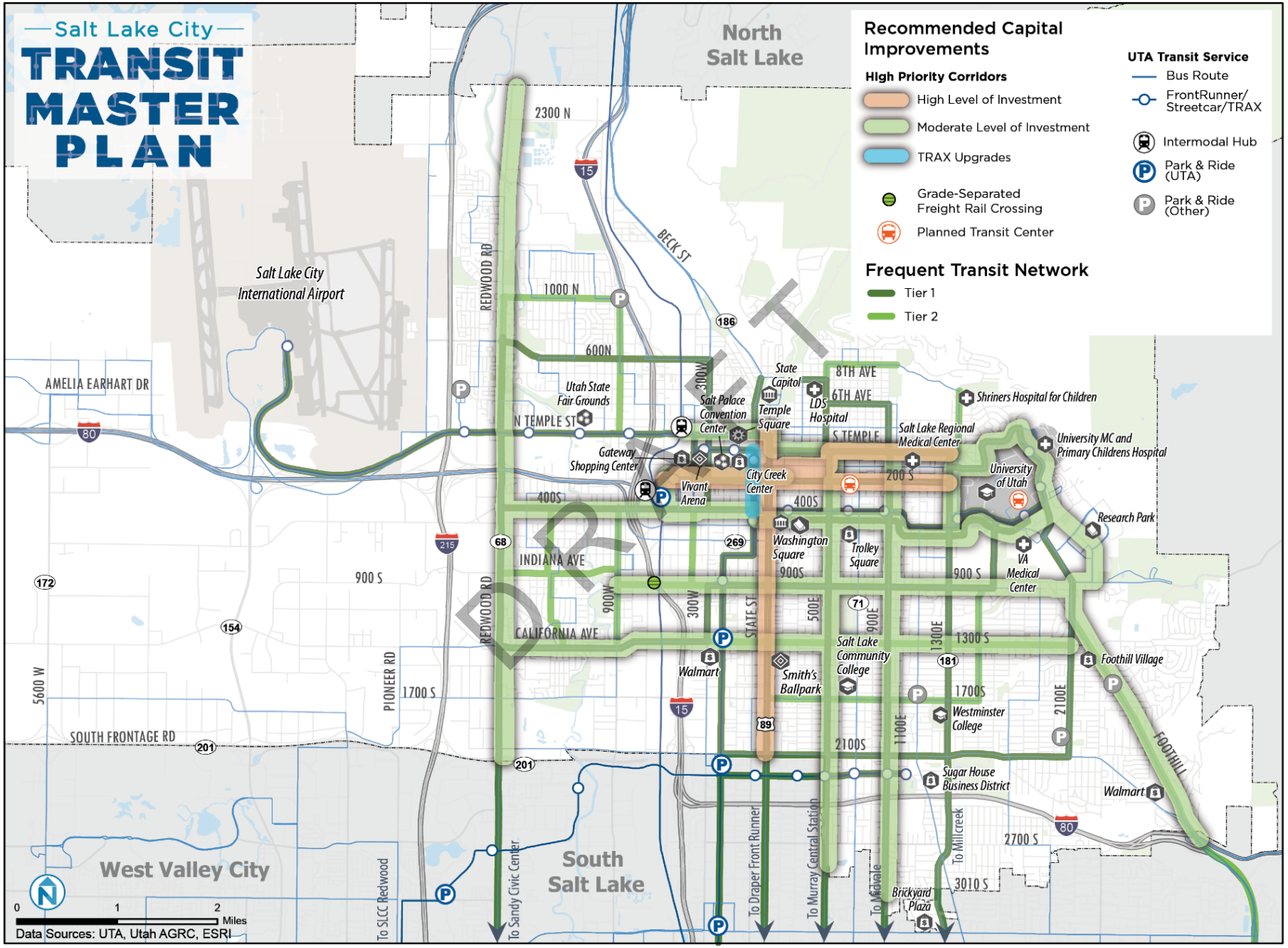


Figure 3-7 Transit Master Plan Priority Corridors for Capital Investments and Compatible Modes

Corridor #	Corridor Name	Recommended Mode Options [1]			Notes	Past Plans Map ID [2]	Previously Planned Project	Previously Planned Mode	Primary Source Plans or Studies
		Rail	BRT	Enhanced Bus					
1	200S	--	X	X		N	200 S E	Enhanced Bus	UTA Network Study [3]
2	South Temple	--	--	X		n/a	n/a	n/a	n/a
3	400S	TRAX	-	X	Continuous bus corridor from Redwood Road to University; TRAX extension also identified in corridor (see additional projects, Figure 3-9)	H	400 S TRAX Extension	TRAX	Downtown in Motion; Sustainable Salt Lake City
4a/b, 7	900 S and 1300 S	--	--	X	A continuous connection to Redwood Road on 900 S is not possible in the near-term due to an at-grade freight rail crossing. Portions of these corridors implemented in the near-term could be connected using 300 W (see Chapter 2).	n/a	n/a	n/a	n/a
8	State	--	X	X		C	State Street Enhanced Bus / BRT	BRT	Downtown in Motion; UTA Network Study
9a/b	500E	--	--	X		J	500 E Enhanced Bus	Enhanced Bus	UTA Network Study
11a/b	900E	--	--	X		K	900 E Enhanced Bus	Enhanced Bus	UTA Network Study
12	Foothill Drive	--	--	X		O	Currently under study	Enhanced Bus or BRT	Foothill Drive Implementation Strategy
14a	Redwood	--	--	X		B2	North Redwood project	Enhanced Bus	UTA Network Study
14b	Redwood	--	--	X		B1	Redwood BRT	BRT	West Side Master Plan; UTA Network Study

Corridor #	Corridor Name	Recommended Mode Options [1]			Notes	Past Plans Map ID [2]	Previously Planned Project	Previously Planned Mode	Primary Source Plans or Studies
		Rail	BRT	Enhanced Bus					
6	Black Line	TRAX	--	--	Capital improvements to signals and existing track would provide a fourth TRAX line connecting the Airport and University of Utah and would increase frequency on the 400 South TRAX segment (assuming no changes to other lines). This would require additional operating funds and training. Adding lines, revising termini, or increasing frequencies on existing lines thereafter would require duplicative N-S and E-W rail connections and additional study.	I	Black Line TRAX	TRAX	n/a
1 & 2	Downtown Streetcar	Streetcar	--	--	Not specifically analyzed, but 100 S corridor performed well in plan's analysis.	E	Downtown Streetcar	Streetcar	Downtown in Motion; Sustainable Salt Lake City; UTA Network Study

Notes: [1] Compatible modes based on Transit Master Plan corridors analysis and capital investment principles; recommendation to be refined in a more detailed study of each corridor. [2] See Figure 3-8 illustrating the relationship between Transit Master Plan priority corridors and previous plans. [3] Bus Plus is equivalent to Enhanced Bus.

Figure 3-8 Relationship of Transit Master Plan Priority Corridors to Other Local and Regional Capital Improvement Plans

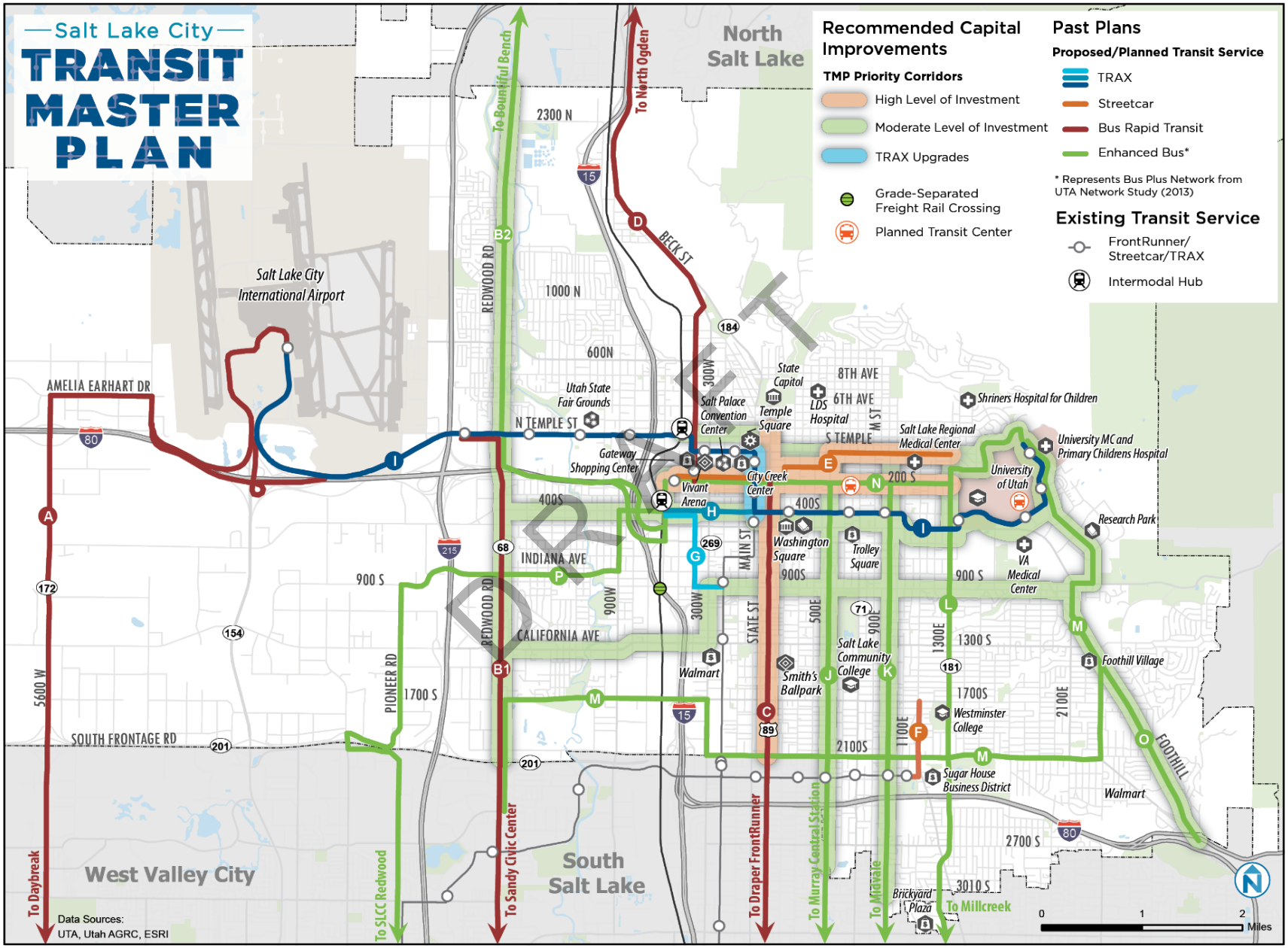


Figure 3-9 Assessment of Capital Investments in Other Corridors and Compatibility with Transit Master Plan Goals

Corridor #	Past Plans MAP ID	Previously Planned Project	Mode	Supportive of the plan's Goals	Notes	Primary Source Plans or Studies
Additional Projects Supported by Transit Master Plan						
10	L	1300 E Enhanced Bus	Enhanced Bus	Aligned	Part of the recommended FTN.	UTA Network Study
5	M	2100 S/1700 S Enhanced Bus	Enhanced Bus	Aligned	2100 S/2100 E shows strong demand in this analysis and is part of the recommended FTN. 2100 S west of I-15 did not show strong local demand in this analysis, but could have regional utility.	UTA Network Study; WFRC RTP
n/a	D	South Davis BRT	BRT	Aligned	This is a regionally-significant project that has been studied by UTA. The Transit Master Plan focused on local needs and therefore did not consider this corridor; however, the local portion of the project, which recommends Enhanced Bus along the 400 W corridor, supports the plan's local transit recommendations.	UTA Network Study; Davis SLC Community Connector Study
3	H	400 S TRAX Extension	TRAX	Aligned	Part of recommended FTN; the Transit Master Plan will support evolving capital recommendations over time.	Downtown in Motion; Sustainable Salt Lake City
n/a	G	TRAX "outer loop" of Downtown [1]	TRAX	Aligned	Part of recommended FTN; but not included in capital recommendations; the Transit Master Plan will support evolving capital recommendations over time as development patterns and market demand changes.	Downtown in Motion; UTA Network Study
11c	F	S-Line Streetcar Extension (Phase II)	Streetcar	Neutral	Included as an element of the 900 E corridor in the Transit Master Plan corridor evaluation. The 900 E corridor is part of the FTN and is also included in the Transit Master Plan capital recommendations for Enhanced Bus. The plan will support evolving capital recommendations from the Sugar House Streetcar project that would improve utility of the line, e.g., an extension to 1700 S (consistent with Regional Transportation Plan) with a connection to the 900 E FTN corridor. A future extension along 900 E could connect to TRAX service at 400 S.	Sugar House Master Plan; Sustainable Salt Lake City; UTA Network Study
Regionally-Significant Projects with Limited Local Transit Implications						
n/a	A	5600 West BRT	BRT	Neutral	This is a regionally-significant project that has been studied by UTA. The Transit Master Plan focused on local needs and therefore did not consider this corridor.	UTA Network Study

Corridor #	Past Plans MAP ID	Previously Planned Project	Mode	Supportive of the plan's Goals	Notes	Primary Source Plans or Studies
n/a	P	2700 W Corridor	Enhanced Bus	Neutral	This is a regionally-significant project that has been studied by UTA. The Transit Master Plan focused on local needs and therefore did not consider this corridor.	WFRC RTP
n/a	xx	Mountain Transportation System	N/A	Neutral	This is a regionally-significant project that is currently being studied, but is outside the scope of the Transit Master Plan	Sustainable Salt Lake City; UTA Network Study

Notes: [1] TRAX lines on 700 South from 200 West to 400 West, and then continuing north on 400 West connecting to the existing system near Gateway – completing outer loop that serves Downtown and the emerging southwest quadrant.

Transit Priority Toolbox

Figure 3-10 provides a list of potential roadway, stop, and vehicle treatments for Salt Lake City that can reduce system inefficiencies and improve the functionality of the transit. This toolbox can help guide future investments along the identified Transit Master Plan corridors. The toolbox is generally consistent with the NACTO Transit Street Design Guide,[1] which provides additional design options and implementation details.

Figure 3-10 Transit Priority Toolbox

Treatment	Definition	Benefits	Constraints
Roadway Treatments			
Transit signal priority (TSP)	At traffic signals, vehicles communicate with the traffic signal system to provide a green signal indication to an approaching vehicle. This often works better in conjunction with a far-side transit stop.	Reduces travel time and delay for buses at intersections. This could be particularly beneficial given long traffic signal times.	Less effective when signals are operating at capacity.
Queue jump lanes	At signalized intersections, a bus is provided with a lane adjacent to general purpose traffic and an advanced green signal indication to bypass congested areas.	Buses "jump" the queue of waiting cars, reducing travel times.	Lane must be as long as the typical queues. TSP makes these much more effective, particularly if there is no far-side receiving lane. May increase pedestrian crossing times.

Queue jump lane.
Source: Nelson\Nygaard

[1] http://nacto.org/publication/transit-street-design-guide/

Treatment	Definition	Benefits	Constraints
Dedicated bus lanes	A lane is reserved for exclusive use by buses. It may also be used for general purpose traffic right-turn movements onto cross streets and for access to adjacent properties.	Reduces travel times.	Conflicts with right-turn and delivery vehicles. Potential opposition from businesses that may lose on-street parking.
Dedicated bus median lanes	A median lane is reserved for exclusive use by buses. This treatment speeds bus travel times.	Reduces travel times.	Conflicts with left-turning vehicles. Signalization challenges.
Reversible or contra-flow lanes	A reversible transit lane is a dedicated transit facility that operates in the peak travel direction. A contra-flow bus lane is a dedicated lane of an otherwise one-way street reversed for buses and other mass transit. Contra-flow lanes can also be reversed to add capacity in the peak travel direction.	Helps transit get around bottle-necks or access limited access facilities. Applies roadway capacity to meet peak-direction travel needs.	Loss of roadway capacity. Pedestrian safety considerations. Signalization challenges.

Left: Peak-hour business-access-and-transit signage in Seattle, WA. Right: Bus-only lane in New York City.

Sources: Left – Flickr user Oran Viriyincy; Right – Nelson\Nygaard

Dedicated median bus lane in Cleveland, OH.

Source: NACTO

Contraflow bus lane in Boston, MA.

Source: Nelson\Nygaard

Treatment	Definition	Benefits	Constraints
Transit priority streets	A street that is dedicated to transit or is designed primarily as a transit corridor.	Highly effective for moving high volumes in urban centers, particularly during peak hours.	Loss of roadway capacity. Limited number of streets in geographically constrained areas.
Limited or time prohibited general public (GP) turning movements	GP turning movements are restricted at all times or during peak periods. May be implemented with queue jump or dedicated bus curb lanes.	Helps implement peak period queue jump lanes or transit only lanes. Can also benefit pedestrian safety.	Impacts on other roadways from diversion of GP traffic/turning movements.
Innovative bus-bike treatments	Treatments to provide bicycles with safe routes along high-volume transit corridors, manage bicycle-transit vehicle interactions, and allow bicycles to share transit lanes. Examples include shared lane markings, colored pavement, and bicycle-only signals.	Reduce transit delay on busy bicycle corridors and improve bicycling experience.	Highly contextual and must be considered within balance of person travel delay/benefit for specific street or corridor conditions.

Transit priority street in Minneapolis, MN.

Source: NACTO

Innovative bus-bike treatment in Eugene, OR.

Source: Nelson\Nygaard

Treatment	Definition	Benefits	Constraints
Stop Treatments			
Curb extensions/bus bulbs/boarding platforms	Sidewalks are extended into the street so that buses would stop in the lane of traffic. This prevents buses from getting trapped by passing vehicles, unable to return to the flow of traffic.	Minimizes delays from merging back into traffic lane. This also reduces the pedestrian crossing distance.	Only applicable where an on-street parking lane exists. Impacts to traffic flow must be taken into account.
Boarding islands	A transit access point constructed in a lane that allows buses to use the faster moving left-lane of a roadway.	Removes side friction caused by right-turning vehicles, parking maneuvers, and delivery vehicles.	Pedestrian safety and ADA access requirements. Effects on overall traffic due to taking an additional lane.
Level boarding platforms	A boarding platform that is level with the bus to enable easier and faster boarding, particularly for passengers with mobility impairments, using wheelchairs, or bringing a stroller on-board the vehicle.	Reduces dwell times and travel times.	Mostly applicable to BRT and rail systems where vehicle and platform design is standardized.
Defined platform loading locations	Defining the locations where doors will open allows passengers to wait in nearest proximity to their bus or train.	Reduces dwell times.	May be most effective in a proof-of payment system where passengers may board through any door.

Bus boarding island in Seattle, WA, also routes cyclists around the stop.

Source: Nelson\Nygaard

Level boarding platform in Eugene, OR.

Source: NACTO

Treatment	Definition	Benefits	Constraints
Defined bus loading positions	Defining the platform loading locations at a stop allows passengers to more quickly find/walk to their bus and ensure that a bus is correctly positioned to be able to depart before a bus in front of it.	Reduces dwell times.	Most effective with "platooned" bus arrivals (e.g., buses timed to leave a common origin point at the same time).
Bus stop consolidation	Reduces the number of stops on a route, particularly where spacing is less than one stop every three blocks.	Reduces dwell times and travel times.	ADA and elderly/disabled access. Grades must be taken into account.
Off board fare payment	Users can pay their fare before boarding the vehicle. On-vehicle fare payment typically delays the loading and unloading of buses, as only one door may be used.	Speeds boarding and allow full utilization of all doors.	Capital and O&M expense of off-board payment machines. Passenger safety at night.
Vehicle Treatments			
Low-floor, wide-door vehicles	Low-floor vehicles (including in conjunction with level boarding platforms) allow passengers to board more quickly without climbing steps, particularly for passengers with mobility challenges.	Wheelchair lifts on low-floor vehicles operate more quickly. Wide-door vehicles allow passengers to enter and exit vehicles more efficiently.	Wide-door vehicles are most effective if implemented in conjunction with prepaid fare payment.
On-vehicle perimeter seating	On heavily loaded routes, increases standing capacity, makes more efficient use of seating capacity, and allows passengers to exit the vehicle more quickly.	May increase vehicle carrying capacity and reduces dwell times.	More appropriate for shorter-distance routes.

Defined platform loading locations for SWIFT BRT in Snohomish County, WA. Longer stop spacing often accompanies Enhanced Bus or BRT lines. Industry experience is that passengers are often willing to walk longer distances to high-quality stations with good amenities. Amenities at SWIFT stations include off-board fare payment.

Source: Nelson\Nygaard

Low-floor vehicle in Los Angeles, CA.

Source: Wikimedia User METRO96

Application of Transit Priority Toolbox

Figure 3-11 identifies which treatments might be applicable to Transit Master Plan priority corridors (Figure 3-7) identified as likely bus corridors and provides examples of locations where treatments have already been implemented or could be applied. Treatments that require construction should be simultaneously completed with other street reconstruction projects. A corridor study would need to be conducted to develop a detailed plan for each corridor. General phasing recommendations are provided in Chapter 7.

Figure 3-11 Treatments for Transit Master Plan Priority Bus Corridors

			Potential Treatments							
Corridor #	Corridor Name	Specific Examples	TSP	Queue Jumps	Dedicated Lane	Reversible or contra Flow	Transit Priority Street	Limited GP turns	Curb Extensions / Bus Bulbs	Stop Consolidation
1	200 S		X	X	X		X	X	X	X
2	South Temple		X							X
3	400 S	Queue jump at 700 E	X	X						X
4a/b, 7	900 S and 1300 S		X	X					X	X
8	State		X	X	X			X	X	X
9a/b	500 E	Queue jump at 400 S	X	X				X	X	X
11a/b	900 E		X	X				X	X	X
12	Foothill Drive	Queue jump at Sunnyside; Stops at Kensington Ave S & Bryan Ave S are less than 500 feet apart	X	X	X	X				X
14a/b	Redwood	Queue jump at N. Temple	X	X						X

SUMMARY OF RECOMMENDATIONS – TRANSIT CORRIDOR AND FACILITY CAPITAL INVESTMENTS

High priority strategies are highlighted in blue.

