FINAL REPORT

ON BOARD MOBILITY PLAN

RTC

JULY 2020

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June 2020

I am pleased to present the results of the work carried out by a Technical Advisory Group (TAG) comprised of staff from local governments and regional organizations and RTC staff to prepare the On Board Mobility Plan. This plan represents more than 24 months of technical analysis and community engagement.

The RTC charged the Metropolitan Planning Organization (MPO) and the TAG with developing a plan to transform mobility in Southern Nevada. The plan was conceived in response to Southern Nevada's rapid economic growth, which was outpacing capacity the region's transportation infrastructure. In the spring 2020, just as On Board was being finalized Southern Nevada's growth expectations were disrupted by the COVID-19 pandemic. The On Board Plan adapted to this challenge by highlighting opportunities to address short-term needs and position the region for economic recovery and advancing the region's longer term infrastructure needs.

On Board recognizes that growth management—and economic recovery—presents Southern Nevada with both challenges and opportunities. On Board is completed during difficult economic circumstances. While our regional economy is re-opening, public health concerns persist and will almost certainly impact Southern Nevada's economy for the next few years. At the same time, we are confident that Southern Nevada is poised to regain its position as one of the fastest growing regions in the United States. Efficient, equitable and affordable mobility will be key to ensuring we, as Southern Nevada residents, emerge from the economic downturn and prepare for future growth. Investing in a high quality public transportation system can help to ensure this happens in ways that are inclusive, equitable and sustainable.

Over the course of this project, the On Board team identified immediate, short, and long term projects, conducted technical and financial analyses, and engaged community members and leaders for feedback at each stage of the process to strengthen and improve our recommendations. We believe the resulting On Board Mobility Plan represents community values and will transform travel in Southern Nevada towards an equitable, efficient, and safe transportation system that provides a strong return on investment for Southern Nevada taxpayers.

Finally, I would like to acknowledge the hard work and commitment of the TAG members and our technical staff in creating this plan. My thanks also to the team of staff and consultants who supported our work.

Sincerely yours,

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PREFACE

On Board is the vision for transportation and mobility in Southern Nevada for the next two decades. Implementing the strategies and projects in On Board will facilitate development of a strong and diverse regional economy.

People playing craps at a table with transparent partitions after the reopening of the Bellagio Hotel & Casino on Thursday, June 4, 2020 in Las Vegas.
Image from John Locher/Associated Press

COVID-19

On Board was initiated in 2017, in the midst of rapid growth in Southern Nevada. Indeed, the pace of growth was so fast that congestion was limiting access, impacting regional quality of life, and constraining development. It was within this context that Southern Nevada stakeholders pursued On Board, a mobility plan designed to strengthen and diversify the region's transportation network, providing more options to meet the needs of the broader population. On Board accomplished these goals with a strategy targeted around 8 Big Moves and defined with 64 individual projects.

In Spring 2020, during the final stages of completing On Board, Southern Nevada, like the rest of the United States, faced an unprecedented challenge with the COVID-19 pandemic. "Stay home for Nevada" orders were imposed to control the spread of the virus, effectively putting a hold on local, regional, and international travel, and closing or significantly limiting entertainment and hospitality industries. The impacts on Southern Nevada's economy are expected to be severe, at least in the short term. Data collected in the early stages of the pandemic by the Las Vegas Convention and Visitor Association show that visitor volumes for April 2020 were a mere fraction of expected rates; Southern Nevada attracted 16,900 visitors in April 2020 as compared with 3,542,000 in April 2019. In addition, gaming revenue in Clark County decreased by 99.5%.[1] Resorts and casinos began re-opening in June 2020, but the time and pace of recovery to pre-COVID-19 conditions remains uncertain.

Despite changes in the region's immediate economic forecasts, On Board remains relevant. The On Board Mobility Plan includes investments and strategies designed to diversify and expand regional travel opportunities and make it easier for people to get to work and moving forward with these strategies is critical to the region's recovery. As the immediate impacts of COVID-19 subside, On Board provides a roadmap for mobility improvements and a flexible and adaptable strategy that responds to short- and longer-term regional transportation needs. There is a strong body of research showing investment in public transportation generates local jobs during periods of construction and operations.[2] On Board provides an investment schedule that will both stimulate the local economy and support workers and employers as residents return to work and as the region begins to recover.

1 Las Vegas Convention and Visitors Authority (LVCVA) April 2020 Executive Summary (https://www.lvcva.com/stats-and-facts/visitor-statistics/)
2 2020 APTA Economic Impact of Public Transit Investment, AASHTO EconWorks database and General Accountability Office (GAO) report Bus Rapid Transit: Projects Improve Transit Service and Can Contribute to Economic Development

ABOUT THIS REPORT

As the regional mobility plan, On Board lays out a roadmap to modernize and transform the way people travel in Southern Nevada. The Plan is built around a proposed High Capacity Transit (HCT) network that will link residential areas with employment, education facilities, medical services, and major recreational destinations. HCT investments will significantly improve the speed, reliability, and comfort of public transportation, increasing the ability for people to use transit for all types of trips.

On Board also recommends projects and programs that support HCT investments, including an expansion of local bus service with increased service frequency, hours of operations, and new transit service delivery models that bring flexible demand-responsive services to lower-density areas. In addition, On Board expands regional mobility through investments in regional streets, neighborhoods, and activity centers, making it safer and easier to walk and bike in Southern Nevada. The investments will be supported by changes in Southern Nevada's land use policies and development practices to increase transit-oriented design on HCT corridors and stations, plus creation of "complete streets" so that roadways continue to meet the needs of people who drive while, at the same time, providing a safer, more hospitable environment for bikers and walkers. On Board transforms Southern Nevada's transportation infrastructure by providing more choices that are inclusive, affordable, and safe for all travelers.

On Board is Southern Nevada's plan. Recommendations reflect a data-driven, technical approach that was balanced by ideas and input provided by regional stakeholder and community members. In total, more than 80,000 individuals influenced On Board by participating in meetings, attending presentations, filling out surveys, and providing input at community meetings and pop-up events. Regional stakeholders participated in interviews and focus groups and took part in multiple meetings, shaping findings, establishing priorities, and agreeing on recommendations.

This document presents the On Board Mobility Plan in its entirety. After this introductory section, it consists of four sections:

- ☑ **Introduction –** Introduces On Board with an overview of the study process, study goals, and objectives and a summary of economic and societal benefits resulting from implementation. This section also includes an overview of the impacts of and response to COVID-19.
- ☑ **Description of On Board's 8 Big Moves and 64 supporting projects –** Provides an overview of each of On Board's 8 Big Moves and the individual projects that bring the strategy to fruition.
- ☑ **Next Steps: Moving Forward to Implementation –** Summarizes next steps for the region to implement and carry out On Board, including an overview of funding options.
- ☑ **Document Library –** Presents a summary of the critical documents developed and prepared as part of the On Board Plan with links to project deliverables.

This report is designed to accomplish two important goals. The first is to present and summarize Plan findings and recommendations in a single document. This document is also designed to lay out Southern Nevada's mobility plan as defined by On Board's 8 Big Moves and underlying 64 projects.


EMERGENCY
EXIT
PULL HANDLE

INTRODUCTION

INTRODUCTION

On Board is Southern Nevada's comprehensive mobility plan. Developed with substantial and sustained community and stakeholder input, the visionary plan consists of 8 "Big Moves" that will improve future mobility for residents and visitors. On Board is a continuation of transportation planning work that Southern Nevada's local and regional agencies began in 2012. The first major program was the Fuel Revenue Indexing program, or FRI, which addressed Southern Nevada's top road-related priorities and was first implemented in 2014 and extended in 2016. The next effort was the 2015 Southern Nevada Strong Regional Plan, which further defined regional priorities for transportation and housing, employment, and education. The Transportation Investment Business Plan built on this work to craft a vision that linked economic growth with critical transportation improvements. Access2040, the Regional Transportation Plan, considered these recommendations as it laid out a long-range regional transportation plan. On Board addresses the region's remaining mobility needs and priorities.

SOUTHERN NEVADA'S REGIONAL PLANNING CONTEXT

2012-2015

Southern Nevada's Strong: establishes the valley's first regional plan to build complete communities that provide transportation choices, employment opportunities, housing options and quality education.

2014-2016

Transportation Investment Business Plan: develops a vision linking the health and growth of the valley's resort and tourist economy with critical transportation improvements in the Resort Corridor and Downtown areas.

2014-2016

Fuel Revenue Indexing Program: implements and funds a program of street and highway construction and maintenance projects to address the region's backlog of unfunded projects and keep pace with growth.

2016-2017

Access2040 Regional Transportation Plan: links Southern Nevada's growth, travel patterns, and transportation system into overarching performance goals including improving safety, managing congestion, improving connectivity, and maintaining infrastructure in good condition.

2017-2020

On Board Regional Mobility Plan: Identifies a vision to address the changing mobility needs for Southern Nevada including future high capacity transit lines, an expanded bus network, and more transportation options through new technologies and services.

EIGHT BIG MOVES

- **Big Move #1:** Build High Capacity Transit System
- **Big Move #2:** Expand Transit Service to Maximize Access to Jobs and Housing
- **Big Move #3:** Make All Travel Options Safer and More Secure
- **Big Move #4:** Make Short Trips Easier
- **Big Move #5:** Expand Service for Seniors, Veterans and People with Disabilities
- **Big Move #6:** Improve Connections to Major Destinations
- **Big Move #7:** Provide Reliable Transit for Resort Corridor Employees
- **Big Move #8:** Leverage New Technology to Improve Mobility

These Big Moves will improve the quality of life for Southern Nevada's residents, workers, and visitors as the region emerges from the COVID-19 pandemic and prepares for growth. Investments recommended in On Board will make transportation more convenient, more comfortable, and safer. By providing more choices for more people, the investment strategy will strengthen the regional transportation system by making it more reliable, sustainable, and equitable. An economic impact analysis conducted as part of the strategy demonstrates that On Board maximizes regional economic competitiveness and improves transportation sustainability. Recommendations will generate economic benefits that greatly exceed costs.

IMPORTANCE OF ON BOARD

Southern Nevada's population and economy have grown rapidly, with economic activity expanding in nearly every sector. In the past several years, Southern Nevada added new sports teams, hospitals, master planned communities, employment centers, resorts and a convention center, and education facilities. Forecasts prior to COVID-19 projected the region attracting 640,000 new residents by 2035, increasing Southern Nevada residents from 2.28 million to 2.82 million.[1] While the COVID-19 pandemic dampens these forecasts, regional economists expect Southern Nevada to begin growing again. On Board lays out a plan for regional mobility infrastructure that will stimulate growth in the short term and prepare for continued development in the longer term.

PLAN DEVELOPMENT

On Board was developed through a combination of technical analysis and input from stakeholders, elected officials, and over 80,000 Southern Nevada residents. The technical analysis spanned numerous analytical and evaluation steps, spanning peer reviews, transit demand analysis, market assessments, and cost estimations. Other technical work reflected ridership forecasts detailing local, regional, and corridor-specific transit markets as well as RTC's existing ridership trends. On Board's planning process also encompassed rigorous economic impact analysis. The process and findings from the individual technical tasks are described in Part IV of this report.

The planning process for On Board also included extensive engagement with stakeholders and members of the public. Stakeholders participated in interviews, surveys, public meetings, and pop-up events. A Technical Advisory Group comprised of staff from local planning and public works departments and representatives from business groups, community organizations and regional authorities, like McCarran Airport. The TAG participated met more than 20 times during the On Board process and participated in all parts of plan development. Members of the project team also made more than 100 presentations over the course of developing the On Board plan. Residents participated in the study through multiple surveys and over 250 community events. The platforms provided opportunities for residents to share perceptions, priorities, and aspirations on a range of issues, such as existing and emerging technologies, impressions of High Capacity Transit, and the importance of investments in expanded mobility options. In total, On Board heard from over 80,000 individuals. Details on the stakeholder and community engagement process and findings are included in Part IV of this report.

1 2019-2060 Population Forecasts Long-Term Projections for Clark County, Nevada, June 2019. Center for Business and Economic Research, University of Las Vegas.

ON BOARD GOALS AND OBJECTIVES

Stakeholder and community engagement determined the goals and objectives used to guide On Board. The strategic principles provide policy-level guidance to direct the development of future services, investments, programs, and policies. Each core principle is defined by a set of strategies and measures that serve as the benchmarks for success.

	Goal	Objectives
1	**Connected** - Provide more convenient and reliable transit options	☐ Better connect residents to jobs, services, and activity centers ☐ Provide better opportunities for vulnerable populations ☐ Make trips faster ☐ Make trips more reliable ☐ Make trips more comfortable ☐ Improve first mile/last mile connections
2	**Livable** – Make Southern Nevada more livable	☐ Develop a modern transit system that provides more ☐ Help create vibrant downtowns and town centers ☐ Improve safety and security ☐ Promote healthier communities
3	**Competitive** – Stimulate a dynamic and thriving economy	☐ Stimulate economic investment in Southern Nevada ☐ Improve access to jobs ☐ Make Southern Nevada a more competitive visitor destination
4	**Innovative** – Innovate to improve mobility options	☐ Use technology to improve existing services ☐ Use technology to improve access to transit ☐ Enable new service delivery models ☐ Seamlessly integrate RTC services and other mobility options
5	**Sustainable** – Develop fiscally and environmentally sustainable solutions	☐ Provide services that are productive and cost effective ☐ Reduce greenhouse gas emissions
6	**Responsive** – Advance regional priorities	☐ Pursue projects, policies and programs that receive strong public support ☐ Pursue projects, policies and programs that receive strong stakeholder support ☐ Build and expand partnerships

ON BOARD'S BENEFITS AND ECONOMIC IMPACTS

On Board, as discussed, is organized into 8 Big Moves that collectively and individually increase mobility in Southern Nevada. Strategies and projects will increase the intensity and diversity of mobility infrastructure, making it more convenient, easier, and safer for people to travel. Investments are designed to encourage using transit, biking, and walking for short trips as well as commuting. Southern Nevada residents who drive will benefit from reduced congestion, improved safety, and better air quality. On Board analyzed the collective economic value of the proposed investments and the resulting changes in behavior. The analysis evaluated the impact through four lenses:

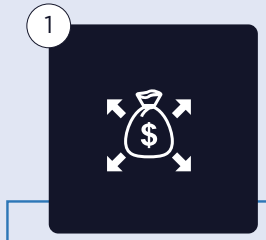
- ☑ **Spending impacts** that capture the jobs and business sales in the regional economy supported by money spent on building, operating, and maintaining the transit system as well as mobility services and infrastructure.
- ☑ **Societal benefits** that reflect time and money savings accruing to people and businesses, plus regional benefits associated with improved safety, and fewer negative environmental effects from vehicle emissions. Societal benefits capture these performance effects and their value to society in monetary (dollar value) terms.[1]
- ☑ **Long-term economic impacts.** Transportation system performance improvements will support long-term economic growth in the Southern Nevada region. Long-term economic impacts represent changes in regional economic activity from improved regional productivity and competitiveness.
- ☑ **Land value and local development.** Transportation performance improvements from High Capacity Transit (HCT) can lead to increased land values and changes in local development along HCT corridors. This represents a "capitalization" of transportation benefits. With targeted local development policies and support, HCT can also serve as a catalyst for transformative impact in station areas, supporting local and regional land use and economic development goals.

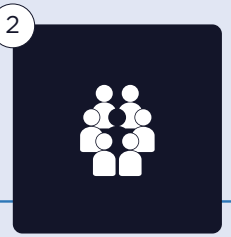
The economic impact analysis evaluated the collective impact of the 8 Big Moves using cost, ridership, and travel characteristics (e.g. travel time, service frequency); changes in these characteristics were used in conjunction with the TREDIS® "Transportation Economic Development Impact System"[2] to understand societal benefits and impacts on the Southern Nevada economy.

On Board will create both short- and long-term benefits and economic opportunities for Southern Nevada. HCT corridors—roads where light rail, bus rapid transit, and rapid bus operate—are the backbone of the On Board Plan and the single largest source of benefits and economic impacts. The 7 other Big Moves were designed to deliver mutually supportive strategies that stimulate the regional economy through their construction and operations, deliver benefits to transit users and non-users, and support long-term economic growth long past the 2040 plan horizon.

1 The full economic analysis report includes additional qualitative and non-monetized but quantified measures of benefit.
2 Inside TREDIS..

Figure 1 Summary of Economic Findings





	1 **Spending Impact** supporting business in SNV	2 **Societal Benefits** monetized social benefits	3 **Economic Growth** from more efficient transportation	4 **Land Value & Development** capitalization and transformation
BIG MOVE 1: High Capacity Transit	Every dollar spent on HCT will generate **1.5 to 1.6** times that amount for the regional economy	HCT will also create **between $700 and $800 million** in annual societal benefits	**$2.8-$3.5 billion** added business output over first 20 years of implementation	**+1-6%** property value increase in HCT corridors, **+10-15%** for commercial office rents. **$1-4 x** private investment per public $
BIG MOVE 2-8: Supportive Mobility Strategies	All 8 Big Moves will generate between **$19.4 and $26.9 billion** in business sales	Transportation performance improvements will provide between **$800 and $900 million** in annual societal benefits*	**$300-$350 million** added in business sales each year to the overall output of the economy	

* At full implementation (2040). NOTE: The range of outcomes reflect the fact that the final HCT network may take the form of a "low scenario," in which the network is mostly bus-based forms of transit or "high scenario" which is a mix of BRT and light rail.

FACILITATING ECONOMIC RECOVERY

As of June 2020, the COVID-19 pandemic has presented Southern Nevada with an unprecedented challenge. RTC continues to serve mobility needs of essential workers while supporting the regional public health response. At the same time, RTC remains focused on the long-term vision of supporting a prosperous Southern Nevada. On Board provides a roadmap for shorter-term economic stimulus through infrastructure investments; these investments also set the stage to meet longer-term mobility needs as the region recovers.

The 2009 American Recovery and Reinvestment Act (ARRA) provided $48.1 billion for capital transportation expenditures. In studying such examples of past stimulus efforts, Transportation Research Board Special Report 312, "Transportation Investments in Response to Economic Downturns" found that well-planned transportation projects are a win-win as a form of stimulus in that they can deliver short-term economic gains, while being justified on the basis of long-term performance benefits. These findings are supported by analysis prepared by Smart Growth American's (SGA) report "What We Learned from the Stimulus".

Much remains uncertain about this current pandemic and accompanying economic downturn, including the timing of necessary health advances. Therefore, it was not possible to develop an economic impact analysis for On Board that fully accounts for future COVID-19 impacts. Recessions cause short-term dips in the economy, with an eventual recovery and return to growth. The pace of growth is dependent on the drivers of the recession and their impacts on individual economic sectors. The most likely outcome is that performance benefits and impacts of On Board will materialize over time, but that it may take longer to reach the full magnitude of the 2040 forecasts. The need for increased mobility and access to employment is paramount to economic growth. In the immediate term, transit demand may stay soft as public health concerns persist, increasing the importance of biking and walking. Over time, however, riders will return to transit, and improvements to the bus network including increased coverage and frequency will support economic recovery efforts and ensure people can get to work.

The COVID-19 pandemic requires both foresight and adapting to uncertainty. On Board provides a road map of potential actions and opportunities. The targeted corridors were chosen because of their demonstrated patterns of activity that have the highest likely demand for transit. At the same time, On Board was developed with phasing and technology choices built in, including the low- and high-cost HCT scenarios. Moving forward, Southern Nevada will benefit from both On Board's foresight and flexibility as the region advances to a more livable and prosperous future.

MOBILITY, PUBLIC HEALTH, AND COVID-19

Health impacts of the COVID-19 pandemic led several states to issue "shelter in place" directives requiring people to stay at home as much as possible. Only workers designated as essential were allowed to work. Many people worked from home, while many others were furloughed or laid off. The impact on local and regional transportation systems was immediate: traffic volumes and transit ridership decreased immediately and dramatically. In the weeks after the initial directive, people began to emerge from their homes for short trips and recreation. During this time, data suggested more people in Southern Nevada were biking and walking. In early May 2020, the RTC reported use of the bike share program in April 2020 increased by 97% over 2019.[1]

In June 2020, roughly 70 days after the initial shelter in place directive was issued, businesses and industries are slowly re-opening, including several of the casinos and resorts in Las Vegas and Clark County. Employment, however, has not yet been fully restored. People working from home are expected to continue to do so home until late summer or early fall.

While the experience of RTC with the bike share program suggests that people are willing to use shared mobility service, riders' return to public transportation is expected to be more cautious. This section of the On Board report is intended to outline immediate term actions for public transit and identify ways to address safety concerns, attract customers back, and prepare for a new transportation paradigm. Strategies also reflect the transit services' need to maintain financial viability and support people relying on their services.

1 RTC bike share usage nearly doubles in April amid shutdown", Las Vegas Review -Journal, May 4,2020.

MESSAGING AND COMMUNICATION

Transit riders, like all consumers, need to know the steps that transit agencies are taking to protect them. Public transit has benefited from strong public support during COVID-19, being an essential service for frontline workers and others. Transit agencies can build on this benefit and work to restore public confidence and comfort about using transit. This is an opportunity to demonstrate leadership and engage with the public and riders.

- ☑ Educate and inform riders. Be active about sanitation policies, using both physical and online systems. This includes marking where to stand at transit centers with stencils, signs, and physical structures as well as where to sit on vehicles to maintain social distance. It also includes policies about face masks for drivers and riders. Educate riders about safety measures through social media and information on vehicles and at stops and transit centers.

- ☑ Communicate through every means possible. Make sure riders are signed up for e-news, text alerts, social media, etc. Changes to policies or services may happen quickly, and riders should have a clear path to finding the latest information. Use sanitation symbols or post on a vehicle when it was last cleaned. Make short videos to demonstrate how to safely use the system.

- ☑ Offer new ways to ride safely. RTC already communicates with its riders through online schedules, mobile ticketing, and email and text alerts. Highlight and encourage options that reduce the need to interact with drivers or customer service staff to plan and pay for trips in advance. TransitApp offers a way for riders to see passenger loads in real time; this level of data sharing provides increased comfort to know that a bus will not be overcrowded.

- ☑ Consider short-term promotions. Partner with local businesses to offer discounts, target visitors or special events, or discount fare products for limited periods. Be creative in making the new normal feel normal, by aligning choosing to ride with the economy or climate change or to provide (socially distanced) human connections again.

- ☑ Highlight the work RTC is doing in the community. Whether providing groceries to seniors through paratransit services or bringing frontline workers to their jobs. Also highlight employees – so much is going on behind the scenes – to showcase those working hard to respond to this crisis.

Best Practices

CREATING A CLEAN BRAND

The RTC and public transit providers are not the only industry challenged to attract customers back to their services. The hospitality industry, for example, has moved swiftly to demonstrate their commitment to public health and high standards for cleanliness. The Hilton brand of hotels is promoting the “Hilton CleanStay” program, which includes a collaboration between Hilton, the Mayo Clinic’s Infection Protection and Control Team, and RB, the maker of Lysol and Dettol.

There is potential for RTC to adapt this strategy and create a new “clean brand” to promote updated standards and commitment to protecting public health. The brand provides opportunities to package and announce changes in cleanliness in ways that are proactive and accessible. Developing a clean brand is also a lower cost strategy that with potential for a big impact on riders and non-riders.

OPERATIONAL AND SERVICE ADJUSTMENTS

Transit services also need to adapt as social distancing measures expand and retract as society "manages the curve" of infections. As workers return to their jobs, public transit will see a slow return of ridership, but almost certainly with new commuting patterns. Those who can work from home may be doing so longer than others, and other riders will come back in phases. Travelers will also almost certainly also be increasing their use of cycling and walking for short and commute trips.

Understanding ridership needs and being responsive to those needs may require new sources of data and approaches to service planning. The pandemic is demonstrating the importance of building flexibility into their service models should another pandemic emerge. The RTC may, for example, consider piloting or making permanent new operating procedures to reduce risk of transmission such as off-vehicle fare payment, rear door boarding/alighting, elimination of cash, and reduced use of paper schedules. Areas to address:

- ☑ Short-term service adjustments. Develop a pandemic equivalent of "snow routes" to focus service during shelter in place orders. Many agencies were caught flat-footed and ran weekend schedules in response to operator availability and reduced demand for services. Work rules around how operators choose work make it difficult to adapt schedules in real-time. Anticipating a future event and having a service plan in place will allow for greater operations flexibility and allow RTC to focus their resources on routes that service essential workers and healthcare facilities while also providing enough service to avoid crowding.

- ☑ Monitor the return of the workforce, students, and other riders, by considering new sources of data. This may include monitoring the use of trip planning services (TransitApp is doing this well and publicizing data) to the purchase of fare products, agencies can understand ridership trends to anticipate changes in demand. Review all existing data sources – website visits, Automatic Passenger Count (APC) and farebox data, fare purchases, customer service calls – and compile into a performance report that can be shared daily or weekly within planning and senior leadership. External sources such as Teralytics and Streetlight can also monitor overall transportation demand or working closely with RTC's FAST Department, local and regional transportation departments to understand travel patterns.

- ☑ Strategize about how to rebuild ridership. Transit ridership will be different through the end of 2020 and likely into 2021 as well. Peak-period and commuter travel patterns may never reemerge. On Board calls for re-investment in the transit network, including projects and programs that recommend high frequency networks and increased span of service. While relevant, they may need to be reconsidered in light of new travel patterns.

- ☑ Invest in bus priority infrastructure, such as dedicated lanes, signal priority, and level platform boardings. On Board Big Move 1: Build High Capacity Transit calls for bus priority infrastructure investments on Southern Nevada's most important travel corridors. Other On Board strategies are designed to reduce friction in mobility by improving travel speed and reliability. Improved transit service quality will be particularly valuable for visitors who may find the traditional barriers to riding transit too overwhelming in a post-COVID-19 world.

Best Practices

UL MTA SPENDS $1 MILLION TO TEST DISINFECTING NYC SUBWAYS WITH UV LIGHT: IT'S LIKE A UV CHAMBER. TRAVIOLET LAMPS

Large transit agencies in the United States, including the MTA in New York City, are piloting the use of ultraviolet lamps to disinfect trains, buses, stations, and crew facilities. The lamps use UVC, which show promise for killing the virus responsible for COVID-19. UVC systems are used in hospital operating rooms and offer potential to kill the virus more effectively and at a lower cost as compared with cleaning by hand. Individual devices are relatively inexpensive (estimated at less than $10,000 per device) and offer potential for cost savings over the long run. RTC may consider developing a pilot project to test similar technology on their buses, transfer facilities and staff rooms. Success with this technology will also help RTC bolster its "clean brand" and response to the pandemic.[1]

1 MTA spends $1 million to test disinfecting NYC subways with UV Light: It's like a UV chamber.

Figure 2 UVC Lamp

Images from MTA New York City Transit


Bay
12
THIS IS A
NON
SMOKING
FACILITY
BAY 12
12 206 East
206 EAST
USA

1 2 3 4 5 6 7

Build High Capacity Transit

1

BIG MOVE

BUILD HIGH CAPACITY TRANSIT

85%
rated Big Move 1 at least

RTC On Board Strategies Survey (January-March 2020)
11,221 respondents

High Capacity Transit (HCT) provides frequent and convenient service for passengers in high volume areas. HCT includes light rail transit (LRT); bus rapid transit (BRT), which is light rail-like service provided with buses; and Rapid Bus, which consists of a mix of transit measures. HCT also stimulates economic development in the region and along the corridors where it operates. On Board's HCT network will:

- ☑ Provide **higher capacity, enhanced** service
- ☑ **Be frequent**, with service operating at least every 10 to 15 minutes
- ☑ Provide **faster service**. Depending on the corridor, travel times will decrease by 10% to 30%
- ☑ Provide **reliable service** via exclusive right-of-way, with trains and buses operating as scheduled
- ☑ Connect neighborhoods to **key destinations** throughout the region

☑ Be **comfortable**, pleasant, and easy to use

☑ Be **safe and secure** at stations and on vehicles

Corridors included in the HCT network and the phasing of specific corridors represent an iterative process that reflects a combination of technical analysis and stakeholder input. The evaluation framework processes consisted of six steps (see Figure 1-A) that informed the corridors recommended for implementation in the Phase 1 and Phase 2 HCT network.