Figure 3-12 Transit Corridor and Facility Capital Investment Recommendations

Recommendation category	#	What is the recommendation?	Why do it?	Who is responsible?	When should it happen?*
Priority Corridors	3.1	Develop design standards for Enhanced Bus and BRT corridors, including branding for vehicles and stations.	Provides a distinctive identify for high-quality transit services that offer faster, reliable travel times	**Lead:** City **Support:** UTA	Near-term
Priority Corridors	3.2	Engage with City traffic engineering staff to identify the level of transit signal priority that can be provided.	Develop a TSP standard with staff-level support.	**Lead:** City **Support:** n/a	Near-term
Priority Corridors	3.3	Develop a pilot Enhanced Bus corridor project with coordinated frequent service and capital investments. 200 S has been discussed as a potential project.	Demonstrate the benefits of frequent service and capital improvements in a corridor with near-term readiness.	**Lead:** City **Support:** UTA	Near-term
Priority Corridors	3.4	Conduct corridor studies to refine mode, alignment, and other design elements for each corridor.	Work out detailed concepts for each corridor and engage the public to work through design tradeoffs and secure broad community support.	**Lead:** City or UTA (varies) **Support:** n/a	Near to long-term (varies by corridor)
Priority Corridors	3.5	Develop a coordinated approach to implement priority corridors, including coordination with other modal plans, targeting three corridors every two years. Focus initial investments in corridors that do not require major service restructuring or other logistical challenges.	Develop a realistic implementation plan for the Transit Master Plan priority corridors (additional guidance is provided in Chapter 7)	**Lead:** City or UTA (varies) **Support:** n/a	Near-term
Facility Design	3.6	Endorse the NACTO Transit Street Design Guide and incorporate its guidance into design of transit facilities and bicycle and pedestrian access to transit.	Ensure that facilities are designed consistent with industry best practices.	**Lead:** City **Support:** n/a	Near-term

*Note: Near term = within 2 years; medium term = 3-5 years; long term = 6-10 years

High priority strategy

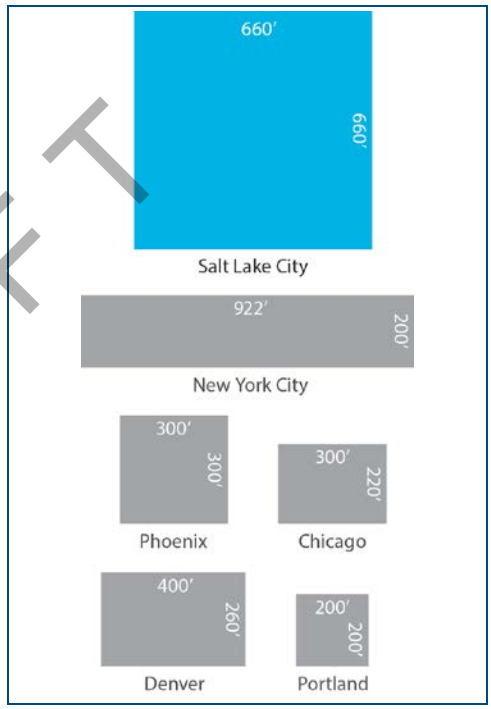
4 ACCESS TO THE TRANSIT SYSTEM

4 ACCESS TO THE TRANSIT SYSTEM

A safe and connected network of pedestrian and bicycle facilities is a foundation of a complete transit system. Providing safe, comfortable access to public transit is critical to attract new riders and improve the overall travel experience for existing riders. While Salt Lake City does not manage transit service, it does manage the streets that connect people to transit.

PEDESTRIAN AND BICYCLE ACCESS

The need for safe, convenient, and comfortable pedestrian and bicycle access to transit stops and stations has been identified through public outreach efforts for the Transit Master Plan and past Salt Lake City planning efforts. Forty-three percent (43%) of participants in the *Design Your Transit System Tool* identified "improved access to transit on foot and by bike" as a priority.[1]



Salt Lake City has much larger blocks than cities like New York, Phoenix, and Chicago.
Source: http://greatergreater.com/files/2010/gridposter.pdf

Pedestrian Access

Every transit trip begins and ends as a pedestrian trip. Safe, comfortable sidewalks that connect directly to destinations can be a deciding factor for transit riders when choosing whether or not to take transit at all, especially for those with the option to drive. A quality pedestrian network includes sidewalks that are well-lit and buffered from traffic and streets with well-marked crossings at frequent intervals. Compared to other U.S. cities, Salt Lake City has long blocks (see graphic at right). For example, Portland's blocks are 200 feet by 200 feet, while Salt Lake City blocks are more than three times as long—660 feet by 660 feet. Salt Lake City's long blocks have been identified as a key barrier to pedestrian mobility in the Pedestrian and Bicycle Master Plan and through community outreach for the Transit Master Plan.

> "My motivation for taking transit is so I can bike to work and get physical exercise; otherwise it is cheaper, quicker, and more convenient for me to drive. I am a big advocate of alternative modes of travel, but it has to make economic sense for the users."
>
> *- Design Your Own Transit System" Survey Respondent*

[1] Of note: for Salt Lake City residents that took the survey, this number jumped to 48% who selected improved access to transit on foot and by bike as a priority.

Characteristics of good pedestrian access to transit are outlined below; specific recommendations for improving pedestrian access in Salt Lake City are presented in Figure 4-1.

Well-marked intersection and mid-block crossings that provide a safe and visible place for pedestrians to cross the street. Mid-block crossings are especially important where blocks are long to provide more opportunity for pedestrians to cross the street safely and cut down on walking time to reach transit stops. Pedestrian-specific signals, such as RRFB (Rectangular Rapid Flashing Beacons) and HAWK (High-Intensity Activated Crosswalk), are traffic control devices used to stop traffic and allow pedestrians to cross safely either at intersections or mid-block.

- **Traffic calming measures** such as curb bulbouts and median refuge islands reduce crossing distances, vehicle speeds, and the number of travel lanes pedestrians must negotiate to cross the street.
- **Exclusive pedestrian phases** at intersections with high walking activity allow pedestrians to cross the street in both directions at the same time. A **leading pedestrian interval** (LPI) gives pedestrians a 3-7 second head start entering an intersection to increase their visibility to turning motorists.
- **Street lights** near transit stops improve safety and comfort.
- **Wayfinding** along the frequent transit network improves access to transit and helps passengers connect to key destinations from transit (also see Recommendation 5.4 Wayfinding in Chapter 5).

Pedestrian accommodation is most important within a quarter-mile radius of transit stops. Taking into account bus stops as well as rail, this includes most of the downtown, business areas, and neighborhoods of Salt Lake City. The map in Figure 2-8 in Chapter 2 highlights the quarter-mile buffer around the frequent transit network.

Pedestrian flashing beacons (left) and high-intensity activated crosswork (HAWK) signals (right) alert drivers to crossing pedestrians.

Source: Salt Lake City

Bicycle Access

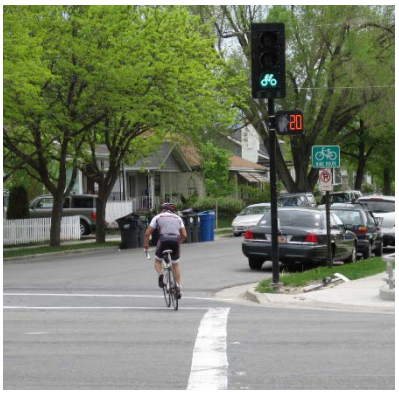
Safe and direct bicycle facilities that connect to transit increase the catchment area of transit service by providing important first mile/last mile connections – extending up to three miles for routine travel such as commuting. The on-street bicycling environment must be safe and comfortable for people with a broad range of skills and for all ages. On-street bicycle improvements and off-street facilities should be prioritized along the FTN.

Key components that comprise good bicycle access to transit are outlined below; specific recommendations for improving bicycle access in Salt Lake City are presented in Figure 4-1.

- **Protected bike lanes** provide a dedicated space for bicycling that is separated from the roadway by a physical barrier, such as the curb, a flexible plastic post, and/or plantings. Salt Lake City built its first protected bike lanes on Broadway (300 South) and 200 West in 2014 and 2015.
- **Protected intersections** improve safety and visibility when bicycle facilities cross a roadway. Features can include bike ramps, forward waiting areas, corner refuge islands, setback crossings, and bike signals. In 2015, Salt Lake City built the second protected intersection in the U.S. on the corner of 200 West and Broadway (see photo below).
- **Bicycle lanes and boxes** are another technique to provide dedicated space in the street for cyclists and to increase driver awareness to the presence of cyclists. Increasingly, cities are using colored pavement treatments to designate bike lanes, either by coloring the beginning of the lane, the entire lane, and/or boxes at intersections. Cities are also providing a striped buffer to provide more separation between the bike lane and the roadway.
- **Neighborhood byways** are low-traffic streets that have been optimized for use by both pedestrians and bicyclists. A variety of traffic calming elements and signage are used to reduce car volumes and speeds, fostering a safe bicycling environment. Additionally, signals and other pedestrian and bicycle-specific treatments provide safe crossings of major streets.
- **GREENbike** bike share provides an important mobility option for people taking transit—either by extending the reach of transit, allowing riders to complete the first and last segments of their trip easily, or by providing a transportation option for other short trips during the day.
- **Smart placement of transit stops near bike facilities** help bicycles access transit seamlessly.

In 2015, Salt Lake City opened a protected intersection on the corner of 200 West and Broadway.

Source: Salt Lake City



Bicycle signal treatment along 600 E neighborhood byway.

Source: Salt Lake City

UTA First/Last Mile Study Demonstrates Need for Improved Access to Transit

A survey conducted in 2014 as part of UTA's First/Last Mile Study demonstrates passenger priorities for improved access to transit. Priorities identified included bike paths, improved crosswalks, improved passenger waiting areas, and UTA shuttles as the most important features at or near rail stations. Additional access strategies are needed to support first/last mile access to the FTN.

Bicycle Amenities

Bike parking, end of trip facilities such as showers and lockers, and bike racks on buses also help passengers seamlessly connect to transit by ensuring cyclists have a secure place to park their bikes at the transit stop and/or by allowing them to bring their bikes on board.

Covered bicycle parking is provided along the SelectBus BRT line in New York City.

Source: Wikimedia Commons, User Jim Henderson

Key components that comprise good bicycle amenities are outlined below; specific recommendations for improving bicycle amenities in Salt Lake City are presented in Figure 4-1.

- **Bike parking** allows transit riders to use bikes for the first and last mile of a transit trip without needing to transport the bike on bus or rail vehicles. Solutions range from simple outdoor "U" racks that are suitable for short-term parking to secure parking in locked, covered cages. Bike lockers are available at most TRAX and FrontRunner stations. Salt Lake City's bus stop guidelines specify basic bicycle parking at every stop. Chapter 6 recommends policy guidelines for bike parking at different types of transit facilities, including secure parking at Intermodal Hubs, Transit Centers, and Mobility Hubs, and at TRAX or BRT stations as appropriate based on the station land use context. The City's existing guidelines recommend increasing bike parking capacity at stations and stops to meet the level of demand. Design guidelines should also ensure that parking is attractive.

- **Bikes on transit** allow passengers to bring their bike on board transit vehicles. All UTA buses are equipped with a bicycle rack and bicycles are allowed on TRAX and FrontRunner trains even during peak commute times. Providing bike parking at stops and stations helps ensure that on-vehicle capacity is available for riders who need their bike on both ends of their transit trip.
- **Other end of trip facilities** such as bike maintenance stations allow passengers to do routine bike maintenance right at the transit stop. Amenities include repair tools and a bike pump. Showers and changing facilities can also help improve the biking experience. The City can work with employers to add these amenities and could provide them at high ridership locations.

A bike maintenance facility —called Bike Fixtation—is provided at Metro Transit Lake Street/Midtown LRT Station in Minneapolis.
Source: Bike Fixtation

SUMMARY OF RECOMMENDATIONS – PEDESTRIAN AND BICYCLE ACCESS

The following table outlines specific improvements that are recommended for improving bicycle and pedestrian access. High priority strategies are highlighted in blue.

Figure 4-1 Pedestrian and Bicycle Access Recommendations

Recommendation category	#	What is the recommendation?	Why do it?	Who is responsible?	When should it happen?*
Mid-Block Crossings	4.1	Per the Salt Lake City Pedestrian and Bicycle Master Plan, create pedestrian and bicycle routes using mid-block crossings and passageways, wide sidewalks, and signage;[1] prioritize mid-block crossings along the Frequent Transit Network; designate neighborhood byways to connect to the FTN	Blocks are long in Salt Lake City; mid-block crosswalks can help create a more well-connected, fine-grained street network that enables shorter and more direct walking connections, provides greater choice of routes, and is easier to serve with cost-effective transit	**Lead:** City **Support:** n/a	Ongoing
GREENbike Integration	4.2	Treat bike share as an extension of the transit system and prioritize expansion of bike share to provide access and connection to the Frequent Transit Network	GREENbike has proven to be an important complement to Salt Lake City's transit system, allowing people to take transit and ride the rest of the way by bike	**Lead:** GREENbike **Support:** City and UTA	Ongoing
Bike/Transit Integration	4.3	In partnership with the City's Pedestrian and Bicycle Program, designate a well-connected network of multiuse paths; buffered and protected bike lanes; neighborhood byways; and regular bike lanes that provide direct connections to local destinations and the Frequent Transit Network	Paths of travel to and from transit facilities should be comfortable, safe, and direct to expand the catchment area of transit service	**Lead:** City **Support:** n/a	Ongoing
Bike Parking at Transit Stops	4.4	Per the Salt Lake City Pedestrian and Bicycle Master Plan, encourage installation of bicycle parking spaces, including secure parking, such as bicycle lockers and secure parking areas, at high-demand transit stops[1] Work with UTA to ensure cost for secure bicycle parking is affordable and commensurate with the cost and site footprint of providing a vehicle parking stall.	Bike parking at transit stops and stations allows passengers to easily connect to transit by bike, providing a safe and convenient place for them to park their bike before riding transit	**Lead:** City and UTA **Support:** Private sector as development occurs	Near Term

[1] Salt Lake City Pedestrian and Bicycle Master Plan (2015).

*Note: Near term = within 2 years; medium term = 3-5 years; long term = 6-10 years

High priority strategy

Recommendation category	#	What is the recommendation?	Why do it?	Who is responsible?	When should it happen?*
Bikes on Transit	4.5	Coordinate with UTA to continue to provide bicycle storage on buses and light rail vehicles and ensure continued accommodation of bicycles on future commuter rail trains[1]	Ample capacity for bikes on transit vehicles facilitates first and last mile connections by allowing passengers to take their bikes with them	**Lead:** UTA **Support:** n/a	Near Term
Safe Routes to Transit Program	4.6	Establish an ongoing funding program that identifies and constructs bicycle and pedestrian safety improvements along the Frequent Transit Network	A Safe Routes to Transit program prioritizes safety improvements along the Frequent Transit Network	**Lead:** City **Support:** UTA	Medium Term
Complete Streets	4.7	Strengthen the City's existing Complete Streets Ordinance (per the Salt Lake City Pedestrian and Bicycle Master Plan) by integrating transit	The City's existing Complete Streets Ordinance does not include transit	**Lead:** City **Support:** n/a	Near Term
Stop Siting Near Low Stress and Other Bikeways	4.8	Support bike access to transit by including connections to low stress and other bikeways as a criterion for locating bus stops along the FTN, particularly when the transit street lacks a bike facility. Incorporate proximity to connecting bikeways as a design criterion in the City's Bus Stop Guidelines (Design Element #12).	Locating transit stops near low stress bikeways supports bike/transit integration	**Lead:** City **Support:** n/a	Near Term

1 Salt Lake City Pedestrian and Bicycle Master Plan (2015).

*Note: Near term = within 2 years; medium term = 3-5 years; long term = 6-10 years

High priority strategy

Beaverton Transit Center Bike SPA: Beaverton, OR

Beaverton Transit Center's Bike Secure Parking Area (SPA) offers a secure bike parking facility at the transit station. The large facility is conveniently located at the transit center and is secure. There are a total of 100 bike parking spots that are accessed using a BikeLink card. This keycard allows a rider to pay a one-time $5 activation fee and then pay $.30/hr. 8am-8pm weekdays; $.01/hr. all other hours.

Source: TriMet

OTHER ACCESS TO TRANSIT SOLUTIONS[2]

Car share and park-and-ride facilities are another opportunity to improve access to transit:

- **Car share** service, particularly point-to-point service, allows passengers to connect to or access transit. The point-to-point model, such as Car2Go, allows passengers to pick up a shared car near their home (for example) and drop it at the nearest transit stop. Enterprise car share is currently offered in Salt Lake City, although this is a fixed point system where members are required to pick up and drop off the car in the same location.
- **Park and ride facilities** allow people to use transit for some or most of their journey, especially for express bus and commuter rail services. Ideally, park and rides should be located between where people live and where they are traveling to avoid out-of-direction travel that increases total travel time. For transit users who need to commute by car for a portion of their trip, park-and-rides can be a useful option. They are not the sole solution for encouraging transit ridership as they combat the air quality benefits that taking transit helps to provide. To reduce automobile trips, park-and-rides can also provide high quality bike parking and bike share stations to connect bicyclists to transit. See Chapter 6 for further details.

SUMMARY OF RECOMMENDATIONS – OTHER ACCESS TO TRANSIT SOLUTIONS

The following table outlines specific improvements that are recommended for improving access to transit.

Figure 4-2 Other Access to Transit Solutions Recommendations

Recommendation category	#	What is the recommendation?	Why do it?	Who is responsible?	When should it happen?*
Car Share	4.9	Explore the feasibility of implementing a point-to-point car sharing service that allows users to pick up and drop off shared cars within the "home" zone	Car sharing needs to be flexible; point-to-point options, such as Car2Go, allow users to reserve cars up to 30 minutes in advance and drop off cars anywhere within the "home" zone	Lead: City Support: Private car share companies	Near term
Park and Rides	See Recommendation 6.12 in Chapter 6				

*Note: Near term = within 2 years; medium term = 3-5 years; long term = 6-10 years

[2] Note: Other first/last mile strategies such as on-demand ride services and shuttles are discussed in detail in Chapter 2 Service.

5 SUPPORTIVE PROGRAMS & POLICIES

5 SUPPORTIVE PROGRAMS & POLICIES

Access to clear **information** about public transit improves system **legibility**, helps customers navigate the system, and allows informed transportation choices. Knowing where and when transit operates, when the next bus will arrive, how long it will take, and how to integrate with other modes like bike share makes it easy for people to take transit. Good information can increase and sustain ridership when paired with easy-to-use tools and targeted and tailored **education and outreach** programs and messaging campaigns. **Fare and pass programs** provide a seamless and often more affordable way for passengers to access the transit system. Finally, **parking management** strategies, such as parking pricing and availability, are needed to fully leverage the City's transit investments.

This chapter describes recommendations for a range of programs and policies that support the frequent transit network and enhance the usability and attractiveness of the public transit system in Salt Lake City.

TRANSIT INFORMATION AND LEGIBILITY

For people to be able to use transit, they must first know what services exist and understand how to use those services. Providing clear and concise information in multiple formats is a fundamental element of a high-quality transit system.

Branding

Effective branding of transit service can improve awareness and understanding of the transit system. A consistent brand that visually unites transit vehicles, stops, and stations with print and online information reinforces the value of the service and improves system legibility. In April 2016, UTA underwent a comprehensive "brand refresh and update" effort. UTA published its Customer Information Standards brand guide and is in the midst of updating all existing materials and signage as well as adding new customer information materials. As the City and UTA implement the frequent transit network and enhanced services such as bus rapid transit and enhanced bus (see Chapters 2 and 3), a unified branding approach will reinforce existing UTA

Elements of a Branded Transit System

Salt Lake City's Frequent Transit System should be branded, including:

- Logo and overall look and feel
- Marketing campaigns
- Online engagement
- Customer feedback systems
- Information systems (e.g., website, real-time information, and mobile apps)
- Buses
- Stops and stations
- Maps and trip planners

branding efforts to create a dynamic, attractive public image for these high-quality transit services, and help the City and UTA retain and attract riders and cultivate support in the community.

One branding opportunity is to clearly delineate the network of transit services that meet standards for high frequency and a long service span, as defined in Chapter 2. The FTN provides an opportunity to create a recognizable subset of services that communicates quality, comfort, and convenience, regardless of mode. Establishing a distinct brand for the FTN will also communicate that the city's highest quality transit network is a permanent, integrated part of city infrastructure. The FTN brand should be implemented across vehicles, stops, stations, and schedule information, but could also be consistent with regional branding for high-frequency service and will need to recognize that frequent service on some routes may not extend the full length of all routes, e.g., outside of Salt Lake City limits.

The UTA website indicates which bus routes have a frequency of 15 or 30 minutes but this is not as visible to users riding the system. While UTA currently identifies 15 minute routes with green signs and a "15 minute" marking, comments from the general public indicate that it is not readily understood. Visible branding paired with accessible information improves awareness of the system and helps riders navigate and understand how to use the FTN. This could include an FTN map, logo, bus stop signage, or bus wraps. In addition, the UTA website uses colors to distinguish bus route frequency, but these colors could be confused with the colors used to identify rail lines. Other agencies with bus and rail systems use icons to distinguish frequent service routes.

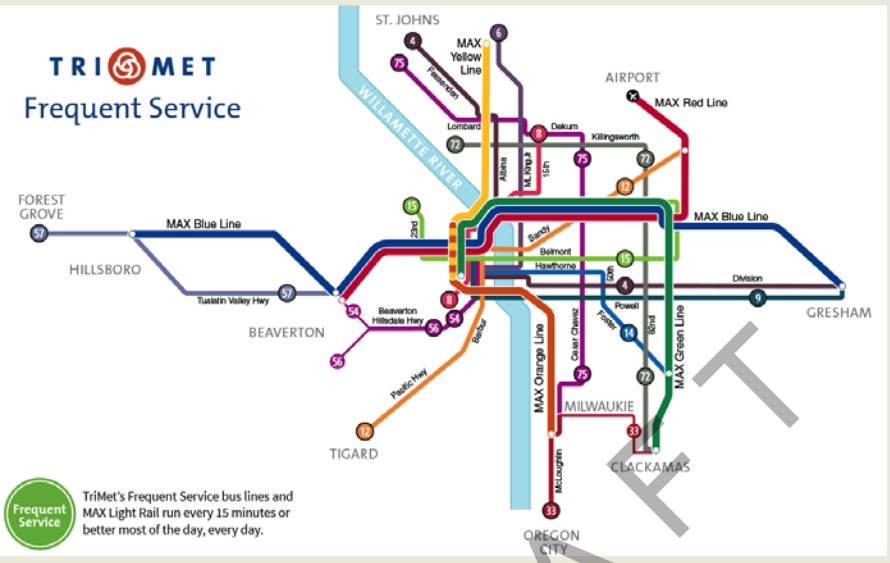
The sidebars below provide examples of frequent service branding in Portland and Minneapolis.

UTA currently indicates frequent routes with a green route sign and a small "15 minute" indicator on the sign. More prominent frequent service branding that is visible to both people driving and walking helps promote the service and improve awareness of transit.
Source: Salt Lake City

Frequent Transit Network Examples

The frequent transit network maps provided below highlight the subset of each transit agency's bus and rail lines that provide high-frequency all-day service. In most cases these maps integrate frequent service branding used on bus stop signs or vehicles to help establish a unique branding for the service. UTA has studied many peer examples and discussed implementing such a system, highlighting that there is a shared goal between UTA and SLC. Two examples are described below—Portland and Minneapolis.

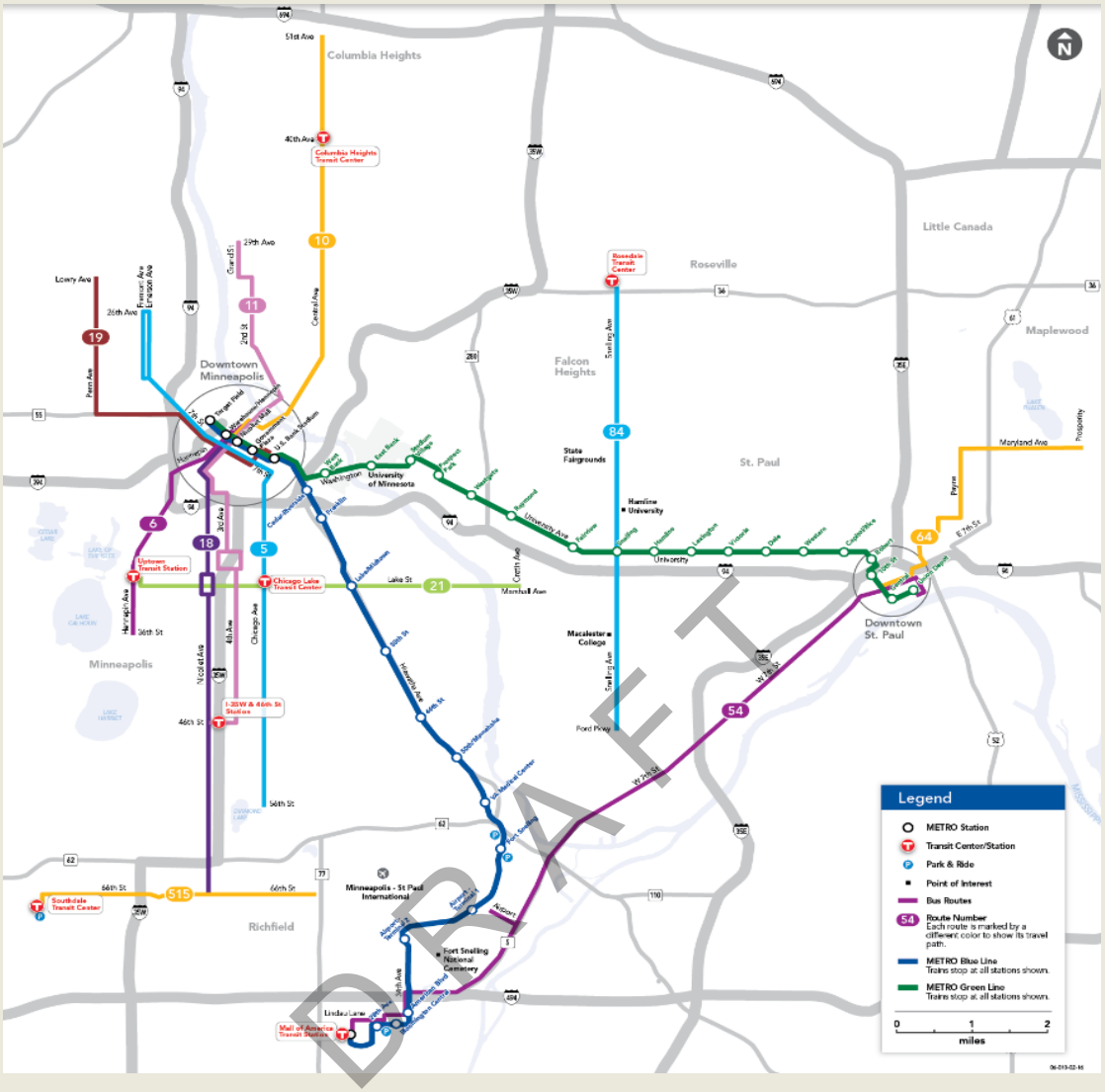
TriMet – Portland, OR

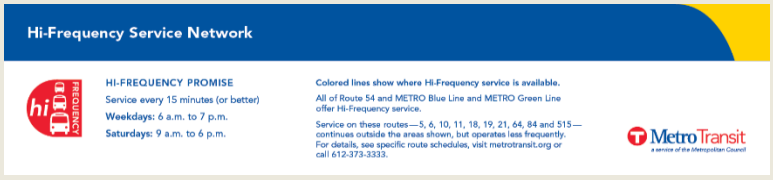


Portland's transit agency, TriMet, provides a separate map to easily highlight frequent bus and rail lines that operate every 15 minutes or better every day. The "Frequent Service" branding is also applied to other printed and online material and signage at bus stops. TriMet's frequent bus routes carry about 55% of all bus riders. In 2014, weekday ridership on frequent service bus lines increased by over 10%, and over 11% on weekends. By comparison, overall bus ridership increased by slightly less than 7%.

Source: TriMet

Metro Transit, Minneapolis-St. Paul, MN





Metro Transit in Minneapolis operates high-frequency bus and rail routes. Some routes operate at a lower frequency outside of the map area. Metro Transit's five highest-ridership bus routes are part of the high-frequency network.

Source: Metro Transit

A second branding opportunity is to provide unique branding for the enhanced bus services that UTA plans to develop in Salt Lake City. UTA already has a distinct brand for MAX Bus Rapid Transit service. It could similarly develop a unique brand for Enhanced Bus service. Both of these services would also be part of the frequent transit network, but would have additional transit priority features to improve bus speed and reliability, along with other amenities to enhance the passenger experience. Just as TRAX and FrontRunner are highly recognizable brands that communicate the regional role of these services, distinct branding would differentiate these two families of bus services. The sidebars below describe the RapidRide brand in Seattle and UTA's existing MAX BRT line.

RapidRide, Seattle, WA

RapidRide is one of Seattle's bus rapid transit systems, including fully branded vehicles, stations, and maps. Corridor improvements are geared toward reducing passenger travel time and increasing convenience. There are five existing lines (A, B, C, D, and E) and additional lines are planned. King County Metro implemented RapidRide service and capital improvements in three Seattle corridors between 2010 and 2014. All corridors have been successful in attracting new riders to the system, with increases in weekday ridership as high as 75% over the baseline service.

Source: King County Metro, http://metro.kingcounty.gov/travel-options/bus/rapidride/

MAX, Salt Lake City, UT

UTA launched MAX Bus Rapid Transit service in Salt Lake City in 2008. The current 10.8 mile route along 3500 South connects Magna and West Valley City with the 3300 South TRAX station. The route operates every 15 minutes between 5:30 a.m. and midnight. Using bus-only lanes between 2700 West and 5700 West and transit signal priority, MAX BRT has increased ridership by a third, reduced travel times by 15%, and linked MAX to TRAX to provide passengers with an efficient bus to rail connection. The service has a distinct look and feel to improve awareness and highlight its distinguishing features.

Sources: UTA Fact Sheet, ITS America http://www.itsa.org/awards-media/press-releases/779-smart_solution_spotlight_winner-_salt_lake_city%E2%80%99s_max_3500_south_bus_rapid_transit_(brt)_line

Information and Tools

Information and tools are a critical component of a legible transit system. UTA currently has two real-time information tools available at bus stops. The RideTime SMS texting service allows riders to text their stop ID to UTA-UTA (882-882) and receive a response with the next three bus departures at that stop. Information about RideTime is at http://www.rideuta.com/Rider-Tools/Ride-Time and signs are posted at bus stops. The signs also include a QR code[1] so people can simply scan the code and receive the information. The new Vehicle Locator feature on UTA's redesigned website (launched Feb 2016) also allows users with a mobile device to see where their bus is in real time.

In addition to the real-time information tools available at bus stops noted above, the City can work in partnership with UTA and the business community to install real-time information displays at bus stops. These should be prioritized along the FTN and other high ridership stops.

[1] A "QR code" is a machine-readable code consisting of black and white squares typically used for storing URLs or other information that can be read by a camera or on a smartphone.

SUMMARY OF RECOMMENDATIONS – TRANSIT INFORMATION AND LEGIBILITY

Below are specific recommendations to improve transit information and the overall legibility of the transit system in Salt Lake City. High priority strategies are highlighted in blue.

Figure 5-1 Transit Information & Legibility Recommendations

Recommendation category	#	What is the recommendation?	Why do it?	Who is responsible?	When should it happen?*
Real-Time Information	5.1	Provide real-time information displays at bus stops along the FTN; partner with the business community to help sponsor real-time information signs (see Chapter 6 for Stops and Stations recommendations in Figure 6-3 and Bus Stop Guidelines in Figure 6-4)	Real-time information allows people to travel without a schedule by letting them know *exactly* when the next bus will arrive	**Lead:** UTA **Support:** City businesses	Near term
Frequent Transit Network Brand	5.2	Establish a frequent transit network (FTN) brand that is highly visible and distinguishable from other service types; brand should expand UTA's existing frequent service branding to include: printed and web/app-friendly maps and schedule information, branded vehicles, and branded stops[1] (see RapidRide side bar)	A unified, unique visual representation of the FTN on the street and in all printed/online materials will help existing passengers understand where frequent transit service is and will build recognition among potential new customers	**Lead:** UTA **Support:** City	Near term
Transit Maps	5.3	Partner with UTA to add FTN level services to existing maps	As the FTN is implemented, it will be important to clearly communicate where service is located to existing and potential transit riders, especially in neighborhoods with a high propensity to ride transit	**Lead:** UTA **Support:** City	Near term
Wayfinding	5.4	Implement on-street wayfinding to direct people to transit service; integrate with GREENbike wayfinding and Downtown and Sugar House parking wayfinding initiatives[2]	On-street wayfinding is an initiative that the City can lead to help people access transit and help passengers connect to other destinations in the community	**Lead:** City **Support:** Downtown businesses	Medium term

1 It will be important to coordinate with UTA to determine how the FTN brand will be implemented on routes that extend beyond Salt Lake City boundaries.

2 The Downtown and Sugar House Parking Study (2016) recommends a parking communications plan focused on wayfinding, information, and branding.

*Note: Near term = within 2 years; medium term = 3-5 years; long term = 6-10 years

High priority strategy

Recommendation category	#	What is the recommendation?	Why do it?	Who is responsible?	When should it happen?*
Mobility Platforms & Transit Screens	5.5	Support development of a mobility platform that pushes real-time transit, rideshare, car share, bike share, Uber and Lyft, and other mobility service data to web and mobile platforms; integrate with the GREENbike app	A comprehensive mobility platform that integrates real-time information for transit, bikeshare, and car share helps people understand the various transportation options available and how they can be linked together to serve their transportation needs	**Lead:** App developers **Support:** City and UTA to provide open source data	Medium term
	5.6	Work with private developers to install real-time transit screens at central locations to display mobility platform data	Transit screens displayed in the lobbies of major employers, hotels, the airport, residential developments, and at local eating establishments help improve awareness of transportation options throughout the community and improve the usability of the transit system	**Lead:** City **Support:** Developers and businesses	Medium term
Multimodal Trip Planner	5.7	Work with UTA to develop a multimodal trip planner that helps transit riders plan trips that link seamlessly between modes; integrate with the GREENbike app	A multimodal trip planner allows passengers to better understand how biking, walking, or driving can help them link to the transit system, especially if transit service is not available at their front door	**Lead:** UTA **Support:** City and app developers	Long term
Integrated Technology Development	5.8	Promote development of integrated technology, including mobility kiosks, reader boards to assist travelers with mobility planning, shared payment opportunities, and opportunity for other evolving technology applications	With increased reliance on technology, transit agencies and partners will need to keep abreast of emerging technology, providing tools that help travelers transition seamlessly between modes	**Lead:** Private developers **Support:** City and UTA	Long term

[1] It will be important to coordinate with UTA to determine how the FTN brand will be implemented on routes that extend beyond Salt Lake City boundaries.

[2] The Downtown and Sugar House Parking Study (2016) recommends a parking communications plan focused on wayfinding, information, and branding.

*Note: Near term = within 2 years; medium term = 3-5 years; long term = 6-10 years

High priority strategy

EDUCATION AND OUTREACH

Education and outreach programs that strategically distribute transit information and resources to target audiences are another fundamental element of a complete transit system. A lack of knowledge and understanding are often the greatest barriers to transit use. Continuing to build on Salt Lake City's "transit culture" and improving the availability, effectiveness, and delivery of transit information through education and promotional programs is a powerful way for Salt Lake City to increase the number of people riding transit for more trips.

> "We should do more to encourage students using mass transit. This saves parents time, helps with air quality and creates new habits of using mass transit for future generations."
>
> - *"Design Your Own Transit System" Survey Respondent*

Salt Lake City has had great success with its 2014 Smart Trips Program in the Sugar House neighborhood. Building off of this success, the City can develop a broader transit marketing, education, and outreach program that educates the public on the benefits of transit. Strategies might include targeting specific neighborhoods along the frequent transit network as service enhancements are made and engaging in partnerships, such as economic development organizations and schools, to promote transit use.

Salt Lake City SmartTrips Program

In 2014, Salt Lake City launched a Smart Trips campaign to educate Sugar House households on the benefits of transportation options. The goal was to get at least 15% of targeted households to use public transit and active transportation.

Residents were provided with customized information kits on how to ride the bus, bike, and walk. **Drive-alone trips decreased by 21%** among SmartTrips participants.

Source: Salt Lake City, http://www.slcgov.com/ and https://smarttripsslc.wordpress.com/

LA Metro "Naughty/Nice" Campaign, Los Angeles, CA

In August 2008, Los Angeles Metro launched an aggressive public information campaign to educate people about the benefits of transit and the social ills resulting from auto dependency. LA Metro created an in-house ad agency that focused exclusively on communicating the benefits of public transit and improving the passenger experience. The goal was to improve the public's perception of transit and increase the number of discretionary riders.

Metro's "Opposites" campaign included online content, billboards, t-shirts, and on-board graphics to create a consistent brand. The brand communicated that Metro was the solution to many of the community's problems (congestion and greenhouse gas emissions, for example). Estimates show that the newly branded system and information campaign resulted in an increase in discretionary ridership from 22% to 36%.

LA Metro also sponsors a public art campaign in which they contracted with over 200 artists to beautify transit stops and stations.

Source: LA Metro "Promoting Mass Transit" Video.

SUMMARY OF RECOMMENDATIONS – EDUCATION AND OUTREACH

Below are specific recommendations for developing an education and outreach program for the transit system in Salt Lake City. High priority strategies are highlighted in blue.

Figure 5-2 Education & Outreach Recommendations

Recommendation category	#	What is the recommendation?	Why do it?	Who is responsible?	When should it happen?*
Centralized Transportation Options Program	5.9	Establish a transportation options program that provides information, education, and resources to residents, employees, and visitors	Education and outreach, particularly to employees and schools, can be a powerful way to increase the number of people taking transit	**Lead:** City **Support:** Business community	Near term
Public Information Campaign	5.10	Expand on UTA's existing public information campaigns to educate Salt Lake City residents, employees, and visitors on the benefits of transit	Lack of information is often a key barrier to riding transit	**Lead:** City **Support:** UTA, employers, neighborhood groups	Near term
Targeted Marketing	5.11	Continue to develop an individualized marketing/ SmartTrips program that targets neighborhoods along the frequent transit network as service improvements are made; a new resident program is also an effective way to reach residents when the move to the city	Individualized marketing programs are proven to shift travel behavior; aligning targeted marketing with service enhancements leverages transit investments; a new resident targeted marketing program provides information on biking, walking, taking transit, and sharing rides before new travel behaviors are established.	**Lead:** City **Support:** Neighborhood groups and UTA	Near term
Business Outreach	5.12	Develop a SmartTrips for Business program that provides information and resources to Salt Lake City employers related to transit, carpooling, bicycle parking, walking and biking routes, and other transportation options information	Cities like Portland, OR, have had great success with their SmartTrips for Business programs; commute trips are often the easiest to influence because they are predictable and often occur during times that auto travel is least attractive due to traffic congestion	**Lead:** City **Support:** Large employers, Downtown Alliance	Medium term

*Note: Near term = within 2 years; medium term = 3-5 years; long term = 6-10 years

High priority strategy

Recommendation category	#	What is the recommendation?	Why do it?	Who is responsible?	When should it happen?*
Other Outreach	5.13	Engage with other key partners such as tourism organizations, high schools, and the University to educate people about transit options and incentivize use of the transit system. This should include education and outreach to help people access transit trip planners, real-time information, and on-demand ride services on both desktop and mobile devices	Partner with tourism organizations to promote use of transit for visitors starting from the airport; partner with high schools to develop student passes like at West High to get students riding the bus at an early age; partner with universities to include transit information as part of new student orientation; partner with non-profits who work with populations that may not be comfortable with transit technology applications.	Lead: City Support: Tourism groups, high schools, universities, and non-profits	Medium term

*Note: Near term = within 2 years; medium term = 3-5 years; long term = 6-10 years

High priority strategy

FARE AND PASS PROGRAMS

Fare and pass programs can provide a seamless and more affordable way for individuals and families to ride transit. Improving the affordability of UTA fares for intra-Salt Lake City trips, large families, youth, and low-income residents was identified as a high priority for Salt Lake City residents during public outreach.

Salt Lake City's Hive Pass program has been a success to date. Hive Pass holders take more trips by transit. In a before and after survey conducted at the conclusion of the first year of the Hive Pass Program, the percentage of respondents who rode transit daily doubled once they had a Hive Pass. After improvements were made to the program in the second year, the number of daily riders jumped from 20% before the pass to 50% afterward. Similarly, the survey showed that people who rarely or never used transit before the pass were riding at least three days per week once they had a pass.

> "I would not be able to keep my job and get to work every day without [my Hive Pass]. I would not be able to afford the bus fare every day to get to and from work. The Hive Pass has really helped me to be successful." – A Hive Pass holder

Current UTA Payment Methods

Currently, UTA riders can purchase tickets at ticket vending machines, at Pass Sales Outlets, or online. Riders can also purchase a reloadable FAREPAY card to pay their fare. FAREPAY users simply tap the card reader when they board and tap off when they alight the vehicle.

Source: Nelson\Nygaard

SUMMARY OF RECOMMENDATIONS – FARE AND PASS PROGRAM

Below are specific recommendations for improving fare and pass programs in Salt Lake City. High priority strategies are highlighted in blue.

Figure 5-3 Fare and Pass Program Recommendations

Recommendation category	#	What is the recommendation?	Why do it?	Who is responsible?	When should it happen?*
HIVE Pass Expansion	5.14	Promote the HIVE Pass Program to get more passes into hands of people who are not currently using transit	The HIVE Pass Program provides an affordable option for people to ride transit in Salt Lake City	**Lead:** City **Support:** UTA	Near term
Fare Affordability	5.15	Explore fare affordability; work with UTA to determine next steps for establishing more affordable fare options for intra-Salt Lake City trips[1]	The standard $2.50 fare is high for many Salt Lake City families, especially for short trips within Salt Lake City. This undermines the competitiveness of transit against other transportation options, especially in areas where parking is free; a simpler and more equitable fare system is needed	**Lead:** UTA **Support:** City	Medium term
Mobile Ticket App	5.16	Work with UTA to develop a mobile ticket app that allows people to download all types of passes on a smart phone[2]	Mobile ticket applications make it even easier to ride transit by allowing passengers to download tickets on their smart phones at the click of a button – no exact change is needed	**Lead:** UTA **Support:** City	Medium term
Integrated Fare Payment System	5.17	Work with UTA to develop an integrated fare payment system that allows public transit, bike share, and car share users to use a single ticket or pass and/or launch a multimodal access pass that integrates mobile ticketing *and* membership for transit, bike share, car share, etc. (see Recommendation 5.8 Integrated Technology Development above)	A truly multimodal transportation system would allow travelers to use a single ticket or payment method for bike share, transit, car share, and parking	**Lead:** UTA **Support:** City	Long term

1 UTA's 2020 Strategic Plan highlights the need to "develop new fare products and equitable fare policies." https://www.rideuta.com/uploads/2020StrategicPlanFinalWebVersion.pdf

2 As of August 2016, UTA is in the process of procuring a vendor to develop mobile ticketing capabilities as well as developing a comprehensive strategic plan regarding all the fare payment options available (cash, paper, FAREPAY, electronic fare payment systems, mobile ticketing, etc.).