Figure 1-A: Evaluation Framework

Figure 1-B: Different Types of High Capacity Transit

LIGHT RAIL

TYPICAL FEATURES
- Two car trains
- Service in exclusive rights-of-way
- Center running in urban arterials
- High quality stations with level boarding
- Very frequent service (at least every 10 minutes)
- Service for 24 hours a day
- Limited stops
- Transit signal priority
- Special branding
- Off-board fare collection
- Real-time passenger information

Salt Lake City TRAX light rail service

BUS RAPID TRANSIT (BRT)

TYPICAL FEATURES
- Larger, rail-like buses
- Primarily center-running on urban arterials
- Primarily operates in exclusive rights of way
- High quality stations
- Very frequent service (at least every 10 minutes)
- Service from early morning to late night
- Simple service design
- Limited stops
- Transit signal priority
- Special branding
- Off-board fare collection
- Real-time passenger information

Cleveland Healthline BRT service

RAPID BUS

TYPICAL FEATURES
- Similar to BRT but without exclusive lanes, or only limited exclusive lanes
- 40' or 60' articulated coaches
- More limited forms of transit priority:
  - Transit signal priority
  - Queue jump lanes
- Frequent service, but less frequent than light rail or BRT
- Service from early morning to late night, but often shorter span than light rail or BRT

Las Vegas SDX service

Different Types of High Capacity Transit

Phoenix Light Rail

Image from KTAR

Los Angeles Orange Line Bus Rapid Transit

Image from Dan Read via flickr

Las Vegas SDX, which has many Rapid Bus Features

Light Rail Transit (LRT)

LRT is rail service that operates with one- to three-car trains in high volume corridors. Service typically operates in dedicated lanes in roadway medians, although underground and elevated service can also be provided. Vehicles are powered electrically. Historically LRT has relied on drawing electrical power from overhead wires. As of Spring, 2020, some LRT systems are experimenting with energy storage and battery technology to power operations. Light rail stations are usually spaced farther apart than those of local bus services. Cities implementing new LRT lines coordinate land use and development strategies to stimulate economic development, increase density, and improve walkability around new stations.

Bus Rapid Transit (BRT)

BRT is a high-quality bus service that operates much like light rail, including in dedicated transit lanes and fixed guideways as part of the right-of-way. When fully implemented, BRT can decrease travel times and spur economic development. Operational and design elements that set BRT apart from traditional local bus service include dedicated transit lanes, enhanced stations with prepayment and level boarding, wider stop spacing, transit signal priority, higher capacity vehicles, specialized branding, and more frequent service.

Rapid Bus

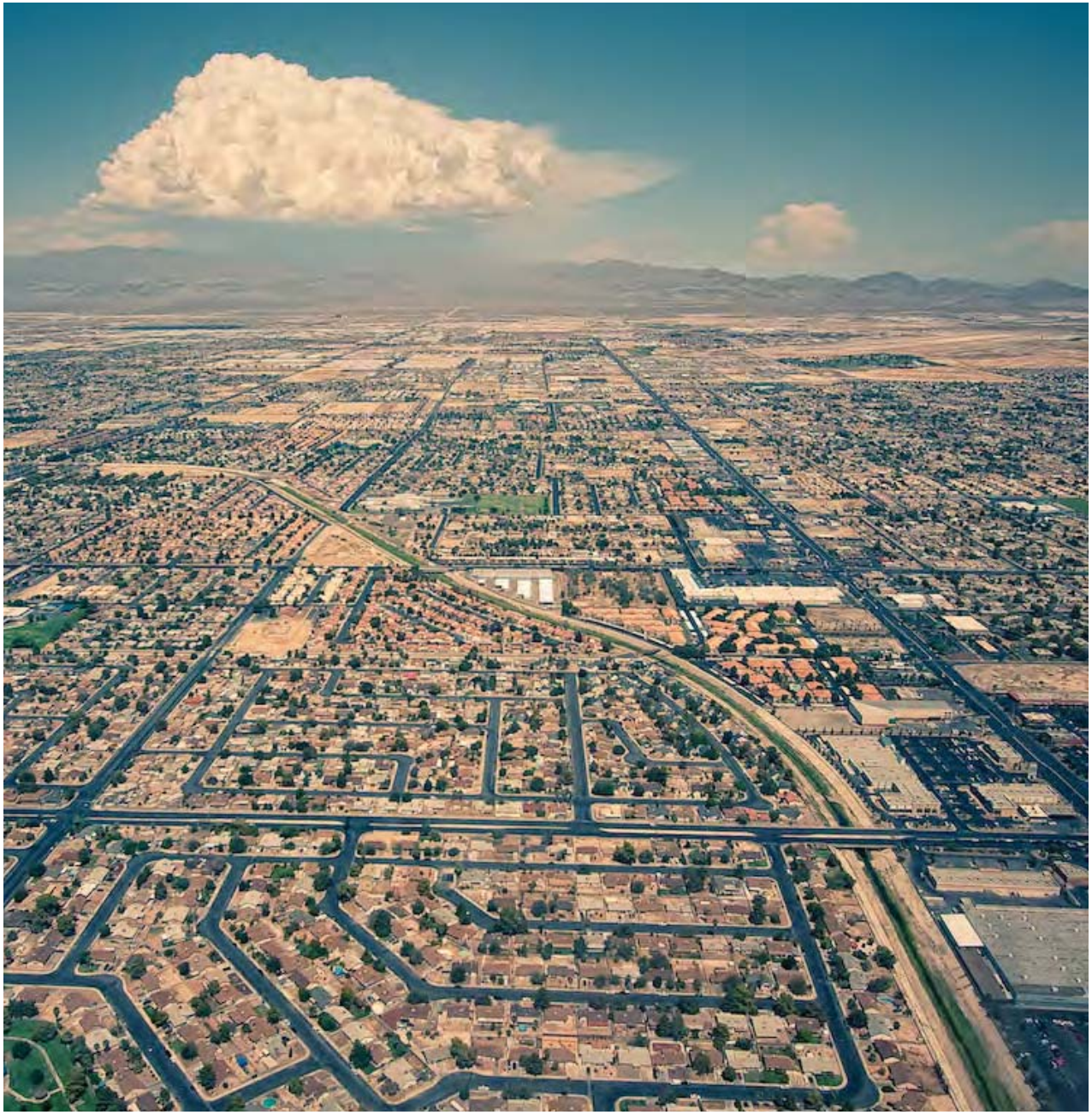
Rapid Bus is very similar to BRT, but does not operate in dedicated transit lanes, or does so only in limited areas. Instead, most service operates in mixed traffic with targeted measures to provide transit priority, such as queue jump lanes (short bus lanes to bypass backups at traffic signals) and signal priority. RTC'S Strip and Downtown Express (SDX) line is a version of Rapid Bus service operating largely without dedicated transit lanes, except for in limited segments.

European Street Tram

Flickr user Ian YVR

European Tram (Euro-Tram)

European tram service is similar to modern American streetcar service that has been implemented in Portland, OR, Kansas City, MO, and other American cities, but with longer vehicles. Euro-Tram vehicles are like LRT vehicles but operate in mixed traffic with limited or no transit priority.



Aerial photo of Southern Nevada

ON BOARD'S RECOMMENDED HIGH CAPACITY TRANSIT INVESTMENTS

On Board will build a total of about 200 miles of HCT in 17 corridors over two phases: Phase 1 will consist of the short-term (one to five years) and medium term (six to 10 years) and Phase 2 would be long term (10 to 20 years). HCT development includes:

- ☑ **Maryland Parkway**, which is currently under development as a BRT corridor.
- ☑ **Three LRT or BRT corridors**, with the determination between LRT and BRT based on more detailed evaluation during project development. These corridors include Charleston Boulevard, Cross-Valley Connector, and North 5th Street.
- ☑ **Three additional BRT routes** slated for development in Phase 2. Two of these corridors will be developed initially as Rapid Bus in Phase 1 and upgraded to BRT as part of Phase 2 (Craig Road and Eastern Avenue). One corridor (Sahara Avenue) currently meets Rapid Bus criteria; this corridor will be upgraded to BRT as part of Phase 2.
- ☑ **Eleven Rapid Bus routes**, of which six will be developed in Phase 1 and four will be developed in Phase 2. Of the five Rapid Bus corridors, two (Craig Road and Eastern Avenue) will be upgraded to BRT in Phase 2. Rapid Bus service on Nellis Boulevard will be extended to Stephanie Road in Phase 2.

Figure 1-A High Capacity Transit Network

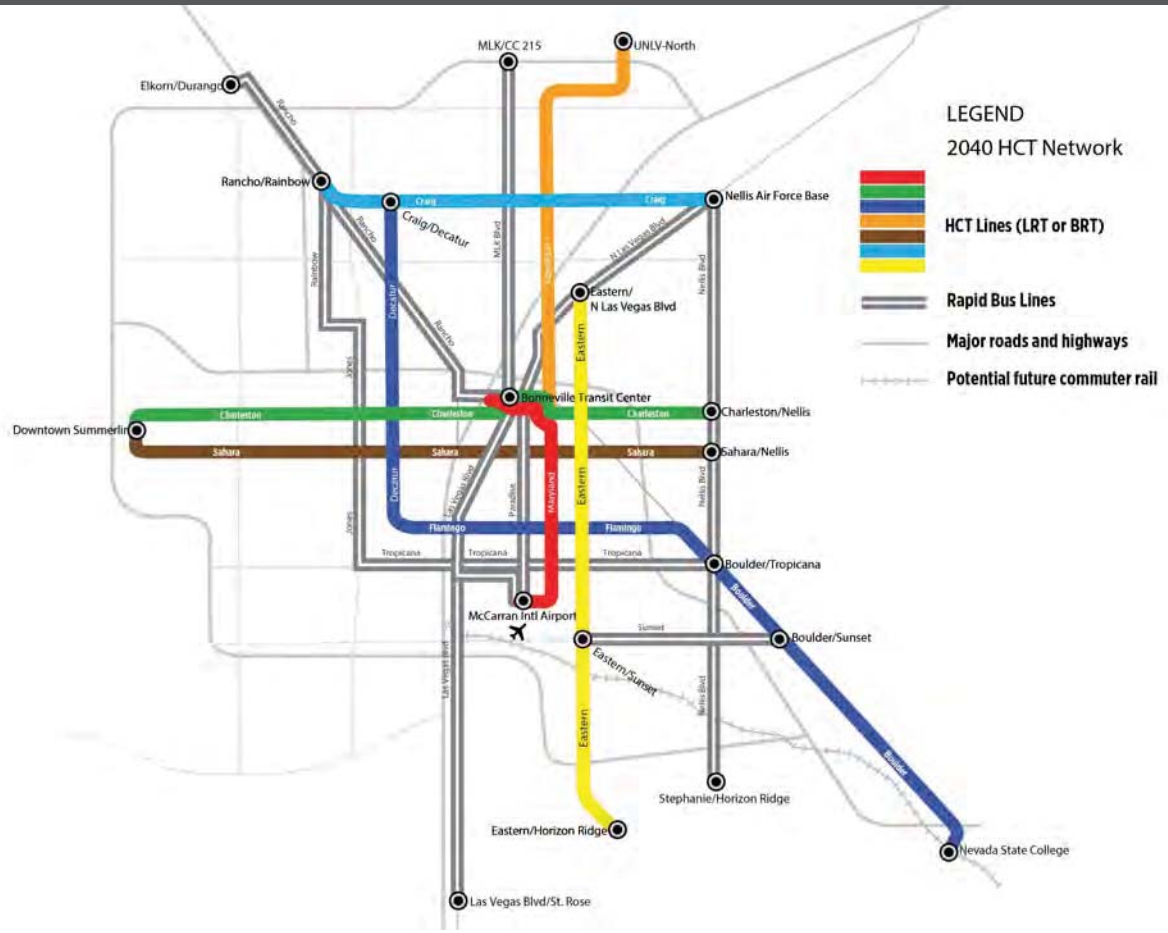


Figure 1-B Qualitative Assessment of Benefit and Impact of Planned HCT Corridors Compared Against Relevant Project Goals

	Corridor Name	Technology	Connected – Provide more convenient and reliable transit options	Livable – Make Southern Nevada More Livable	Competitive - Stimulate a dynamic and thriving economy
1	Maryland Parkway	BRT	★	●	●
2	Charleston Boulevard	LRT or BRT	●	★	●
3	Cross-Valley Connector	LRT or BRT	★	★	★
4	North 5th Street	LRT or BRT	●	●	●
5	Craig Road	Rapid Bus	●	●	●
6	Rancho Drive	Rapid Bus	●	●	●
7	Eastern Avenue	Rapid Bus	●	★	●
8	Nellis Boulevard	Rapid Bus	●	★	●
9	Paradise Road	Rapid Bus	★	●	●
10	Sunset Road	Rapid Bus	●	●	●
11	Sahara Avenue	BRT	●	★	●
12	Craig Road	BRT	●	●	●
13	Jones/Rainbow/Tropicana	Rapid Bus	●	★	★
14	Martin Luther King, Jr. Boulevard	Rapid Bus	●	●	●
15	Nellis/Stephanie	Rapid Bus	●	★	●
16	North Las Vegas Boulevard	Rapid Bus	●	●	●
17	South Las Vegas Boulevard	Rapid Bus	●	●	●

Source: Nelson\Nygaard Consulting Associates

★ **Highest Impact** – demonstrates impact significantly greater as compared with the other corridors

● **High** – expected impact is in top tier among HCT corridors

● **Medium** – expected impact is in the middle tier among HCT corridors

● **Low** – expected impact in the lowest tier among HCT corridors

Figure 1-C Planned HCT Corridors, Development Timeframe and Corridor Characteristics

	Technology	Corridor Length (Miles)	Ridership by Corridor (with LRT)*	Ridership by Corridor (with BRT)*	Ridership per Mile**	2040 Population within ¾ Mile	2040 Employment within ¾ Mile	Assessed Value of Properties within ¾ Miles (Millions)
PHASE I (Less than 10 Years)								
Maryland Parkway	BRT	7.0	11,700	11,700	1,700	88,117	90,378	$2,241.07
Charleston Boulevard	LRT or BRT	16.9	21,000	18,100	1,200 - 1,100	175,109	136,337	$5,423.95
Cross-Valley Connector	LRT or BRT	28.2	42,100	38,400	1,500 - 1,400	303,695	281,888	$12,726.23
North 5th Street	LRT or BRT	11.6	9,600	9,500	500	121,990	83,698	$2,759.15
Craig Road	Rapid Bus	10.9	7,700	7,700	700	99,971	42,183	$2,635.96
Rancho Drive	Rapid Bus	14.0	6,900	6,400	500	133,381	89,326	$3,822.06
Eastern Avenue	Rapid Bus	14.4	12,200	11,700	850-800	171,121	91,282	$3,585.34
Nellis Boulevard Phase I	Rapid Bus	16.0	9,700	9,400	600	180,885	57,880	$3,604.12
Paradise Road	Rapid Bus	5.7	9,500	9,600	1,700	56,424	185,724	$5,453.33
Sunset Road	Rapid Bus	6.3	3,300	3,100	500	40,892	52,595	$1,852.34
PHASE II (More than 10 Years)								
Resort Corridor	Euro-Tram	7.0	28,200	26,500	4,000-3,800	48,349	345,928	$11,257.69
Sahara Avenue	BRT	15.6	17,900	17,900	1,200	169,025	134,711	$5,872.57
Craig Road (Convert to BRT)	BRT	10.9	7,700	7,700	705	99,971	42,183	$2,635.96
Nellis Boulevard (includes expanded service on Stephanie)	Rapid Bus	16.0	9,400	9,400	600	180,885	57,880	$3,604.12
Jones/Rainbow/Tropicana	Rapid Bus	21.3	21,600	21,600	1,100-1,000	240,056	221,773	$10,039.96
Martin Luther King, Jr. Boulevard	Rapid Bus	11.5	6,600	6,600	600	141,628	74,738	$3,355.86
North Las Vegas Boulevard	Rapid Bus	7.9	3,900	3,900	500	103,016	73,231	$2,062.65
South Las Vegas Boulevard	Rapid Bus	11.6	14,700	14,400	1,300-1,200	74,796	159,300	$8,139.05

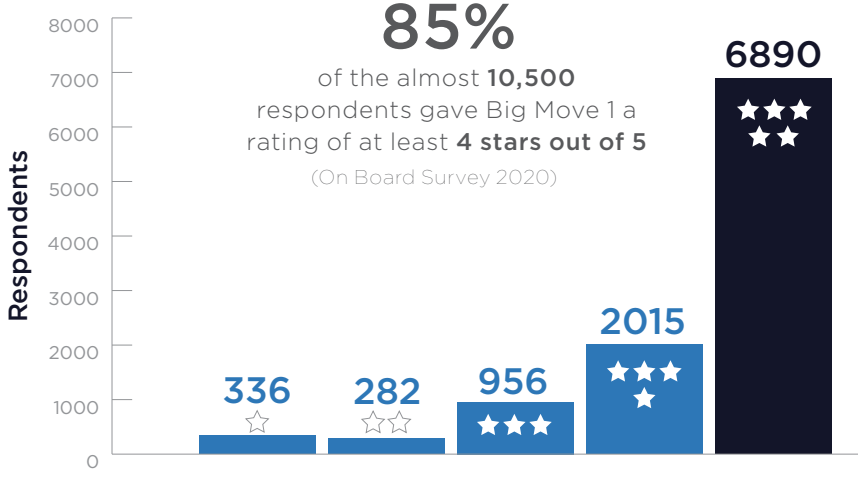
Source: RTC Regional Travel Demand Model and Consultant Team Estimates; Property Value Assessment data provided by Clark County.

Notes:

* Ridership was estimated by corridor based on assumptions about network development. Some corridors have higher ridership as a result of overall network investments in LRT versus BRT.

** Some corridors have higher ridership if there are network-wide investments in LRT instead of BRT; as a result, ridership per mile for these corridors is shown as a range. Corridors with a single number do not substantially benefit from LRT investment in the overall network.

SURVEY FINDING



Southern Nevada residents gave Big Move 1 and all of its associated strategies a rating of

4.4 out of 5 stars

(On Board Survey 2020)

What is your impression of Light Rail?

83% like it
4% oppose

(On Board Vision Survey 2018)

Support for Big Move 1 is especially high among **young people and low-income minorities**

Low-income minorities rating: 4.6/5
Age 29 & under rating: 4.6/5

(On Board Survey 2020)

60%

of respondents said "High Capacity Transit would encourage me to try a new mode of travel

(On Board Vision Survey 2018)

KEY BENEFITS

All mobility strategies generate benefits for individual travelers, the regional economy and the environment. The graphic below provides a relative scale of the benefits.

EFFECTIVENESS IN ADDRESSING REGIONAL PRIORITIES

Building a High Capacity Transit System in Southern Nevada will directly help achieve the following priorities identified through extensive public outreach with nearly 80,000 people and multiple surveys that had almost 25,000 combined responses:

REGIONAL MOBILITY PRIORITIES

1	Improved Road & Transit Safety	◒
2	Fewer Traffic Jams	●
3	High Capacity Transit (including light rail)	●
4	Better Connectivity	●
5	Well-Maintained Roads	○
6	Frequent Bus Service	●
7	More Transportation Choices	●
8	Expanded Service for Seniors, Veterans, & People with Disabilities	◒
9	Improved Job & Housing Access	●
10	Better Walking & Biking Conditions	◒
11	New Modal Technologies & Investments	●
12	Expanded Transit Service Area	◒
13	New Information Technologies	◒
14	Better Transit Stops & Stations	●
15	Improved Transit Security	●

KEY | ● Strongest ◒ Strong ○ Less Strong

PHASE 1 HCT DEVELOPMENT

Phase 1 development will consist of the development of 10 HCT lines: three LRT, one BRT, and six Rapid Bus:

BRT

- ☑ Maryland Parkway BRT (under development in 2020)

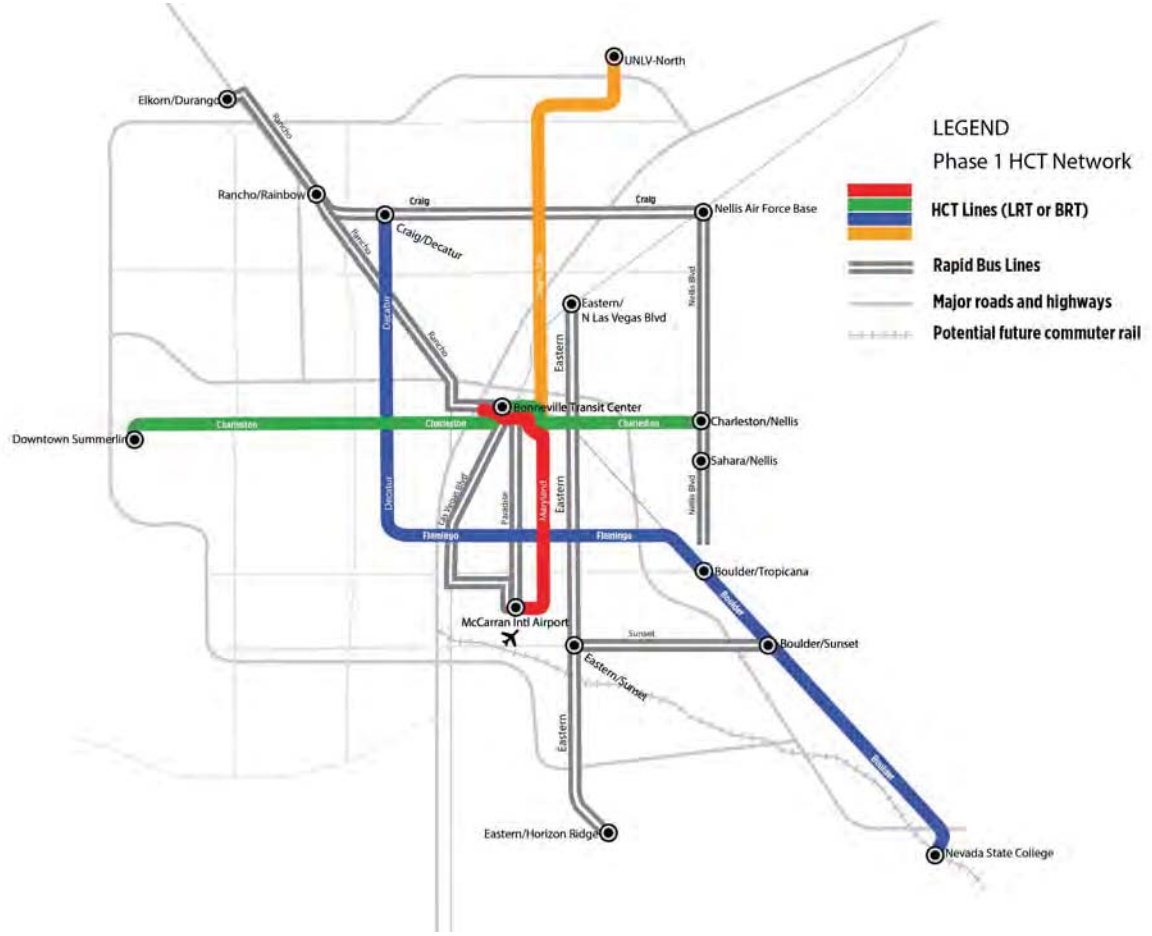
LRT or BRT

- ☑ Charleston Boulevard
- ☑ Cross-Valley Connector (Boulder Highway-Flamingo-Decatur)
- ☑ North 5th Street

Rapid Bus

- ☑ Craig Road
- ☑ Eastern Avenue
- ☑ Nellis Boulevard
- ☑ Paradise Road
- ☑ Rancho Drive
- ☑ Sunset Road

Figure 1-D Phase 1 HCT Lines



PROJECT 1-1

Finish Maryland Parkway HCT Project

OVERVIEW

RTC is now developing its first HCT line between the Las Vegas Medical District and McCarran International Airport via Alta Drive, the Bonneville Transit Center, downtown Las Vegas, and Maryland Parkway. HCT on Maryland Parkway will provide more frequent service, and infrastructure investments will increase service speed and reliability. Investments will also stimulate economic development around station areas. In the spring of 2020, modal technology for this line had not yet been finalized; the assumption is that the service will be developed as BRT.

Timing for Completion	Short Term (1-10 Years)	**Potential Funding Sources**	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax FTA Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) • Bus Facility formula Funds (Section 5339(a)) FTA Discretionary Funds: • Bus and Bus Facilities Program (Section 5339) • New Starts Program • Better Utilizing Investments to Leverage Development (BUILD) Grants FHWA Discretionary Funds: • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grant (STBG) Program
Implementing Agency	Lead: RTC Partner: Local Jurisdictions		

BACKGROUND

Maryland Parkway is a vital corridor for Southern Nevada, extending from McCarran International Airport to downtown Las Vegas, and connecting many high-activity centers, such as University of Nevada, Las Vegas (UNLV), The Boulevard Mall, and Sunrise Hospital, as well as commercial and residential areas.

The Maryland Parkway environmental assessment was completed in 2019. The RTC Board of Commissioners voted to move forward with BRT in April 2019, and the Federal Transit Administration (FTA) issued the Finding of No Significant Impact (FONSI) in December 2019. The project will move forward with applying for federal funding in 2020.

BENEFITS

Implementing BRT on Maryland Parkway will strengthen transit service on one of Southern Nevada's most important corridors. The project includes infrastructure investments to improve transit service speed and reliability as well as enhanced pedestrian and bicycling facilities. Investments will support redevelopment of the corridor, helping to attract investment and strengthening the sense of place in this rapidly growing area of Southern Nevada.

CHALLENGES

There will be several design-related challenges that will need to be addressed to maximize the effectiveness of the project. As currently envisioned, service will operate largely in curbside transit lanes, with right turns by general traffic allowed from the transit lanes. This will cause friction with HCT service, as general traffic turning from the curbside lane can slow down

transit vehicles. Thoughtful designs will need to be developed to reduce friction between HCT and general traffic. There will also be areas where the development of exclusive transit lanes will be difficult. Finally, while there is great potential for TOD along Maryland Parkway, incentives will likely be needed to stimulate this development, and this will require creative approaches among partners.

COMPANION PROJECTS

Project 1-1: Finish Maryland Parkway HCT Project is related to and will be planned in coordination with the following projects:

- ☑ **Big Move 1:** Build High Capacity Transit contains several HCT investments that will be mutually supportive and work to form a network of services.
- ☑ **Project 1-11:** Develop New Revenue Source using Public-Private Partnerships to Build Transit Oriented Developments (TOD) Along High Capacity Routes
- ☑ **Project 2-3:** Expand Frequent Transit Network in High Demand Areas provides for frequency and span of service investments on HCT corridors ahead of technology and roadway investments.
- ☑ **Project 6-2:** Develop Airport Mobility Hub (McCarran Multimodal Transportation Center)

NEXT STEPS

RTC is now preparing an application for FTA New Starts (or possibly Small Starts) funding, which it will submit later this year. The next step will be project design, followed by construction. This process is ongoing, and updates will be posted to the project website at https://www.rtcsnv.com/maryland-parkway/.