*Note: Near term = within 2 years; medium term = 3-5 years; long term = 6-10 years

High priority strategy

What is an Integrated Fare Payment System?

Fare integration between transit, bike share, and other transportation services reduces barriers to using transit by enabling the use of one payment media on multiple public and private transportation services. Simplifying fare payment can reinforce transit, bike share, and car share as an easy-to-use transfer option. Some systems coordinate fare policy—such as a discounted fixed-route transit fare for passengers who use bike share to access the route—to drive revenue and improve connections. These types of strategies are being investigated throughout North America and have been implemented in Europe and Asia. Several European examples are outlined below:

Location	Description
Paris, France[1]  Source: Navigo	The Navigo pass is an integrated transit fare payment method introduced in the Île-de-France region (which includes the city of Paris) in 2001. Bike share rental fees are structured similar to those of U.S. systems, however all membership types can be attached to a Navigo transit card as well. Both annual-subscription RFID cards and the Navigo transit card can be used at card readers at Velib stations. A separate bike share pass must be purchased, but it can be stored on the same physical card as a transit pass/ticket. Navigo uses the Calypso standard[2] and is an account-based system. Individuals can also rent a bike using direct debit (their personal debit card); a €150 fee is held against their card until the bike is returned (within 24 hours).
Montpellier, France[3]  Source: Transports de l'Agglomération de Montpellier	The Velomagg system has 50 stations, with several hundred bicycles available for short-term use, which are operated by and co-branded with the transit agency. The fully integrated fare structure offers free day use for transit pass holders. Users can track their account information online by using an account number and date of birth. The Velomagg program also includes electric bicycles, trailers for children, and long-term (12-month) rentals. Transit rides more than doubled over a 10-year period with the fare and branding integration.
Bordeaux, France[4] Source: Tram et Bus de la Cub	Bordeaux's bike share system—Vcub—has 1,500 bikes and nearly 150 stations. It was designed in conjunction with transit, with 90% of stations co-located with transit stops. The regional RFID transit card can also be used to check out bikes at a discounted subscription rate. The bike share launch was held back five months to wait for the new bus and tram lines to launch at the same time.
London, England[5]  Source: Transport for London	Transport for London (TfL) is considering adding Santander Cycles to their transit smartcard (the Oyster Card). The Oyster Card has been in use for over a decade. To make this integration work, TfL would require Oyster Card users who use the bike share system to store a deposit on their cards to secure against stolen bikes.

http://www.bikearlington.com/tasks/sites/bike/assets/File/Arlington_County_Capital_Bikeshare_TDP_FY2013-2018_Nov2012.pdf

[2] http://en.wikipedia.org/wiki/Calypso_(electronic_ticketing_system)

[3] Darren Buck. "Transit with Bike Sharing: Overview of Practice and Potential." October 16, 2012. Presented to Rail~Volution Conference. https://bikepedantic.files.wordpress.com/2012/08/railvolutiondgboct2012.pdf

[4] http://bike-sharing.blogspot.com/2010/02/bordeauxs-new-v-bike-sharing-flirts.html

[5] http://cycle.travel/city/london/news/hire_a_boris_bike_with_your_oyster_card

PARKING MANAGEMENT

The quantity, location, and price of parking has a significant impact on the use of all transportation infrastructure. Large amounts of low-cost or free parking incentivizes travelers to drive and park, rather than walk, bike, or take transit.

Parking management policies that support transit use include pricing parking relative to demand and availability of transportation options, shared parking between uses, unbundled parking from unit costs in housing developments, and removing minimum parking requirements for new development or even implementing maximum requirements in higher-density neighborhoods with ample transportation options available.

Salt Lake City already has several parking policies in place that support transit:

- **No minimum parking requirements in Transit Station Area districts:** Within the "core" of Transit Station Area (TSA) districts, no minimum number of parking spaces is required for any use.
- **Shared parking:** The zoning code recognizes that different land uses have different periods of peak demand, and different uses can share parking supply to reduce the overall number of spaces provided. Chapter 21A.44.040.B.1 provides the required methodology for determining shared parking supply based on land use, time of day, and day of the week.
- **Parking reductions for pedestrian-friendly development:** Chapter 21A.44.040.B.8 also allows for a reduction in parking spaces if the proposed development includes elements that improve walkability near the project. The provisions only apply to "recreational, cultural or entertainment" or "retail goods and services" land uses in the CB, CN, RB, MU, R-MU, R-MU-35, and R-MU-45 districts.
- **Parking reductions for proximity to mass transit:** The minimum number of spaces can be reduced by 50% if the project (new multi-family residential, commercial, office or industrial land uses are eligible) is located within 1/4 mile of a fixed transit station.
- **Parking reductions for transportation demand management plans:** To reduce the number of single-occupant vehicle trips, the parking code (Chapter 21A.44.050) allows for adjustments to the parking requirements if TDM programs are included. The provisions only apply to uses requiring at least five parking spaces. A 25% reduction or increase in parking is allowed if "major" or "minor" strategies are utilized.

SUMMARY OF RECOMMENDATIONS – PARKING MANAGEMENT

The figure below includes a recommendation to improve parking management policies to support the recommendations of the Transit Master Plan. High priority strategies are highlighted in blue.

In addition to these new recommendations, the Salt Lake City Downtown and Sugar House Parking Study includes a number of transit-related recommendations (see sidebar below).

Figure 5-4 Parking Management Recommendations

Recommendation category	#	What is the recommendation?	Why do it?	Who is responsible?	When should it happen?*
Parking Management Studies	5.18	Initiate additional parking studies for areas beyond Downtown and Sugar House to support the FTN	Model new studies on the Salt Lake City Downtown and Sugar House Parking Study	Lead: City Support: n/a	Near term
Parking Management Oversight and Coordination	5.19	Consolidate management of the City's parking functions to improve overall coordination of parking policies, align parking supply with demand, and enhance the convenience and ease-of-use of parking systems	Effectively utilize parking assets and support the City's overall transportation and mode choice goals	Lead: City Support: n/a	Near term

*Note: Near term = within 2 years; medium term = 3-5 years; long term = 6-10 years

High priority strategy

Salt Lake City Downtown and Sugar House Parking Study (2016)

The Downtown and Sugar House Parking Study (which is scheduled to be completed in Fall 2016) includes several strategies that support transit:

- Ensure that parking is appropriately regulated with effective parking enforcement near transit stations and stops.
- Prioritize active space over parking in the areas immediately around transit stops; effective enforcement is a critical element.
- Coordinate transportation policies across modes to support parking management. Put transit, bicycle, and pedestrian considerations on equal footing with decisions about parking in transportation impact review and other land-development processes.
- Ensure that decisions about parking requirements, pricing, and design are coordinated with overall mobility goals and multimodal investments.
- Revise minimum and maximum parking requirements to simplify the parking code, incentivize shared parking, and modify electric vehicle and bicycle parking requirements.
- Require a TDM program for any new residential development with 10 or more units and any new non-residential development with more than 20,000 SF of net new space in the D1-D4, TSA, and G-MU districts.
- Require that all shared parking be "priced" in D1-D4, TSA, and G-MU districts via unbundling and direct pricing.

Source: Draft Salt Lake City Downtown and Sugar House Parking Study (2016)

6 LAND USE & PLACEMAKING

6 LAND USE & PLACEMAKING

Continued investment in Salt Lake City's transit system is critical to providing equitable, affordable mobility options for residents, workers, and visitors. Transit also supports economic development and opportunity to create safe, walkable, and vibrant neighborhoods. This chapter supports existing City goals and policies to coordinate community planning and design efforts in the areas surrounding transit stops and stations.

TRANSIT-SUPPORTIVE LAND USE AND DESIGN

Attractive and convenient transit service is not just about how often the bus arrives and where it goes; it also depends on the attractiveness of the street, the density and mix of land uses, and a connected street network and safe and convenient crossings that allow bicyclists and pedestrians to easily and safely access transit service. Past Salt Lake City planning efforts have prioritized the connection between transit, land use, and community design, including the following:

- Encourage transit-oriented development (Plan Salt Lake, 2014)
- Create a system of connections so that residents may easily access employment, goods and services, neighborhood amenities, and housing (Plan Salt Lake, 2014)
- Encourage development of transit oriented development (TOD) through form-based codes and allowed increased density within a 10-minute walk of TRAX, streetcar and high-frequency bus routes (Salt Lake City Downtown Community Plan (2014)
- Support transit-oriented development as well as adequate, reliable public transportation so that residents may easily access employment, goods and services, and housing (City Council Philosophy Statements, 2012)

Land Use and Design - Key Concepts

Building off of existing plans and policies, the Salt Lake City Transit Master Plan recognizes the importance of land use, street connectivity, and placemaking to implement a well-used and attractive frequent transit network (FTN). The FTN must be supported by a concentration of land uses, connections to key destinations, a rich mix of uses, and interconnected streets. The Transit Master Plan embraces these concepts to help achieve the City's goals to increase transit ridership in Salt Lake City. Key land use and design concepts are described below.

Concentrate and intensify activities near frequent transit. High density development should be encouraged in areas served by the FTN. There is a strong correlation between land use density and transit demand. Residential densities should be at least 10–12 households per acre for corridors that receive high-frequency transit investments and/or have more than 12–16 jobs per acre (see Figure 6-1). For example, the dense market between the central business district and the University support high ridership on multiple bus and rail lines.

Align major destinations along reasonably direct corridors served by frequent transit. An efficient transit route connects multiple high-demand destinations in a reasonably direct line to minimize out-of-direction travel. It connects major trip origins and destinations along the route and has major activity centers at each endpoint, providing a steady flow of passengers boarding at all points. The proposed FTN was identified based in part on the presence of major activity centers along transit corridors. Transit must efficiently connect to destinations and be accompanied by a walkable street environment, a mix of uses, and safe and convenient access to transit service.

Provide a rich mix of uses that support street-level activity throughout the day and night. A diversity of land uses (including residential, commercial, industrial, institutional, and recreational uses) promotes walking and transit ridership, and reduces driving. A mix of land uses allows more daily needs to be met within shorter distances, encouraging people to walk and take transit for more trips. Land use diversity also creates a more interesting and active urban environment that makes walking and taking transit feel safer and more attractive at all times of the day and night.

Support transit access by providing safe and convenient crossings. Every transit rider is at some point a pedestrian, whether they are dropped off at a park-and-ride or walk from their home to access transit. Research published by Transit Center in July 2016 (see sidebar) found that 80% of transit riders walk to transit. Safe and convenient access to transit is essential to building transit ridership. Of utmost importance is to ensure that crossings are conveniently located and well-marked. Strategies include interior block connections and mid-block crossings, in addition to other strategies discussed in further detail in Chapter 4.

Interconnect streets in a grid pattern shorten distances between transit stops and destinations. Intersection density strongly influences transit ridership. Short blocks and well-connected streets make it easier and faster to access transit and contribute to a high-quality pedestrian experience. Block length is a challenge in Salt Lake City; the recommendations in Chapter 4 support safer and more accessible streets that will help people access transit more easily and feel safe doing so.

Who's On Board 2016: What Today's Riders Teach us about Transit that Works

A study published by Transit Center in July 2016 supports the importance of comfortable and convenient access to transit and locating transit near a mix of uses:

- 80% of "all-purpose" transit riders walk to transit
- All-purpose ridership – or those who ride transit for all types of trips – is stronger where it is easy to walk to transit and where transit is frequent and provides access to many destinations within walking distance

Source: Transit Center. "Who's on Board 2016: What Today's Riders Teach us about Transit that Works." http://transitcenter.org/wp-content/uploads/2016/07/WOB-2016-7_12_2016.pdf

Transit service and land use should complement each other. Transit service is most efficient in areas that have a moderate-to-high density of people and jobs, a variety of destinations, and good bicycle and pedestrian access.

Source: Lance Tyrrell

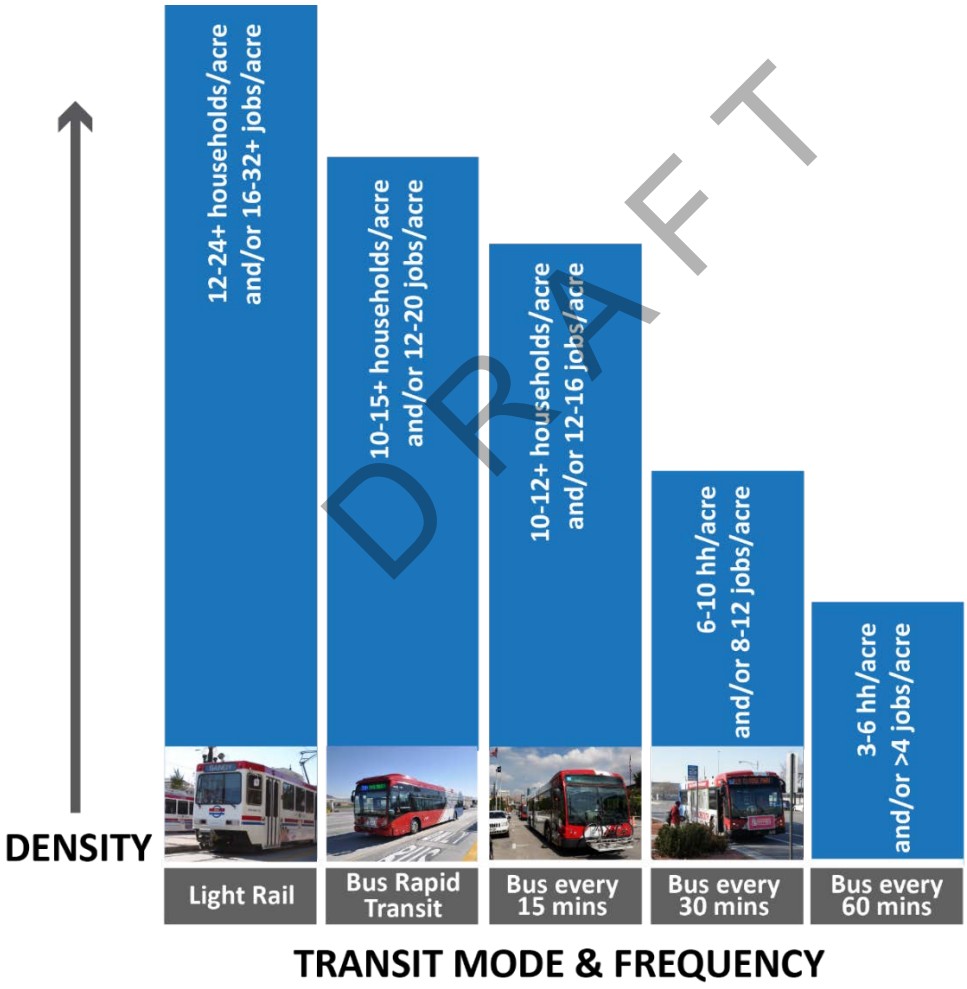
Land Use Density and Transit in Salt Lake City

The value of investment in the frequent transit network is exponential when supported by land use policies and strategies that facilitate activity density where transit service quality and capital investment is highest. In any growing city, the success of transit in attracting riders is dictated by the type and density of development and the other characteristics of urban form. Similarly, higher-density development depends on high-quality transit service to move large numbers of people efficiently on limited street right-of-way. Therefore, it is advantageous to develop land use and transit policies in concert to ensure their mutual benefit and success. Salt Lake City should work with UTA to ensure quality transit will be available when land use and street design take transit-oriented forms.

While transit service and infrastructure investment are primarily controlled by UTA, Salt Lake City can influence development along the FTN. Furthermore, Salt Lake City can work with UTA to ensure that transit service levels are adequate to support areas as they grow and become more transit-oriented. The Transit Master Plan does not dictate priorities for land use plan updates; rather it provides information for coordination of land use plans, to ensure that future land development patterns are supportive of Transit Master Plan goals.[1]

The thresholds outlined in Figure 6-1 relate density of households and jobs to transit service quality (based on industry standards for when service and capital investments are justified). These thresholds were used to develop FTN recommendations and can be adjusted over time as land use changes. The densities outlined in Figure 6-1 should occur on average in an area; there may be much higher concentrations adjacent to stations and lower concentrations further from station areas. As areas in Salt Lake City reach certain densities, service levels should be adjusted.

Figure 6-1 Transit Mode & General Frequency by Gross Density



Source: Adapted from TCRP Report 100: Transit Capacity and Quality of Service manual, TCRP Report 102: Transit-Oriented Development in the United States, and other sources; employment is converted from household density based on a typical relationship of 4 jobs: 1 dwelling unit.

[1] Note: The Transit Master Plan does not include any specific land use or zoning recommendations; area master plans could be re-visited to bring density to match desired transit service levels.

Standards for New Development

Salt Lake City also plays an important role in working with developers to set standards for new development. These standards can help ensure land uses support the FTN, including:

- **Parking management policies:** The number of parking spaces and whether or not parking is free for employees and visitors (see Chapter 5).
- **Transportation Demand Management (TDM) policies:** Integrating TDM plans and strategies into the approval process for new development can ensure that developments of certain sizes, that meet certain thresholds, or that are located in certain places implement TDM strategies (such as subsidized bus passes, on-site transportation coordinators, etc.).
- **Bicycle, pedestrian, and transit improvements:** Depending on the size or location of the development, the City could require specific bicycle and pedestrian improvements or bus stop improvements be implemented as a requirement of development approvals.
- **Pedestrian-oriented design:** Identify design standards that promote pedestrian-oriented urban design features, such as active frontages built right to the street with parking located at the rear of the building and landscaping that provides a buffer between the sidewalk and the street. See Chapter 4 for further details on pedestrian improvements to the right of way.

City policies that promote pedestrian-oriented design support use of transit.

Source: Lance Tyrrell

SUMMARY OF RECOMMENDATIONS – LAND USE

The recommendations below provide guidance for how land use policies can support success of the Transit Master Plan. High priority strategies are highlighted in blue.

Figure 6-2 Land Use and Placemaking Recommendations

Recommendation category	#	What is the recommendation?	Why do it?	Who is responsible?	When should it happen?*
Land Use	6.1	Concentrate and intensify uses along the Frequent Transit Network	Density is a key driver of transit ridership	**Lead:** City **Support:** Developers	Ongoing
	6.2	Establish density thresholds that indicate when certain frequency levels are justified (see Chapter 2 Service)	Density is a key indicator for transit ridership	**Lead:** City **Support:** UTA	Near term
	6.3	Continue to monitor zoning along the FTN to ensure transit is supported by a mix of uses, adequate densities, parking requirements, and other transit supportive elements[1]	Zoning can help support transit service with mixed use development, streetscape elements, and transit-supportive parking requirements	**Lead:** City **Support:** n/a	Near term
	6.4	Provide a mix of housing options along the FTN to support housing affordability and diversity	Providing a mix of housing options along the FTN is critical to affordability and diversity of residents, leading to better, more active public spaces and the creation of an equitable city	**Lead:** City **Support:** n/a	Medium term

[1] Zoning around the FTN could include: increased development capacity, maximum zoning setbacks, outdoor seating, active frontage buildings, increased bicycle parking requirements, reduced minimum parking requirements, and limitations of driveways that cut across sidewalks where pedestrians access transit. Salt Lake City's Transit Station Area Development Guidelines (which has been successfully applied along North Temple and 400 S) provides guidance for development near transit stations, including mix of uses, housing affordability, development density, accessibility, parking, and other urban design elements.

*Note: Near term = within 2 years; medium term = 3-5 years; long term = 6-10 years

High priority strategy

Recommendation category	#	What is the recommendation?	Why do it?	Who is responsible?	When should it happen?*
Placemaking & Design	6.5	Provide interior block connections, mid-block crossings, and a pedestrian and bicycle network that connects to destinations and transit stops (See Chapter 4 Access, recommendation 4.1)	A well connected pedestrian and bicycle network supports access to transit	**Lead:** City **Support:** n/a	Ongoing
	6.6	Direct economic development activities to locate transit-supportive uses, such as cafes, restaurants, shops, etc. along the FTN	These types of uses contribute to an attractive streetscape	**Lead:** City **Support:** Business community	Near term
	6.7	Create community gathering places around transit stops and stations (such as plazas, parklets, squares, or parks), consistent with the City's Parklet Pilot Program Design Guidelines.[2] (See also parklet sidebar)	Community gathering places near transit make transit a more attractive option	**Lead:** City **Support:** Business community	Ongoing
	6.8	Invest in shade treatments, weather protection, pedestrian-scaled lighting, street furniture, bus shelters, street trees, and public art to enhance the attractiveness and safety of the street environment surrounding the FTN	Provision of these elements makes the street a more attractive and safe place and facilitates access to transit	**Lead:** City **Support:** Business community	Near term
Development Standards	6.9	Integrate transportation demand management (TDM) strategies into the development review process by either requiring or incentivizing TDM Plans for new developments[3]	TDM Plans ensure that transit-supportive programs and infrastructure are implemented as service enhancements are made	**Lead:** City **Support:** Development community	Medium term

[2] Salt Lake City Outdoor Design Guidelines & Parklet Pilot Program, Parklet Pilot Program Design Guidelines, Summer 2013, p 9 of PDF. http://www.slcdocs.com/planning/projects/odpf.pdf

[3] This would require an assessment of which new developments would be required to develop and implement TDM Plans (either based on geographic location and/or number of employees, number of residential units, or square footage).

*Note: Near term = within 2 years; medium term = 3-5 years; long term = 6-10 years

High priority strategy

Seattle's Parklet Program

A concept originated in San Francisco, parklets re-purpose street space for people instead of cars by providing space for the general public to sit and enjoy the street where existing narrow sidewalks would preclude such occupancy. The City of Seattle launched its Pilot Parklet Program in summer 2013 to evaluate how well parklets would serve neighborhoods and businesses in Seattle. The evaluation showed that the pilot program was a resounding success. Today, the now permanent program has enabled dozens of parklets across the city. Parklets are paid for by the businesses that sponsors them, including design, materials, construction, and maintenance costs, as well as review and permit fees (about $1,000 for the first year). Additionally, businesses pay $1.56 per square foot for the use of the space each year (the same fee as for a sidewalk café) since the business is making money by using the right-of-way. If the parklet is in an area with paid parking, there is also a fee of $3,000 per space per year for the recovery of lost parking revenue.

This parklet in Seattle provides a comfortable and inviting place for people to dine and visit.

Source: City of Seattle

Temporary parklet created in the 21st and 21st business district under Salt Lake City's pilot program. A permanent design is being developed for this location.

Source: Salt Lake City

STOPS AND STATIONS

Transit stops and stations are important destinations that can bring people together and build community. More than just a connection to the transit system, stops and stations must be comfortable, weather-protected, and well-lit.

Figure 6-3 and Figure 6-4 provide recommendations for a range of transit facilities in Salt Lake City, including:

- **Intermodal Hubs**. Existing facilities at Salt Lake Central and North Temple Station support connections between FrontRunner, TRAX, and local and regional bus routes, as well as with intercity transit providers at Salt Lake Central. A small park-and-ride facility is located at Salt Lake Central. UTA plans to develop a small park-and-ride facility at north Temple Station; this would be integrated into new development.
- **Transit Center**. As described in Chapter 2, two transit centers are recommended to support transfers on the FTN. These include one in East Downtown, in the vicinity of 200 S and 700 E, and on the University of Utah campus.
- **Mobility Hubs**. As described in the sidebar below, mobility hubs facilitate transfers between intersecting bus lines and other mobility options including car and bike sharing.
- **Transit Stations**. Transit stations provide a higher level of passenger capacity and investment in amenities at TRAX light rail and Bus Rapid Transit stations. For TRAX stations, the UTA First-Last Mile Study differentiated between Multimodal and Urban/Institutional Stations based on urban context; existing park-and-ride facilities are located at several of the Multimodal TRAX stations, including Ballpark and Central Pointe Stations.
- **Transit Stops**. While stop amenities are better in Salt Lake City than throughout the UTA system, of the over 1,200 bus stops in Salt Lake City, only 17% of bus stops have a bench or a shelter for people to wait for transit to arrive. Salt Lake City recently adopted Bus Stop Guidelines (which were adapted from the UTA guidelines); see Figure 6-6. The Transit Master Plan supports the implementation of these guidelines for prioritizing stop improvements based ridership levels and also recommends prioritizing improvements on a corridor basis along the Frequent Transit Network.

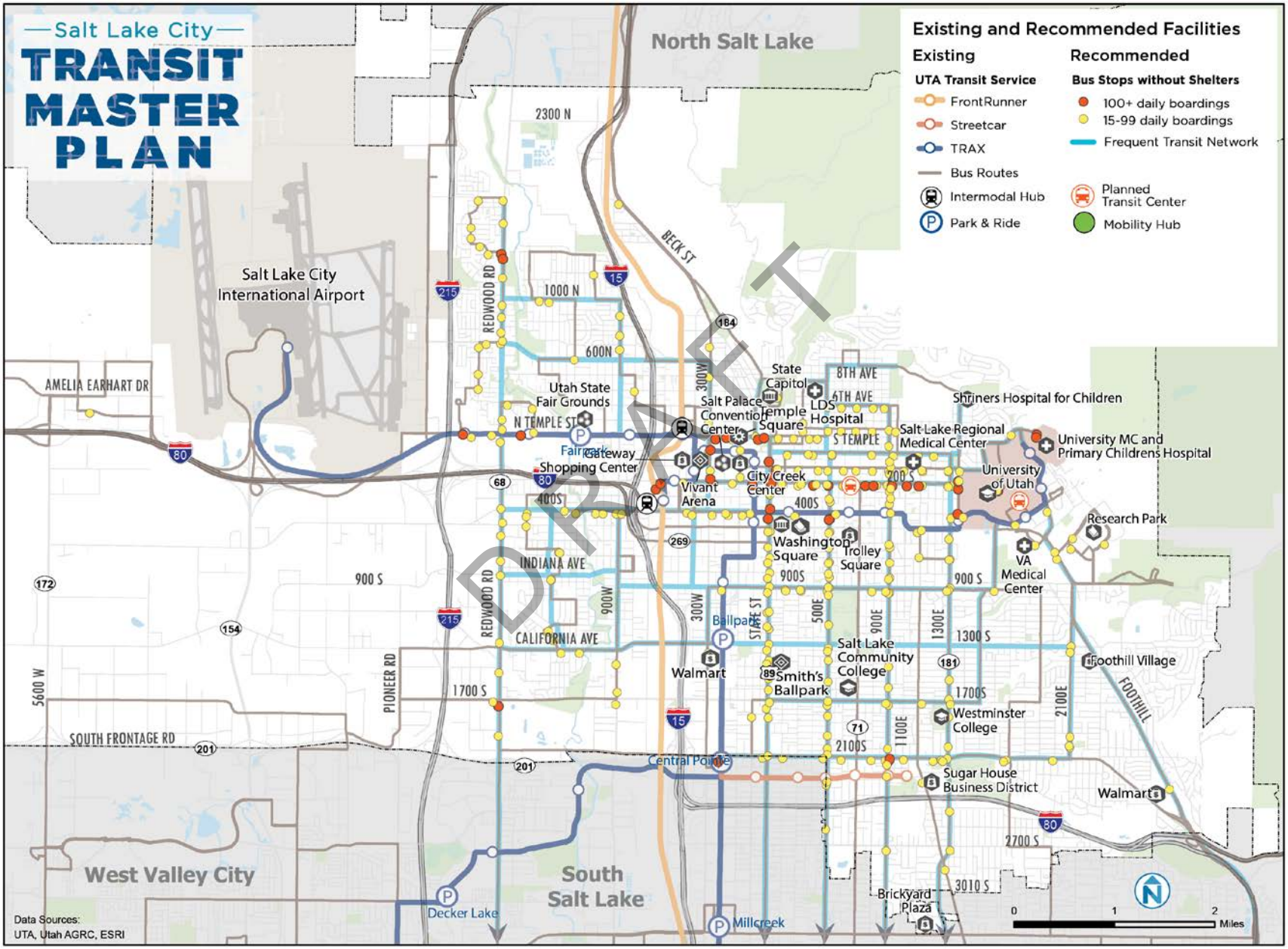
There is also an opportunity to leverage support from the private sector; for example, as new developments are built, the City can provide business owners and developers with incentives if they sponsor and/or build transit stops and stations.

Figure 6-3 Facilities Hierarchy and Amenity Prioritization Guidelines

				Modes			Access (Context-Appropriate)				Other Amenities [2]	
Facility Type	Station Typology [1]	Location(s)	Existing / Proposed	Front-Runner	TRAX / Streetcar	Bus	Park & Ride	Car Share	Bike Share	Bike Parking [2]	Shelter and Seating	Information and Fare Technology
Intermodal Hub	Multimodal	Salt Lake Central	Existing	X	X	X	X	X	X	Bike racks and secure parking	Custom shelters	Real time information; pre-board fare payment
	Multimodal	N. Temple	Existing	X	X	X	Future	X	X			
Transit Center	Urban/Institutional	200S & 700E	Proposed	-	-	X	-	X	X			
	Urban/Institutional	Univ. of Utah	Proposed	-	X	X	-	X	X			
Mobility Hub	Urban/Institutional	Various – see map	Proposed	-	X	X	-	X	X	Bike racks and/or secure parking	Based on stop guidelines	
Transit Station (TRAX/BRT)	Multimodal	Various	Existing or Future	-	X	X	Context Appropriate	X	X	Bike racks and/or secure parking	Custom shelters	
	Urban/Institutional	Various	Existing or Future	-	X	X	-	X	X	Bike rack		
Transit Stops [2]	Tier I (≥ 200 boardings per day)	Various	Various	-		X	-	-	X	Bike rack	Custom Shelter	
	Tier II (150 to 199 boardings per day)	Various	Various	-		X	-	-	X		16’ ADA shelter	
	Tier III (100 to 149 boardings per day)	Various	Various	-		X	-	-	-		12’ ADA shelter	
	Tier IV (15 to 99 boardings per day)	Various	Various	-		X	-	-	-		8’ ADA shelter	Schedule; real-time info. access panel
	Tier V (1 to 14 boardings per day)	Various	Various	-		X	-	-	-		Bench or Simme Seat [3]	Real time access information panel

Notes: [1] A station typology for TRAX and FrontRunner stations was a key outcome of the UTA First-Last Mile Study, including Urban, Multimodal, and Institutional station types in Salt Lake City. These designations are based on the built environment are each transit station. A map is provided in Figure 6-5 of the Fact Book (See Appendix A). [2] The Salt Lake City Bus Stop Design Guidelines, adapted from UTA’s bus stop guidelines, prioritize stop amenities based on boarding thresholds and provide additional details on the types of amenities recommended for each stop tier. Amenities are also prioritized based on available funding. [3] A seat that is incorporated into the bus stop sign.

Figure 6-4 Facilities Map



SUMMARY OF RECOMMENDATIONS – STOPS AND STATIONS

Recommendations related to improving stops and stations are described below. High priority strategies are highlighted in blue.

Figure 6-5 Stops and Stations Recommendations

Recommendation category	#	What is the recommendation?	Why do it?	Who is responsible?	When should it happen?*
Stop and Station Upgrades Along the FTN Network	6.10	Stop and station upgrades should be prioritized along the FTN, in alignment with the priority corridors recommended for service upgrades	Implementing stop enhancements along an entire corridor in conjunction with enhancements to the frequency of transit service and other elements to support a coherent look and feel along a corridor work in concert to allow transit service to be more accessible, comfortable, and attractive	UTA/City Partnership	Near term
Transit Shelter Program	6.11	Initiate a Transit Shelter program that allows a private company to own/maintain transit stops and stations in exchange for advertising space	Transit stops and stations are improved and maintained at no cost to UTA or the City	Lead: Private company Support: UTA	Medium term
Developer Incentives	6.12	Create incentives for developers to build or improve transit stops as part of the development review process	This program ensures transit stops are built and improved where new development occurs	Lead: City Support: UTA	Near term
Mobility Hubs	6.13	Implement mobility hubs along the FTN that integrate high ridership stops, bike sharing stations, bike fixit stations, and car sharing options	Mobility hubs are important focal points for community and transportation activity	Lead: City Support: UTA, Wasatch Front Regional Council (WFRC)	Long term
Park and Ride Facilities	6.14	Integrate shared use park and ride into new development at North Template intermodal hub as opportunities arise.	Context-appropriate park & rides at intermodal hubs help commuters access regional transit, e.g., Frontrunner	Lead: UTA Support: City	Long term

*Note: Near term = within 2 years; medium term = 3-5 years; long term = 6-10 years

High priority strategy

Salt Lake City Bus Stop Design Guidelines

Salt Lake City developed guidelines for bus stops and bike share stations in 2014. These guidelines are aligned with UTA standards and ridership thresholds for prioritizing improvements.

Figure 6-6 Salt Lake City Bus Stop Guidelines and Ridership Thresholds

Tier	Bus Stop Amenity	# of Average Daily Boardings
Tier I	Custom shelter with bench; bike rack; trash receptacle; shielded lighting; current bus schedule; real-time bus data; pre-board fare pay facility; vegetation[1]	≥ 200 boardings per day
Tier II	16' ADA compliant shelter with bench; bike rack; trash receptacle shielded lighting; current bus schedule; real-time bus data; pre-board fare pay facility; vegetation[1]	150 to 199 boardings per day
Tier III	12' ADA compliant shelter with bench; bike rack; trash receptacle; shielded lighting; current bus schedule; real-time bus data; pre-board fare pay facility; vegetation[1];	100 to 149 boardings per day
Tier IV	8' ADA compliant shelter with bench; bike rack; current bus schedule; route information panel with instructions on accessing real-time arrival data; vegetation[1]	15 to 99 boardings per day
Tier V	Seating (bench or Simme Seat[2]) on hard surface; bike rack; route information panel with instructions on accessing real-time arrival data	1 to 14 boardings per day

Notes: [1] Shade tree, or planter at least 36" diameter and 24" tall with maintained vegetation within 10' of primary bus stop feature. [2] A seat used by UTA that is incorporated into the bus stop sign. See guidelines for examples.

Source: Adapted from Salt Lake City Bus Stop Design Guidelines, which are based on UTA Bus Stop Design Guidelines

What is a Mobility Hub?

The goal of a Mobility Hub is to fully integrate the transit network with multimodal access and connections at the intersection of Frequent Transit Network corridors. Mobility Hubs include pedestrian and bicycle improvements and other sustainable modes (e.g., car or bike sharing) designed to connect transit passengers to adjacent neighborhoods and nearby land uses. Key elements of a Mobility Hub include:

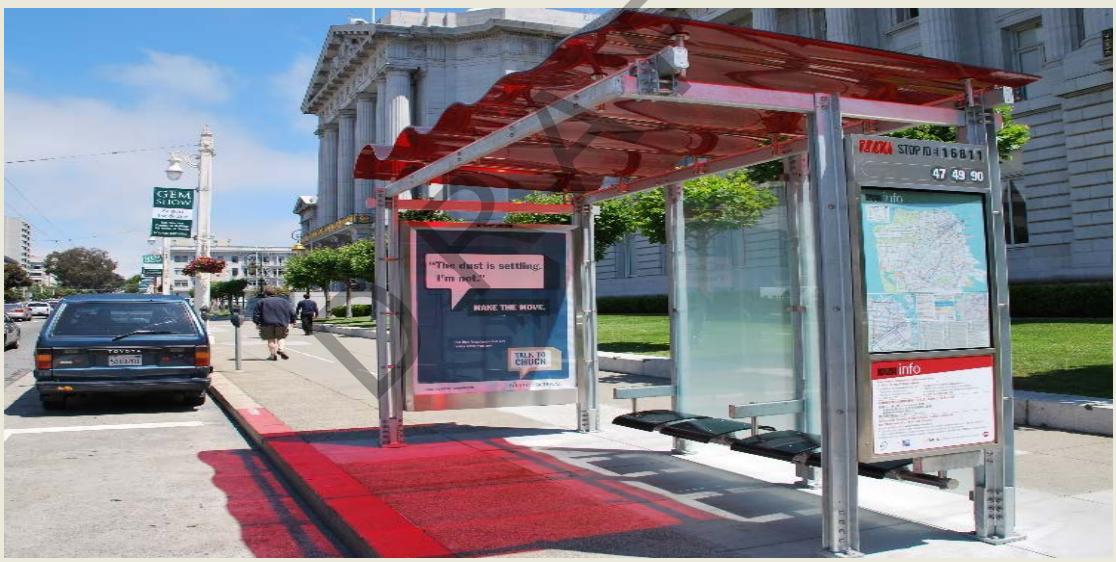
- Accessible, universal design allows people of all physical abilities to access transit stops/stations and nearby destinations
- Shared mobility services—including bike share stations, car share vehicles, and loading space for other private or shared mobility services—enable access outside of the stop walkshed
- Integrated mobility technology—including kiosks, reader boards with real-time information on transit and other modes, and shared payment interfaces—assists travelers with trip planning and arranging shared rides, and provides opportunities for other evolving applications
- Placemaking elements, such as public art and seating, active street environments with a mix of land uses, and strong land use anchors invite social interaction and vibrant business opportunity
- Secure, covered bicycle parking and access to the surrounding bicycle transportation network
- Excellent pedestrian infrastructure within a quarter- to half-mile walkshed
- Context-appropriate parking, including shared and/or paid on- and off-street parking

Transit Shelter Program, San Francisco, CA

San Francisco Municipal Transportation Agency (SFMTA) was one of the first transit agencies to develop a formal shelter program in 1987. The purpose of the program was to replace old shelters in San Francisco with new shelters that provide improved travel information, seating, lighting, and weather protection and to maintain the shelters on an ongoing basis to keep them in good repair. Previously, many shelters were not well maintained and had become covered in graffiti.

SFMTA initiated its shelter program through an innovative arrangement with a private contractor, CBS Outdoor. Under the arrangement, the contractor owns and maintains the shelters and pays for improvements. SFMTA does not pay the contractor to manage the shelters; the contractor pays for the improvements by selling advertising, which is placed prominently in the shelters. In 2007, SFMTA entered into a 15-year contract with Clear Channel with the option of one 5-year renewal after 2017. The contract with Clear Channel requires that the company install between 1,110–1,500 new shelters over five years, replace 39 kiosks, provide 1,500 traffic controllers, and install 3,000 solar-powered customer-information signs. It stipulates that the contractor make a one-time signing payment of $5 million and pay $500,000 for administration costs. In addition, they will make minimum annual payments to the agency during the duration of the contract—for example, they will have to pay $8.6 million to SFMTA in 2010.

Note: In these types of partnerships it is important to have clear guidelines written into the contract that indicate where stops are upgraded to make sure these shelters are equitably distributed to neighborhoods based on Salt Lake City's prioritization scheme not based on advertising markets.



SFMTA bus shelters are made of recycled materials and include energy efficient LED lighting, wireless internet, real-time arrival information through NextMuni, and Push to Talk capabilities for customers with low vision.

Source: Jamison Wieser on Flickr

7 IMPLEMENTATION & FUNDING

7 IMPLEMENTATION AND FUNDING

This chapter highlights key strategies to implement the service, capital, and programmatic recommendations and policies in the Transit Master Plan. It provides additional guidance on implementation and outlines potential revenue sources the City and UTA can use to fund these enhancements and programs, and options for structuring the relationship between the City and UTA to most effectively meet Transit Master Plan goals.

IMPLEMENTATION

The previous chapters of the plan summarize the implementation strategies. This section highlights the overall priorities for the City, identifies key strategies to build momentum for the plan in the first year following adoption, and provides additional guidance on how the City and UTA can implement the frequent transit network (FTN) and employer and residential-oriented local shuttle and ride services partnerships to improve connections to the FTN.

Key Transit Master Plan Strategy Areas

Salt Lake City Transit Master Plan strategies fall into four basic categories. Within each strategy area, the City and UTA should look to implement relatively quick "wins" that are achievable given current funding levels, make the transit system more usable, and demonstrate the benefits of faster, more reliable, and frequent service that operates all day every day.

- **Implement a frequent transit network** to provide reliable, efficient, and frequent transit service all day every day that takes advantage of the City's strong street network grid. The FTN would be implemented through enhanced or new fixed-route service, including longer hours of operation on weekdays and on weekends, increased frequency, service on new corridors, and route extensions to more directly serve key destinations.

  Initial priorities include:

  - **"Buying up" evening service on key routes.** One of the most significant gaps in transit service is on weekday evenings (see Appendix A, State of the System Report, Figures 4-5 and 4-11). Providing service longer into the evenings makes transit more usable for both work and non-work trips. (The concept of buying up service is described below.)
  - **Implementing frequent service in the 200 S corridor**, in coordination with capital improvements (see below for more detail).
- **Develop pilot programs and partnerships for employer shuttles and on-demand ride services** that extend the reach of fixed route service for employment areas or neighborhoods that lack sufficient density or demand to support cost-effective frequent transit service.
- **Develop enhanced bus corridors** that help transit run faster and more reliably and offer high quality stop amenities that make riding transit comfortable and attractive. **An initial priority is to implement more frequent service and capital**

improvements on 200 S, a primary east-west transit corridor for bus (and potentially future bus rapid transit and/or streetcar) service between downtown and the University. The City and UTA have already partnered to enhance stops on 200S and UTA provides a relatively high level of service (15-minute weekday service from about 6 am to 8 pm). Enhancing service and facilities on this corridor is a key step in implementing a grid transit network since it enables convenient transfers from routes serving north-south transit corridors.

- **Implement a variety of transit-supportive programs and transit access improvements** that overcome barriers to using transit in terms of information, understanding, and access (including pedestrian and bicycle facilities and affordability). **Initial plan priorities include:** Developing a highly visible frequent service brand and focusing access improvements, rollout of real-time transit information, and targeted transit marketing programs on corridors that will be prioritized for FTN service enhancements.

Implementation of the Frequent Transit Network

FTN Implementation Strategies

There are three basic approaches that Salt Lake City could follow to implement frequent service on the corridors identified in Chapter 2, as well as coordinated capital improvements and transit-supportive programs and policies. UTA already plans to implement frequent service on its "Core Route Network," which will overlap with a number of the corridors identified in the Salt Lake City FTN. These approaches may be focused to develop frequent service where UTA does not provide the City's desired minimum level-of-service. Illustrative examples are given below; further analysis will be needed to determine actual routing.