Figure 1-E Maryland Parkway

Maryland Parkway Corridor

Corridor Length	7.0 miles
Total Ridership (Ridership by Mile)	**LRT**: 11,700 *(1,700 boardings per mile)* **BRT**: 11,700 *(1,700 boardings per mile)*
2040 Population within ¾ mile	88,117
2040 Employment within ¾ mile	90,378
2020 Assessed Valuation of Properties within ¾ mile	$2.2 billion

PROJECT 1-2

Charleston Boulevard LRT or BRT

OVERVIEW

Charleston Boulevard is one of the RTC's highest ridership corridors, and this project will upgrade service to either LRT or BRT, with the modal decision made during the FTA Project Development phase (see below). The decision on mode may also impact the length of the project. Given the lower cost of BRT, it is likely that development as BRT would be between downtown Summerlin and Nellis Boulevard, whereas LRT would be between Torrey Pines Drive (which is located between Rainbow Boulevard and Jones Boulevard) and Nellis Boulevard..

Timing for Completion	Medium Term (6-10 Years)	**Potential Funding Sources**	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax (For Associated Road Improvements) FTA Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) • Bus Facility formula Funds (Section 5339(a)) FTA Discretionary Funds: • Bus and Bus Facilities Program (Section 5339) • New Starts Program • Better Utilizing Investments to Leverage Development (BUILD) Grants FHWA Discretionary Funds: • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grant (STBG) Program
Implementing Agency	Lead: RTC Partner: Local Jurisdictions		

BACKGROUND

Charleston Boulevard is currently served by Route 206 Charleston, which is a frequent local route. It is RTC's fourth highest ridership route, and one that On Board found would be among the most supportive of HCT. Major activity centers along the corridor include downtown Summerlin, CSN's Charleston Campus, the Las Vegas Medical District, and downtown Las Vegas.

BENEFITS

The development of HCT in the Charleston Boulevard corridor will provide better service to existing riders, attract new riders to transit, and provide an east-west backbone to the development of a valley-wide HCT network. The Charleston Boulevard corridor also has a high potential for TOD.

CHALLENGES

The development of LRT and BRT services are by nature challenging, particularly with respect to fitting the required transit facilities, especially exclusive transit lanes, into the built environment. In addition, with BRT, it is often too easy to make compromises – for example, forgoing transit lanes in difficult areas – that ultimately diminish the anticipated benefits.

COMPANION PROJECTS

Project 1-2: Charleston Boulevard BRT or LRT is related to and will be planned in coordination with the following projects:

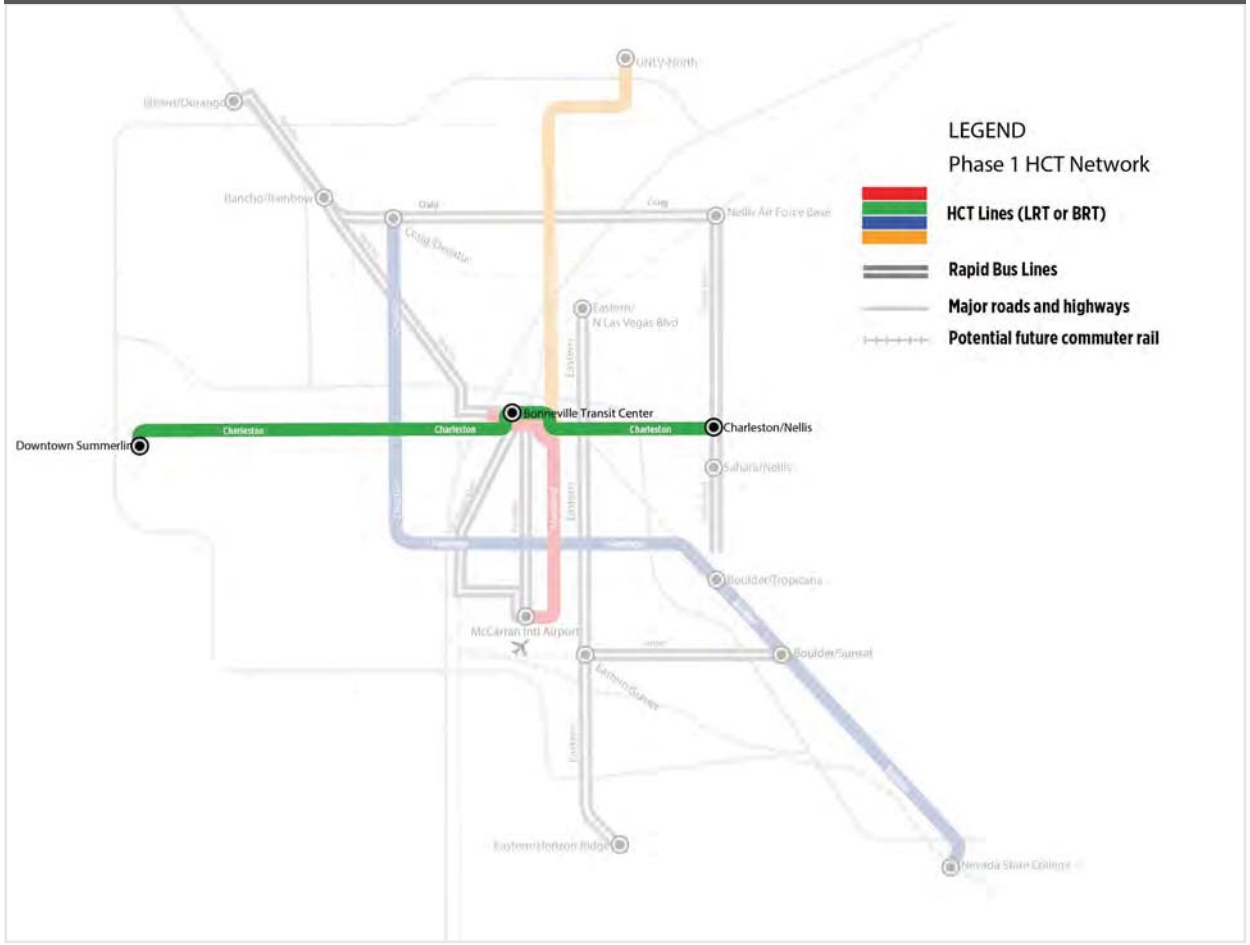
☑ **Big Move 1:** Build High Capacity Transit contains several HCT investments that will be mutually supportive and work to form a network of services.

- ☑ **Project 1-11:** Develop New Revenue Source using Public-Private Partnerships to Build Transit Oriented Developments (TOD) Along High Capacity Routes
- ☑ **Project 2-3:** Expand Frequent Transit Network in High Demand Areas provides for frequency and span of service investments on HCT corridors ahead of technology and roadway investments.

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Develop Locally Preferred Alternative with finalized corridor plan, including final recommendation on technology and alignment	RTC	Local Jurisdictions
2	Request approval from FTA to enter the Project Development Phase/Prepare Project Application	RTC	Local Jurisdictions
3	Advance into Project Development	RTC	Local Jurisdictions

Figure 1-F Charleston Boulevard



Charleston Boulevard Corridor

Corridor Length	16.9 miles
Total Ridership (Ridership by Mile)	**LRT**: 21,000 over corridor *(1,200 boardings/mile)* **BRT**: 18,100 over corridor *(1,100 boardings/mile)*
2040 Population within ¾ mile	175,109
2040 Employment within ¾ mile	136,337
2020 Assessed Valuation of Properties within ¾ mile	$5.4 billion

PROJECT 1-3

Cross-Valley Connector LRT or BRT

OVERVIEW

The Cross-Valley Connector would be a nearly 25-mile-long LRT or BRT line that would run between the northwest and southeast via Decatur Boulevard, Flamingo Road, and Boulder Highway. Its northern terminal would be at the intersection of Craig Road and Decatur Boulevard in Las Vegas and Nevada State College in Henderson. It would provide connections with most other HCT lines.

Timing for Completion	Medium Term (6-10 Years)	**Potential Funding Sources**	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax (For Associated Road Improvements) FTA Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) • Bus Facility formula Funds (Section 5339(a)) FTA Discretionary Funds: • Bus and Bus Facilities Program (Section 5339) • New Starts Program • Better Utilizing Investments to Leverage Development (BUILD) Grants FHWA Discretionary Funds: • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grant (STBG) Program
Implementing Agency	Lead: RTC Partner: Local Jurisdictions		

BACKGROUND

HCT lines recommended in On Board were developed through a process that combined a technical evaluation of potential services and stakeholder desires. The Cross-Valley Connector had among the highest levels of stakeholder support, and particularly from the City of Henderson.

BENEFITS

The development of either HCT in the Decatur, Flamingo, and southern Boulder Highway corridor will provide very strong connections between the valley's outer ring communities, as well as connecting service to downtown Las Vegas and the Resort Corridor.

CHALLENGES

The development of LRT and BRT services are by nature challenging, particularly with respect to fitting the required transit facilities – especially transit lanes – into the built environment. One major exception along this line will be along Boulder Highway, where transit lanes may be developed as part of reconstruction of that roadway. This line, due to its length, would also be the most expensive of the HCT lines. As with all lines, to make the service as efficient as possible, it will be important to build dedicated transit lanes even in difficult areas.

COMPANION PROJECTS

Project 1-3: Cross-Valley Connector BRT or LRT is related to and will be planned in coordination with the following projects

☑ • **Big Move 1:** Build High Capacity Transit contains several HCT investments that will

be mutually supportive and work to form a network of services.

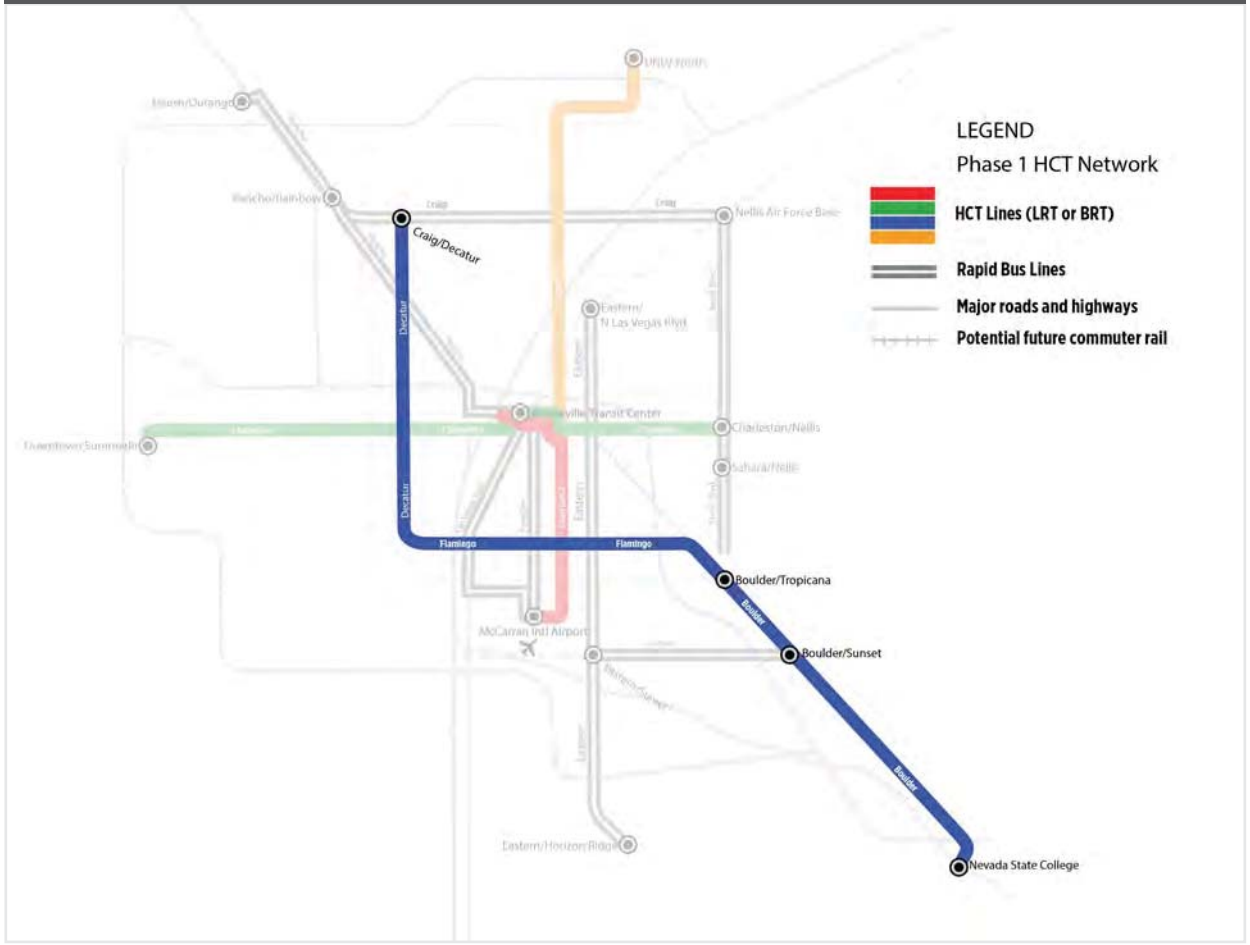
☑ • **Project 1-11:** Develop New Revenue Source using Public-Private Partnerships to Build Transit Oriented Developments (TOD) Along High Capacity Routes

☑ • **Project 2-3:** Expand Frequent Transit Network in High Demand Areas provides for frequency and span of service investments on HCT corridors ahead of technology and roadway investments.

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Develop Locally Preferred Alternative with finalized corridor plan, including final recommendation on technology and alignment	RTC	Local Jurisdictions
2	Request approval from FTA to enter the Project Development Phase/Prepare Project Application	RTC	Local Jurisdictions
3	Advance into Project Development	RTC	Local Jurisdictions

Figure 1-G Cross-Valley Connector HCT Line



Cross-Valley Corridor

Corridor Length	28.2 miles
Total Ridership (Ridership by Mile)	**LRT**: 42,100 over corridor *(1,500 boardings/mile)* **BRT***: 38,400 over corridor* *(1,400 boardings/mile)*
2040 Population within ¾ mile	303,695
2040 Employment within ¾ mile	281,888
2020 Assessed Valuation of Properties within ¾ mile	$12 billion

PROJECT 1-4

North 5th Street LRT or BRT

OVERVIEW

The North 5th Street line would run from UNLV-North to downtown Las Vegas primarily along North 5th Street. It would be the major HCT line in North Las Vegas. North Las Vegas has prioritized North 5th Street as its primary commercial corridor and has planned transit-oriented development in and around the roadway.

Timing for Completion	Medium Term (6-10 Years)	**Potential Funding Sources**	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax (For Associated Road Improvements) FTA Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) • Bus Facility formula Funds (Section 5339(a)) FTA Discretionary Funds: • Bus and Bus Facilities Program (Section 5339) • New Starts Program • Better Utilizing Investments to Leverage Development (BUILD) Grants FHWA Discretionary Funds: • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grant (STBG) Program
Implementing Agency	Lead: RTC Partner: Local Jurisdictions		

BACKGROUND

Proposed HCT corridors were developed through a process that combined a technical evaluation of potential services and stakeholder desires. The North 5th Street line is the City of North Las Vegas' highest priority line, and the City has already identified North 5th Street as its primary commercial corridor. In addition, North Las Vegas and RTC have already begun collaborating to direct development to the corridor by preparing land use and transit-oriented development plans. Efforts include:

- ☑ **The Deer Springs District Livable Center** *(completed January 2020).* Deer Springs is located on the northern edge of the Las Vegas urbanized area near the I-15 corridor. The district is slated for a mixed-use development, including a 150-acre Job Creation Zone, 500 acres of residential development, and space for the University of Nevada, Las Vegas – North Campus. North 5th Street will be the primary corridor connecting Deer Springs with the City of North Las Vegas. HCT connections between activity centers can help stimulate development along the corridor.
- ☑ **North Fifth Street Transit Supportive Land Use Plan.** While older (study was completed in 2005), this plan established a Transit Oriented Design (TOD) framework that lays out desired land use plans along the North 5th Street corridor.

This work will help advance implementation of the corridor plan and start to build the densities that will be required to support HCT.

BENEFITS

The City of North Las Vegas is working to make North 5th Street its primary commercial corridor and views the development of HCT there as instrumental in those efforts, particularly in terms of TOD.

Project 1-4

CHALLENGES

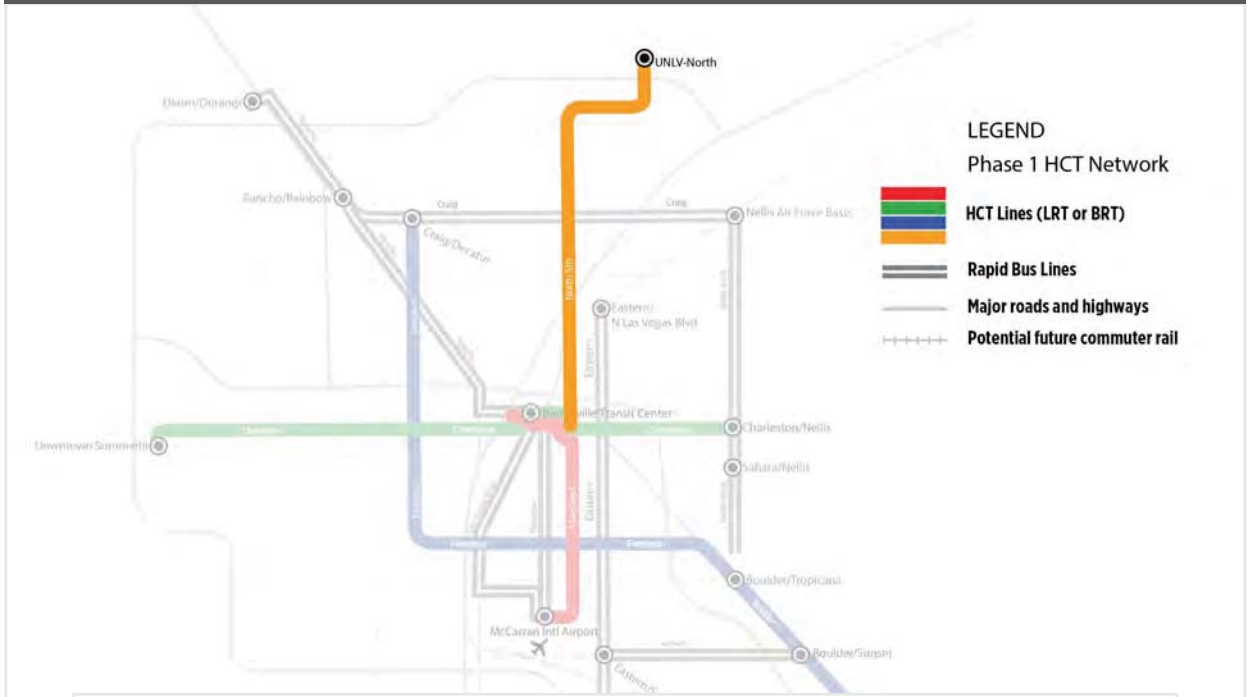
A handful of challenges associated with bringing HCT to North 5th Street. Development along the corridor is thin, with most existing development oriented around automobile travel. The corridor will need to attract a significant amount of new development to produce the base levels of ridership required to qualify for FTA New Starts funding. Further, North 5th Street is a relatively narrow corridor with two travel lanes in each direction. This suggests that dedicating the right-of-way for transit travel may be challenging. .

COMPANION PROJECTS

Project 1-4: North 5th Street BRT or LRT is related to and will be planned in coordination with the following projects:

- ☑ **•Big Move 1:** Build High Capacity Transit contains several HCT investments that will be mutually supportive and work to form a network of services.
- ☑ **•Project 1-11:** Develop New Revenue Source using Public-Private Partnerships to Build Transit Oriented Developments (TOD) Along High Capacity Routes
- ☑ **•Project 2-3:** Expand Frequent Transit Network in High Demand Areas provides for frequency and span of service investments on HCT corridors ahead of technology and roadway investments.

Figure 1-H North 5th Street HCT Line



North 5th Street Corridor

Corridor Length	11.6 miles
Total Ridership (Ridership by Mile)	**LRT**:* *9,600 over corridor (500 boardings/mile)* **BRT**:* *9,500 over corridor (500 boardings/mile)*
2040 Population within ¾ mile	121,990
2040 Employment within ¾ mile	83,698
2020 Assessed Valuation of Properties within ¾ mile	$2.8 billion

* Network impacts of LRT or BRT on ridership for the North 5th Street BRT corridor are negligible.

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Develop Locally Preferred Alternative with finalized corridor plan, including final recommendation on technology and alignment	RTC	Local Jurisdictions
2	Request approval from FTA to enter the Project Development Phase/Prepare Project Application	RTC	Local Jurisdictions
3	Advance into Project Development	RTC	Local Jurisdictions

PROJECT 1-5

Phase 1 Rapid Bus Routes

OVERVIEW

On Board proposes the development LRT or BRT in the corridors where ridership would be highest and/or local jurisdictions most desire it. Rapid Bus is proposed in other high demand corridors.

The first Rapid Bus lines will be in the following corridors:

- Craig Road
- Eastern Avenue
- Nellis Boulevard
- Paradise Road
- Rancho Drive
- Sunset Road

Timing for Completion	Medium Term (6-10 Years)	**Potential Funding Sources**	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax (For Associated Road Improvements) FTA Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) • Bus Facility formula Funds (Section 5339(a)) FTA Discretionary Funds: • Bus and Bus Facilities Program (Section 5339) • Capital Investment Grants New Starts Program (Section 5309) FHWA Discretionary Funds: • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grant (STBG) Program
Implementing Agency	Lead: RTC Partner: Local Jurisdictions		

BACKGROUND

The proposed HCT network was developed through a process that combined a technical evaluation of potential services and stakeholder desires. The overall network, at 17 lines, will be very large, and it would not be affordable to construct all as light rail or BRT. The lines that are planned for light rail and BRT are those that would either serve the highest number of riders and/or are most desired by local jurisdictions. The remainder will be developed as Rapid Bus to provide many of the same benefits at a lower cost.

BENEFITS

While not providing all the features of light rail and BRT, Rapid Bus will still be a significant upgrade over regular local bus routes. Rapid Bus will offer riders improved service frequency and operating hours, faster travel times, and improved stations and station areas, with more fare payment options and better lighting, safety, and security. The improved service will benefit existing riders and help attract new riders to transit.

CHALLENGES

Rapid Bus is much easier to implement, mostly because it does not require the development of exclusive transit lanes. However, Rapid Bus does employ other transit priority measures such as queue jump lanes and transit signal priority that will present implementation challenges. Higher quality stations will also require additional sidewalk space.

COMPANION PROJECTS

Project 1-5: Six Rapid Bus Routes is related to and will be planned in coordination with the following projects:

- ☑ **Big Move 1:** Build High Capacity Transit contains several HCT investments that will be mutually supportive and work to form a network of services.
- ☑ **Project 1-11:** Develop New Revenue Source using Public-Private Partnerships to Build Transit Oriented Developments (TOD) Along High Capacity Routes
- ☑ **Project 2-3:** Expand Frequent Transit Network in High Demand Areas provides for frequency and span of service investments on HCT corridors ahead of technology and roadway investments.

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Develop Locally Preferred Alternative with finalized corridor plan, including final recommendation on technology and alignment	RTC	Local Jurisdictions
2	Request approval from FTA to enter the Small Starts or Very Small Starts Project Development Phase/ Prepare Project Application	RTC	Local Jurisdictions
3	Advance into Project Development	RTC	Local Jurisdictions

Figure 1-I Phase 1 Rapid Bus Lines

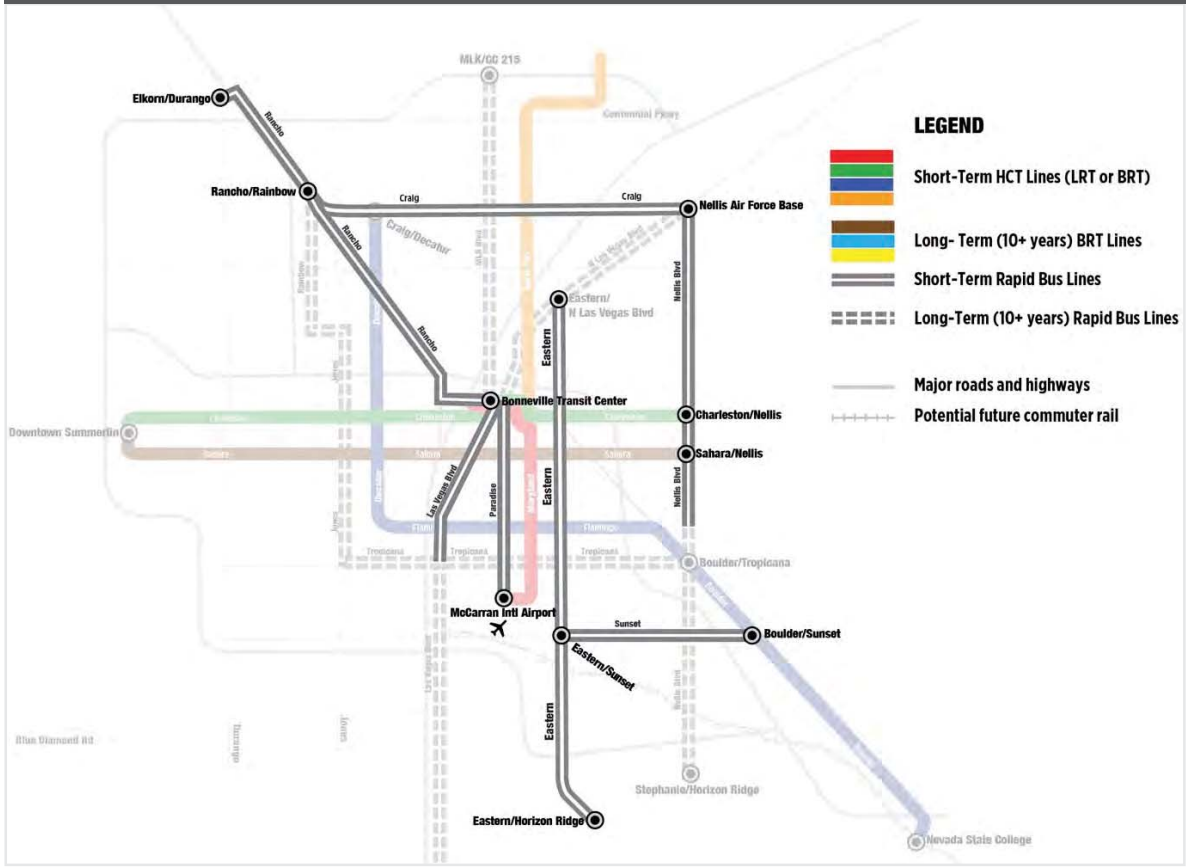


Figure 1-J Planned Phase I Rapid Bus Corridors and Corridor Characteristics

	Miles	Ridership	Ridership per Mile	Population	Employment	Assessed Value (M)
Craig Road	10.9	7,700	700	99,971	42,183	$2,636
Eastern Avenue	14.0	6,900-6,400	500	133,381	89,326	$3,822
Nellis Boulevard	14.4	12,200-11,700	850-800	171,121	91,282	$3,585
Paradise Road	16.0	9,700-9,400	600	180,885	57,880	$3,604
Rancho Drive	5.7	9,600-9,500	1,700	56,424	185,724	$5,453
Sunset Road	6.3	3,300-3,100	500	40,892	52,595	$1,852

Source: RTC Regional Travel Demand Model and Consultant Team Estimates; Property Value Assessment data provided by Clark County.

Notes:

* Ridership was estimated by corridor based on assumptions about network development. Some corridors have higher ridership as a result of overall network investments in LRT versus BRT.

** Some corridors have higher ridership if there are network-wide investments in LRT instead of BRT; as a result, ridership per mile for these corridors is shown as a range. Corridors with a single number do not substantially benefit from LRT investment in the overall network.

PHASE 2 HCT DEVELOPMENT

Phase 2 HCT development will consist of the development and improvement of eight HCT lines. This will build out the network to nine HCT corridors, seven of which are new HCT lines:

Euro-Tram

☑ Resort Corridor

BRT

☑ Sahara Avenue

☑ Craig Road (upgraded Rapid Bus investments made in Phase I)

☑ Eastern Avenue (upgraded Rapid Bus investments made in Phase I)

Rapid Bus

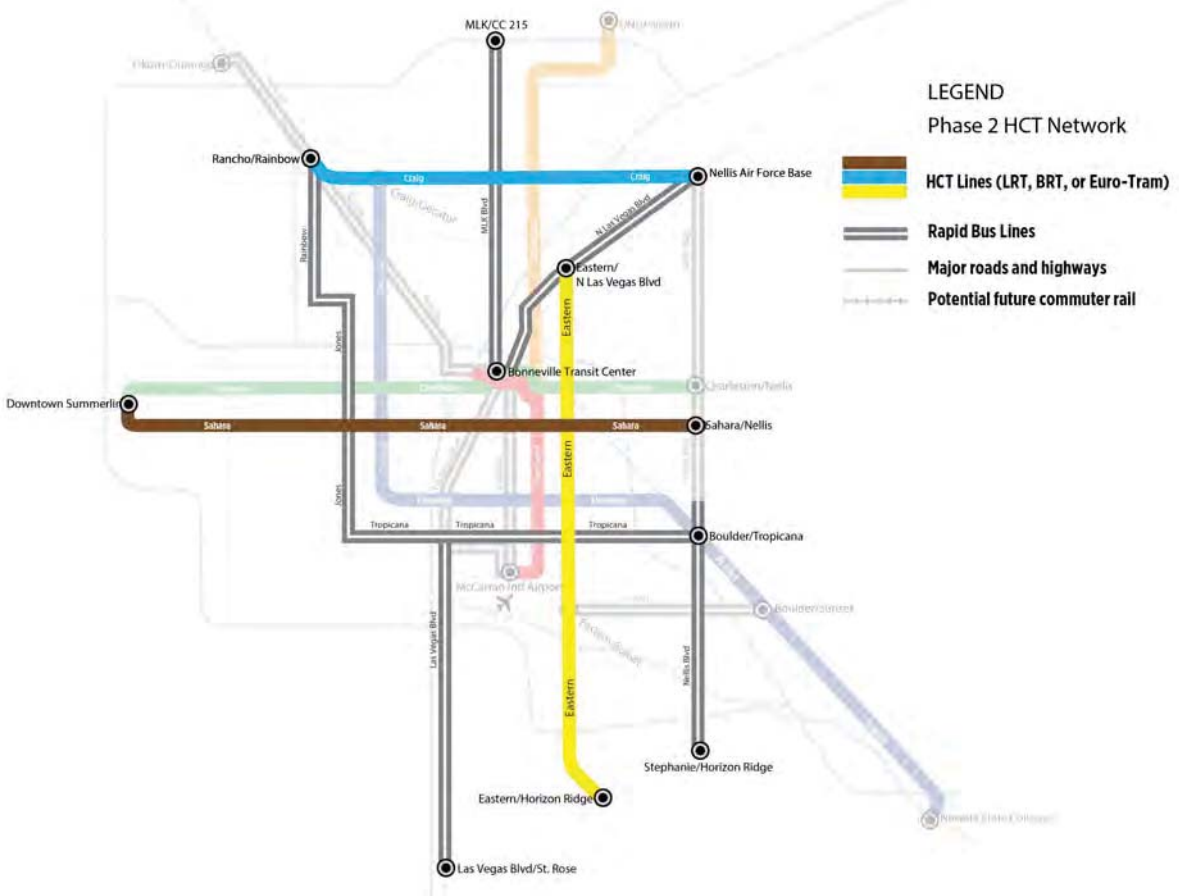
☑ Tropicana/Jones /Rainbow

☑ Martin Luther King, Jr.

☑ North Las Vegas Boulevard

☑ South Las Vegas Boulevard

Figure 1-K Phase 2 HCT Lines



Light Rail High Capacity Transit in Salt Lake City, Utah
Image from Utah Transit Authority

PROJECT 1-6

Sahara Avenue BRT

OVERVIEW

Sahara Avenue is one of RTC's highest ridership corridors and will be upgraded to BRT. The route will run between downtown Summerlin and Nellis Boulevard.

Timing for Completion	Long Term (11-20 Years)	**Potential Funding Sources**	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax (For Associated Road Improvements) FTA Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) • Bus Facility formula Funds (Section 5339(a)) FTA Discretionary Funds: • Bus and Bus Facilities Program (Section 5339) • Capital Investment Grants New Starts Program (Section 5309) • Better Utilizing Investments to Leverage Development (BUILD) Grants FHWA Discretionary Funds: • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grant (STBG) Program
Implementing Agency	Lead: RTC Partner: Local Jurisdictions		

BACKGROUND

Sahara Avenue is currently served by the Sahara Express (SX), which is a limited stop Rapid Bus route. RTC used ARRA stimulus funds to implement upgrades to the SX.

The Sahara Express is RTC's third highest ridership route, and a corridor that On Board found would be among the most supportive of HCT. Major activity centers include downtown Summerlin and the north end of the Strip. The route would connect to six other HCT lines.

BENEFITS

Sahara Avenue already has Rapid Bus service, and the corridor has experienced the benefits associated with improved service frequent and operating hours, faster travel times and improved stations and station areas, with more fare payment options, and better lighting, safety, and security. These improvements have helped the SX rise to the third-highest ridership route in RTC's network.

With an upgrade from Rapid Bus to BRT, the SX will operate in a dedicated travel lane, significantly improving service speed and reliability and reducing passenger travel times. Investment upgrades will also increase the potential for development and land use benefits along the corridor resulting from TOD projects and improved station area designs.

CHALLENGES

The development of BRT services is by nature challenging, particularly with respect to fitting the required transit facilities into the built environment. However, this will be easier along Sahara Avenue, as there are already shoulder bus

lanes along most of the route. These could be upgraded or shifted to the center.

COMPANION PROJECTS

Project 1-6: Sahara Avenue BRT is related to and will be planned in coordination with the following projects:

- ☑ **Big Move 1:** Build High Capacity Transit contains several HCT investments that will be mutually supportive and work to form a network of services.
- ☑ **Project 1-11:** Develop New Revenue Source using Public-Private Partnerships to Build Transit Oriented Developments (TOD) Along High Capacity Routes
- ☑ **Project 2-3:** Expand Frequent Transit Network in High Demand Areas provides for frequency and span of service investments on HCT corridors ahead of technology and roadway investments.

NEXT STEPS

This is a Phase 2 project, and as such, there will be no immediate next steps. Near the end of Phase 1, RTC will need to seek approval from FTA to enter Project Development and then conduct the necessary project development.

Figure 1-L Sahara Avenue HCT

Sahara Avenue Corridor

Corridor Length	15.6 miles
Total Ridership (Ridership by Mile)	**LRT**: 17,900 over corridor *(1,200 boardings/mile)* **BRT**: 17,900 over corridor *(1,200 boardings/mile)*
2040 Population within ¾ mile	169,025
2040 Employment within ¾ mile	134,711
2020 Assessed Valuation of Properties within ¾ mile	$5.9 billion

PROJECT 1-7
Craig Road BRT

OVERVIEW

In Phase 1, service on Craig Road will be upgraded to Rapid Bus (Project 1-5). In Phase 2, service will be further upgraded to BRT.

Timing for Completion	Long Term (11-20 Years)	**Potential Funding Sources**	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax (For Associated Road Improvements) FTA Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) • Bus Facility formula Funds (Section 5339(a)) FTA Discretionary Funds: • Bus and Bus Facilities Program (Section 5339) • Capital Investment Grants New Starts Program (Section 5309) • Better Utilizing Investments to Leverage Development (BUILD) Grants FHWA Discretionary Funds: • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grant (STBG) Program
Implementing Agency	Lead: RTC Partner: Local Jurisdictions		

BACKGROUND

All the proposed HCT lines were developed through a process that combined a technical evaluation of potential services and stakeholder desires. This line is a high priority of the cities of Las Vegas and North Las Vegas.

BENEFITS

The On Board Plan recommends investing in the Craig Road corridor in two steps. Phase I will create Rapid Bus service; Phase II will make additional investments and upgrade the service to BRT. Rapid Bus creates benefits related to service frequency and operating hours, faster travel times, and improved stations and station areas.

The upgrade to BRT means service along Craig Road will operate in a dedicated travel lane, significantly improving service speed and reliability and reducing passenger travel times. Upgrades will also increase the potential for development and land use benefits along the corridor resulting from TOD projects and improved station area designs. Craig Road BRT service also provides important connections with six north-south HCT lines, building out the network of expanded services.

CHALLENGES

Development in the Craig Road corridor is still thin, and a significant amount of new development will be needed to produce the base levels of ridership required to qualify for FTA New Starts funding. As a result, upgrading service from Rapid Bus to BRT will be heavily dependent upon the amount of development that occurs over the next 10-plus years.

COMPANION PROJECTS

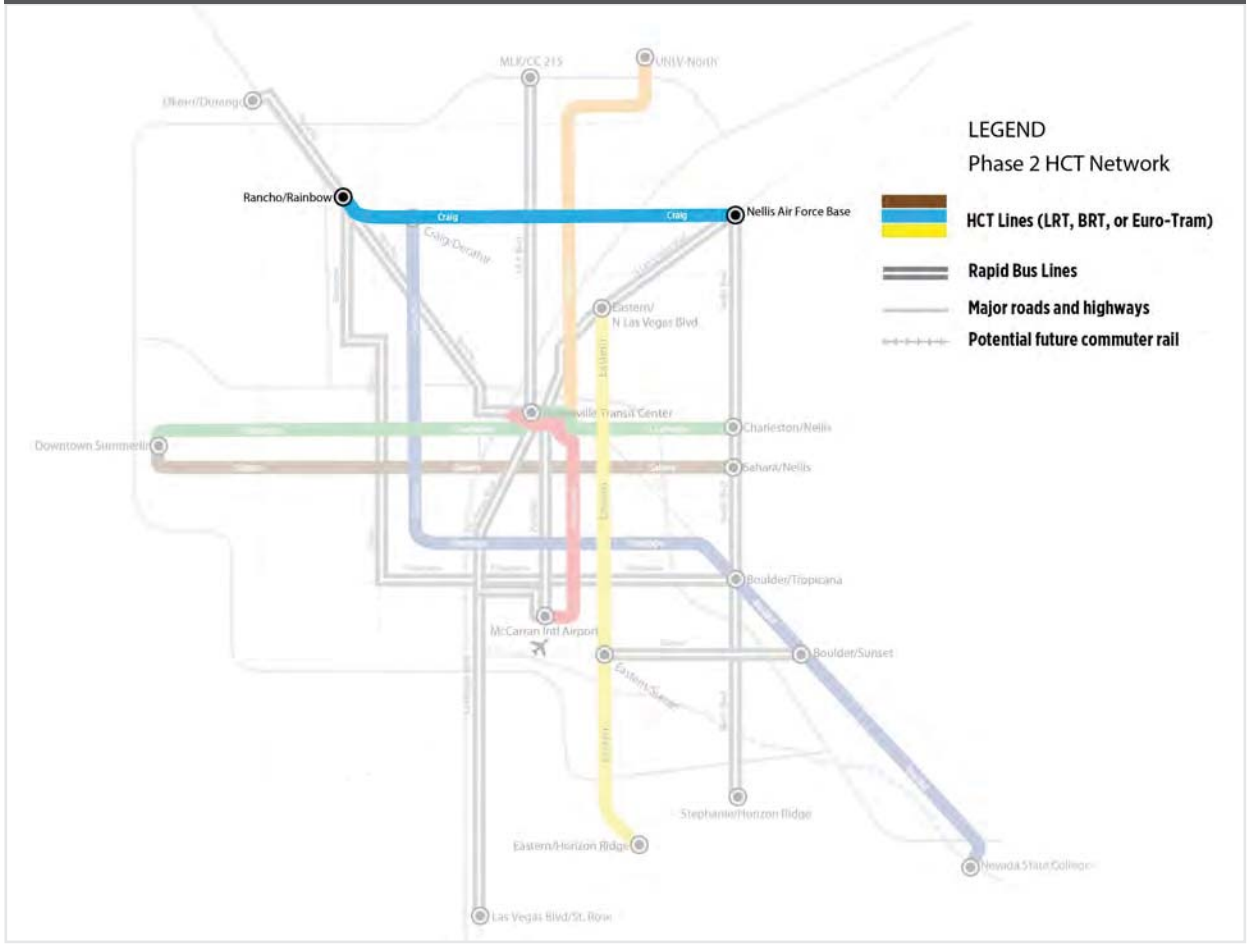
Project 1-7: Craig Road BRT is related to and will be planned in coordination with the following projects:

- ☑ • **Project 1-5:** Six Rapid Bus Routes - service on Craig Road will be upgraded to Rapid Bus in Phase 1 (Project 1-5) before being subsequently developed as BRT.
- ☑ • **Project 1-11:** Develop New Revenue Source using Public-Private Partnerships to Build Transit Oriented Developments (TOD) Along High Capacity Routes
- ☑ • **Project 2-3:** Expand Frequent Transit Network in High Demand Areas provides for frequency and span of service investments on HCT corridors ahead of technology and roadway investments.

NEXT STEPS

Given this project is scheduled for the longer term, next steps will be for the cities of Las Vegas and North Las Vegas to stimulate development in this corridor to help build the densities that will be required to support BRT.

Figure 1-M Craig Road BRT



Name Corridor

Corridor Length	10.9 miles
Total Ridership (Ridership by Mile)	**LRT**: # over corridor *(# boardings/mile)* **BRT**: # over corridor *(# boardings/mile)*
2040 Population within ¾ mile	99,971
2040 Employment within ¾ mile	42,183
2020 Assessed Valuation of Properties within ¾ mile	$2.6 billion

PROJECT 1-8

Eastern Avenue BRT

OVERVIEW

In Phase 1, service on Eastern Avenue would be upgraded to Rapid Bus (Project 1-5). In Phase 2, service would be further upgraded to BRT.

Timing for Completion	Long Term (11-20 Years)	**Potential Funding Sources**	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax (For Associated Road Improvements) FTA Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) • Bus Facility formula Funds (Section 5339(a)) FTA Discretionary Funds: • Capital Investment Grants New Starts Program (Section 5309) • Better Utilizing Investments to Leverage Development (BUILD) Grants FHWA Discretionary Funds: • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grant (STBG) Program
Implementing Agency	Lead: RTC Partner: Local Jurisdictions		

BACKGROUND

All the proposed HCT lines were developed through a process that combined a technical evaluation of potential services and stakeholder desires. This line is a high priority of the cities of Las Vegas and Henderson.

BENEFITS

Like Craig Road, On Board invests in Eastern Avenue over two phases – an initial investment to create Rapid Bus service and a second investment to BRT. Rapid Bus updates improve service frequency and operating hours, faster travel times and improved stations and station areas.

The upgrade to BRT will create a dedicated travel lane, improving service speed and reliability and reducing passenger travel times. Upgrades will also increase the potential for development and land use benefits along the corridor resulting from TOD projects and improved station area designs. Eastern Avenue BRT service also builds out Southern Nevada's HCT network with connections to six east-west HCT lines.

CHALLENGES

Eastern Avenue is recommended as a BRT in part to complete the HCT network. Investments in BRT and the dedicated travel lanes are especially important in the portion of the corridor south of I-215, which currently has high traffic volumes. Without dedicated travel lanes, the service will struggle to operate quickly and reliably.

However, the upgrade to BRT service is slated for Phase II, largely because demand on Eastern Avenue is not yet at the levels needed to produce the base amounts of ridership required to qualify for FTA New Starts funding. As a result, the

upgrading of service from Rapid Bus to BRT will be heavily dependent upon the amount of development that occurs over the next 10-plus years.

COMPANION PROJECTS

Project 1-8: Eastern Avenue BRT is related to and will be planned in coordination with the following projects:

- ☑ • **Project 1-5:** Six Rapid Bus Routes - service on Eastern Avenue will be upgraded to Rapid Bus in Phase 1 (Project 1-5) before being subsequently developed as BRT.
- ☑ • **Project 1-11:** Develop New Revenue Source using Public-Private Partnerships to Build Transit Oriented Developments (TOD) Along High Capacity Routes
- ☑ • **Project 2-3:** Expand Frequent Transit Network in High Demand Areas provides for frequency and span of service investments on HCT corridors ahead of technology and roadway investments.

NEXT STEPS

Given that this project is scheduled for the longer term, the next steps will be for the cities of Las Vegas and Henderson and Clark County to stimulate development in this corridor to help build the densities necessary to support BRT.

Figure 1-N Eastern Avenue BRT

Eastern Avenue Corridor

Corridor Length	14.4 miles
Total Ridership (Ridership by Mile)	**LRT**: 12,200 over corridor *(900 boardings/mile)* **BRT**: 11.700 over corridor *(800 boardings/mile)*
2040 Population within ¾ mile	171,121
2040 Employment within ¾ mile	91,282
2020 Assessed Valuation of Properties within ¾ mile	$3.6 billion

PROJECT 1-9

Phase 2 Rapid Bus Routes

OVERVIEW

Similar to Phase 1, Rapid Bus will be developed in high demand corridors not already identified as light rail or BRT.

These corridors will include:

- An extension of Nellis Boulevard service south to Stephanie Street
- Jones Boulevard/Rainbow Boulevard
- Tropicana Avenue
- Martin Luther King, Jr. Boulevard
- North Las Vegas Boulevard
- South Las Vegas Boulevard

Timing for Completion	Medium Term (6-10 Years)	**Potential Funding Sources**	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax (For Associated Road Improvements) FTA Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) • Bus Facility formula Funds (Section 5339(a)) FTA Discretionary Funds: • Capital Investment Grants New Starts Program (Section 5309) • Bus and Bus Facilities Program (Section 5339) FHWA Discretionary Funds: • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grant (STBG) Program
Implementing Agency	Lead: RTC Partner: Local Jurisdictions		

BACKGROUND

As discussed, the recommended HCT network includes 17 lines and over 220 miles of HCT service. The sheer size and level of investment means implementation must be phased in and carried out over several years. Phasing service implementation also gives the region an opportunity to move forward with important land use and development strategies like Complete Streets, TOD, and mobility hubs, and to improve the local operating environment so it is more attractive, safer, and conducive to transit riders.

The six Rapid Bus corridors identified for development in Phase II reflect corridors with longer-term potential for HCT. Most corridors also serve to build out the full network of HCT services and provide connections between major services.

BENEFITS

Rapid Bus provides a significant improvement over local bus services with investments in service frequency and operating hours. Rapid Bus also includes capital projects to make service faster and more reliable, as well as more comfortable with improved stations and station areas. These improvements have demonstrated their success in benefiting existing riders and attracting new riders per RTC's experience with the SX.

CHALLENGES

Rapid Bus is easier to implement because it does not require the development of exclusive transit lanes. Instead, the service relies on other transit priority measures such as queue jump lanes and transit signal priority. Other improvements are focused on stations and station areas. Investments will change the current operating

environment, which will impact vehicular travel. Rebalancing the travel priorities between private vehicles and transit will require cooperation and political will.

COMPANION PROJECTS

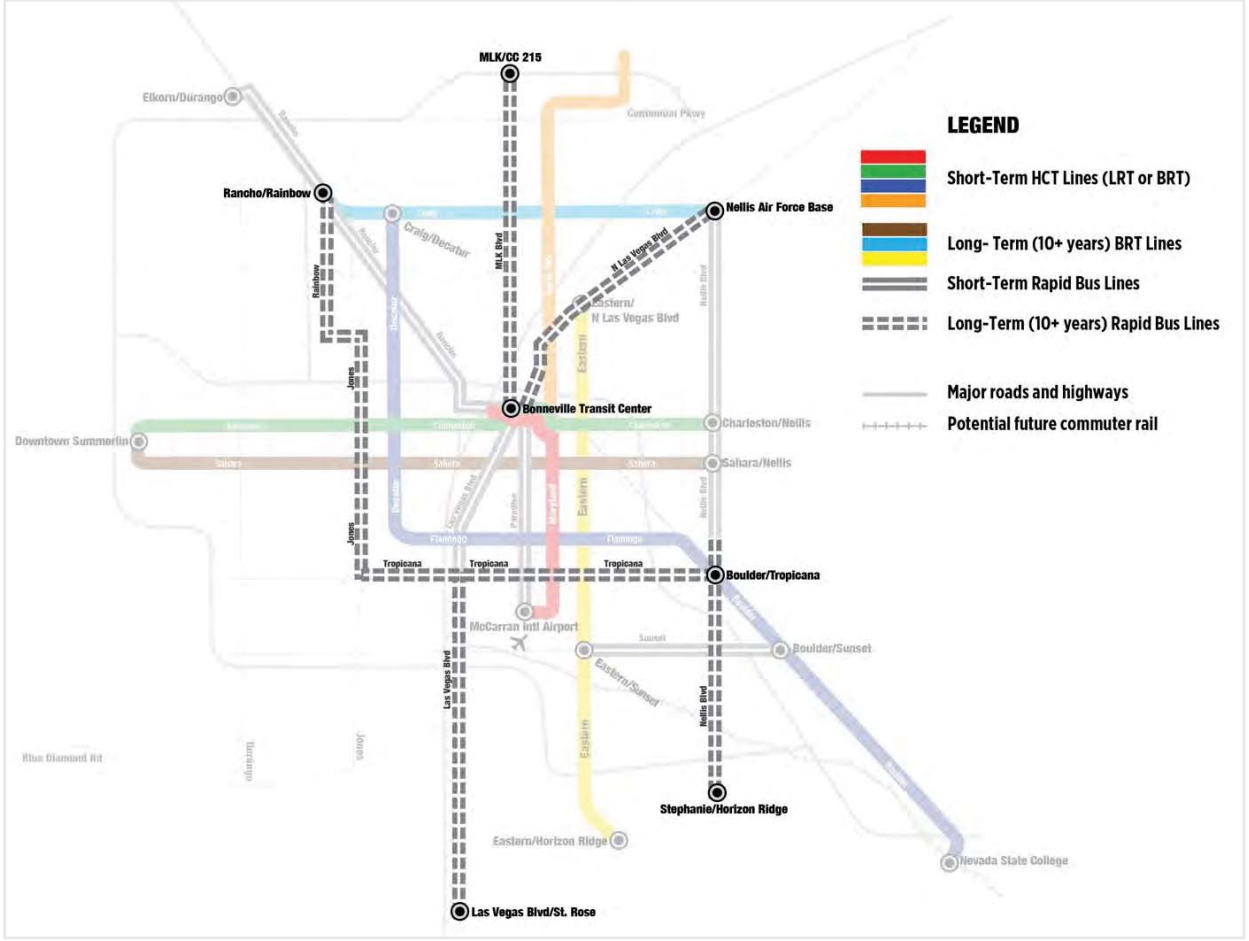
Project 1-9: Six Rapid Bus Projects is related to and will be planned in coordination with the following projects:

- ☑ • **Project 1-5:** Six Rapid Bus Routes – the experience and lessons learned from implementing Phase 1 Rapid Bus projects will inform and shape Phase 2 implementation
- ☑ • **Project 1-11:** Develop New Revenue Source using Public-Private Partnerships to Build Transit Oriented Developments (TOD) Along High Capacity Routes
- ☑ • **Project 2-3:** Expand Frequent Transit Network in High Demand Areas provides for frequency and span of service investments on HCT corridors ahead of technology and roadway investments.

NEXT STEPS

Given that this project is scheduled for the longer term, there will be no immediate or short-term next steps.

Figure 1-0 Phase 2 Rapid Bus Lines



Phase 2 Rapid Bus Lines Corridors

Corridor Length	68.4 miles
Total Ridership (Ridership by Mile)	**LRT**: 56,200 over corridor *(800 boardings/mile)* **BRT**: 55,900 over corridor *(800 boardings/mile)*
2040 Population within ¾ mile	740,380
2040 Employment within ¾ mile	586,923
2020 Assessed Valuation of Properties within ¾ mile	$27.2 billion

PROJECT 1-10*

Expand Frequency Network in High Demand Area

*Cross Listed as **Project 2-3**

OVERVIEW

Transit service is most appealing when it is frequent enough that riders can just go to a stop with the knowledge that a bus or train will be arriving shortly, instead of needing to consult a timetable. Frequent Transit Networks have the following characteristics:

- ☑ **Frequent service**, typically every 10 to 15 minutes or less from the beginning of morning peak to early evening or later
- ☑ Enough **direct routes** to create a network that serves all high-demand corridors
- ☑ Special **branding** and information to make the service visible and memorable

RTC currently has a de-facto Frequent Transit Network consisting of nine routes. Project 2-3 (Improve and Expand Frequent Transit Work in High Demand Areas) will support and fund RTC's effort to expand and formalize this network. It is also designed to make frequency and service span investments in service operating on corridors identified for HCT investments to build and develop the market in these areas.

Timing for Completion	Ongoing	**Potential Funding Sources**	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax (For Associated Road Improvements) FTA Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) • Bus Facility formula Funds (Section 5339(a)) FTA Discretionary Funds: • Bus and Bus Facilities Program (Section 5339) FHWA Discretionary Funds: • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grant (STBG) Program
Implementing Agency	Lead: RTC Partner: Local Jurisdictions		

BACKGROUND

Transit systems nationally have used Frequent Transit Networks to create a core network of higher service levels and connections to employment and activity centers. Cities around the United States created bus-based Frequent Transit Networks to operate a high-quality, reliable, and frequent network of transit services, providing similar service frequency and hours of operation throughout the Frequent Transit Network. This service planning approach represents a slight departure for some transit agencies because it integrates corridor-based investments into an expanded network of services that connect and provide higher quality services regionally. Indeed, the "network" component of a Frequent Transit Network reflects expanded accessibility and connectivity, allowing transit riders to use service to get to more places.

Today, RTC's nine frequent routes serve 24% of residents. On Board will bring service to over 50% of Southern Nevada's residents, and to 90% of those who live in higher demand areas.

Frequent Transit Networks function as the framework of local bus networks and have successfully expanded the use of and reliance on public transportation. Investments in Frequent Transit Networks create short-term benefits (increased ridership, expanded accessibility) and build ridership for longer-term, higher-level transit investments like HCT. For On Board, this strategy helps Southern Nevada expand its transit "culture" by bringing more riders to the service. As mentioned, because service improvements are expanded to a larger network, people can rely on transit to get to more places and begin to forego automobile ownership.

BENEFITS

More frequent service is more convenient service. The development of a Frequent Transit Network will bring more convenient service to a large proportion of existing riders and help attract new riders. Frequency investments will also build the market for future HCT services.

CHALLENGES

The major challenges related to the development of a robust Frequent Transit Network will be related to funding, as operating costs are directly related to the amount of service that is provided. If the Frequent Transit Network is developed by simply adding service, then these increases would likely be high. However, Comprehensive Operations Analyses (COA) (Big Move 2 Project 2-1 Develop Regional Service Goals) are typically designed to shift services around to focus them where demands are highest and could provide an opportunity to mitigate cost increases.