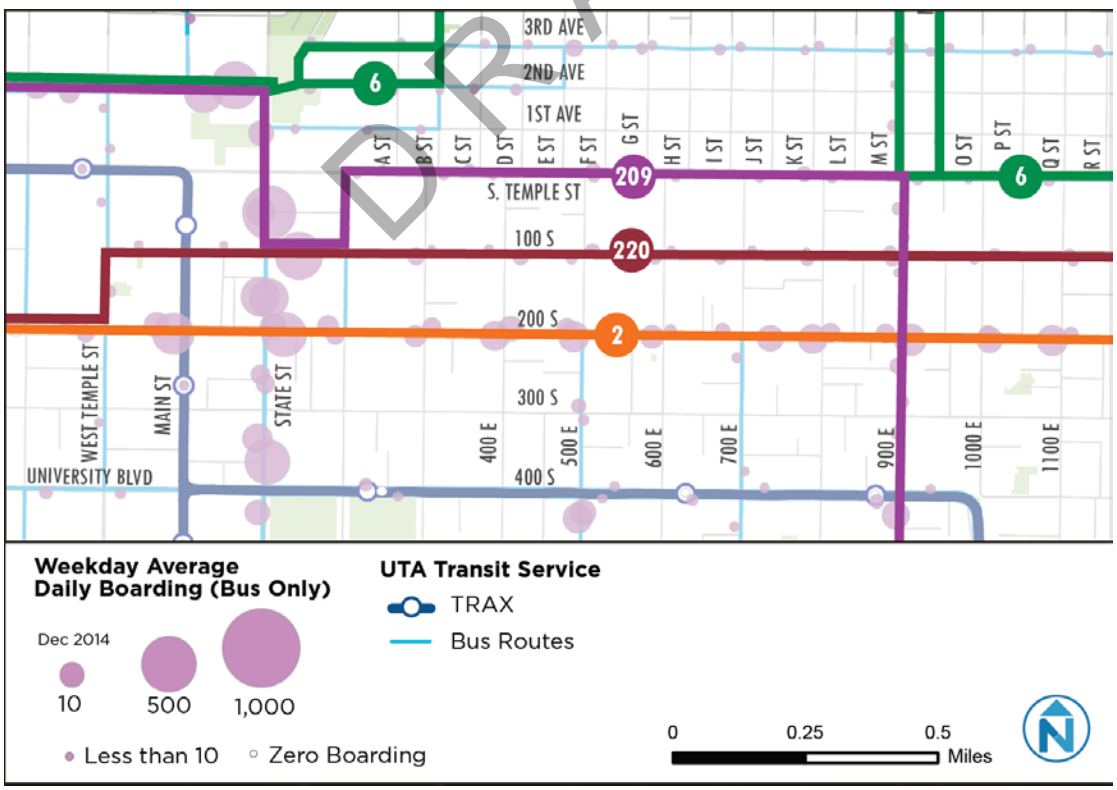
- **Restructure existing service**. Redesigning existing routes, e.g., changing the streets on which they operate or modifying route terminal locations, is the most cost-effective approach to providing frequent service. The City will work with UTA to consider ways to use existing operating funds to implement the plan's priorities. For example, UTA operates service on N. Temple Street, 100 S, and 200 S, which are each 500 feet apart. Route 220 serves 100 S between 1300 E and State Street. Route 209 operates on S. Temple Street between 900 E and State Street (it turns west from 900 E onto S. Temple). Route 6 also serves N. Temple Street, east of 900 E. A potential scenario where Route 220 would move from 100 S to N. Temple Street, illustrated in Figure 7-1, would have the following benefits:
  - Provide a continuous route on N. Temple Street connecting downtown and the University with approximately a quarter-mile separation from 200 S; this is a more appropriate spacing between routes (consistent with recommendations in Chapter 2).
  - Focus ridership on N. Temple Street stops, allowing those stops to meet ridership thresholds for a higher level of amenities.
  - Provide better service along the southern edge of the Avenues neighborhood and potentially enable better service to LDS Hospital by allowing Route 209 to be extended north (given a frequent service grid that offers convenient transfers, e.g., on N. Temple and 200 S).
  - Potentially support future implementation of a downtown streetcar, which is planned to run on 100 S between W. Temple Street and 500 E.

  Some changes could be cost-neutral or reduce costs (as with N. Temple and 900 S), while others may require additional operating cost and/or vehicles.

- **City service buy-up**. Salt Lake City could provide UTA with a financial contribution to increase frequency or span of service on a route. If the change does not require additional vehicles, i.e., increasing midday or evening service to the same level of service provided at a different time period, no additional vehicles would be required. For example, Routes 205, 209, and 220 already provide frequent service on 500 S, 900 S, and 1300S, respectively, during weekday daytime hours; increasing frequency on weekday evenings would not require additional vehicles. However, Route 228, which provides service along 400 S between the University and Salt Lake Central, only operates with 30-minute frequency and additional vehicles would be required.

  Where the City desires to buy-up service on routes that extend beyond Salt Lake City limits, the City would invest only in service that is within city boundaries. UTA would be responsible for how that service is connected to the rest of the system. For example, service increases that the City buys up could terminate at/near city limits. It is anticipated that once service is demonstrated to meet UTA service standards, the agency would take over provision of that service, as funding allows. UTA and the City would need to document any such agreements in a memorandum of understanding.
- **Introduce new service**. Service on new transit corridors that cannot be achieved through restructuring existing routes would be the most costly option in terms of both operating and capital costs. For example, extending Route 228 to provide continuous service along 400 S between Redwood Road and the University would likely require additional operating resources for the Redwood Road to 600 W portion of the route, as well as to increase service to frequent levels. Additional vehicles would also likely be required. Providing service when and where there wasn't service before requires an analysis and possible implementation of paratransit service as well.

Figure 7-1 Service Restructuring Example: Existing Service on S. Temple, 100 S and 200 S



UTA Routes 2, 220, and 209 serve 200 S, 100 S, and S. Temple Street, respectively. As described above, restructuring Route 220 to serve S. Temple Street is an example of cost-neutral or low cost changes to existing service that can help implement the FTN.

Figure 7-2 summarizes needs and applicability of implementation strategies to FTN corridors along with key considerations.

FTN Cost Estimates

In 2016, UTA provided a cost estimate of **$6 per vehicle-mile** for additional service that could be operated by the existing bus fleet, such as midday, in the evening, or on weekends. The number of buses required to operate a route is typically driven by peak periods when service is the most frequent. The estimated cost is **$7 per vehicle-mile** if additional vehicles are required, such as to operate new service on a corridor or increase frequency during peak periods.

The **net incremental cost** to provide frequent service on the Tier 1 FTN is **$4.1 million annually, and $3.6 million annually on the Tier 2 FTN ($7.7 million total)**, based on an order-of-magnitude estimate using the latest information available at the time of analysis (Spring 2016). This cost does not include portions of the FTN corridors where UTA had existing plans to provide frequent service, i.e., the estimate represents the additional cost to extend frequent service beyond existing plans, nor does it include costs for any additional paratransit service that may be required.

For example, the **total annual cost** to provide frequent service on a one-mile route segment of an existing transit corridor would be approximately $240,000 (roughly 40,000 annual vehicle miles at a cost of $6 per mile), comprised of approximately $180,000 for weekdays, $40,000 for Saturdays, and $20,000 for Sundays. For service on a new corridor, this cost would be $1 per mile higher, or an additional $40,000 per year. The **net cost** accounts for existing or planned service on some corridors, and may be significantly lower than the total cost if only enhancements to midday, evening, or weekend are required.

Figure 7-2 Incremental Cost Estimates to Implement FTN Vision

	Daily Vehicle Miles			Incremental Annual Costs*			
Tier	Weekday	Saturday	Sunday	Weekday	Saturday	Sunday	Total
1	1,800	2,100	800	$3,000,000	$800,000	$300,000	$4,100,000
2	1,500	1,800	700	$2,700,000	$700,000	$300,000	$3,600,000
1+2	3,300	4,000	1,500	$5,700,000	$1,500,000	$600,000	$7,700,000

Notes: * Based on $6 per vehicle mile for service if no additional vehicles are required, or $7 per vehicle mile if additional vehicles are required, and 40,000 annual vehicle miles.

Figure 7-3 FTN Implementation Considerations

Corridor	Potential Time Frame	Primary Route(s)	FTN Service Needs				Potential Implementation Strategies				Key Elements / Considerations
			Peak	Mid-day	Eve	Sat/ Sun	UTA Core Network*	City Buy-Up	Service Restructure	New Service	
200 S (Transit Spine)	Tier 1	2			X	X	X	X			▪ Possible initial joint City-UTA project ▪ Incorporate clean vehicles (UTA "No-Low" Emission vehicle grant) ▪ Bulb-outs, other amenities, community-oriented features
North/South Temple	Tier 1	220, 3, 6			X	X		X	X		▪ Consider restructuring 220 to consolidate east-west service on North-South Temple ▪ Consider restructuring Route 3 to terminate at North Temple Station, or serve SLC Central via 600 W
500 E / 900 E; to LDS Hospital and Avenues Neighborhood	Tier 1	205, 209			X	X	X	X	X		▪ Identify potential layover location near LDS ▪ Coordinate with 200 S and N. Temple corridors (frequent east-west connections)
State Street; to State Capitol	Tier 1	200			X	X	X	X	X		▪ Part of larger BRT project; could SLC portion be advanced as the initial segment of a broader project ▪ Consider rerouting Rt 200 to serve State Capital in the shorter-term, e.g., in conjunction with 200S transit spine ▪ Identify potential layover location
400 S	Tier 1	228, 500	X	X	X	X		X	X	X	▪ Identify Redwood Road terminus options (e.g., N. Temple)

Corridor	Potential Time Frame	Primary Route(s)	FTN Service Needs				Potential Implementation Strategies				Key Elements / Considerations
			Peak	Mid-day	Eve	Sat/ Sun	UTA Core Network*	City Buy-Up	Service Restructure	New Service	
California / 300 W / 900 S Indiana (west of 300 W) 1300 S (east of 300 W)	Tier 1 Tier 2 Tier 2	9	X	X	X	X		X	X	X	▪ Identify Redwood Road terminus options (e.g., N. Temple) ▪ Consider modifying Rt 9 to serve California segment (e.g., split tail of Rt 9 between California and 300W portion, 1300S – Central Pointe Station, or serve via alternative route). West end of Route 17 could also potentially be rerouted to serve 300W between 1700S & Central Pointe Station ▪ Western segment of 900 S contingent on grade-separated freight rail crossing
1300 E	Tier 1	220			X	X	X	X			▪ See also N./S. Temple
Rose Park	Tier 1 / 2	519, 520	X	X	X	X		X	X	X	▪
2100 S / 2100 E	Tier 1	21			X	X	X	X			▪
Redwood Road	Tier 1	217			X	X	X	X	X		▪ See also 900 S / California and 400 S corridors
1700 S	Tier 2	17			X	X		X			▪
Foothill Drive	Tier 2	228, 313, 354	X	X	X	X	X	X			▪
TRAX	Tier 1					X	X				▪ 15 minute weekend service

*UTA is in the process of defining its Core Route Network.

Implementation of Alternative Service Pilot Projects

Establishing partnerships with employers and ride services companies are key steps in developing pilot projects to provide employer- and residential-oriented services to extend the reach of fixed route service in Salt Lake City. The City and/or UTA will need to foster partnerships with employers and non-profits and develop agreements with private transportation providers to develop these pilot projects. The following sections outline key implementation steps and parameters that should be addressed in these agreements.

Employer-Oriented Service

The City and/or UTA will need to work with employers to structure effective shared ride shuttle services to employment sites that cannot be served effectively by the FTN. As described in Chapter 2, Transportation Management Associations (TMAs) are often effective ways to organize employers to coordinate schedules and provide funding for shuttle programs. Key information required to plan an employer-oriented shuttle program includes:

- Primary employee shift times (start and end)
- Employee origins (home locations) and the rail or FTN station(s) that would most efficiently provide connections for the most employees

A TMA can also provide the City and UTA with a more centralized way to facilitate education and outreach to employers and employees, and foster incentives to use transit including company-sponsored passes (such as the Hive Pass) which can be supported by an employer-sponsored guaranteed ride home program. Although employees use guaranteed ride home programs relatively infrequently, they remove a key barrier to use of transit and employee shuttles; if a participating employee unexpectedly needs to leave work early or late, the program would cover the cost of a taxi or shared ride home or to the transit station.

Residential-Oriented Service

As described in Chapter 2, residential-oriented ride services would extend the reach of the FTN in Salt Lake City. A number of issues and concerns emerged in early discussions of the concept of partnering with ride services companies to offer subsidized shared ride services. These concerns could be addressed through the contracting/procurement process for such a partnership, i.e., ride services companies would need to be able to address these concerns in order to be eligible for the subsidized ride program. Figure 7-3 summarizes the likely service parameters and issues/concerns along with potential resolution of those issues.

UTA would need to determine whether this model is specific to Salt Lake City or could be applied elsewhere in the UTA service area.

Residential-Oriented Shared Ride Cost Estimate

The cost to subsidize an on-demand shared ride service in the conceptual residential service zones identified in Chapter 2 would vary depending on contractual arrangements with ride services companies, service parameters (geographies and hours of availability), and residents' demand for the service. Based on rough assumptions, the net cost to Salt Lake City could be on the order of **$500,000 to $900,000** to subsidize rides for such a service for the full operating hours of the FTN (17 hours Monday-Saturday and 12 hours on Sundays) in the identified zones. Assumptions include that average daily rides would total 1% of residents in the zones and that residents would pay a small premium over the cost of a transit fare. The current, unsubsidized cost of a single person on-demand ride to a nearby transit station ranges from $5 to $8 for each of the zones.

Figure 7-4 Ride Services Partnership Service Parameters/Concerns

Issue/Concern	Principle or Contractual Stipulation to Address
Service Parameters, e.g., where and when is the service available?	
Eligible Origins	▪ Defined areas outside of the geographic coverage of the FTN (see Chapter 2)
Eligible Destinations	▪ Rail and FTN stations (i.e., connections available to Salt Lake Central or other major transit stations) ▪ *Potentially* direct access to other key nodes defined within each service area, e.g., neighborhood shopping area
Eligible Hours of Operation	▪ Hours of FTN service, i.e., 17 hours per day Monday-Saturday and 12 hours per day Sundays (see Chapter 3) ▪ If an area has only partial frequent service, e.g., daytime but not evenings, trips could be made eligible for a subsidy only outside of actual frequent service hours (the model could also potentially be used in this way to extend service hours in other neighborhoods in Salt Lake City)
Other Considerations	
Fare Payment	▪ Desirable to integrate with Hive Pass
Fiscal Sustainability	▪ Program availability would need to be constrained by available funds and estimated costs; testing the program in a pilot neighborhood or zone would help refine the budget
Environmental Sustainability	▪ The service would balance shared rides (to maximize sustainability) with efficient travel times in order to avoid the perception that the service offers single-passenger rides ▪ Align with SLC Sustainability Goals, i.e., shared ride, clean vehicle requirements or incentives ▪ A premium subsidy or preferential allocation of rides could be offered to incentivize clean-fuel vehicles
Equity	▪ Address potential or perceived equity implications of providing shared ride services program in some neighborhoods that may be generally higher-income than others, i.e., providing better (door-to-door) service to a higher-income area than is available in lower income areas ▪ Address potential equity concerns related to accessibility for people without smart phones (e.g. partner with a third party to allow riders to schedule via the web instead of a smart phone)
Accessibility	▪ Availability of accessible vehicles
Technology	▪ Desirable to integrate into development of a shared mobility platform

FUNDING STRATEGIES

Implementing the service, capital, and programmatic recommendations of the Transit Master Plan will require the City and UTA to develop new, sustainable transit funding sources. This section describes potential funding mechanisms including federal, state, and local sources as well as public-private partnerships.

Existing Funding Sources

Existing funding for transit in Salt Lake City is primarily provided by UTA. UTA revenue sources for the FY 2015-2016 budget year, illustrated in Figure 7-4, total approximately $347 million and include:

- **Local option sales tax:** Largest revenue source for UTA, imposed by service area and varies by county—Salt Lake County: 0.6875 cents per dollar in retail sales; Weber, Davis, Box Elder counties: 0.55 cents; Utah County: 0.526 cents; Tooele County (select cities): 0.3 cents. Sales tax revenues were projected to increase by 4.2% from 2014 to 2015.[1]
- **Federal grants:** UTA has secured nearly $1.7 billion in discretionary and formula federal grants over the past decade.[2]
- **Passenger revenue:** UTA recovers 17% of transit operating costs from fares.[3] This percentage is an average and includes all modes. Fare revenues are projected to increase based on growth in ridership.
- **Advertising:** From lease of exterior space on the sides and rear of bus and light rail vehicles.
- **Investment income:** Interest earned on invested operating funds not yet expended and funds held for future capital expenditures.
- **Other income:** Income from rents and leases on the right-of-way.[4]

Salt Lake City pays for transportation investments using primarily general funds—there are no funds dedicated to public transit. Funding contributions from the City for FY 2015-2016 include: [5]

- $2.2 million for Transportation Operations including one HIVE program administrator[6]
- $50,000 of general funds for Ground Transportation
- $1.8 million for Bikeway Infrastructure projects including:
  - $1.77 million of general funds
  - $46,000 of impact fee funds

Additionally, the City dedicates $7,500 to a Rail~Volution Partner level membership, which further supports future transportation investments in Salt Lake City.

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[1] UTA. 2015 Budget Document. Retrieved from http://www.rideuta.com/uploads/2015MasterBudgetDoc.pdf

[2] Utah Transit Authority. UTA Year in Review 2014. Retrieved from https://www.rideuta.com/uploads/UTAYearinReview2014.pdf.

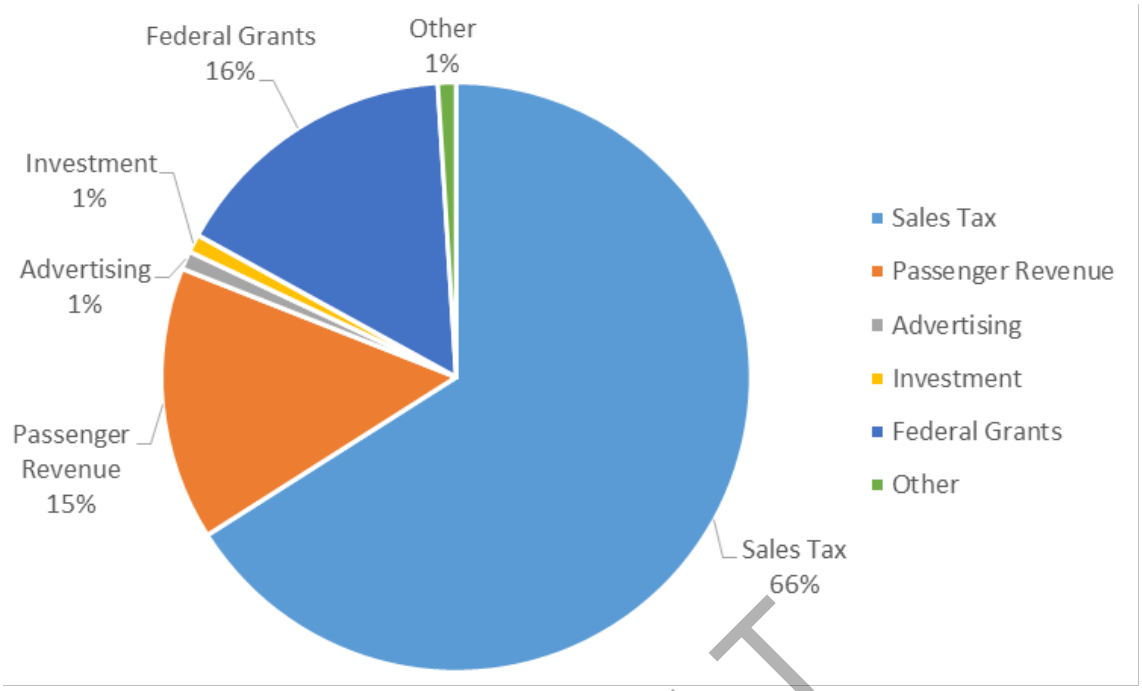
[3] National Transit Database. https://www.transit.dot.gov/sites/fta.dot.gov/files/ntd/tap/2013_Utah_Transit_Authority_ID8001.pdf

[4] UTA. 2015 Budget Document. Retrieved from http://www.rideuta.com/uploads/2015MasterBudgetDoc.pdf

[5] Salt Lake City. Capital and Operating Budget Fiscal Year 2015-2016. Retrieved from http://www.slcdocs.com/budget/bookFY16.pdf

[6] The Hive Pass is a program provided by Salt Lake City through an agreement with UTA that allows residents to purchase reduced cost monthly or annual transit passes.

Figure 7-5 2015 UTA Operating Budget



Source: UTA 2015 Master Budget

Potential Funding Sources

A variety of funding sources exist to help support public transportation. Program eligibility, match requirements, and use of funding vary by program and whether distributed at the federal, state, or local level. This section describes the funding sources available, some of which the City already receives, and some which would be new sources of funding.

Federal

On December 4, 2015, President Obama signed into law P.L. 114-94, the Fixing America's Surface Transportation (FAST) Act. Funding surface transportation programs at over $305 billion for fiscal years (FY) 2016 through 2020, the FAST Act continues many of the streamlined and performance-based surface transportation programs established in the Moving Ahead for Progress in the 21st Century Act (MAP-21). Federal transportation funding is generally formula or discretionary-based. Formula-based programs have a pre-determined amount of funding allocated each year to states and metropolitan planning organizations, whereas discretionary programs are competitive and provide grants to communities that submit funding applications.

The following formula-based programs for urbanized areas are relevant to Salt Lake City, and unless otherwise noted, generally require a 20% local match for capital assistance and a 50% match for operating assistance (if applicable). Revenue from these funding sources is typically allocated at the regional level; UTA is the recipient for these funds.

Urbanized Area Formula Program (FTA Section 5307). This program is primarily intended to fund fixed-route transit projects. For urbanized areas over 200,000 in population,

5307 funds can only be used for capital expenditures, including preventative maintenance.[7] In addition, certain expenses associated with mobility management programs are eligible and some Americans with Disabilities Act (ADA) complementary paratransit service costs are considered capital costs. Up to 10% of 5307 funds can be applied to ADA Paratransit service; up to 20% of program funds can be used for complementary paratransit service if certain conditions are met. A 20% local match is required for all capital expenditures; the local share may be lowered to 10% for the cost of vehicle-related equipment attributable to compliance with the ADA.