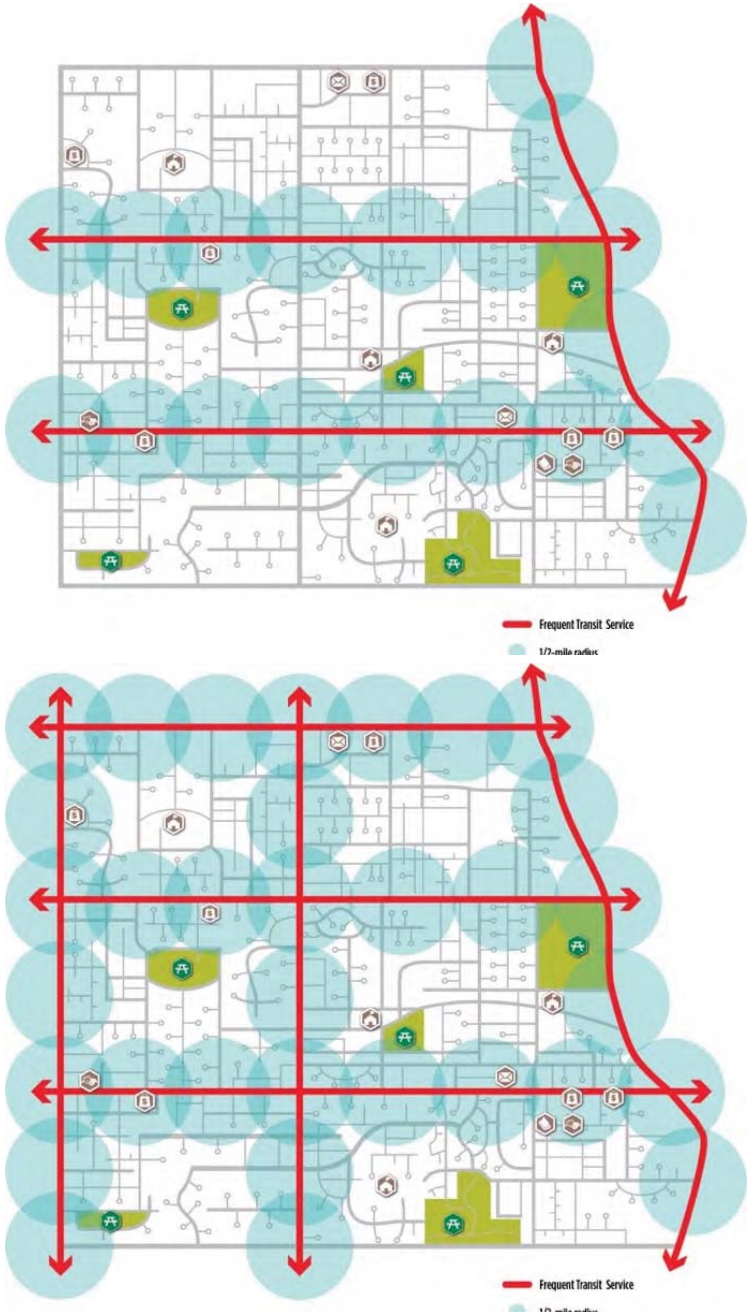
COMPANION PROJECTS

Project 1-10: Expand Frequency Network in High Demand Areas is cross listed as Project 2-3 and has the same name (Expand Frequent Transit Network in High Demand).

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Identify funding for frequency and service investments along planned HCT corridors.	RTC	Local Jurisdictions
2	Use Project 2-1: Develop Regional Service Goals to confirm corridor investments	RTC	Local Jurisdictions
3	Evaluate service effectiveness and adapt/ adjust service investments as appropriate	RTC	Local Jurisdictions

Figure 1-P Frequent Transit Service Concept: Development of a Frequent Transit Network



PROJECT 1-11

Develop New Revenue Source using Public-Private Partnerships to Build Transit-Oriented Developments (TOD) Along High Capacity Routes

OVERVIEW

High Capacity Transit systems can increase the value of surrounding real estate. Public agencies can capitalize on this value by partnering to develop land near stations. In doing so, the RTC could create revenue streams to support transit improvements. This initiative will take the form of a collaboration between the RTC and jurisdictional or private partners to build dense, walkable, mixed-use development near transit. Beyond the revenue opportunities, there will also be transit benefits in terms of increases in ridership and fare revenue.

The strongest development opportunities related to transit will be around light rail and BRT stations, and potentially, regional Mobility Hubs. The RTC would focus on these areas. Opportunities include:

- ☑ Development on land already owned by the RTC
- ☑ Joint development at station sites in which stations are built as part of a larger development rather than as standalone facilities (like the way many Las Vegas Monorail stations are built into the resorts they serve)
- ☑ A TOD funding program in which the RTC provides funding assistance in return for an annual share of revenues
- ☑ Active RTC involvement in planning, design, and financing of station area developments

Timing for Completion	Medium Term (6-10 Years)
Implementing Agency	Lead: RTC Partner: Local Jurisdictions
Potential Funding Sources	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax FTA Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) FTA Discretionary Funds: • Pilot Program for Transit oriented Development (TOD) • Bus and Bus Facilities Program (Section 5339) FHWA Discretionary Funds: • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grant (STBG) Program

BACKGROUND

High Capacity Transit systems can increase the value of surrounding real estate. Public agencies can capitalize on this value by partnering to develop land near stations. In doing so, the RTC could create revenue streams to support transit improvements. This initiative will take the form of a collaboration between the RTC and jurisdictional or private partners to build dense, walkable, mixed-use development near transit. Beyond the revenue opportunities, there will also be transit benefits in terms of increases in ridership and fare revenue.

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- ☑ Joint development at station sites in which stations are built as part of a larger development rather than as standalone facilities (like the way many Las Vegas Monorail stations are built into the resorts they serve)
- ☑ A TOD funding program in which the RTC provides funding assistance in return for an annual share of revenues
- ☑ Active RTC involvement in planning, design, and financing of station area developments

BENEFITS

TOD provides a range of benefits, including better health and lifestyle outcomes; enhanced levels of access and connectivity to jobs, entertainment, and retail opportunities; increased

economic benefit and investment; and options for more affordable and diverse housing. Potential revenue streams from this type of development can then help build more robust transit services.

COMPANION PROJECTS

Project 1-11: Develop New Revenue Source using Public-Private Partnerships to Build Transit Oriented Developments (TOD) Along High Capacity Routes is related to and will be planned in coordination with all the projects included in Big Move 1: Build High Capacity Transit.

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Develop a regional vision and benchmarks for identifying and evaluating TOD locations along the identified HCT corridors shown in the On Board Mobility Plan map	RTC	Local Jurisdictions
2	Prioritized HCT station areas that show high potential for growth and may benefit from TOD	RTC	Local Jurisdictions
3	Investigate and develop regulatory tools such as zoning ordinances, design standards and guidelines, and complete streets policies	RTC	Local Jurisdictions
4	Create a regional task force consisting of RTC, local jurisdictions, community leaders, and local developers to identify potential approaches, partnerships, and roles	RTC	Local Jurisdictions
5	Investigate incentives such as tax abatements and credits, development subsidies, expedited fees and permits, parking reductions, and related capital improvements	RTC	Local Jurisdictions
6	Identify a process to use FTA Joint Development and/or CMAQ funds to invest in TOD	RTC	Local Jurisdictions
7	Investigate the creation of regional administrator of TOD along all HCT corridors	RTC	Local Jurisdictions
8	Create a TOD Department/Office within the RTC	RTC	Local Jurisdictions

PROJECT 1-12

Develop Resort Corridor Rail-Based Transit ("Euro-Tram") between Downtown Las Vegas and McCarran International Airport Via the Strip

OVERVIEW

In the short term, Rapid Bus service will be developed between downtown Las Vegas and McCarran International Airport via the Resort Corridor. In the longer term, the region is considering a variety of modes to operate corridor-based HCT service, including European Tram service or potentially hyperloop service. There are no timelines attached to these projects; decisions and corridor development are assumed to occur in Phase 2.

Timing for Completion	Ongoing
Implementing Agency	Lead: RTC Partner: Local Jurisdictions
Potential Funding Sources	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax (For Associated Road Improvements) Transient Lodging Tax/Resort Corridor Room Tax FTA Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) • Bus Facility formula Funds (Section 5339(a)) FTA Discretionary Funds: • Bus and Bus Facilities Program (Section 5339) • Capital Investment Grants New Starts Program (Section 5309) • Better Utilizing Investments to Leverage Development (BUILD) Grants FHWA Discretionary Funds: • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grant (STBG) Program

BACKGROUND

The RTC's Transportation Investment Business Plan (TIBP) identified HCT improvements as a proposed means to "enhance visitor mobility between McCarran International Airport, the Resort Corridor, and Downtown". The TIBP also identified improving the safety and mobility of pedestrians along Las Vegas Boulevard as a high priority.

As part of a separate effort, the RTC examined various HCT options for the Resort Corridor and concluded that European Tram service should be considered as a mid- to long-term option. In June 2020, Southern Nevada is also evaluating emerging technologies such as hyperloop service.

BENEFITS

Automobile traffic continues to grow in the Resort Corridor, particularly with the expansion of ride-hailing services, creating more congestion on the region's most important economic activity centers. HCT has the potential to transport more people between destinations, venues, and attractions in the Resort Corridor and consequently to reduce automobile dependence and reduce congestion, for visitors and residents alike.

CHALLENGES

The Resort Corridor is Southern Nevada's lifeblood, and the development of rail service must be developed within the context of the "Strip" environment, including its history as an automobile-centric roadway and recreational value for drivers seeking to travel along the corridor. The legacy and development of the Strip also means the corridor has historically had high traffic and pedestrian volumes. Improvements to this corridor must balance the need to maintain opportunities to experience the Strip using a variety of modes.

NEXT STEPS

This is a long-term project with no immediate next steps. However, as RTC coordinates with Strip stakeholders on short-term improvements, it should also continue to discuss mid- to long-term improvements.

Figure 1-Q Potential "Euro-Tram" Service

1 2 3 4 5 6 7

Expand Transit Service to Maximize Access to Jobs and Housing

2

BIG MOVE

EXPAND TRANSIT SERVICE TO MAXIMIZE ACCESS TO JOBS AND HOUSING

82%
rated Big Move 2 at least

RTC On Board Strategies Survey (January-March 2020)
11,221 respondents

OVERVIEW

On Board will improve existing transit services to complement investments in High Capacity Transit (Big Move 1). Big Move 2 will also expand transit to new areas, increasing the availability and accessibility of transit to Southern Nevada. These investments are designed to support regional growth that has occurred over the past decade, as well as future growth, including economic recovery in the wake of the COVID-19 pandemic. As part of investing in existing and new transit services, On Board proposes to develop and implement new transit service models, such as demand-responsive services and partnerships with companies like Uber and Lyft. These service models are designed to reflect local needs while also being cost effective.

Big Move 2 will expand transit to new areas, increasing the availability and accessibility of transit across Southern Nevada.

On Board's **Big Move 2: Expand Transit Service to Maximize Access to Jobs and Housing** includes 10 individual projects:

2-1: Develop Regional Service Goals

2-2: Implement Program to Fill Identified Current Transit Service Needs

2-3: Expand Frequent Transit Network in High Demand Areas

2-4: Implement Frequency and Operating Hours Improvements on Existing Service

2-5: Rideshare Partnerships First Mile/Last Mile Connections to Transit in Suburban Areas

2-6: Micro-Circulator Zones with Suburban Express Connectors to High Frequency Service or Major Transit Hubs

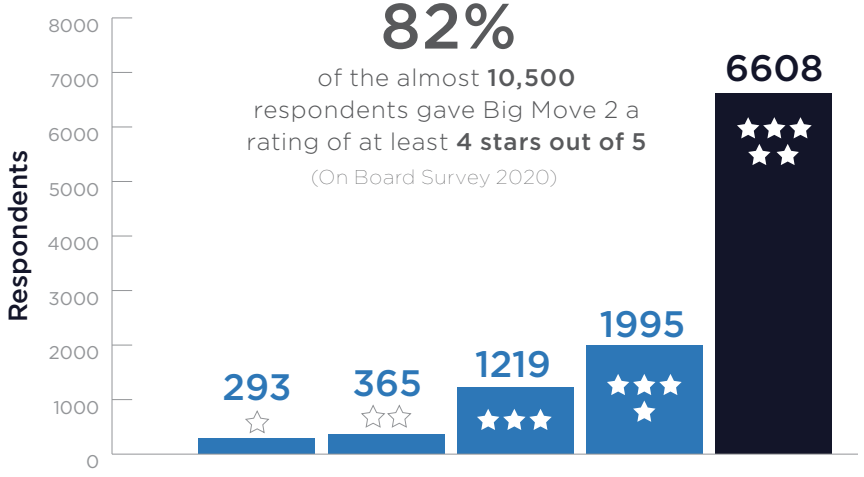
2-7: Rideshare Partnerships for Non-Suburban First Mile/Last Mile Services

2-8: Develop Service Buy-Up Options

2-9: Implement Transit Fare Capping Program

2-10: Reduced Fare Program for Students, Seniors, and Veterans

SURVEY FINDING



Southern Nevada residents gave Big Move 2 and all of its associated strategies a rating of

4.4 out of 5 stars

(On Board Survey 2020)

Support for Big Move 2 is especially high among **women and low-income residents** of Southern Nevada

Low income residents: 4.6/5
Women residents rating: 4.5/5

(On Board Survey 2020)

84%

of respondents support expanding transit to new areas and/or more frequent transit on current routes

On Board Vision Survey 2018

A majority (55%)

of Southern Nevada residents believe that transportation investments should improve access to jobs, housing, and medical services

(On Board Vision Survey 2018)

KEY BENEFITS

All mobility strategies generate benefits for individual travelers, the regional economy and the environment. The graphic below provides a relative scale of the benefits.

EFFECTIVENESS IN ADDRESSING REGIONAL PRIORITIES

Expanding Transit Service to Maximize Access to Jobs and Housing will directly help achieve the following priorities identified through extensive public outreach with nearly 80,000 people and multiple surveys that had almost 25,000 combined responses:

REGIONAL MOBILITY PRIORITIES

1	Improved Road & Transit Safety	○
2	Fewer Traffic Jams	●
3	High Capacity Transit (including light rail)	●
4	Better Connectivity	●
5	Well-Maintained Roads	○
6	Frequent Bus Service	●
7	More Transportation Choices	●
8	Expanded Service for Seniors, Veterans, & People with Disabilities	●
9	Improved Job & Housing Access	●
10	Better Walking & Biking Conditions	◒
11	New Modal Technologies & Investments	●
12	Expanded Transit Service Area	●
13	New Information Technologies	●
14	Better Transit Stops & Stations	●
15	Improved Transit Security	●

KEY | ● Strongest ◒ Strong ○ Less Strong

PROJECT 2-1

Develop Regional Transit Service Goals

OVERVIEW

Working with transit users, the public, stakeholders, and local agencies, the RTC will develop transit service goals standards and guidelines designed to expand the accessibility of transit throughout Southern Nevada in a way that matches service delivery with neighborhood-level measures that reflect transit service needs, socio-economic characteristics and the built environment. Service goals, standards and guidelines will set implementation and performance criteria for RTC's full spectrum of transit service models, such as high capacity transit, frequent bus service, express/commuter services as well as emerging mobility options like rideshare partnerships and micro-circulator services.

On Board sets to expand RTC's current (2020) system where roughly 75 percent of Southern Nevada's population is within 1/2 mile of existing transit service to meet a target where 100 percent of the region's population should be within 1/2 mile of transit service. On Board's recommended transit service expansion will be tied to performance expectations to ensure service levels are appropriate and cost effective. Implementation of RTC's service goals, guidelines and standards will be subject to RTC resource constraints; this means in some cases service goals may be aspirational in the immediate term and serve as guidelines for developing future transit service as resources are available.

On Board recommends a collaborative, focused planning process to develop regional service goals, standards and guidelines that can be applied to meet short-term transit needs as the region advances economic recovery plans in the wake of COVID-19 and as a strategy to guide future system growth and expansion in line with demand and available resources. This project will:

- ☑ Analyze underlying transit demand throughout Southern Nevada, including the existing service area, but also taking into consideration changing market needs in the wake of COVID-19 pandemic and regional economic recovery plans
- ☑ Evaluate existing RTC services, including fixed route, commuter, tourist, demand responsive, and emerging mobility service models, examine how they are implemented across Southern Nevada, identify gaps, and consider how services can be adjusted or expanded to better reflect community needs.
- ☑ Identify and evaluate service improvement opportunities.
- ☑ Move forward with short term implementation opportunities, begin planning for service expansion in line with needs new areas

Timing for Completion	Near-Term (Less than 5 years)	**Potential Funding Sources**	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax FTA Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307)
Implementing Agency	Lead: RTC		

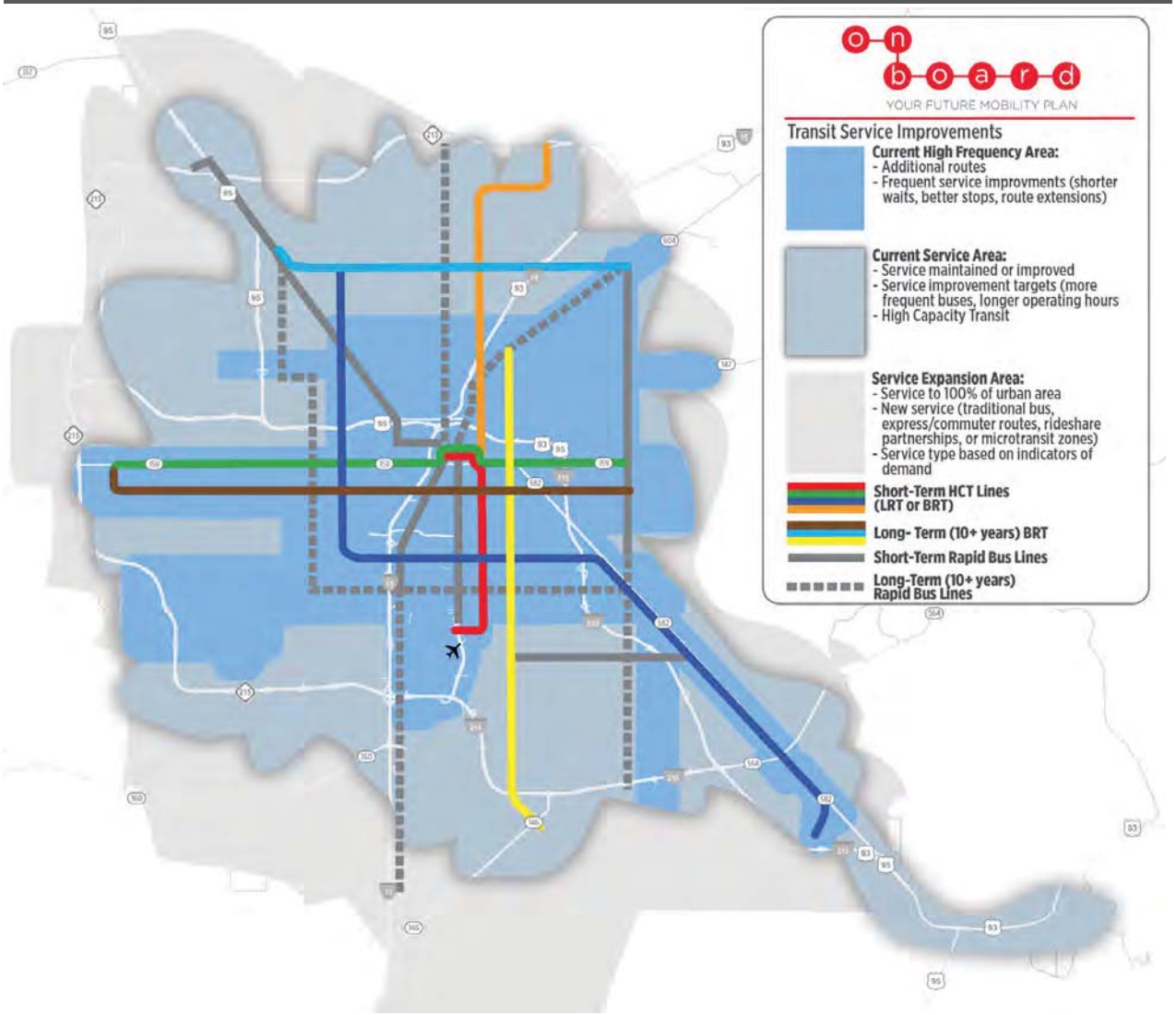
BACKGROUND

RTC's fixed route network is recognized as one of the most cost-effective systems nationally, as measured by cost per passenger. Despite these achievements, there are opportunities to improve RTC service through leveraging new service models and targeting other service upgrades. Comments received through surveys, at public meetings, and with stakeholders identified needs to reduce transit travel times, improve access to employment on the Resort Corridor, and to expand the transit service to new areas. Project 2-1 aims to set goals that will guide and steer future transit service investments.

In the immediate term, RTC transit service goals, standards and guidelines will need to be adjusted within the context of the COVID-19 pandemic and public health concerns. This may mean the RTC adjusts its productivity expectations based on lower vehicle occupancy targets to ensure safe distancing between riders and between riders and drivers. As the region emerges from the pandemic, RTC will also need to monitor and adjust schedules to guide the service network back to existing levels in ways that reflect rider needs, but also support regional economic recovery. This may require changes in service investments and schedules with a focus on employment to ensure individuals and families do not fall further into poverty and avoid growth in the homeless population.

In the longer term, On Board sets a new target that 100 percent of the region's population should be within 1/2 mile of some type of transit service, compared to 75 percent today with access to bus service. This project is designed to determine the best ways to address short-term service-related issues and the 100 percent

Figure 2-A Southern Nevada Transit Service Zones: Existing Service and Service Expansion Areas



coverage target (see Figure 1, which highlights existing service investments together with areas for expansion).

COMPANION PROJECTS

Project 2-1: Develop Regional Transit Service Goals is related to and will be planned in coordination with the following specific projects:

- ☑ **Project 2-2:** Short-Term Transit Adjustments and Expansion in Line with Regional Growth
- ☑ **Project 2-3:** Improve and Expand Frequent Transit Network in High Demand Areas
- ☑ **Project 2-4:** Rideshare Partnerships
- ☑ **Project 2-5:** Microtransit

Project 2-1 is also related to and will be planned in coordination with the overall strategy laid out in the following Big Moves:

- ☑ **Big Move 1:** Build High Capacity Transit System

BENEFITS

Setting regional service goals and working to implement them will improve service for existing riders and expand service to new riders. Benefits include faster and more frequent service, better connections to major activity centers and work sites, and innovative new services. Additional benefits associated with matching new types of service with underlying levels of demand include cost effectiveness and service efficiency. The planning activity will also help ensure that in the short term, transit investments are aligned with regional economic recovery plans and needs.

CHALLENGES

This project will focus on developing and moving RTC towards implementing new service goals. These decisions necessarily involve trade-offs – for example, how much emphasis should be placed on improving existing services versus expanding to new areas, focusing on fewer routes that provide more frequent service versus more routes that provide less frequent service, faster service versus shorter walks to stops, etc. Transit systems often struggle to make these trade-offs and RTC will need to make challenging decisions, especially in the short-term when needs will likely outpace available resources. Additional challenges will emerge as RTC works to communicate goals and advances implementation priorities.

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Establish stakeholder group to assist with setting regional service goals	RTC	Regional Stakeholders
2	Confirm priorities, estimate cost and service impacts of implementation	RTC	Regional Stakeholders
3	Advance implementation as appropriate and funding is available	RTC	Regional Stakeholders

High-intensity Activated CrossWalK (HAWK) type midblock crossing
Image from RTC

PROJECT 2-2

Short-Term Transit Adjustments and Expansion in Line with Regional Growth and Need

OVERVIEW

Project 2-2 will expand service to areas where transit demand has emerged and improve service on existing routes where growth has increased demand. Improvements will include more frequent service for longer hours on existing routes, and the extension of existing routes to new areas.

This strategy provides funding for short term transit needs. On Board recognizes that many of these improvements were identified by the RTC service planning team; these recommendations will be confirmed and adjusted through the COA process. Further, the impact of COVID-19 on regional growth and economic activity means that demand for transit service has already and will almost certainly continue to change, with demand increasing in some areas and slowing in others.

Timing for Completion	Ongoing	**Potential Funding Sources**	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax FTA Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) • Bus Facility formula Funds (Section 5339(a)) FTA Discretionary Funds: • Bus and Bus Facilities Program (Section 5339) FHWA: • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grant (STBG) Program
Implementing Agency	RTC		

BACKGROUND

As Southern Nevada grows, the transit network will also need to grow, filling current and expected gaps in existing services. In some cases, pre-COVID-10 growth in the region has already outstripped transit growth, and this project is designed to serve that growth, including the northeast and southwest corners of Southern Nevada as well as parts of North Las Vegas.

In addition, the COVID-19 pandemic and accompanying "shelter in place" policies are expected to have a protracted impact on Southern Nevada.[1] Consequently, filling short-term transit service needs may require adjustments to reflect immediate impacts (6 to 12 months) and very short term impacts(12 to 24 months) as the region recovers and rebounds from the regional, national, and international public health crisis.

As RTC meets immediate and short-term needs, it must determine the most appropriate types of service to provide based on demand, urban form, and access, including areas with concentrations of households with limited private vehicle ownership, with characteristics similar to RTC transit ridership generally, and areas that lack access to employment markets.

1 How Las Vegas Became Ground Zero for the American Jobs Crisis", New York Times, April 26, 2020.

In more developed areas, new fixed-route services may be the most cost-effective. In less developed areas, alternative approaches such as rideshare partnerships and microtransit will be more appropriate. Rideshare partnerships are described in Project 2-5 and Microtransit is described in Project 2-6.

COMPANION PROJECTS

Project 2-2: Short-Term Transit Adjustments and Expansion in Line with Regional Growth and Need is related to and will be planned in coordination with the following specific projects:

- ☑ **Project 2-4:** Rideshare Partnerships
- ☑ **Project 2-5:** Microtransit

BENEFITS

This project will ensure that the regional transit network will expand in line with growth to serve residents and jobs in newly developing areas. As service is available, residents moving into the area may rely on it more than existing residents. New transit services will also support the region's economic recovery plans and ensure short-term access to employment, helping prevent people from falling into poverty and homelessness.

CHALLENGES

In some cases, transit markets develop over time and depending on the circumstances may require at least 6 months and up to 1 year to attract sufficient ridership. This is especially true for areas that developed without transit service because most residents moved with an understanding that public transportation service was not available.

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Identify funding source for service needs and expansion	RTC	N/A
2	Implement short term changes; prioritize service improvements based on goals identified in Project 2-1	RTC	Local Jurisdictions
3	Evaluate service effectiveness and adapt/adjust service investments as appropriate	RTC	N/A

PROJECT 2-3

Improve and Expand Frequent Transit Network in High Demand Areas

OVERVIEW

RTC currently has a Frequent Transit Network consisting of nine routes (see Big Move 1). Project 2-3 will support and fund RTC's effort to expand and further formalize this network by making frequency and service span investments in operating on corridors identified for High Capacity Transit investments to build and develop a transit ridership market in these areas. Service investments funded as part of the project will be in advance of the HCT investments.

Timing for Completion	Ongoing
Implementing Agency	RTC
Potential Funding Sources	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax FTA Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) • Bus-Bus Facility Formula (Section 5339(a)) FTA Discretionary Funds • Bus and Bus Facilities Program (Section 5339) FHWA • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grant (STBG) Program

BACKGROUND

Transit systems nationally have used Frequent Transit Networks to support a system backbone built around High Capacity Transit lines and supplemented with frequent local bus routes. Over the past few decades, the development of Frequent Transit Networks has spread beyond rail-based systems to bus-only systems, and the development of a Frequent transit Network is now often the centerpiece of many network redesigns (see Figure 2 for schematic of the potential importance of frequent transit services). This strategy is designed to help build and develop transit ridership in corridors planned for High Capacity Transit and invest in new corridors.

COMPANION PROJECTS

Project 2-3: Improve and Expand Frequent Transit Network in High Demand Areas is related to and will be planned in coordination with the following specific projects:

- ☑ **Project 2-1:** Develop Regional Service Goals
- ☑ **Project 2-1:** Short-Term Transit Adjustments and Expansion in Line with Regional Growth and Need

Project 2-3 is also related to and will be planned in coordination with the overall strategy laid out in **Big Move 1:** Build High Capacity Transit System.

BENEFITS

More frequent service is more convenient service because it is faster and reduces wait times, including when transferring between services. The development of a frequent transit network will bring more convenient service to a large proportion of existing riders and attract new riders. Frequency investments will also build the market for future HCT services. Today, RTC's nine frequent routes serve 24% of residents. On Board will bring service to over 50% of Southern Nevada's residents, and to 90% of those who live in higher demand areas.

CHALLENGES

The major challenges related to the development of a robust Frequent Transit Network will be related to funding, as operating costs are directly related to the amount of service that is provided. If the Frequent Transit Network is developed by simply adding service, then these increases would likely be high. However, Comprehensive Operations Analyses (part of **Project 2-1**) are typically designed to shift services around to focus them where demands are highest and could provide an opportunity to reduce increases.

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Identify funding for frequency and service investments along planned HCT corridors	RTC	Local Jurisdictions
2	Use the Regional Goal setting process to identify corridor investments and development of the Frequent Transit Network beyond HCT	RTC	Local Jurisdictions
3	Implement corridor investments	RTC	Local Jurisdictions
4	Evaluate service effectiveness and adapt/adjust service investments as appropriate	RTC	Local Jurisdictions

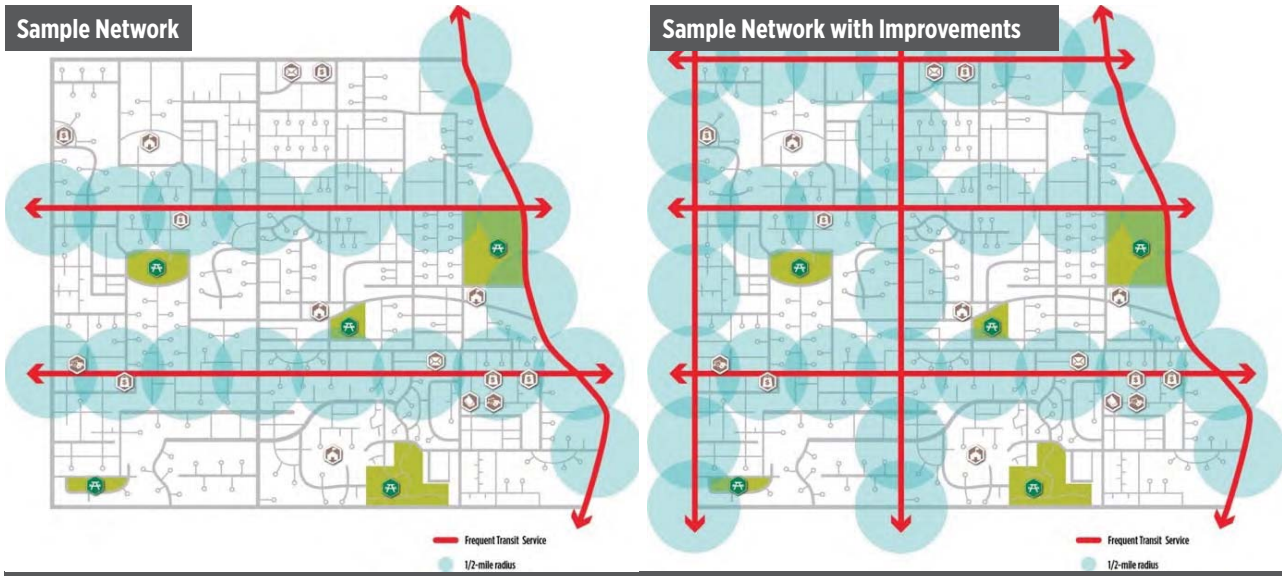


Figure 2-B Frequent Transit Service Concept: Development of a Frequent Transit Network

PROJECT 2-4

Implement Frequency and Operating Hours Improvements on Existing Service

OVERVIEW

Transit service is most appealing when it is frequent enough that riders do not have to reference a transit guide and can simply go to a stop with the knowledge that a bus or train will be arriving shortly. Frequent Transit Networks have the following characteristics:

- ☑ Frequent service, typically every 10 to 15 minutes or less from the beginning of morning peak to early evening or later
- ☑ Enough direct routes to create a network that serves all high-demand corridors
- ☑ Special branding and information to make the service visible and easily accessible

Even with HCT and a more robust Frequent Transit Network, much of Southern Nevada's transit service will be provided with local bus routes. Project 2-4 will improve local bus routes by providing more frequent service for longer hours – for example, routes that currently operate every 30 minutes could instead operate every 20 minutes and start service earlier and end later.

Timing for Completion	Ongoing	**Potential Funding Sources**	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax FTA Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) • Bus-Bus Facility Formula (Section 5339(a)) FTA Discretionary Funds: • Bus and Bus Facilities Program (Section 5339) FHWA: • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grant (STBG) Program
Implementing Agency	RTC		

BACKGROUND

Transit service consists of two fundamental elements: frequency (how often the service operates) and service span (how long service runs). Combined, these two factors influence how convenient and attractive transit is. Increasing frequency and service span better accommodates a broader cross-section of the population, including shift workers who work outside the traditional 9:00 am to 5:00 pm workday. Investments in service frequency and span have increased in importance in the wake of the COVID-19 pandemic when public health concerns mean some workers employed in traditional jobs are working from home. Workers employed in retail and service jobs, however, are not afforded opportunities to work from home. Transit access will be essential for these individuals as they continue to work during the pandemic and/or increase the amount they work or return to the workforce as economic recovery begins.

Most RTC routes operate every 30 minutes. This is one major reason that transit travel times are long – many trips require a transfer, and transfers between 30-minute routes can take up to 29 minutes. Project 2-4 would implement a suite of service upgrades to the RTC fixed route system, ensuring that all areas served by the network have access to more convenient and reliable transit. Implementation of this project will support access to employment and will be an essential part of regional economic recovery.

COMPANION PROJECTS

Project 2-4: Implement Frequency and Operating Hour Improvements on Existing Service is related to and will be planned in coordination with the following specific projects:

- ☑ **Project 2-1:** Develop Regional Service Goals
- ☑ **Project 2-2:** Short-Term Transit Adjustments and Expansion in Line with Regional Growth and Need
- ☑ **Project 2-3:** Service Improve and Expand Frequent Transit Network in High Demand Areas

BENEFITS

These improvements would benefit existing passengers and attract new riders by reducing wait times and travel times. This will make more places reachable in a reasonable amount of time. More frequent service for longer hours will also make transit a practical and affordable option for a much wider range of trips. Investments will be particularly valuable in the short-term as the region focuses on improving access to jobs and economic recovery in the wake of the COVID-19 pandemic.

CHALLENGES

Similar to the development of the Frequent Transit Network, the major challenges related to the provision of more frequent service for longer hours on other routes will be to identify funding, as operating costs are directly related to the amount of service that is provided. RTC will need to implement these improvements as funding permits, with priorities identified by the Regional Service Goals (**Project 2-1**).

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Identify funding for frequency and service investments along planned HCT corridors	RTC	Clark County City of Las Vegas Nevada Resort Association Culinary Union
2	Use the Regional Goal setting process to identify corridor investments and development of the Frequent Transit Network beyond HCT	RTC	Local Jurisdictions
3	Implement corridor investments	RTC	Local Jurisdictions
4	Evaluate service effectiveness and adapt/adjust service investments as appropriate	RTC	Local Jurisdictions

PROJECT 2-5

Rideshare Partnerships for First Mile/Last Mile Connections to Transit in Suburban Areas

OVERVIEW

Rideshare partnerships occur when transit systems and rideshare companies like Uber and Lyft coordinate services. Transit agencies, like RTC, can contract with these rideshare companies to provide connections between RTC fixed routes and destinations with specific needs or that are difficult to reach with traditional transit services. Rideshare partnership also require accommodations to allow passengers to reserve and pay for trips, including options for online and telephone-based systems and cash payment.

Timing for Completion	Short-Term (1-5 Years)	**Potential Funding Sources**	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax FTA Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) FHWA: • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grant (STBG) Program Public Private Partnerships
Implementing Agency	Lead: RTC Partner: Rideshare Companies		

BACKGROUND

One of the On Board recommendations is to provide some form of service coverage to 100 percent of Southern Nevada's residents, many of whom live in areas that do not have high enough population levels to support fixed-route transit. Rideshare partnerships could provide them with service by implementing the following features:

- ☑ Service within low-density residential and employment areas, neighborhoods with poor street connectivity, and neighborhoods at the edges of the valley
- ☑ Service to higher density residential and employment areas located on the periphery of the core urbanized area
- ☑ Connections between those areas and fixed-route transit services

Rideshare partnerships could also provide early morning and late night trips when fixed-route service is not operating and supplement traditional paratransit services.

COMPANION PROJECTS

Project 2-5: Rideshare Partnerships for First Mile/ Last Mile Connections to Transit in Suburban Areas is related to and will be planned in coordination with the following specific projects:

- ☑ **Project 2-6:** Micro-Circulator Zones with Suburban Express Connectors to High Frequency Service or Mobility Hub
- ☑ **Project 2-7:** Rideshare Partnerships for Non-Suburban First Mile/Last Mile Services

Project 2-5 is also related to and will be planned in coordination with the overall strategy laid out in **Big Move 5:** Expand Services for Seniors, Veterans and People with Disabilities.

BENEFITS

Rideshare partnerships can extend the reach of transit to places where fixed-route service cannot be provided efficiently or cost-effectively.

CHALLENGES

Ridership partnerships can have higher costs in terms of operating costs-per-passenger. Current national examples demonstrate that rideshare trip costs range between $10 and $15 per passenger, compared to less than $2.26 per passenger on RTC's fixed-route services. Thus, while rideshare partnerships could be a solution in many areas, their use must be carefully weighed against other options.

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Define specific program goals and objectives, including the types of connections that will be included in the program and how potential services will be prioritized	RTC	Regional Stakeholders
2	Develop an evaluation framework that provides the means to define acceptable performance and adjust services as appropriate	RTC	Regional Stakeholders
3	Identify maximum acceptable costs to RTC and minimum contributions from employers and other third-party partners	RTC	Regional Stakeholders
4	Develop subsidy strategy, which may be provided in one of two ways: (1) a set subsidy cost for RTC and its partners with users paying above that level, and (2) a set fare for passengers with RTC and its partners paying costs above that level. Option 1 would best limit subsidy costs, while option 2 is the more traditional transit approach	RTC	Regional Stakeholders

PROJECT 2-6

Micro-Circulator Zones with Suburban Express Connectors to High Frequency Service or Major Transit Hubs

OVERVIEW

Microtransit is a new transit service delivery model that provides on-demand service between stops within specified zones, typically in a van or shuttle. They provide service between designated stops within the zones and provide connections to fixed-route services for travel beyond the zones. The connections would be made at regular bus stops, mobility hubs, and future High Capacity Transit connections.

New microtransit services would also be app-based, with trip booking and fare payment made primarily through a smart-phone app (with accommodations for those without smartphones) in essentially the same manner as Uber and Lyft. The app will also provide real-time information.

Timing for Completion	Short-Term (1-5 Years)	**Potential Funding Sources**	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax Transient Lodging Tax/Resort Corridor Room Tax FTA Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) FHWA • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grant (STBG) Program
Implementing Agency	Lead: RTC Partner: Rideshare Companies		

BACKGROUND

One of RTC's targets is to expand service coverage to 100% of Southern Nevada's residents, many of whom live in areas that do not have enough population levels to support fixed-route transit. Along with rideshare partnerships, microtransit could be an additional approach for serving relatively low demand areas.

The types of areas that would be served by microtransit are like those served by rideshare partnerships, but with higher volumes of riders – three or more passengers per vehicle trip. These areas include low-density residential and employment areas, neighborhoods with poor street connectivity, and neighborhoods at the edges of the valley.

COMPANION PROJECTS

Big Move 2: Expand Transit Service to Maximize Access to Jobs and Housing includes three projects that use new service delivery models to serve low density, areas with suburban design and important destinations that are difficult to serve with traditional fixed route services. The three projects (**2-5:** Rideshare Partnerships First Mile/Last Mile Connections to Transit in Suburban Areas; **2-6:** Micro-Circulator Zones with Suburban Express Connectors to High Frequency Service or Mobility Hub; and **2-7:** Rideshare Partnerships for Non-Suburban First Mile/Last Mile Services) should be planned and considered together to ensure policies and rider guides are coordinated. Projects should also be coordinated with and consistent to recommendations developed as part of **Big Move 5:** Expand Services for Seniors, Veterans and People with Disabilities. Project 2-6: Micro-Circulator Zones with Suburban Express Connectors to High Frequency Service or Mobility Hub is related to and will be planned in coordination with the following specific projects:

- ☑ **Project 2-5:** Rideshare Partnerships for First Mile/Last Mile Connections to Transit in Suburban Areas
- ☑ **Project 2-7:** Rideshare Partnerships for Non-Suburban First Mile/Last Mile Services

Project 2-6 is also related to and will be planned in coordination with the overall strategy laid out in **Big Move 5:** Expand Services for Seniors, Veterans and People with Disabilities.

BENEFITS

These proposed microtransit services would become an important service model for RTC to extend its network to all Southern Nevada. It is a less expensive approach than the provision of fixed-route services in areas where demand is low. It may also be a useful tool in RTC's COVID-19 recovery strategy to provide access to essential employment in the short-term.

CHALLENGES

Microtransit holds significant promise for transit agencies, especially in low density, high need areas that are difficult to serve with fixed route service. However, to date, most microtransit services and transit agency partnerships have struggled to provide relevant, useful, and cost effective services; in most cases this means that ridership is so low that service cost effectiveness is eroded. Another challenge involves the ability to scale microtransit services beyond confined pilot areas. The challenge for Southern Nevada, therefore, will be to implement a service that attracts sufficient ridership and can be scaled to a larger geographic area.

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Define specific program goals and objectives, including the types of connections that will be included in the program and how potential services will be prioritized.	RTC	Regional Stakeholders
2	Develop an evaluation and performance framework that provides the means to define acceptable performance and adjust services as appropriate.	RTC	Regional Stakeholders
3	Determine areas where microtransit would be the most appropriate way to expand service to new areas. Microtransit services will be designed to expand transit coverage and not to compete with fixed-route services.	RTC	Regional Stakeholders
4	Develop fare levels and acceptable costs. Fares can be set by either (1) setting a subsidy cost for RTC and its partners with users paying above that level or (2) setting a fare for passengers with RTC and its partners paying costs above that level. Option 1 would best limit subsidy costs, while option 2 is the more traditional transit approach.	RTC	Regional Stakeholders

PROJECT 2-7

Rideshare Partnerships for Non-Suburban First Mile/Last Mile Services

OVERVIEW

Rideshare partnerships between transit systems and rideshare companies like Uber and Lyft are designed to provide connections from mainline transit services to limited destinations outside of the main transit service area. The actual services are very similar to taxi service, but with app-based reservations and fare payment. With transit-system sponsored service, there are typically also accommodations for phone reservations and cash payment. RTC currently has one of these partnerships, which is with Fanatics, a sports merchandise company, and Lyft. Through this program, Fanatics employees are provided with fare-free service to and from 13 specified RTC bus stops along six transit routes. RTC provides $1 toward the cost of each trip and Fanatics pays the rest of the fare. Under this project, RTC would expand this type of partnership to additional worksites.

Timing for Completion	Short-Term (1-5 Years)	**Potential Funding Sources**	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax Transient Lodging Tax/Resort Corridor Room Tax FTA Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) FHWA: • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grant (STBG) Program Public Private Partnerships
Implementing Agency	Lead: RTC Partner: Rideshare Companies		

BACKGROUND

Especially in the suburbs, many work sites are in areas that cannot be practically served by fixed-route bus services and rideshare partnerships can more efficiently provide these connections.

Transit systems throughout the United States are now experimenting with rideshare partnerships. They generally are structured in one of three ways:

- ☑ Marketing partnerships in which transit systems and rideshare companies jointly market trips but do not have direct financial arrangements
- ☑ Provide subsidized connections with the rideshare fare split between the transit system and/or a project sponsor and the rider (see call out box advertising RTC's existing partnership with Fanatics)
- ☑ Provide free connections to rideshare services, with the rideshare fare paid by the transit system and/or a project sponsor

Partnership can be provided to the public and/or limited to specific groups and trips that go beyond first mile/last mile connections. For example:

- ☑ Serve employees of specific companies like the existing partnership between RTC, Fanatics and Lyft

- ☑ Offer point-to-point service for trips that cannot be made by fixed-route transit
- ☑ Serve early morning and late night trips when fixed-route service is not operating
- ☑ As part of Guaranteed Ride Home programs that are a common component of Transportation Demand Management programs like RTC's Club Ride
- ☑ As an alternative to traditional paratransit services

For all models, RTC will carefully consider whether more traditional transit options could provide similar services at a lower cost before providing subsidies for ridesharing.

COMPANION PROJECTS

Project 2-7: Rideshare Partnerships for Non-Suburban First Mile/Last Mile Services is related to and will be planned in coordination with the following specific projects:

- ☑ **Project 2-5:** Rideshare Partnerships for First Mile/Last Mile Connections to Transit in Suburban Areas
- ☑ **Project 2-6:** Micro-Circulator Zones with Suburban Express Connectors to High Frequency Service or Mobility Hub

Project 2-7 is also related to and will be planned in coordination with the overall strategy laid out in **Big Move 5:** Expand Services for Seniors, Veterans and People with Disabilities

BENEFITS

Rideshare partnerships can extend the reach of transit to places where fixed-route service cannot be provided in a cost-effective manner.

CHALLENGES

Rideshare partnerships, on a cost per passenger bases, can have high operating costs. Current national examples demonstrate that rideshare trip costs range between $10 and $15 per passenger, compared to less than $2.26 per passenger on RTC's fixed-route services. Thus, while rideshare partnerships will be a solution in many areas, their use must be carefully weighed against other options.

Figure 2-C Example Flyer from RTC Partnership for Last/First Mile Connections

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Define specific program goals and objectives, including the types of connections that will be included in the program and how potential services will be prioritized	RTC	Regional Stakeholders (potential partner employers and rideshare companies)
2	Develop an evaluation and performance framework that provides the means to define acceptable performance and adjust services as appropriate	RTC	Regional Stakeholders (potential partner employers and rideshare companies)
3	Identify maximum acceptable costs to RTC and minimum contributions from employers and other third-party partners	RTC	Regional Stakeholders (potential partner employers and rideshare companies)
4	Develop subsidy strategy, which may be provided in one of two ways: (1) a set subsidy cost for RTC and its partners with users paying above that level, and (2) a set fare for passengers with RTC and its partners paying costs above that level. Option 1 would best limit subsidy costs, while option 2 is the more traditional transit approach	RTC	Regional Stakeholders (potential partner employers and rideshare companies)

Technology Partnerships

As part of Expanding Transit Service to Maximize Access to Jobs and Housing, RTC will evaluate opportunities to integrate new technologies and systems in their service portfolio. Integrating new technologies and systems will almost certainly involve new partnerships. Advancing fare systems, such as the use of fare capping will almost certainly move faster and more efficiently through collaboration with software and app developers. Likewise, expanding transit services into high need and lower density communities requires consideration of new service models. Private sector service partners and transportation network companies, like Uber, Lyft, VIA (for example) can help RTC advance these opportunities efficiently and quickly.

PROJECT 2-8

Develop Service Buy-Up Options

OVERVIEW

Service Buy-Ups allow local governments, businesses, and other entities to financially partner with RTC to provide additional service in their jurisdictions or to their facilities. The program is intended to provide a way for organizations to obtain additional service to meet specific needs and provide RTC with the financial means to satisfy requests for new or expanded services that they would not otherwise be able to provide. Potential partnerships could include operating and capital funding for the expansion of traditional transit services, plus new microtransit services, rideshare partnerships, and more. RTC would develop program details that specify how the agency could participate financially at levels to be determined.

Timing for Completion	Short-Term (1-5 Years)
Implementing Agency	RTC
Potential Funding Sources	FTA Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) Public Private Partnerships

BACKGROUND

Financial constraints mean transit systems can never provide as much service as all constituents want. To provide additional services beyond what available resources could otherwise support, several transit agencies have developed programs that enable local governments, businesses, and other entities a way to directly fund specific transit service improvements – a process called "Service Buy-Ups." These programs enable organizations to purchase additional services they want or need while providing transit agencies – and their constituents – the financial means to satisfy requests for new or expanded services.

Local Governments: Service Buy-Up programs enable local governments to purchase additional transit service to meet local desires. Examples include $40 million per year from the City of Seattle to King County Transit for additional bus service, and funding from the City of Fort Worth to Trinity Metro for microtransit connections at commuter rail stations.

Schools: Many universities provide direct funding to transit agencies to operate expanded bus services to their campuses. The Denton County Transportation Authority (DCTA), for example, has a 10-year contract with the University of North Texas to operate expanded bus service between their campus and adjacent residential neighborhoods. In addition, many school districts

and private institutions fund expanded public transit options as an alternative to providing dedicated school bus services.

Businesses: Businesses with shift workers, such as hospitals, call centers, and factories, can use Service Buy-Ups to provide front-door service to their buildings at shift changes. Businesses with large corporate campuses like Microsoft and Amazon have used Service Buy-Ups to provide more frequent service to their campuses.

Developers: Service Buy-Ups are being increasingly included as part of transportation impact mitigation packages for new developments with developers typically agreeing to provide an annual subsidy for new or additional transit services in neighborhoods adjacent to their project. In addition, many office parks have high demand for transit but are difficult to serve with existing local bus routes and fund shuttle connections.

COMPANION PROJECTS

None

BENEFITS

Service Buy-Ups provide a source of funding for service improvements that would not otherwise be possible for communities with limited resources. These can include better service on existing routes and the expansion of service to new areas. They also provide a way to serve specialized needs that RTC would not be able to service on its own.

CHALLENGES

The major challenges will involve encouraging third parties to help pay for something—transit—that many believe that they should get for "free." While there are many successful Service Buy-Up examples and their benefits, convincing entities to contribute to transit improvements is challenging.`

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	RTC should develop a formal program to solicit, evaluate, and incentivize Service Buy-Ups. The first step will be to develop program parameters, including requirements and guidelines related to: Types of eligible projects Required funding contributions that would range from partial funding to full funding Prioritization	RTC	Regional Stakeholders/ Potential Users of Buy-Up Program
2	Develop a 5-year transit service plan that describes the service that RTC expects to provide over the next five years. This would provide baseline service levels, and additional services would require funding through the service buy-up program.	RTC	Regional Stakeholders/ Potential Users of Buy-Up Program
3	Include a Service Buy-Up set aside amount in its annual budget, with funding levels to be set annually.	RTC	Regional Stakeholders/ Potential Users of Buy-Up Program
4	Solicit Service Buy-Up proposals, prioritize them according to the adopted prioritization process, and implement the highest ranked projects up to the annual budget amount.	RTC	Regional Stakeholders/ Potential Users of Buy-Up Program

PROJECT 2-9

Implement Transit Fare Capping Program

OVERVIEW

RTC would introduce a fare capping strategy to make transit fares more affordable. Fare capping lets riders pay single trip fares up to maximum fare levels for daily, 7-Day, 15-Day, and 30-Day use. The strategy makes transit more affordable for lower income riders, provides more flexibility for all riders, and encourages the use of transit on a more spontaneous basis. This strategy could be an important part of Southern Nevada's economic recovery plan in the wake of the COVID-19 pandemic because it would help lower-income workers manage their transportation costs.

Although the details would need to be determined prior to implementation, based on RTC's current fare structure, fare capping could work as follows (see also Figure 3):

- ☑ All riders will pay single ride fares for all trips with total costs that will max out at daily, 7-Day, 15-Day, and 30-Day pass rates.
- ☑ On a daily basis and at current fare levels, riders would pay $2 per trip for the first two trips and $1 for the third day, for a total of $5, which is the cost of a daily pass. For the rest of the day, all subsequent rides would be free.
- ☑ Daily expenditures would also roll up to 7-Day, 15-Day, and 30-Day fare levels. After spending $5 per day for four days, travel for the rest of the seven day period would be free. After spending $34, travel for the rest of the 15 day period would be free, and after spending $65, travel for the rest of the 30-day period would be free.

Fare capping would also be implemented for riders who use discount fares and ride Strip routes.

Figure 2-D Potential RTC Fare Capping

	Step	Single	2-Hour	24-Hour	7-Day	15-Day	30-Day
1	Cost (Residential Routes)	$2	$3	$5	$20	$34	$65
2	Number of Paid Days to Reach Cap	NA	NA	NA	4	7	13
3	Number of Free Days	NA	NA	NA	3	8	17

Timing for Completion	Short-Term (1-5 Years)	**Potential Funding Sources**	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax FTA Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) FHWA: • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grant (STBG) Program Public Private Partnerships
Implementing Agency	RTC		

BACKGROUND

RTC currently offers 6 different fare options for full fare riders, which range from $2 for a single trip to $65 for a 30-Day pass. The 30-Day pass provides the best value but requires an upfront payment for low income riders that can often be difficult. In addition, many riders do not have the same travel patterns every day. In effect, fare capping provides a "payment plan" for passes in which riders pay for individual trips up to the pre-paid pass cost after which subsequent trips are free.

Fare capping is a new concept that, to date, is currently only being used by DART in Dallas and TriMet in Portland, OR. Outside of the United States, it is used in London, Great Britain; Dublin, Ireland; and Sydney, Australia (see Figure 4: Fare Capping Strategy used in Portland, Oregon). However, many other US transit systems are now exploring the concept, and some, such as RIPTA in Providence, RI, have committed to it as part of fare system improvements.

COMPANION PROJECTS

Project 2-9: Implement Transit Fare Capping Program is related to and will be planned in coordination with the following specific projects:

☑ **Project 2-10:** Reduced Fare Program for Students, Seniors, and Veterans

Project 2-9 is also related to and will be planned in coordination with the overall strategy laid out in **Big Move 5:** Expand Services for Seniors, Veterans and People with Disabilities.

BENEFITS

Fare capping will make transit more affordable for lower income residents and should encourage additional use by occasional riders who will achieve the benefits of a pre-paid pass without having to commit to rides that they may not take. These features will increase ridership, help workers access jobs, and support regional economic recovery in the wake of the COVID-19 pandemic.

CHALLENGES

Fare Capping can be a difficult concept to communicate to the wider audience of transit stakeholders and riders. Successful implementation will require good marketing and developing an easy and consistent message.

By expanding pass discounts to single trip riders, RTC will collect less revenue. TriMet in Portland, which was the first transit agency in the United States to implement fare capping, estimates that it has reduced fare revenue by 1 to 1.5 percent.

In addition, fare capping requires the use of mobile apps and/or prepaid fare cards as there is no way to track cash payments. As a result, to make fare capping widely available and equitable, RTC will need to provide ways for all riders to be able to access the program. For those without smartphones, this could be done using prepaid fare cards. These could be sold at RTC fare vending machines and at retail outlets such as convenience stores and pharmacy chains.

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Determining the fare structure and fare levels. RTC could implement fare capping and keep its fare structure the same, or it could use fare capping as an opportunity to simplify the fare structure.	RTC	Regional Stakeholders
2	Develop back-end systems. RTC already has the technology components required for fare capping. However, back-end programming will be required to process and store sales data and provide free rides once the caps have been met.	RTC	Regional Stakeholders
3	Make provisions for the sale and distribution of pre-paid fare cards and reloading capabilities for riders who do not have smartphones.	RTC	Regional Stakeholders

PROJECT 2-10

Reduced Fare Program for Students, Seniors, and Veterans

OVERVIEW

RTC provides a 50 percent fare discount for veterans, youths aged 6 to 17, K-12 students, senior citizens age 60 and over, persons with disabilities, Medicare eligible persons, and Mobility Trained customers. These discounts are available for all fare types. This project will increase those discounts.

Timing for Completion	Short-Term (1-5 Years)	**Potential Funding Sources**	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax FTA Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) FHWA • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grant (STBG) Program Public Private Partnerships
Implementing Agency	RTC		

BACKGROUND

Many students in Southern Nevada depend on public transportation to get to and from school. The American Public Transportation Association found that trips to school, including elementary, secondary, and higher education, account for over 13% of all transit trips nationally. Similarly, veterans, who are disproportionately more likely to use transit, often depend on public transportation to reach jobs and medical appointments.