Enhanced Mobility of Seniors and Individuals with Disabilities Program (FTA Section 5310). This program provides formula funding for services to seniors and persons with disabilities that go beyond traditional fixed-route services and ADA paratransit. It can be used for operating and capital costs. In general, this funding source requires a 20% local match for capital and a 50% local match for operating expenditures, however only a 10.27% match is required for purchased transportation services.

A sub-component of this program created in the FAST Act is a new discretionary pilot program for innovative coordinated access and mobility. This pilot program is open to 5310 recipients to assist in financing innovative projects for the transportation disadvantaged that improve the coordination of transportation services and non-emergency medical transportation (NEMT) services; such as: the deployment of coordination technology, projects that create or increase access to community, One-Call/One-Click Centers, etc. In the first year of the discretionary program (2016) Congress appropriated $2 million, followed by $3 million in 2017, $3.25 million in 2018, and $3.5 million in 2019.

Buses and Bus Facilities Grants Program (FTA Section 5339). There are three components to this program. The first is a continuation of the formula bus program established under MAP-21 that provides funding to states and transit agencies to replace, rehabilitate, and purchase buses and related equipment and to construct bus-related facilities. The FAST Act added two new components: a bus and bus facilities competitive grant program based on asset age and condition and a low or no emissions bus deployment program. Both the formula and competitive funding require a 20% local match and are only eligible for capital expenditures.

A pilot provision in the FAST Act allows designated recipients in urbanized areas between 200,000 and 999,999 in population to participate in voluntary state pools to allow transfers of formula funds between designated recipients during the period of the authorized legislation.

Capital Investment Grant Program. This program is the primary federal funding source for development of new major transit capital investments. The program funds fixed guideway transit projects including: commuter rail, light rail, heavy rail, bus rapid transit, streetcars, and ferries. There are three components to the program: New Starts, Core Capacity, and Small Starts; projects can be grouped into "Programs of Interrelated Projects" that are comprised of any combination of two or more New Starts, Small Starts, or Core Capacity projects.

- New Starts projects must have a total capital cost over $300 million or request $100 million or more in funding.

[7] Capital projects include: planning, engineering, design and evaluation of transit projects and other technical transportation-related studies; capital investments in bus and bus-related activities such as replacement, overhaul and rebuilding of buses, crime prevention and security equipment and construction of maintenance and passenger facilities; and capital investments in new and existing fixed guideway systems including rolling stock, overhaul and rebuilding of vehicles, track, signals, communications, and computer hardware and software. In addition, associated transit improvements and certain expenses associated with mobility management programs are eligible under the program. All preventive maintenance and some ADA complementary paratransit service costs are considered capital costs.

- Core Capacity projects are major capital investments in existing fixed guideway systems that increase capacity on corridors that are at capacity today or will be in five years.[8]
- Small Starts projects must have a total capital cost of less than $300 million and seek less than $100 million in funding.

Local match requirements are 20% of that total cost; in recent years the FTA has been pushing recipients to pay closer to a 50% local match.

Communities seeking funding under the capital investment grants programs must complete a series of steps over several years to be eligible for funding. New Starts and Core Capacity projects have two phases: (1) Project Development: the evaluation of alternatives leading to the selection of a locally preferred alternative, and (2) Engineering: during which cost and designs are finalized and environmental issues are addressed. The process can take five or more years from initiation of an alternatives analysis (AA) to execution of a full funding agreement.

A pilot program in the FAST Act allows communities seeking funding or that recently received funding under the Capital Investment Grants programs to apply to the Pilot Program for Transit-Oriented Development Planning. This program funds local community initiatives to integrate land use and transportation planning to improve economic development and ridership, foster multimodal connectivity and accessibility, improve transit access for pedestrian and bicycle traffic, engage the private sector, identify infrastructure needs, and enable mixed-use development near transit stations.

Congestion Mitigation and Air Quality (CMAQ) Program. Administered by the Federal Highway Administration (FHWA), this program funds a wide variety of surface transportation projects – including transit – that contribute to air quality improvements and provide congestion relief in areas that do not meet federal air quality standards (non-attainment) or former nonattainment areas that are now in compliance (maintenance areas). Funding is provided to the State, which has discretion to prioritize and fund projects. Salt Lake County is a non-attainment or maintenance area for some pollutants, making it eligible for funding under this program.

Surface Transportation Block Grant Program. Also administered by the FHWA, this program can be used by the State and larger metropolitan regions to fund a wide variety of transportation projects. A percentage of the program is set aside for bicycling and walking projects (called "Transportation Alternatives") and there is a requirement that at least half of each state's funding be provided to geographic areas in proportion to their relative shares of the State's population.

TIGER Discretionary Grants. The U.S. Department of Transportation's Transportation Investment Generating Economic Recovery (TIGER) Discretionary Grant program invests in projects that address national objectives in safety, economic competitiveness, state of good repair, quality of life, and environmental sustainability. DOT also evaluates projects on innovation, partnerships, project readiness, benefit cost analysis, and cost share. The eligibility requirements of TIGER allow project sponsors to obtain funding for multi-modal, multi-jurisdictional projects that are more difficult to support through traditional federal programs. There have been rounds of funding each year since 2009. However, since the program is not authorized, it is subject to the annual appropriations process year to year. A TIGER grant was used to develop the Sugarhouse Streetcar (see sidebar).

[8] FTA calculates capacity for light rail and heavy rail projects as useable space per passenger in the peak hour in the peak direction. Levels below 5.7 square feet are considered to be at capacity now or within 5 years and is eligible. More information on the calculations can be found on page 85 of the Final Capital Investment Grant Program Interim Policy Guidance, June 2016 available at www.transit.dot.gov/sites/fta.dot.gov/files/docs/FAST_Updated_Interim_Policy_Guidance_June%20_2016.pdf

Public Transportation Innovation (FTA Section 5312). This program provides annual discretionary funding to develop innovative products and services to better meet the needs of transit agency customers. For the first round of the program, the FTA announced $8 million in funding for Mobility on Demand Sandbox. The FTA seeks to fund project teams to innovate, explore partnerships, develop new business models, integrate transit and mobility on demand solutions, and investigate new solutions, enabling technical capabilities such as integrated payment systems, decision support, and incentives for traveler choices. Future grant opportunities could be pursued to help develop the recommended on-demand ride services partnership to extend the reach of frequent transit service.

Sugarhouse Streetcar Funding Partnership

The S-Line was funded through a partnership between Salt Lake City, South Salt Lake, and UTA.

- UTA received a $26 million TIGER II grant in 2010 and provided the three streetcar vehicles (valued at $12 million) and the right-of-way (valued at $6.3 million) at no cost to the cities of South Salt Lake and Salt Lake City.
- The gap in funding to complete the project ($11.18 million) was shared between Salt Lake City ($5.38 million), South Salt Lake ($4.2 million), and UTA ($1.6 million). Salt Lake City and South Salt Lake also shared in the cost of operating the line along with UTA for three years.

Source: http://www.shstreetcar.com/files/MasterStreetcarTransmittal.pdf

State Funding

State funding for transit operations and capital projects can be a good local match for federal sources and also provides stable funding over many years.

Gas Tax. During the 2015 General Session, the State of Utah passed H.B. 362 which increased the statewide gas tax by 4.9 cents from 24.5 cents per gallon to 29.4 cents per gallon.[9] In addition, beginning in 2016, there is an additional 12% sales tax on wholesale gas that will fluctuate based on the statewide average wholesale pretax price of a gallon of regular unleaded motor fuel during the previous three fiscal years, not to exceed 40 cents. The new taxes provide an annual adjustment as the statewide average wholesale price of fuel fluctuates within the floor ($2.45) and ceiling ($3.33) prices.

These revenues are deposited into the state Transportation Fund and Transportation Investment Fund and project funding decisions are made by the Transportation Commission each year. Utah's transportation commissioners are appointed by the governor and serve as part of an independent advisory committee. The local option sales tax provision of H.B. 362 is discussed below under Local Funding.

Sales Tax. Counties within the Utah Transit Authority service area assess sales taxes that are earmarked for transit, including both operations and for the local share of capital expenditures. Approved local option sales taxes include:

- Salt Lake County 0.6875%
- Davis County 0.5500%
- Weber County 0.5500%
- Box Elder County 0.5500%
- Utah County 0.5260%
- Tooele County 0.3000%

[9] http://www.wfrc.org/new_wfrc/index.php/resources/house-bill-362-transportation-infrastructure-funding

Salt Lake City SmartTrips

Salt Lake City's SmartTrips program is an on-the-ground effort to educate and encourage local residents to use public and active transportation for their travel needs. This program targeted households and businesses in the Fairmont and Westminster neighborhoods of lower Sugar House. Residents were educated on the importance of decreasing polluting activities associated with driving. One goal of the program was to empower at least 15% of the targeted households to successfully negotiate barriers to adopt and sustain the use of public and active transportation to reduce vehicle emissions.

The Salt Lake City Sustainability Division applied for a Utah Clean Air (UCAIR) grant to support six activities of this program:

1. Community Listening and Collaboration Cultivation
2. Business Recruitment
3. Participant Recruitment
4. Participant Engagement
5. Community Partnering Events
6. Evaluation/Feedback

Of the $29,424 originally granted to SmartTrips by UCAIR, $8,852 (approximately 30%) was spent on personnel costs. The remaining $20,571 (approximately 70%) was used for program materials.

Source: 2014 SmartTrips Salt Lake City UCAIR Final Grant Report

Local Funding Options

Many recent capital projects in the United States have relied largely, if not solely, on local funding for construction and operations. Avoiding complex requirements associated with federally-funded construction projects has allowed many cities to implement more cost-effective and rapid construction and implementation of service. The following are some of the potential local sources of funding for constructing and operating transit projects.

General Obligation Bonds. Bonds are a primary source of funds for constructing major capital improvements. Voter-approved bonds are sold to provide up-front funding for transportation projects, including street and transit corridor improvements. A set of projects may be grouped into a "bond package" that goes before the public for voter approval. General obligation bonds could be supported through the city's existing property tax base, or backed with incremental increases in universally-applied city taxes, such as those on sales or property, or parking meter revenues.

Taxes

Sales Tax

General sales taxes can provide a large source of funding for transit operations or capital projects, though revenues tend to fluctuate with the overall economy introducing uncertainty year to year. While transit agencies have traditionally relied on sales tax commitments from local governments, many agencies are moving to diversify their revenue sources after the economic downtown in 2008 severely impacted operating budgets, service levels, and fares. As described above under the statewide sales tax section, H.B. 362 allowed counties to impose a 0.25% general sales tax for transportation, with voter approval. Salt Lake City (urban area) and UTA would each receive 0.10% (a tenth-cent) of the sales tax increase, and Salt Lake County would receive 0.05% (0.05 of a cent); however, Salt Lake County voters did not approve Proposition 1 on November 3, 2015 so this potential funding source is currently not available to UTA and Salt Lake City.

Payroll Tax

In this scenario, a payroll tax is imposed directly on employers served by transit. It is based on payroll for services performed within a transit district, including traveling sales representatives and employees working from home. This tax applies to covered employees and self-employed workers. Advantages include flexibility of revenues (capital and operating purposes), administrative ease, and equity.

Employee Head Tax

While not a common source of transit funding, employee head taxes can be a way to tie transit benefits to employment and economic growth. Head taxes charge employers a flat tax on each worker, typically annually. An example is the Employers' Expense Tax in Chicago, which applies to employers with more than 50 employees. The rate is $2.00 per employee per month. (This tax was repealed in 2014.)

Usage Fees

Congestion Pricing and Toll Revenue

Congestion pricing and toll revenue can provide a potential funding source for transit when coupled with improvements to transit services along the same corridor. It also increases the cost of driving, which can make transit more cost-competitive. Revenues are often flexible (operating or capital purposes) but in some cases their use is limited to a specific corridor or zone. Typically, tolls are only implemented on new roads or roads that have recently undergone major improvements.

Vehicle-Miles Traveled (VMT) Fees

The recently passed H.B. 362 included provisions directing the Utah Department of Transportation to study the feasibility of a mileage-based user fee. VMT fees have been considered by many states and municipalities, but none have been implemented for personal vehicles in the United States. Unlike tolls, VMT fees are distance-based fees that are not facility- or zone-specific.

Vehicle Registration Fee

Many communities levy a fee on residents who register a car within the jurisdiction to cover the costs associated with using the local transportation system. The revenues from this fee can be directly tied to improvements in the transportation network that benefits drivers, including transit projects and service improvements. Utah currently levies a uniform fee based on the age of the vehicle between $10 and $150 as well as a registration fee based on vehicle type, fuel type, and county.

Travel and Tourism Fees

Visitors traveling within the Salt Lake City region place demands on the transportation system. This fee would assess a tax on rental cars or hotel rooms to account for these costs and provide revenues to operate the transit system. Utah state law allows a county, city, or town to impose a transient room tax on the rental of rooms in hotels, motels, inns, trailer courts, campgrounds, tourist homes, and similar accommodations for stays of less than 30 consecutive days.

Transit Access (Utility) Fee

A transit access (utility) fee is paid by households and businesses and is a stable source of support for the transit agency over time. While only a handful of cities have adopted this revenue source, a transit access fee could be assessed for all households within the city and generate significant

revenues. Transit access fees are typically a monthly charge of between $1 and $5 per household. For equity reasons, a discounted rate for low-income households would need to be considered.

Corvallis Transit Operation Fee

In the City of Corvallis, Oregon the Transit Operation Fee (TOF) is a monthly charge to City of Corvallis utility customers to generate revenue for the exclusive purpose of funding Corvallis Transit System (CTS) operations. This revenue source was developed to replace property tax funds that previously supported transit operations and transit fares revenues. Single-family residential customers are charged $2.75 per month and multi-family residential customers are charged $1.90 per housing unit per month. Fees for commercial and industrial customers are based on the type of business.

The fee has generated consistent revenue with $1,200,000 in FY 2013–14 and slightly less than $1,200,000 in FY 2014–15. This approach provides significantly more revenue than the property tax revenue, which previously provided about $400,000 in annual revenues.

Source: City of Corvallis. Transportation Operations Fee. January 2016. Retrieved from http://www.corvallisoregon.gov/modules/showdocument.aspx?documentid=4248

Development Impact Fees

Municipalities often tax developers based on the impact of a new development on the transportation system. These fees are used to pay for infrastructure improvements that will mitigate the level of service concerns brought by the new development. This is a common fee used for road infrastructure but is increasingly being used to fund transit or transportation demand management (TDM) measures associated with new development. San Francisco, for example, collects fees to ensure the new development receives adequate transit service. Depending on local implementation, use of this revenue source can be flexible, paying for operating or capital improvements. Salt Lake City has an impact fee mechanism with funds eligible for streets, parks, and public safety projects, but not for maintenance of existing facilities. A one-year moratorium went into effect in Fall 2015 while the City updated policies to ensure funds are used within six years, as required by the impact fee ordinance.

Utah Foundation Report: Fueling Our Future, 2013-2040: Policy Options to Address Utah's Future Transportation Needs

The Utah Foundation published a report in February 2013 (Report Number 713: Fueling Our Future, 2013-2040: Policy Options to Address Utah's Future Transportation Needs) that outlined the following potential transit funding options:

- Sales tax increase of 0.25% ($3.8 billion over the next 30 years)
- 1% increase in hotel taxes ($139 million over the next 30 years)
- 1% increase in rental car tax ($71 million over the next 30 years)
- Transit property tax of $0.1 for counties in the UTA service area ($5.8 billion over the next 30 years)

Source: UTA Network Study, p. 91

Special Districts

Business Improvement District

A business improvement district (BID) is an area within which businesses pay an additional tax to enhance the area within the district's boundaries. Often used to support streetscape improvements and to activate parks and open spaces, some BIDs have funded circulator buses, transit shuttles, and bus stop amenities that improve access and enhance the sense of place in the area.

Parking Benefit Districts

Pricing parking provides a stable revenue source and also reduces reliance on single-occupant vehicles. Parking meter revenue may be prioritized to support transit services in the area where the parking fees were collected. Many cities are exploring these funding approaches for downtown areas, universities, and employment centers that have specific transit service needs.

City of Seattle Transit Benefits District

In 2010, the Seattle City Council authorized the creation of a transportation benefit district – the Seattle Transit Benefits District (STBD). Voter approval of the STBD in November 2014 authorized a 0.1% sales tax increase and a $60 annual vehicle license fee (VLF) per registered vehicle. The current VLF stands at $80 per year, with a $100 cap.

Based on state legislation, funding sources that may be used without voter approval include an up to a $20 annual VLF and a transportation impact fee on commercial and industrial buildings. Subject to voter approval, the following additional revenue sources are available:

- Property taxes (one-year excess levy or an excess levy for capital purposes)
- Sales and use tax (up to 0.2%)
- Annual VLF of up to an additional $80 ($100 total) per vehicle registered in the district
- Vehicle tolls

This funding mechanism is expected to raise $45 million per year to address overcrowding and reliability issues with Metro service and to add frequency to meet demand for more transit.

Source: SDOT. Seattle Transit Master Plan. 2016. Retrieved from http://www.seattle.gov/transportation/docs/TMP/final/TMPSupplmtALL2-16FINAL.pdf

Public-Private Partnerships

Public/private partnerships are agreements between public and private partners that can benefit from the same improvements. While traditionally considered primarily for the construction of large transit projects, they have been used in several places around the country to provide public transportation amenities within the public right-of-way in exchange for operational revenue from the facilities, such as sidewalks, bike lanes, and multi-use trails, in addition to transit services. Transit agencies can work with major employers and trip generators to help pay for transit service and facilities.

Advertising/Sponsorships

UTA permits the sale and placement of ads on many of its vehicles as a means to generate additional revenue. Revenues from advertisement currently make up approximately 1% of total revenues.

Institutional Partners

Institutions can provide financial contributions by helping fund transit operations, partnering on capital projects, and purchasing transit passes. The University of Utah is a significant demand

center for transit in Salt Lake City with more than 30,000 students and more than 17,000 faculty and staff. Four TRAX stations and more than 15 bus routes serve the campus and approximately 35% of University trips are made by transit. The University operates eight free campus shuttles, an express shuttle to Salt Lake Central Station, and provides staff, faculty, and students with transit passes.[10] The University can partner with the City and UTA to develop a recommended transit hub with layover space for UTA buses. UTA and City could also work with the University to identify high trip generators on campus and throughout the city that might warrant additional levels of service, such as the University of Utah Research Park and the University of Utah Health Sciences Center.

Other institutional partners could include the VA Salt Lake City Health Care System, state and county government offices and city agencies, or other educational institutions, such as Westminster College. Finally, the Church of Jesus Christ of Latter-day Saints, with locations throughout the city could be an important potential service partner with UTA, particularly for special events and major functions.

Transit Oriented Development and Joint Development

Property access fees, and benefit assessment districts are approaches to sharing transit costs with owners of property located near a transit resource (e.g., a transit station or a park and ride) who benefit directly from proximity to the transit resource. These funding mechanisms, sometimes referred to as land value capture, provide a way to finance transit through taxes or fees paid by nearby private development, where property values are expected to increase as a result of transit investments. Implementing strategies to capture a portion of the increase can be used to help fund public transit infrastructure. These revenues can be used for operations, administration, and capital expenses.

[10] State of the System Fact Book, Appendix A. See p. 4-20.

Summary of Existing and Potential Funding Sources

A number of the potential transit funding sources that have been used to fund transit in other cities and regions are currently available or *could* be available to the City and UTA. Some of the potential options may be less appropriate for Salt Lake City. Figure 7-5 displays a conceptual assessment of these options, organized based on their revenue potential and likely ease of implementation (estimates for revenue potential are based on high-level assumptions for illustrative purposes).

A number of the "easy" sources are already in use for existing services and programs, but a package of relatively small and easy sources is likely to be the best path to increase funding for transit in the near term. The "big and challenging" sources shown in the upper left quadrant are likely to be challenging to implement for various reasons, but could be longer term sources to contemplate. The "small and challenging" sources shown in the lower left would likely be low on the City's list of potential transit revenue sources.