COMPANION PROJECTS

Project 2-10: Reduced Fare Program for Students, Seniors, and Veterans is related to and will be planned in coordination with the following specific projects:

☑ **Project 2-9:** Implement Transit Fare Capping Program

Project 2-10 is also related to and will be planned in coordination with the overall strategy laid out in **Big Move 5:** Expand Services for Seniors, Veterans and People with Disabilities.

BENEFITS

This program will enhance affordability and mobility for students, seniors, and veterans to allow them to better access employment, education, medical services, and other needed destinations.

CHALLENGES

Reduced fares for certain groups can result in a minor reduction in transit fare revenue, and eligible groups must register with RTC for a reduced fare identification. RTC can make it easier for the targeted groups to receive reduced fare by partnering with local schools, colleges, universities, and the VA system to ensure that eligible riders carry the identification they need to receive reduced fares.

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Develop goals and objectives for reduced fare program, identify target riders and markets (e.g., students and veterans).	RTC	Regional Stakeholders
2	Estimate expected usage and impacts on RTC systems. Ensure that existing RTC services can accommodate increased ridership at the times when targeted riders will use services (e.g., school bell times). Estimates of costs should include additional capital needs if required.	RTC	Regional Stakeholders
3	Consult with stakeholders and refine RTC's reduced fare program. Make sure program accommodates partner needs and expectations.	RTC	Regional Stakeholders
4	Develop cost sharing program for targeted populations.	RTC	Regional Stakeholders
5	Create outreach and marketing plan to ensure targeted populations are aware of program	RTC	Regional Stakeholders
6	Track and measure use. Adjust/adapt as needed.	RTC	Regional Stakeholders
7	Work with CCSD, charter schools, institutions of higher learning, etc. to develop free student passes for transit	RTC	Regional School District
8	Work with Veterans Administration and related organizations/agencies to robustly expand veteran mobility programs.	RTC	Veterans Administration and Partner Agencies

1 2 3 4 5 6 7

Make All Travel Options Safer and More Secure

3

BIG MOVE

MAKE ALL TRAVEL OPTIONS SAFER AND MORE SECURE

RTC On Board Strategies Survey (January-March 2020)
11,221 respondents

OVERVIEW

On Board emphasizes safety and security as core values for RTC's operations and planning. The RTC has advanced its Lights, Camera, Action! Program to communicate the agency's commitment to safety and security. The agency has also laid out a safety-focused capital investment program and tracked progress towards meeting implementation goals. In addition to recent investments in transit rider safety, there are opportunities to continue existing programs and expand on others. Stakeholders and members of the public consistently identified safety and security as priority concerns associated with moving throughout Southern Nevada. This Big Move is oriented around safety and security measures that focus on transit riders. Safety measures aimed at pedestrians, people who bike, and other roadway users are described in **Big Move #4:** Make Short Trips Easier.

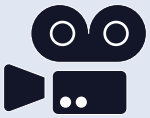
RTC's Existing "Light, Camera, Action" Program

LIGHTS

LIGHTING
In Progress

Of **1,670 SHELTERS, 2/3**
currently have lighiting

CAMERA



SURVEILLANCE
Complete

$200,000 to install surveillance software that provides local law enforcement
REAL-TIME ACCESS to live video stream on transit vehicles

ACTION

SHELTERS
Complete

$1.81 MILLION in federal funding to move shelters five feet behinde the curb to enforce the safety of transit riders

1,113 SHELTERS moved

900 NEW SHELTERS purchased and installed

Source: RTC

Big Move #3 focuses on strategies and projects to improve transit riders' real and perceived sense of personal security and safety. Making travel more secure refers to a person's sense of safety and security, including public health protections. Concerns include the communication of public health-related information and reminders, the distribution of masks and disinfectant, and the deep cleaning of touch points at bus stops.

Many of these projects and strategies have increased in importance during the COVID-19 pandemic, which has underscored the importance of safety in terms of public health. While short- and medium-term public health concerns are discussed in other parts of On Board, they are also included in Projects 3-1, 3-2, 3-4, and 3-5.

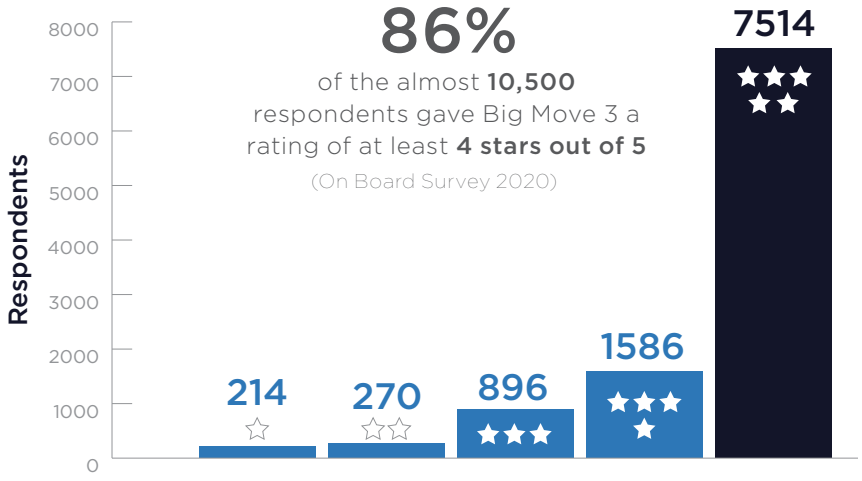
On Board's Big Move 3:Make All Travel Options Safe and Secure includes projects and programs that work towards the health and safety goals outlined above:

- **3-1: Utilize established Crime Prevention Through Environmental Design (CPTED) strategies during design of transit facilities**
- **3-2: Increase transit security staff presence**
- **3-3: Develop technology-based active security monitoring at bus stops**
- **3-4: Install emergency Blue Light call boxes at high risk locations**
- **3-5 Expand RTC Transit Watch program**
- **3-6 Review criminal codes to ensure appropriate treatment of transit-related criminal activity**

Closely related to the above strategies are projects that protect users of all travel options from crashes with motorized vehicles:

- **3-7: Traffic crash review and countermeasures program**
- **3-8: Accelerate efforts to move bus stops back from fast moving traffic**
- **3-9: Install bollards at high-volume stops with fast moving traffic**

SURVEY FINDING



86%
of the almost **10,500** respondents gave Big Move 3 a rating of at least **4 stars out of 5**
(On Board Survey 2020)

Southern Nevada residents gave Big Move 3 and all of its associated strategies a rating of

4.5 out of 5 stars
(On Board Survey 2020)

Big Move 3 received especially high ratings from Southern Nevada's **low-income, minority, and women residents**

Low income residents: 4.6/5
Minority residents: 4.6/5
Women residents rating: 4.6/5
(On Board Survey 2020)

62%
of respondents said that improved safety was the most important transportation investment to them
(RTC Access2040 Vision Survey 2016)

Big Move 3 received

more 5 star
ratings than any other Big Move
(On Board Survey 2020)

78%
Southern Nevada residents listed "transportation safety" as a top priority investment to them
(RTC Access2040 Vision Survey 2016)

KEY BENEFITS

All mobility strategies generate benefits for individual travelers, the regional economy and the environment. The graphic below provides a relative scale of the benefits.

EFFECTIVENESS IN ADDRESSING REGIONAL PRIORITIES

Making All Travel Options Safer and More Secure will directly help achieve the following priorities identified through extensive public outreach with nearly 80,000 people and multiple surveys that had almost 25,000 combined responses:

REGIONAL MOBILITY PRIORITIES

1	Improved Road & Transit Safety	●
2	Fewer Traffic Jams	◒
3	High Capacity Transit (including light rail)	●
4	Better Connectivity	◒
5	Well-Maintained Roads	○
6	Frequent Bus Service	◒
7	More Transportation Choices	●
8	Expanded Service for Seniors, Veterans, & People with Disabilities	◒
9	Improved Job & Housing Access	◒
10	Better Walking & Biking Conditions	●
11	New Modal Technologies & Investments	◒
12	Expanded Transit Service Area	◒
13	New Information Technologies	●
14	Better Transit Stops & Stations	●
15	Improved Transit Security	●

KEY | ● Strongest ◒ Strong ○ Less Strong

PROJECT 3-1

Utilize Established Crime Prevention Through Environmental Design (CPTED) Strategies During Design of Transit Facilities

OVERVIEW

Project 3-1 will review and update as necessary RTC's existing bus stop design standards, and construct new and modify existing bus stops in line with CPTED standards. CPTED is a set of design principles used to discourage crime and promote security. These design interventions implemented at the region's bus stops with higher incidents of crime will ensure that more people feel safe taking transit in Southern Nevada.

Timing for Completion	Long Term (11- 20 years)	**Potential Funding Sources**	Local sales tax Motor Vehicle Fuel Tax Capital Program Question 10 Capital Improvement Program Surface Transportation program FTA Urban Area Formula Funds (Section 5307) FTA Bus and Bus Facilities Funds (Section 5339)
Implementing Agency	RTC		

BACKGROUND

RTC's "Lights, Camera, Action!" initiative is focused on improving passenger security and safety by adding lighting and surveillance equipment to bus stops and moving bus shelters away from the curb. Project 3-1, which implements CPTED principles and practices, can enhance this existing program by providing additional funding to accelerate these efforts while concurrently redesigning stop areas according to CPTED.

CPTED is the application of designing safety and security into the natural environment of a specific area.[1] The design standards follow three interrelated principles of natural surveillance, natural access, and territoriality. The principles are based on an understanding that by using the behavior of people, a knowledge of crime generators, the physical environment, and the space of an area, effective design can create safety and security benefits if principles and standards are applied in the conceptual, design and planning stages of a project.[2] Fundamental principles include:

☑ **Natural Surveillance:** Maximize visibility by designing doors and windows to investigate public areas, such as parking lots, roadways

1 American Public Transportation Association (APTA).

2 https://www.apta.com/wp-content/uploads/Standards_Documents/APTA-SS-SIS-RP-007-10.pdf

or sidewalks.

- ☑ **Natural Access Control:** Use landscape structures and architectural designs to discourage access to private areas.
- ☑ **Territoriality:** Create physical designs that enhance or extend the sphere of influence so that users develop a sense of proprietorship. Organized territorial strategies typically include neighborhood crime watches, receptionists, and guard stations. Mechanical strategies can be perimeter sensing systems. Natural territorial strategies include fences, walls, and landscaping.
- ☑ **Maintenance:** Keep up with repairs and deep-clean and disinfect high touch points such as benches and poles daily. Maintain paint, trim landscaping, and remove trash and debris accordingly. Enforce a zero-tolerance policy to graffiti and vandalism and maintain the aesthetic appearance of assets, equipment, and facilities.

BENEFITS

Following CPTED principles helps incorporate safety and security goals into a project's design and can reduce the need for additional monitoring and surveillance investments to deter criminal behavior. Increasing rider safety may help attract more users to the system. Finally, CPTED principles will create functional, aesthetically pleasing facilities.

CHALLENGES

Adopting CPTED principles will be easier for new bus stops and mobility hubs, while challenges are more likely to arise from retrofitting existing facilities to CPTED facilities. In some locations, space or other limitations may make complete reconstruction of transit facilities to CPTED principles cost prohibitive and unrealistic. In those cases, certain CPTED-recommended designs like additional lighting will be added to a stop. Additional lighting may also be necessary to address the related challenge of building shade at bus stops while also following CPTED principles. Shaded facilities at RTC's bus stops is vital in Southern Nevada's desert climate; redesigning bus stops in accordance with CPTED principles will have to take shade into careful consideration.

COMPANION STRATEGIES

Project 3-1 is related to and will be planned in coordination with the following projects:

- ☑ **Project 3-3:** Develop Technology Based Active Security Monitoring at Bus Stops
- ☑ **Project 3-4:** Install Emergency Blue Light Call Boxes at High Risk Bus Stop Locations
- ☑ **Project 3-9:** Accelerate Efforts to Move Bus Stops Back from Fast Moving Traffic

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Update existing bus stop and mobility hub design guidelines to incorporate CPTED standards and practices. Adhere to design guidelines for future passenger facilities	RTC	Las Vegas Metropolitan Police Department City of North Las Vegas Police Department City of Henderson Police Department
2	Inventory RTC's highest risk bus stops for crime and security violations	RTC	Las Vegas Metropolitan Police Department City of North Las Vegas Police Department City of Henderson Police Department
3	Begin planning for bus stop expansion and reconstruction according to CPTED principles	RTC	Local Jurisdictions

PROJECT 3-2

Increased Transit Security Staff Presence

OVERVIEW

Project 3-2 will increase transit security presence on RTC vehicles to supplement the driver and live cameras currently installed on buses as part of RTC's "Lights, Camera, Action!" initiative. The program is intended to: ensure increased transit security staff resources are deployed in line with community policing best practices; provide comprehensive training for transit security enforcement personnel; and deploy de-escalation teams to help anyone who might be in distress. Expanded transit staff presence can also be leveraged to speed the distribution of masks and disinfectant directly to passengers. This project is designed to ensure more people feel safe riding transit, helping to make it a more competitive mode of transportation in the region..

Timing for Completion	Near Term (1-5 years)	**Potential Funding Sources**	Local sales tax Question 10 Capital Improvement Program FTA Urban Area Formula Funds (Section 5307)
Implementing Agency	RTC		

BACKGROUND

The purpose of providing security on transit system is to enhance the safety and security for all transit users. Historically in the United States, criminalization and enforcement of laws affecting transit riders has disproportionately impacts minority and marginalized communities. On Board calls for correcting these historical trends and improving the equitable treatment of all riders, so that they can have a safe, secure, and comfortable journey when using RTC's transit system.

Today, RTC employs uniformed, armed security staff at key locations and uses uniformed, unarmed fare checkers on routes with off-board payment mechanisms. On Board recommends RTC continue this practice of tiered security with Project 3-2 funding teams of specialized staff dedicated to improving transit safety. Specifically, funding would support the training and deployment of three types of safety-related personnel: 1) uniformed and unarmed fare enforcement staff; 2) resource outreach staff to respond to a homeless presence on transit; and 3) uniformed and unarmed transit security ambassadors trained in de-escalation strategies.

Project 3-2 provides funding for uniformed and unarmed fare inspectors to conduct fare checks on RTC routes with off-board fare payment. Fare checkers will be trained to conduct their work without discrimination and without the use of

violence. These unarmed inspectors will also be trained in de-escalation and anti-bias strategies.

While major crime rates remain low on RTC's system, individuals experiencing homelessness sometimes seek shelter in RTC vehicles and facilities. As an alternative to criminalization, On Board recommends investing in outreach staff to work with homeless riders. Workers will be trained in de-escalation techniques. Their primary role will be to help people experiencing homelessness navigate the resources available to assist them. Outreach workers will not be uniformed or armed.

The final tier of security staff will be transit ambassadors. Safety concerns most often arise when riders feel isolated and that no one is around. Project 3-2 address this concern by increasing use of transit ambassadors who will provide a non-threatening presence on transit vehicles and at transit facilities. Transit ambassadors will follow national transit safety best practice[1] by providing a physical presence as a deterrent to potential crimes or harassment. Transit ambassadors will be uniformed and unarmed.

BENEFITS

Increased staffing will strengthen RTC's presence at some of the most problematic stops, corridors, and bus routes and improve riders' overall sense of safety and security on the transit system. One potential role for transit ambassadors in the immediate term (if/when they return to RTC) would be to assist with COVID-19 public health concerns. Ambassadors could assist by encouraging people to adhere to guidelines. Transit staff can also help distribute masks and disinfectant to bus passengers.

CHALLENGES

Transit agencies across the United States struggle to deploy the appropriate type and amount of resources that make some riders feel secure without eroding the safety of others. RTC needs to be sure transit ambassadors and security receive appropriate training and are prepared to respond to incidents without escalating problems.

COMPANION STRATEGIES

Project 3-2 is related to and will be planned in coordination with the following projects:

- ☑ **Project 3-3:** Develop Technology Based Active Security Monitoring at Bus Stops
- ☑ **Project 3-4:** Install Emergency Blue Light Call Boxes at High Risk Bus Stop Locations
- ☑ **Project 3-5:** Expand Transit Watch Program

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Conduct needs assessment to determine locations and times when/if additional staff is needed	RTC	
2	Procure security resources with an emphasis on training and de-escalation approaches.	RTC	Las Vegas Metropolitan Police Department City of North Las Vegas Police Department City of Henderson Police Departmen
3	Deploy staffing resources at highest priority times and locations	RTC	Las Vegas Metropolitan Police Department City of North Las Vegas Police Department City of Henderson Police Departmen
4	Collect data, review effectiveness, and adjust program as needed	RTC	

1 Transit Center, TransitTools no. 14, Policing + Transit.

CASE STUDY

TRANSIT SAFETY STAFF AND DE-ESCALATION IN BAY AREA TRANSIT AGENCIES

In response to protests in Ferguson, Missouri following the police shooting of Michael Brown, an unarmed Black man, the President's Task Force on 21st Century Policing released a series of recommendations designed to reduce police brutality, which overwhelming affects minorities and people of color. The report recommended that law enforcement agency training policies on use of force should emphasize de-escalation and alternatives to arrest or summons in situations where appropriate.[1] In line with the recommendations of this report, transit agencies in the Bay Area implemented new programs to deploy unarmed inspectors and transit ambassadors.

Best practice recommendations suggesting fare enforcement should be conducted by unarmed fare inspectors and not police led SFMTA to introduce unarmed inspectors, who receive training in de-escalation and anti-bias strategies. In a similar move—and to address safety concerns that most often arise when there is a sense that there is no one around—BART has hired 10 transit ambassadors to provide a non-threatening presence on transit vehicles and in stations. In both cases, the unarmed staff wear their own uniforms and are easily identifiable.[2] SFMTA's program is permanent, while BART's program is a pilot which began in early 2020.[3]

"Being more visible, having high visibility on the trains, patrolling and de-escalating situations where we don't necessarily have to call the police," will be part of what the ambassadors do, explains Lateefa Davis, one of the new ambassadors. She says the ambassadors will also be there to help passengers navigate the system. "If that's helping with directions or which BART to get on, if they need help with their clipper card and where to go, that is what we will be there for," says Davis. Their focus will be patrolling the transbay corridor between 12th St. in Oakland and Civic Center station in San Francisco, the most heavily-traveled section of the BART system.[4]

1 https://cops.usdoj.gov/pdf/taskforce/taskforce_finalreport.pdf

2 https://transitcenter.org/wp-content/uploads/2020/02/Police-and-Transit.pdf

3 https://www.sfgate.com/commute/article/BART-ambassador-program-officers-unarmed-details-14962960.php

4 https://abc7news.com/bart-safety-ambassador-program/5917733/

DE-ESCALATION TRAINING AND OUTCOMES

SFMTA and BART safety personnel undergo dedicated de-escalation training. Specifically, their training informs inspectors and ambassadors "of the definitions, explanations, and/or origins of aggression and violence" that often occur on transit systems. Staff learn a number of nonviolent strategies for "prevention and management (i.e., reactive strategies) of aggression and/or violence."via lecture, role playing, and real-world experience that involves following more experienced colleagues. Overall, scholars have found that equipping officers at the individual level with the appropriate de-escalation skills, and providing a framework of internal and external accountability, is key to reducing negative behavior and violence against citizens.[5] After de-escalation training, the severity of incidents appears to decline, suggesting that de-escalation training might help to reduce the level of aggression/violence in those encounters.[6]

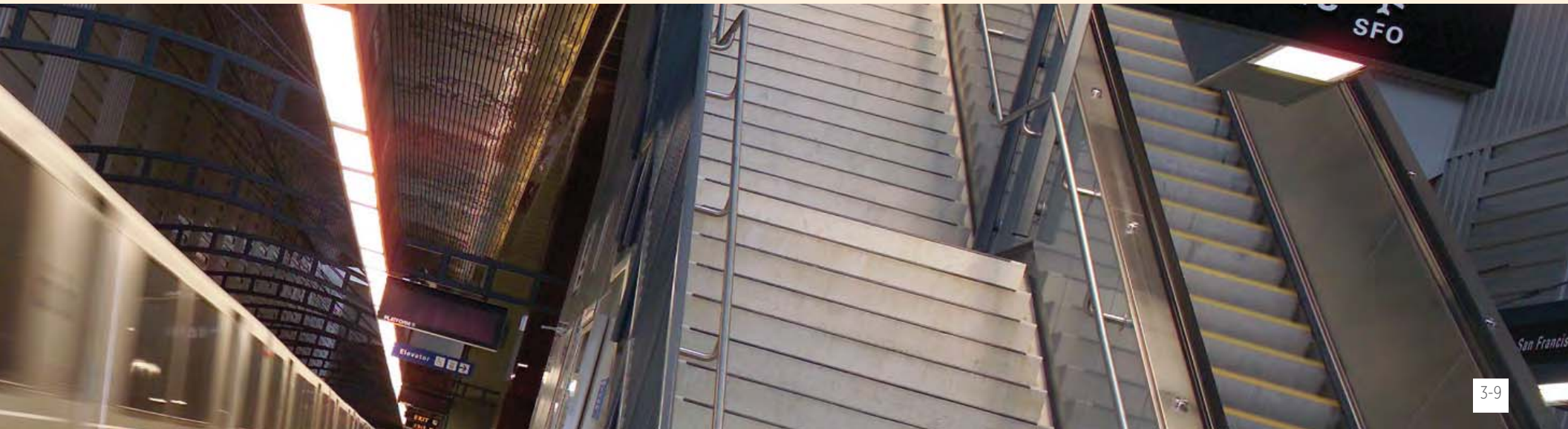
One challenge that the SFMTA transit inspectors program has faced is that the force is not large enough to meet the needs of the system. Some Muni drivers and many students who ride the bus regularly say they have never seen the monitors and in some cases have never heard of the program.[7] This challenge underscores scholars' findings that the prospects for wider reductions in police use of force are fairly good—subject to genuine commitment from police leaders.[8]

5 https://de-escalate.org/wp-content/uploads/2019/02/Reducing-Police-Use-of-Force-Case-Studies-and-Prospects.pdf

6 https://www.theiacp.org/sites/default/files/IACP_UC_De-escalation%20Systematic%20Review.pdf

7 https://missionlocal.org/2010/04/where-are-munis-transit-assistants/

8 https://de-escalate.org/wp-content/uploads/2019/02/Reducing-Police-Use-of-Force-Case-Studies-and-Prospects.pdf



PROJECT 3-3

Develop Technology-Based Active Security Monitoring at Bus Stops (Future Tech)

OVERVIEW

Project 3-3 will deploy real-time security monitoring systems at bus stops that harness big data and predictive analytics to prepare and position security resources. This "predictive policing" technology can help mitigate incidents before they occur and ensures transit security is able to respond quickly when they do occur. This strategy will increase the efficiency of how transit security officials are deployed and better manage incidents in Southern Nevada. It will also increase transit riders' sense of safety and security.

Timing for Completion	Near Term (1-5 Years)		
Implementing Agency	Lead: RTC Potential Partners: Local Jurisdictions Las Vegas Metropolitan Police Department City of North Las Vegas Police Department City of Henderson Police Department Nevada Department of Public Safety: Office of Traffic Safety	**Potential Funding Sources**	Local sales tax Question 10 Capital Improvement Program FTA Urban Area Formula Funds (Section 5307)

BACKGROUND

The use of technology and big data to analyze statistical patterns and identify locations not at increased risk of crime helps law enforcement and RTC security personnel anticipate problems and deploy resources efficiently to prevent criminal behavior. Predictive policing does not replace conventional policing methods but enhances these traditional practices by applying advanced statistical models and algorithms to deploy existing resources. Technology must also be applied carefully so data does not perpetuate implicit and explicit biases. The use of statistical models can be of immense value for reducing crime, increasing efficiency, and ensuring safety in cities.[1]

1 Albert Meijer & Martin Wessels (2019) Predictive Policing: Review of Benefits and Drawbacks, International Journal of Public Administration, 42:12, 1031-1039, DOI: 10.1080/01900692.2019.1575664

BENEFITS

In some cases, this technology has resulted in decreased crime rates. The presence of security personnel makes transit users feel safer, and this technology increases the likelihood that security personnel are deployed to the areas where transit users are most likely to feel unsafe.

CHALLENGES

Predictive policing is a technology still in development. Whereas some empirical studies conclude that predictive policing strategies lead to a decrease in crime, others find no effect. Predictive policing is currently used in some large city police departments (such as the LAPD's ETAS model) where researchers have found that the technology does indeed help to reduce crime.[2] However, not all studies that tested the effectiveness of predictive policing methods found positive results. The technology is expected to become more effective over time.[3]

COMPANION STRATEGIES

Project 3-3 is related to and will be planned in coordination with the following projects:

- ☑ **Project 3-2:** Increased Transit Security Staff Presence
- ☑ **Project 3-6:** Review Criminal Codes to Ensure Appropriate Treatment of Transit-Related Criminal Activity

2 Mohler et al., 2015

3 Ibid.

Moreover, researchers note that the most effective predictive policing approaches are elements of larger proactive strategies that build strong relationships between police departments and their communities to solve crime problems.[4]

4 Perry, Walter L., Brian McInnis, Carter C. Price, Susan Smith, and John S. Hollywood, Predictive Policing: The Role of Crime Forecasting in Law Enforcement Operations. Santa Monica, CA: RAND Corporation, 2013. https://www.rand.org/pubs/research_reports/RR233.html. Also available in print form.

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Dedicate RTC resources to monitor innovations in predictive policing technologies	RTC	
2	Coordinate internal data collection with the needs of predictive policing technology to ensure that RTC can effectively leverage technology as it becomes more useful	RTC	Las Vegas Metropolitan Police Department City of North Las Vegas Police Department City of Henderson Police Department Nevada Department of Public Safety: Office of Traffic Safety
3	Develop a plan to leverage the technology when technological innovation allows	RTC	Las Vegas Metropolitan Police Department City of North Las Vegas Police Department City of Henderson Police Department Nevada Department of Public Safety: Office of Traffic Safety

PROJECT 3-4

Install Emergency Blue Light Call Boxes at High Risk Locations

OVERVIEW

Project 3-4 will install emergency "Blue Light" call boxes at locations with higher crime and/or complaint rates. Technology solutions such as blue light emergency call boxes can increase people's personal sense of security and safety.

Timing for Completion	Medium Term (6-10 years)	**Potential Funding Sources**	Local sales tax Motor Vehicle Fuel Tax Capital Program Question 10 Capital Improvement Program Surface Transportation Block Grant Program FTA Urban Area Formula Funds (Section 5307) FTA Bus and Bus Facilities Funds (Section 5339
Implementing Agency	RTC		

BACKGROUND

Blue light towers and call boxes are commonly used safety resources at universities, colleges, and other public areas. They are typically used in areas with little foot traffic or other physical security presence. The call boxes create a highly visible and accessible way to reach local law enforcement. The dispatch center receives location data when the button is pressed, and first responders can quickly identify and respond to the request. Emergency blue light call boxes are typically used as part of a broader security plan.

BENEFITS

A widespread blue light emergency call box network may help residents to feel safer while traveling. These highly visible boxes also may result in an increased perception that all travel options in Southern Nevada are safer and more secure, helping to strengthen the region's competitiveness both for visitors and employers evaluating location options.

CHALLENGES

Blue light emergency call boxes are not mobile, so people are unable to call for help and keep moving. There is also a sense that in the long run, the blue light boxes may be replaced by mobile phone technology (see **Project 3-5**). Blue light call boxes require users to physically touch a button in order to contact RTC. As a result, these touch points are a potential vector for communicable diseases like COVID-19 and should be regularly disinfected and maintained in accordance with public health guidelines.