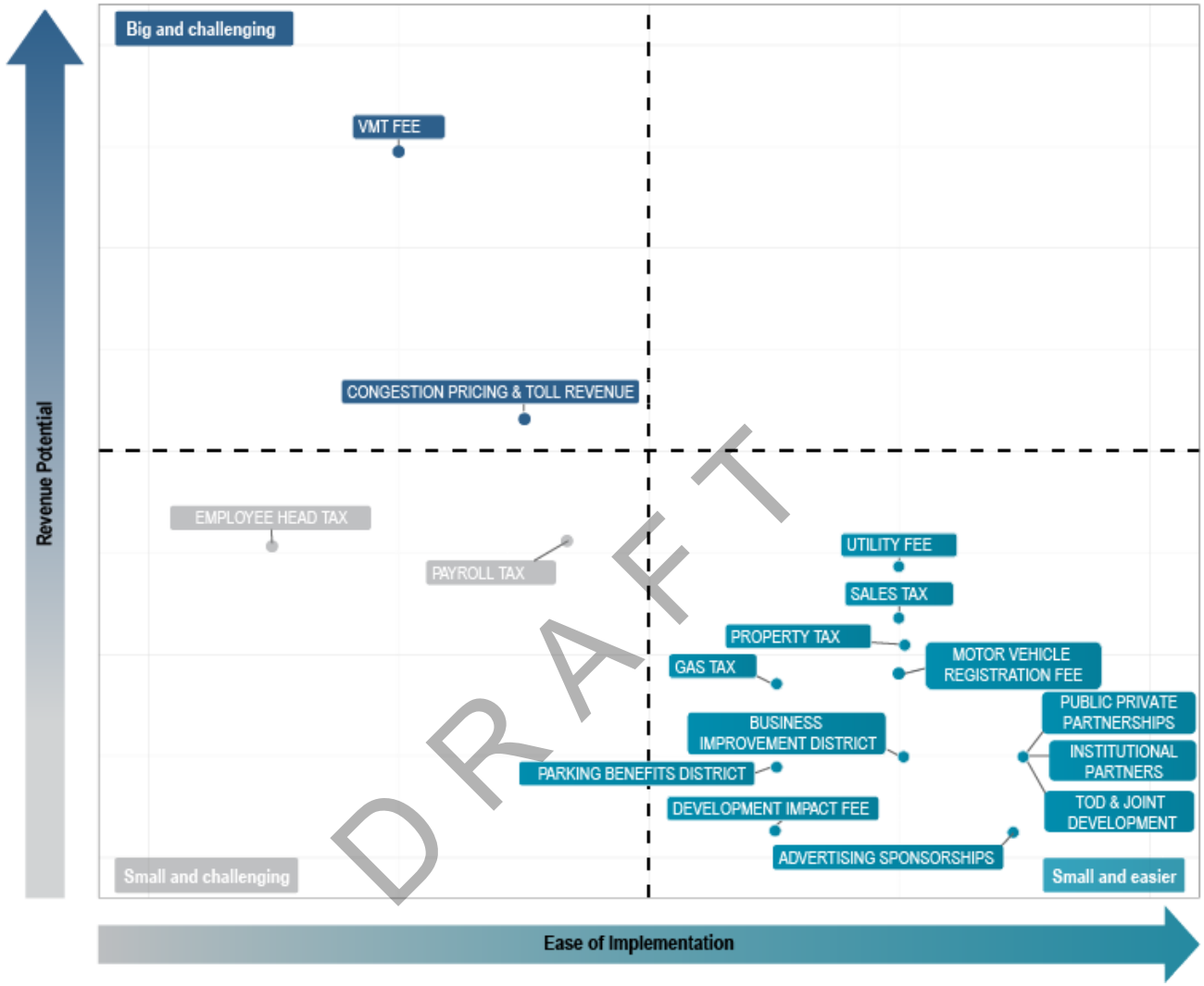
Qualitative considerations affecting ease of implementation include:

- Cost (initial and ongoing operation) and complexity of implementation
- Time frame to implement
- Need for partnerships
- Potential need for local government (e.g., City Council), state government (Legislature), and/or voter approval
- Likely political support

Issues of affordable, accessible transportation, affordable, accessible housing, and strengthening the local economy are interrelated. As funding options are considered, their applicability to a variety of City plans will allow for a more comprehensive, cost-effective approach.

The illustration of potential transit revenue sources is based on funding mechanisms used in other regions. Some of the options may be less appropriate for Salt Lake City.

Figure 7-6 Conceptual Illustration of Funding Sources by Revenue Potential and Ease of Implementation



Assumptions used for conceptual purposes in developing order-of-magnitude estimates of revenue potential included:
Utility fee: Monthly fee of approximately $3 per housing unit (range of $1 to $5 monthly possible based on peer cases.
Gas Tax: Rate of 2 cents per gallon; current Utah statewide gas tax is 24.5 cents.
Property Tax: Rate of 0.01%; current tax rate is 0.015288%.
Sales Tax: Rate of 0.01%. As noted above, H.B. 362 allowed counties to impose a 0.25% general sales tax for transportation, with voter approval. Salt Lake City (urban area) and UTA would each receive 0.10% (a tenth-cent) of the sales tax increase, and Salt Lake County would receive 0.05% (0.05 of a cent); however, Salt Lake County voters did not approve the tax.
Payroll Tax: Rate of 0.01%, applied to covered private employment (i.e., subject to the National Labor Relations Act).
Employee Head Tax: Rate of $12 per employee annually at firms of 100 people or more.
Congestion Pricing & Toll Revenue: $0.50 charge per vehicle within a downtown zone for 250 days per year.
VMT Fee: Rate of 1 cent per mile, applied to per capita VMT of about 9,339 (Source: Salt Lake City Carbon Footprint Report, 2010).
Development Impact Fee: $75 per new residential unit and $0.25 per square foot of new commercial development.
Parking Benefits District: Assumes 25 cents per hour over 12 metered hours per day with parking occupancy of 60%.
Motor Vehicle Registration: $5 fee per year. As noted above, current fees in Utah range from $10 and $150.
Business Improvement District, Public Private Partnerships, Institutional Partners, and TOD & Joint Development: Revenue potential is highly dependent on specific cases.

TRANSIT SERVICE DELIVERY

Cities around the country are investing resources in their transit systems and expect greater accountability from their transit provider. A key outcome of the Transit Master Plan is to define an approach to delivering local service that is more responsive to Salt Lake City's needs and desired outcomes. A focus of the Transit Master Plan has been to build on the strong existing partnership between the City and UTA, and implementation of the Transit Master Plan relies on continued collaboration and partnership between the City and UTA. This section explores a range of options for how the City could structure its relationship with UTA and influence the delivery of transit to achieve the plan's goals – most importantly, to achieve the highest quality public transit services for current or potential future passengers.

Transit Master Plan Recommendation

Given the already strong City-UTA partnership that the plan has built upon, the Transit Master Plan recommends developing a local service delivery approach that strengthens this relationship and provides the City with additional accountability. The City and UTA should develop an agreement or memorandum of understanding (or a set of agreements) that comprehensively and clearly outlines mutual responsibilities, decision-making structure, and commitments to promote transparency and ensure accountability. The FTN, which represents the City's policy vision for frequent service corridors and service levels, is a key area that could be addressed in such as agreement. The City can provide local funding support to increase frequency and hours of operation on high priority corridors and implement capital improvements that enhance transit speed and reliability; the City controls management of streets and public right-of-way and is well-positioned to take on such a role. UTA can commit to maintain frequent, stable, and consistent service on FTN corridors once implemented, provided service standards are met. The City and UTA can also partner to implement specific services such as the recommended on-demand ride services partnership. Funding partnerships, described above, would help the City work with UTA to support implementation of the plan vision, similar to what cities such as Boulder and Seattle have done to support their priorities.

On the other hand, contracting local service would entail a host of complex funding and governance issues that Salt Lake City would need to resolve, and risks making the transit passenger experience more complex. These issues include:

- Lack of a substantial dedicated local funding source for transit operations, which is necessary to ensure stable and consistent service; the operating cost for local bus routes serving Salt Lake City was nearly $16 million in 2014 [11]
- State or other legal restrictions, including restrictions on accessing federal funds
- Service coordination/integration between local and regional services, including service that crosses city limits.
- Fare/fare policy implications, including transfers and revenue sharing
- Americans with Disabilities Act (ADA) implications, including responsibility for bus stops and complementary ADA Paratransit service
- Significant cost and staffing requirements
- Control over decision-making and plan implementation

[11] State of the System Fact Book, Appendix A.

City-UTA Collaboration

The City and UTA have been working in close collaboration throughout development of the Transit Master Plan. Continuing to build on this working relationship, grounded in a mutual commitment to providing high-quality transit service will be critical to carrying out and securing funding for the plan's recommendations.

Several of the key areas identified in the plan where a range of City departments and UTA will need to work together include:

- Jointly develop the 200 S corridor as an initial, pilot branded bus corridor, with coordinated service, capital facility, and transit-supportive improvements
- Develop an approach for improving service on FTN corridors (i.e., where the City would like to prioritize frequent service) that are outside of the UTA Core Network of frequent service routes
- Develop a standardized branding approach for frequent service corridors, including an approach for routes/corridors that extend beyond Salt Lake City
- Prioritize implementation of the next phases of frequent service, enhanced bus, and/or BRT corridors
- Define the parameters for and work to establish partnerships for pilot employer- and residential-oriented shared ride services
- Rollout real-time information and improve pedestrian and bicycle access to transit stops along the FTN and other corridors
- Develop (or support private sector development of) a multimodal trip planner that helps people link seamlessly between modes
- Pursue a potential funding measure to provide funding for transit operations, capital improvements, and supportive programs

The City and UTA will need to define areas of mutual agreement and areas that will require joint decision-making. While some of these areas can be anticipated, most importantly the City and UTA will need to adapt to changing circumstances throughout the life of the plan, and address issues and concerns as they emerge.

Potential Service Delivery Options

A range of potential service delivery structures are available in Salt Lake City. Options range from maintaining regional agency operations (the status quo), strengthening a City-Transit Agency partnership (recommended approach), and contracting all local service (to UTA or a third-party). Operating transit in-house is not considered. These options are briefly described below including the key benefits and challenges, and peer examples.

Regional Agency Operation (Status Quo)

Similar to today, a single regional agency, UTA, would operate both local and regional transit service in Salt Lake City. This service delivery option would maintain the benefits of the current service delivery structure. It would not entail a significant effort to reorganize transit governance and operations, as would be required with some other options. It is important to recognize that UTA has been an engaged and closely involved partner throughout the City's Transit Master Plan process and shares many aspects of the City's transit vision and goals. However, UTA must also balance meeting regional obligations and manage its own internal constraints, such as union rules.

Description	UTA, the regional transit agency for a six-county service area, operates local and regional transit service within and to/from Salt Lake City
Key Benefits	▪ UTA has been a willing and engaged partner in the City's Transit Master Plan process and shares many aspects of the City's transit vision and goals ▪ City staff can focus efforts on implementing Transit Master Plan recommendations rather than on a potentially major reorganization of transit service delivery and governance; the City does not need to take on the large-scale infrastructure and staffing needed to directly operate transit ▪ Trips across city boundaries are transparent to the customer; people focus on where they want to travel to and from ▪ Maintains a unified local and regional system, including fare policy and transit information
Key Challenges	▪ More limited opportunity for the City to influence service planning, design, and implementation compared to a City-led local service delivery model ▪ As a regional provider, UTA must balance regional obligations with Salt Lake City's needs ▪ UTA may not be able to overcome organizational or institutional barriers that prevent it from being more responsive to Salt Lake City's needs
Peer Examples	▪ In Denver, CO, the Regional Transportation District (RTD) provides local and regional service in the city. ▪ This service model is prevalent in many cities and regions. Additional examples highlighted within the discussion of other models include a large number of cities and regions where cities have developed incremental transit programs or contracting approaches, often in partnership with the regional provider.

City-Transit Agency Partnership (Recommended)

In various cities where the local and regional transit system is primarily operated by a regional agency (i.e., UTA), cities have incrementally expanded oversight and management of selected local transit routes or services. This provides the city with more influence over these services and ability to meet local transit needs. It also creates potential challenges such as multiple fare systems, local and regional system coordination, additional responsibilities for existing staff or additional costs for new staff, and more complex governance of transit service. In some cases, cities partner with regional transit agencies to implement this type of structure, which can reduce the barriers and complexity.

Description	City provides targeted local service through an interlocal agreement with the transit agency or a third-party contractor. (This is similar to the GREENBike model used in Salt Lake City or the peer models highlighted below.) UTA would continue to operate other local and regional service.
Key Benefits	▪ City has more control over selected local transit services ▪ City may be able to deliver local services at lower cost if operated by a private contractor
Key Challenges	▪ Potential issues include local and regional service coordination ▪ Additional responsibilities for existing city staff and more complex governance
Peer Examples	In Seattle, WA, SDOT (City) owns and operates the Seattle Streetcar through an interlocal agreement with a regional transit provider, King County Metro. The City of Seattle developed a transit master plan to articulate local transit priorities and developed local funding sources to support these priorities. The City partners with King County Metro to invest in bus service frequency and service span. The City developed the Seattle Transit Benefits District (STBD) to provide funding for service investments. SDOT pays for additional Metro service through this local funding source, purchased on a per-hour basis (with a fully-loaded cost including capital). City staff also plan and implement transit capital improvements, working in close coordination with King County Metro. In Boulder, CO, RTD provides both local and regional transit service. The City of Boulder developed the Community Transit Network (CTN), which includes seven local bus routes operated primarily by RTD, but with smaller, community-oriented buses and a high level of service. The City subsidizes, or buys-up, service on selected routes. When high service levels are warranted based on RTD's service standards, the agency has assumed financial responsibility. The City contracts operation of one CTN route, the HOP, to a local non-profit, VIA. In Portland, OR, TriMet provides local transit service within the city of Portland and regional service to in a tri-County area. The City of Portland owns and operates Portland Streetcar, in partnership with TriMet. The City contracts with a non-profit entity, Portland Streetcar, Inc., that manages and operates the Streetcar. Operations staff include both City and TriMet personnel.

City Contracts Operation of All Local Service

Salt Lake City could assume responsibility for all local service and contract it out. This would maximize its control over local transit service delivery, but entails a variety of practical issues. There are two potential options, contracting service to UTA or contracting to a third-party contractor. (Alternatively, Salt Lake City could operate service in-house instead of contracting to a third-party; this option is not discussed in detail, but entails a significantly greater level of effort and commitment than contracting service). Related to all of these options, it should be emphasized that Salt Lake City lacks a dedicated, long-term transit funding source, an essential element to make any of these approaches feasible given the need for service to be stable over time.

City Contracts Operation of Local Service to UTA

If the City contracts with UTA to operate local service, UTA would continue to operate the majority of local and regional service. The City would be able to define how service is provided, but as a single provider UTA could determine how to provide it most efficiently.

Description	City contracts with the regional transit agency (i.e., UTA) to operate all local service through a formalized procurement process, resulting in a contract between government agencies known as an interlocal agreement; this is a more formalized agreement and requires legislative approval.
Key Benefits	▪ City exercises more control over local transit service provision ▪ Maintains local and regional transit service under a single provider ▪ Passengers experience little change in transit service operations ▪ Maintains a unified regional fare system and transit information
Key Challenges	▪ Additional responsibilities for existing City staff and more complex governance ▪ Requires development of a dedicated local transit funding mechanism; funding and potential legal and legislative issues are likely to be significant and require extensive study
Peer Examples	

City Contracts Operation of All Local Service to a Third-Party

Alternatively, the City could contract all local service to a third-party transit provider, either a non-profit or a private operator. UTA would continue to operate regional service. The City would have more control over local service but it would likely be challenging to integrate multiple providers to ensure a seamless passenger experience, including local/regional service coordination, fares, and transit information.

Description	City contracts with a third-party to provide local service through a formalized procurement process (e.g., Request for Proposals). UTA continues to provide regional service. UTA could also bid on and be awarded the contract, which would result in the previous option.
Key Benefits	▪ City exercises more control over local transit service provision through a formalized procurement process
Key Challenges	▪ With multiple providers, need to resolve issues including service across city limits, i.e., UTA routes currently provide local service within Salt Lake City ▪ Increased complexity of local and regional service coordination, fare policy, responsibility for ADA Paratransit service, and responsibility for bus stop conditions and ADA accessibility ▪ Significant expanded responsibilities for City transit program staff and additional administrative staff time and resources would be needed to transition to a City-led local service delivery model ▪ Requires development of a dedicated local transit funding mechanism; funding and potential legal and legislative issues associated are likely to be significant and require extensive study ▪ A competitive bidding process carries the risk that the lowest bid may not provide the best value from a customer perspective; the procurement process should incorporate a best value selection approach.
Peer Examples	▪ In Phoenix, AZ, Valley Metro provides regional and local transit (bus and rail). It has statutory authority to allocate some funds to separate municipal transit providers. On behalf of Valley Metro, First Transit provides bus service for the City of Tempe. First Transit utilizes the Valley Metro fare system and brand, providing a seamless travel experience for users across the region. ▪ In Alexandria, VA, the DASH System operates local service within city limits. Arlington County also operates transit service to several other cities within the Washington Metropolitan Area Transit Authority (WMATA) service area. A regional fare collection system is in place to ensure revenue sharing between the transit providers. ▪ In Chapel Hill, NC, Chapel Hill Transit (CHT) provide bus service to the cities of Chapel Hill and Carrboro as well as the University of North Carolina (UNC) campus while regional transit is provide by Triangle Transit. ▪ In Los Angeles, CA, LADOT (City) operates a local and commuter express bus service known as the DASH that supplements the regional transit system. This service has been incrementally expanded, replacing transit routes formally served by the regional transit provider, the Los Angeles Metropolitan Transportation Authority (Metro). ▪ In both the Portland, OR, and Minneapolis, MN regions, state and/or regional legislative mechanisms have been developed that allow smaller jurisdictions to withdraw or opt-out of the Metro Transit service district. These providers have the option of contracting service or operating it in-house. None of these jurisdictions are comparable in size to Salt Lake City, however.

Note: Some of the peer examples include cities that operate local transit in-house. These options are instructive as to the benefits and challenges of operating local service; however, Salt Lake City does not desire to operate service in-house due to the significant staff and financial resources required to become a full-service transit provider.

MEASURING SUCCESS

Salt Lake City will work closely with UTA to develop a performance monitoring process that documents continued progress toward the vision laid out in the Transit Master Plan. Building off of UTA's Year in Review, which provides an overview of system performance, special projects, and upcoming initiatives, Salt Lake City should publish an annual Report on Transit Master Plan Progress.

Some measures will track the quantitative performance of the UTA transit system in Salt Lake City, while others will more qualitatively track how transit has supported economic development and placemaking. Capturing the complete picture of success – how transit supports vulnerable populations, job access, environmental goals, and overall quality of life – will help communicate progress to the public and position the City and UTA to continue to invest in a high quality transit system in Salt Lake City.

Figure 1 provides a summary of the goals outlined in Chapter 1 and associated performance measures and data sources to document progress toward Transit Master Plan goals.

Figure 7 Transit Master Plan Performance Measurement Process

Transit Master Plan Goal	Goal Description	Performance Measure (s)	Data Source
Improve air quality	Reduce vehicle miles traveled per capita	▪ Per capita vehicle miles traveled (VMT) ▪ Transit mode share	Federal Highway Administration or best local source for VMT estimates; e.g. regional model, SLC Carbon Footprint, etc. (VMT) Census (transit commute mode share)
Increase the number of people riding transit	Make transit useful for more types of trips	▪ Percent of transit trips for work or school ▪ Percent of transit trips for non-commute or school	UTA On-Board Survey (If a question does not already exist, consider adding a question about trip type)
	Improve competitiveness of transit with auto travel	▪ Ridership ▪ On-time performance ▪ Service hours in Salt Lake City ▪ Travel and access time for transit trips compared to auto trips for 3-5 key origin/destination points	UTA (ridership, on-time performance, service hours) Google (travel time competitiveness)
Provide a safe and comfortable transit access and waiting experience	Improve bicycle and pedestrian access to transit	▪ % of streets that have sidewalks within ½ mile of a frequent transit network stop ▪ % of frequent transit network stops that are within ½ mile of a bikeway or low-stress bikeway	Salt Lake City
	Improve the transit waiting experience and universal accessibility of stops and stations	▪ Passenger comfort rating ▪ % of frequent transit network stops (that meet ridership threshold) with shelters	UTA On-Board Survey (If a question does not already exist, consider adding a question about the transit waiting experience) Salt Lake City & UTA

Transit Master Plan Goal	Goal Description	Performance Measure (s)	Data Source
Provide access to opportunity for vulnerable populations	Design a transit network that supports daily needs including access to jobs, education, etc., for transit-dependent populations	▪ % of transit dependent populations that live within ¼ mile access to frequent transit network ▪ % of transit dependent populations that work within ¼ mile access to frequent transit network	Salt Lake City & UTA American Community Survey
	Provide affordable transit options, particularly for low-income households	▪ Cost of transit fares ▪ Discount pass usage	UTA
Create economically vibrant, livable places that support use of transit	Align transit investments with transit-supportive land use policies and development	▪ % of new office, mixed-use, and multi-family housing development within ¼ mile of a frequent transit stop	Salt Lake City
	Catalyze economic development and jobs in Salt Lake City by providing effective transit service that employers, businesses, and the development community can depend upon	▪ Job growth within ¼ mile of the frequent transit network ▪ Amount of new or redeveloped square footage within ¼ mile of frequent transit network	Salt Lake City

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Erin Mendenhall, District 5
Charlie Luke, District 6
Lisa Adams, District 7

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Executive Steering Committee

Salt Lake City: Mike Akerlow, D.J. Baxter, Vicki Bennett, Liz Buehler, Ed Butterfield, Ben Davis, Paul Dowler, Lani Eggertsen-Goff, David Everitt, J.P. Goates, Robin Hutcheson, Jill Love, Sarah Lyman, Debbie Lyons, Peter Makowski, Nick Norris, Art Raymond, Mike Reberg, Matthew Rojas, Clayton Scriver, Mary DeLaMare Shaeffer, Nora Shepard, Jeff Snelling, Robyn Stanczyk, Jessica Thesing, Nole Walkingshaw, Russell Weeks, Kevin Young

UTA: Mike Allegra, Jerry Benson, Clair Fiet, David Kallas, Steve Meyer, Andrea Packer, Matt Sibul

Project Management Team

Julianne Sabula, Cris Jones (SLC), Kerry Doane, Hal Johnson, Jennifer McGrath (UTA), Tom Brennan, Cathleen Sullivan, Oren Eshel, Brie Becker (Nelson\Nygaard)

Technical Team

Salt Lake City: Nick Britton, Bill Knowles, Amy Lyons, Jerelyn Midthun, Blake Perez, Colin Quinn-Hurst, Becka Roolf, Dave Secrist, Tracy Tran, Alexis Verson

UTA: Joseph Alsop, Marc Bowman, Richard Brockmyer, Eric Callison, Christopher Chesnut, G.J. LaBonty, Jeff LaMora, Lynze Lenio, Todd Provost, Bryan Romrell, Chad Saley, Erika Shubin, Jacob Splan, Grey Turner, Jim Wadley, Jonathan Yip

Transit Master Plan Stakeholder Representatives

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Consultant Team

Lead: Nelson\Nygaard Consulting Associates, Inc.
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