COMPANION STRATEGIES

Project 3-4 is related to and will be planned in coordination with the following projects:

- ☑ **Project 3-2:** Increased Transit Security Staff Presence
- ☑ **Project 3-6:** Review Criminal Codes to Ensure Appropriate Treatment of Transit-Related Criminal Activity

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Secure funding for blue light program	RTC	
2	Prioritize locations in need of safety treatments. This may include locations where RTC has received the highest rate of safety related complaints	RTC	Las Vegas Metropolitan Police Department City of North Las Vegas Police Department City of Henderson Police Department
3	Evaluate prioritized locations for space constraints and utility needs		Local Jurisdictions
4	Begin installing blue light call boxes at RTC identified locations	RTC	Local Jurisdictions

PROJECT 3-5

Expand Transit Watch Program

OVERVIEW

Project 3-5 funds an advertising program to increase awareness of the RTC Transit Watch App, which is used to report suspicious activity directly to RTC. RTC's official smartphone app is designed to promote transit security and communicate directly to security officials when needed. Transit Watch can also be used to distribute important public health-related reminders and information. Expanding awareness and use of Transit Watch will ensure that more users are aware of safety and security resources available to them when they take transit. This increased confidence will help make transit more attractive and competitive in Southern Nevada.

Timing for Completion	Short Term (0-5 years)	**Potential Funding Sources**	Local sales tax Question 10 Capital Improvement Program FTA Urban Area Formula Funds (Section 5307) FTA Bus and Bus Facilities Funds (Section 5339)
Implementing Agency	RTC		

BACKGROUND

RTC's Transit Watch app is a quick and easy way for public transit riders to directly communicate with RTC about suspicious activity and safety issues at a bus stop or while on board a bus. RTC Transit Watch features:

- ☑ Direct access to RTC Safety & Security staff
- ☑ Anonymous two-way chat
- ☑ Access to anti-terrorism awareness training developed by the Department of Homeland Security that includes the "8 Signs of Terrorism"
- ☑ Log of all incident reports sent in by the user and view of RTC Safety & Security responses
- ☑ Ability to send photos to supplement safety reports

Transit Watch is Free from the Google Play Store or the Apple App Store.

BENEFITS

RTC's Transit Watch app allows passengers to report incidents on public transit while on the move. The app also has the functionality to communicate important public health-related information and reminders directly to passengers. These options for communicating with RTC safety and security staff allows passengers to feel safer on transit and to get help if they feel unsafe while riding. Expanding awareness and use of Transit Watch will ensure that more users are aware of safety and security resources available to them when they take transit. This increased confidence will help make transit more attractive and competitive in Southern Nevada.

CHALLENGES

Not all transit users own smartphones, so this project must be implemented in conjunction with other projects included in Big Move 3 in order to help all passengers feel safer and more secure using transit in Southern Nevada.

COMPANION STRATEGIES

Project 3-5 is related to and will be planned in coordination with the following projects:

- ☑ **Project 3-3:** Develop Technology-Based Active Security Monitoring at Bus Stops
- ☑ **Project 3-4:** Install Emergency Blue Light Call Boxes at High Risk Stop Location

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Develop a marketing plan to effectively advertise the program and encourage passengers, residents, and visitors to download the app	RTC	
2	Collect metrics and feedback on program usage	RTC	

PROJECT 3-6

Review Criminal Codes to Ensure Appropriate Treatment of Transit-Related Criminal Activity

OVERVIEW

Personal safety and security are one of the most frequently cited concerns in surveys, community outreach sessions, and stakeholder output. The RTC's ability to provide secure experiences and maintain a reputation for safety is paramount to future success. Project 3-6 will review Southern Nevada's existing criminal codes to ensure they are aligned with RTC's focus on security and safety and at the same time reflect best practices for policing and transit. This strategy seeks to adjust existing criminal codes associated with rule breaking on or near transit and develop policies that address issues related to homeless populations and sexual harassment at RTC transit stops and in vehicles.

Timing for Completion	Short Term (0-5 years)	**Potential Funding Sources**	Local sales tax Question 10 Capital Improvement Program FTA Urban Area Formula Funds (Section 5307)
Implementing Agency	Lead: RTC Potential Partners: Las Vegas Metropolitan Police Department		

BACKGROUND

Transit is the safest way to travel in the United States. Transit riders are less likely to become victims of robbery and assault than car occupants and more likely to reach their destination without incident.[1] While there is a role for law enforcement at transit stops, at transfer stations, and on route current best practices suggest focusing on decriminalizing and de-escalating minor infractions such as fare evasion and loitering. Best practices include:

- ☑ Decriminalizing fare evasion and reducing fines: Transit agencies including TriMet in Portland, the San Francisco Metropolitan Transit Agency (SFMTA), and Sound Transit in Seattle have all decriminalized fare evasion and made fines commensurate with parking tickets. These agencies also offer alternatives to paying the fine, including the opportunity to enroll in a low income fare payment program.[2]

- ☑ Investing in services for the homeless population: An American Public Transit Association (APTA) survey found that many U.S. transit agencies have an office dedicated to addressing issues related to homelessness. These offices guide transit agency protocols

1 TransitCenter Policing + Transit, Transit Tools no. 14

2 Ibid.

and strategies to address homelessness. Strategies that have been implemented include assigning outreach workers to transfer stations, creating drop-in centers at transit stations, and partnering with local agencies to connect homeless individuals with services.

☑ Creating a "Transit Court": Outside of the criminal process, the Transit Court's job is to collect fines for violations and provide a process for individuals to contest their violation. LA Metro has a Transit Court to simplify the process and improve its ability to respond to customer concerns that arise from violations. The Transit Court is also cited with lowering the cost of processing cases, improving customer awareness of safety and operational issues, and creating an appeals process that provides options for customers who receive violations.

BENEFITS

Addressing real and perceived safety and security concerns associated with RTC bus stops and on vehicles will attract more riders to the system. It will also elevate the position of RTC as a regional stakeholder making it easier for RTC to invest in local communities and neighborhoods.

CHALLENGES

It is difficult to find the appropriate balance between creating a safe and secure environment and "over policing" strategies that make many riders feel unsafe and can lead to escalation from minor infractions.

COMPANION STRATEGIES

Project 3-6 is related to and will be planned in coordination with the following projects:

☑ **Project 3-2:** Increased Transit Security Staff Presence

☑ **Project 3-4:** Install Emergency Blue Light Call Boxes at High Risk Stop Locations

☑ **Project 3-5:** Expand Transit Watch Program

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Conduct a peer review of similar agencies' revisions of transit-related criminal codes and responses	RTC	Las Vegas Metropolitan Police Department
2	Form an action team with social service agencies, local police, transit riders, and RTC staff to define how transit security staff will respond to transit-related disturbances	RTC	Las Vegas Metropolitan Police Department
2	Implement the recommendations of the action team and ensure that all relevant parties are appropriately trained	RTC	Las Vegas Metropolitan Police Department

PROJECT 3-7

Traffic Crash Review and Countermeasures Program

OVERVIEW

Project 3-7 will create a program to support engineering fixes at crash hotspots to reduce the risk of future automobile collisions. One of the fastest ways that vehicle collisions can be reduced in Southern Nevada is by addressing design issues at locations with higher crash rates and severe crashes. This program will also create a vehicle crash hotspot report for the region and for each specific location after a fatal automobile crash has occurred.

Timing for Completion	Near Term (1-5 Years)	**Potential Funding Sources**	Local sales tax Motor Vehicle Fuel Tax Capital Program Question 10 Capital Improvement Program Federal Highways Administration (FHWA) Surface Transportation Block Grant Program
Implementing Agency	Lead: RTC Potential Partners: Nevada DOT Local Jurisdictions Local Law Enforcement Agencies Nevada Department of Public Safety: Office of Traffic Safety		

BACKGROUND

In 2017, 39,107 automobile collisions occurred in Clark County (3.7% increase from 2016) resulting in 209 fatalities (3.7% decrease from 2016).[1] Many of these collisions occur on the same roads or at the same intersections—crash hotspots—that could be redesigned to be safer for drivers and other roadway users. These hotspots tend to have many of the same qualities in common:

- ☑ Areas where speeding is more prone to occur such as highways, state routes, and arterials
- ☑ Areas of high traffic such as interstate exits and major intersections
- ☑ Areas with higher populations such as near apartment complexes and houses
- ☑ Areas with a lack of designated crosswalks and/or adequate signage denoting pedestrian presence

Collisions can be avoided through design interventions like lane narrowing, adding landscaping and street trees, better lit and redesigned intersections, signal re-timings, and more and better-designed crosswalks.

Traffic calming measures reduce speeds, especially on local roads, and result in fewer and

1 Source: RTC

less severe crashes. Adequately designed turn bays and entrance and exit ramps can reduce improper merging and driving on the shoulder. Additionally, redesigning intersections into roundabouts can significantly reduce fatal and injury crashes. Median and pedestrian refuge areas—areas between opposing lanes of traffic where pedestrians are protected from passing traffic—are also effective in reducing fatal and injury crashes.

Benefits

Project 3-7 will make Southern Nevada safer for all users by redesigning intersections where collisions often occur.

CHALLENGES

The RTC does not own or maintain the roadways in Southern Nevada. Therefore, the RTC will ensure close partnership with other governmental agencies to coordinate design solutions in these locations.

COMPANION STRATEGIES

Project 3-7 is related to and will be planned in coordination with the following projects:

- ☑ **Project 4-1:** Implement Complete Streets Program
- ☑ **Project 4-2:** Walkability Infrastructure and Education Program
- ☑ **Project 4-4:** Develop Mid-Block Pedestrian Crossings

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Identify funding for traffic crash countermeasure program	RTC	
2	Collect data on the region's crash hotspots	RTC	Nevada DOT Local Jurisdictions Local Law Enforcement Agencies Nevada Department of Public Safety: Office of Traffic Safety
3	Use traffic crash hotspot analysis to prioritize engineering fixes funded with this project	RTC	Nevada DOT Local Jurisdictions Local Law Enforcement Agencies Nevada Department of Public Safety: Office of Traffic Safety

PROJECT 3-8

Accelerate Efforts to Move Bus Stops Back from Fast Moving Traffic

OVERVIEW

Project 3-8 will make bus stops safer by pushing bus stops back from high speed arterials. In some cases, this project may also create "pull-out" style bus stops that separate buses from vehicular travel lanes. Moving bus stops away from vehicle travel lanes also creates an opportunity to upgrade bus shelter facilities and amenities, including safety and security features such as lighting, video monitoring systems, and, shade.

Timing for Completion	Long Term (11-20 Years)	**Potential Funding Sources**	Local sales tax Motor Vehicle Fuel Tax Capital Program Question 10 Capital Improvement Program Federal Highways Administration (FHWA) Surface Transportation Block Grant program FTA Urban Area Formula Funds (Section 5307)
Implementing Agency	Lead: RTC Potential Partners: Local Jurisdictions		

BACKGROUND

As part of its Lights, Cameras, Action! Strategy, RTC began moving bus shelters back from sidewalks. To date, RTC has moved 1,133 transit shelters back five feet from the sidewalk, where space was available. As part of this program, the RTC has pushed back all stops with available right-of-way. The program was implemented in partnerships with local jurisdictions, including the City of Las Vegas.[1]

On Board will expand this strategy by providing additional resources to continue to identify bus stop locations and work with property owners to push bus stops back from the road. While the focus of this project is to physically separate the boarding and waiting area for transit passengers from high-speed arterial traffic, it will also implement a suite of other safety-related upgrades to bus stops:

- ☑ **Relocate Bus Stops Back from Moving Traffic:** RTC transit buses operate on high-speed arterial roads. Although sidewalks are generally available, many sidewalks are narrow, requiring bus stops to be located close to vehicle travel lanes (see photo on facing page). An expansion of RTC's existing programs to move stops back, as well as increased assistance in this area by local jurisdictions, will make bus stops safer.

1 Regional Transportation Commission of Southern Nevada (RTC), Lights, Camera, Action! Website https://www.rtcsnv.com/ways-to-travel/how-to-ride/lights-camera-action/

Project 3-8 will accelerate efforts to move bus stops back from fast moving traffic, like this bus stop along Boulder Highway, where the bus moves from the travel lane into a pull-out lane to pick up passengers.
Image from Google Maps.

- ☑ **Lighting:** Improving lighting is one of the most effective ways to improve people's sense of personal security at bus stops. New technologies, such as solar lighting and remotely controlled lighting panels will further strengthen the RTC lighting programs.

- ☑ **Video Monitoring:** The RTC will broaden the use of CCTV and/or HD cameras to support live viewing of transit stops, especially in locations where there are concerns. Like buses, RTC and local law enforcement will watch activity at stations and respond to activity as appropriate.

- ☑ **Shaded Waiting Areas:** Due to Southern Nevada's hot desert climate, waiting outside for the bus can be an extremely uncomfortable experience, especially during the summer months. Heat can also be intensified when passengers wait alongside asphalt roadways. Bus shelters designed to provide shade for a maximum amount of the day are crucial at most stops in the RTC system. The RTC could also explore air conditioning or water misters at major stops to help with temperature control.

Benefits

On Board's bus stop safety and security recommendations will ensure:

- ☑ Reduced traffic crashes, fatalities, injuries, and property damage.
- ☑ Reduced crime, which reduces societal costs related to transportation and improves quality of life.
- ☑ Improved safety and security for pedestrians, thereby making transit a more attractive option.

CHALLENGES

Most safety improvements would involve close coordination between The RTC and the cities and county. This would especially be the case with an effort to move stops farther back from fast moving traffic. RTC's current partnership with the City of Las Vegas to move stops back is a model of how these partnerships could work. It will also require considerable staff time and effort to work with individual property owners to get easements on their property in order to allow RTC to move stops back from the street.

COMPANION STRATEGIES

Project 3-8 is related to and will be planned in coordination with the following projects:

- ☑ **Project 3-1:** Utilize Established Crime Prevention Through Environmental Design (CPTED) Strategies During Design of Transit Facilities
- ☑ **Project 3-4:** Install Emergency Blue Light Call Boxes at High Risk Stop Locations
- ☑ **Project 3-7:** Traffic Crash Review and Countermeasures Program
- ☑ **Project 3-9:** Install Bollards at High-Volume Stops with Fast Moving Traffic

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Secure funding and staff resources for bus stop movement program	RTC	
2	Prioritize bus stop locations in need of safety treatments. This may include locations where RTC has received the highest rate of safety complaints, where vehicle speeds are highest, and/or where ridership is high	RTC	Local Jurisdictions
3	Evaluate prioritized locations for space constraints and utility needs.	RTC	Local Jurisdictions
4	Begin implementing bus stop movement and reconstruction program	RTC	Local Jurisdictions

Example of a bus stop moved back from fast moving traffic
Image from RTC

PROJECT 3-9

Install Bollards at High-Volume Stops with Fast Moving Traffic

OVERVIEW

RTC initiated a pilot program to test installing bollards at key locations and bus stops at 20 locations in Southern Nevada (see photo on facing page). Project 3-9 would expand this pilot and accelerate implementation of this program with funding and installation guidelines.

Timing for Completion	Medium Term (5-10 Years)	**Potential Funding Sources**	Local sales tax Motor Vehicle Fuel Tax Capital Program Question 10 Capital Improvement Program Federal Highways Administration (FHWA) Department of Homeland Security (DHS) Homeland Security Grant Program (HSGP) DHS Transit Security Grant Program (TSGP) Surface Transportation Block Grant Program
Implementing Agency	Lead: RTC Potential Partners: Local Jurisdictions		

BACKGROUND

Traffic bollards are short, robust metal posts that can be used as barriers between bus stops and roadways to prevent automobiles leaving the roadway from hitting people walking or waiting for transit. Bollards are designed to withstand the impact of a 15,000 pound vehicle traveling at 50 miles per hour and meet the highest penetration rating for perimeter barriers subjected to vehicle impact.[1]

RTC has numerous bus stops located along high-speed arterials with narrow sidewalks. As described in Project 3-8, On Board includes support for moving bus stops back from roadways. In cases where sidewalk space is not enough, or traffic volumes and speeds are significant, pedestrian and transit rider safety can be enhanced by installing protection from vehicular traffic. Bollards help achieve safety goals by providing a layer of defense against errant roadway traffic. This strategy will prioritize construction of bollards at the bus stops where rates of vehicle crashes are above average, vehicle speeds are highest, pedestrian and transit ridership volumes are greatest, and sidewalks are closest to traffic.

Traffic bollards can also support other security-related goals by preventing vehicular access to sidewalks and areas with high pedestrian volumes. Nationally and internationally, there

1 Regional Transportation Commission of Southern Nevada (RTC), Lights, Camera, Action! Website https://www.rtcsnv.com/ways-to-travel/how-to-ride/lights-camera-action/

have been instances where terrorist acts have included using vehicles to harm people. Bollards will restrict this type of harmful activity along some of Southern Nevada's tourist attractions.

BENEFITS

Traffic bollards are a relatively low cost strategy to improve bus rider and pedestrian safety. They may also reduce the number of fatalities that occur near bus stops and areas with high pedestrian traffic. While bollards will not reduce the number of traffic crashes, they will reduce pedestrian and transit rider fatalities. By increasing personal safety, RTC will attract more users to the system.

CHALLENGES

There are some challenges with bollard installations. Bollards must be designed and placed with transit operations in mind. If bollards are spaced too closely, it can be difficult for operators to accommodate front and rear door openings. Bollard spacing also needs to reflect ADA requirements and ensure it allows for all other potential bus stop access needs (e.g., cleaning or new equipment installations).

Bollards may damage vehicles and injure passengers in a crash, which may be perceived as a liability. However, vehicles only contact bollards when they travel outside of marked traffic lanes. In this way, a bollard is no different than a streetlight or other street furniture. Bollards may also be striped with reflective material to alert drivers of their location. Further, the impact to vehicle drivers and passengers is less than the impact to an unprotected transit rider.

Examples of bollards installed in front of RTC bus stop on Las Vegas Boulevard/Boulder Highway.
Image from Google Maps

COMPANION STRATEGIES

Project 3-9 is related to and will be planned in coordination with the following projects:

- ☑ **Project 3-7:** Traffic Crash Review and Countermeasures Program
- ☑ **Project 3-8:** Accelerate Efforts to Move Bus Stops Back from Fast Moving Traffic

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Review findings from RTC pilot project	RTC	
2	Identify funding sources and partnerships to accelerate bollard installations.	RTC	Local Jurisdictions
3	Conduct needs assessment and coordinate with other strategies to improve passenger safety	RTC	Local Jurisdictions
4	Work with local jurisdictions to implement bollards at priority locations	RTC	Local Jurisdictions

1 2 3 4 5 6 7

Make Short Trips Easier

4

BIG MOVE

MAKE SHORT TRIPS EASIER

81%
rated Big Move 4 at least

RTC On Board Strategies Survey (January-March 2020)
11,221 respondents

OVERVIEW

The On Board Mobility Plan integrates transit and multimodal transportation investments to strengthen mobility and accessibility, ensuring that transportation programs and projects connect people, places, and opportunities in ways that are easy, safe, and affordable. It is crucial to ensure that people feel comfortable making all types of trips—traveling by car, walking, biking, and riding the bus. On Board makes investments in alternatives to the private automobile, including projects and programs for pedestrians and cyclists that also support investments in high-capacity transit **(Big Move 1)**, expand transit services **(Big Move 2)** and make all travel options safe and secure **(Big Move 3)**.

Big Move 4 includes strategies to make short trips easier. Defined as trips less than one mile, short trips include traveling for work, school, errands, and/or connections to transit. Short trips significantly impact investments in transit infrastructure

It is crucial to ensure that people feel comfortable making all types of trips – traveling by car, walking, biking and riding the bus.

because the availability of "first mile, last mile" connections often dictate a travelers' mode choice for longer trips. Because of this, making short trips easier is integral to shifting Southern Nevada's mode split and successfully diversifying travel options and patterns.

This recommendation includes a combination of infrastructure investments, policies and programs to influence and change the Southern Nevada urban environments, making it safer, easier, and more comfortable for people to walk and bike or use transit. Additionally, these recommendations would provide a more compelling environment for micro mobility strategies like bike share.

On Board's **Big Move 4: Make Short Trips Easier** consists of 7 distinct investments and projects designed to make short trips easier:

4-1 Upgrade Streets to Be Safe for All Users (Complete Streets)

4-2 Offer Mid-Block Pedestrian Crossings at Long Block Segments and High Traffic Volumes

4-3 Develop a Walkability Infrastructure Funding Program

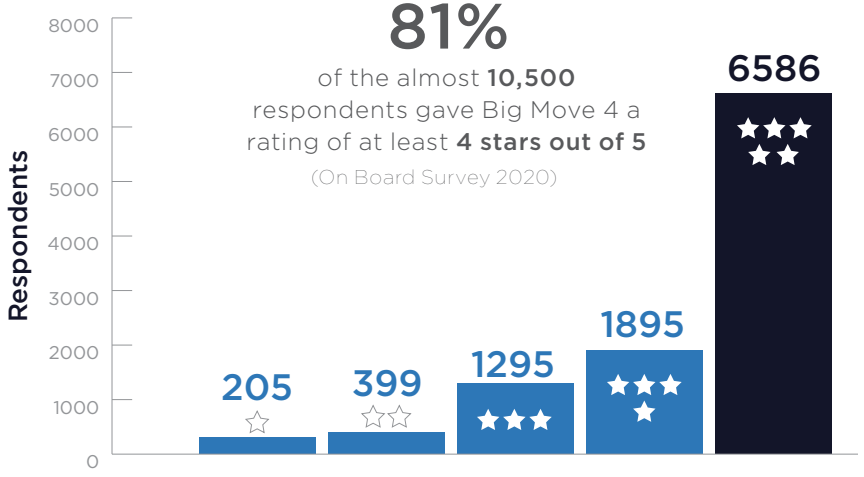
4-4 Make Bus Stops Inviting and Safe

4-5 Develop Regional Mobility Hubs

4-6 Develop Neighborhood Mobility Hubs

4-6 Improve Wayfinding in High Volume Pedestrian Locations

SURVEY FINDING



81%
of the almost **10,500** respondents gave Big Move 4 a rating of at least **4 stars out of 5**
(On Board Survey 2020)

Southern Nevada residents gave Big Move 4 and all of its associated strategies a rating of

4.3 out of 5 stars
(On Board Survey 2020)

50%
of respondents said that improved walking and bicycling were the most important transportation investment to them
(On Board Vision Survey 2018)

Low-income minority
respondents gave Big Move 4 an especially high rating of 4.6
(On Board Survey 2020)

56.3%
of respondents report overall that more space for pedestrians, bicyclists, and transit is more desirable to them than more space for cars
(On Board Vision Survey 2018)

KEY BENEFITS

All mobility strategies generate benefits for individual travelers, the regional economy and the environment. The graphic below provides a relative scale of the benefits.

EFFECTIVENESS IN ADDRESSING REGIONAL PRIORITIES

Making Short Trips Easier and Safer will directly help achieve the following priorities identified through extensive public outreach with nearly 80,000 people and multiple surveys that had almost 25,000 combined responses:

REGIONAL MOBILITY PRIORITIES

1	Improved Road & Transit Safety	●
2	Fewer Traffic Jams	●
3	High Capacity Transit (including light rail)	○
4	Better Connectivity	●
5	Well-Maintained Roads	◒
6	Frequent Bus Service	●
7	More Transportation Choices	●
8	Expanded Service for Seniors, Veterans, & People with Disabilities	◒
9	Improved Job & Housing Access	●
10	Better Walking & Biking Conditions	●
11	New Modal Technologies & Investments	◒
12	Expanded Transit Service Area	○
13	New Information Technologies	○
14	Better Transit Stops & Stations	●
15	Improved Transit Security	◒

KEY | ● Strongest ◒ Strong ○ Less Strong

PROJECT 4-1

Upgrade Streets to Be Safer for All Users (Complete Streets)

OVERVIEW

Project 4-1 will provide funding and policy guidance to help Southern Nevada jurisdictions and municipalities transition roadways into multimodal facilities. Specifically, this project funds the construction of 200 miles of complete streets outside of HCT corridors. The goal is to develop more roadways that align with "Complete Street" principles and programs, while balancing the needs of different travel options. RTC would provide funding and policy guidelines; local jurisdictions would be responsible for design, implementation, and ongoing maintenance.

Complete Streets policies transition roadways from automobile-centric facilities to ones balancing the safety and comfort of a broader spectrum of travelers, including pedestrians, bicyclists, and transit riders. Complete Street policies can be used to design new facilities; they can also be implemented incrementally, allowing a roadway to transition over time in line with budgets and resources.

Timing for Completion	Long-Term (11-20 years)	**Potential Funding Sources**	Local Sales Tax Motor Vehicle Fuel Tax FHWA • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grant (STBG) Program • Better Utilizing Investments to Leverage (BUILD) Grants Public Private Partnerships
Implementing Agency	Lead: Local Jurisdictions Partners: TRTC		

BACKGROUND

RTC completed a Complete Streets Study in 2012 that laid out a series of policies and principles to guide streets and roadways in Southern Nevada. Strategy 4-1 builds on this previous work by developing a grant program to help local and regional jurisdictions advance these strategies on select corridors throughout Southern Nevada. Key strategies and policies outlined in Complete Streets Study that will be carried forward into this strategy include:

☑ **Traffic Calming –** Careful changes to roadway design features reduce vehicle travel speeds, increasing driver awareness of pedestrians and bicyclists. By slowing automobile speeds, traffic calming features enhance the pedestrian environment, improving safety. Traffic calming treatments that contribute to complete streets implementation include medians, traffic circles, curb extensions, lane narrowing, and pavement treatments.

☑ **Road Diets –** Reducing lane width and/or the number of lanes creates space for sidewalks, bicycle lanes, parking lanes, and medians, improving the safety and comfort of bicyclists, pedestrians, and transit riders. Road diets can improve pedestrian safety through lower vehicular speeds and reduced pedestrian crash rates.[1] Road diets

1 Evaluation of Lane Reduction "Road Diet" Measures and Their Effects on Crashes and Injuries, Turner Fairbanks Highway Research Center, http://www.tfhrc.gov/safety/hsis/pubs/04082/ index.htm

also improve traffic flow, especially when implemented with center-running left turn lanes.[2]

☑ **Transit Ways and Facilities –** Enhancing transit facilities along roadways—e.g., adding dedicated travel lanes—increases transit speed and reliability, greatly improving service convenience for riders and operational efficiency. Las Vegas has used dedicated travel lanes to support premium services, like BRT. An alternative approach is to build transit "ways" where infrastructure is available for all transit vehicles. Implementing transit ways on corridors designated as "transit corridors" allows significant bus volumes. These projects are almost always implemented with other enhanced transit facilities, such as bus shelters, stop locations, and lighting.

☑ **Bike Lanes and Facilities –** Dedicating lanes for cyclists, demarcating cycle routes, and providing bike parking all improve the safety and comfort for bicyclists. encouraging use. Bike lanes define roadway space, improve safety, and comfort for bicyclists, and encourage bicyclists to follow traffic rules. They also signal to motorists that bicyclists are allowed to be on the road. Benefits from increased bicycling include improved environmental and personal health, reduced traffic congestion, and enhanced quality of life.

2 Ibid

☑ **Buffer Areas –** Separating vehicle travel lanes from sidewalks and bike lanes greatly improves the safety and comfort of pedestrians, and cyclists. Buffers can be accomplished with landscaping as well as physical barriers. Landscaping improves streetscapes for both walkers and drivers. Motorists benefit because the landscaping frames the roadway, improving drivers' assessment of their speed. Pedestrians benefit from slower moving traffic. Other buffers, like on-street parking, accomplish similar objectives by creating space between motor vehicles and pedestrians and cyclists.

☑ **Shade Complete Street –** Including shade structures such as street trees, landscaping, and planting strips, protects and provides a canopy for pedestrians and bicyclists in the streetscape design, providing a significantly more comfortable pedestrian environment. In hot climates like Southern Nevada, these design treatments make the pedestrian realm more appealing, making it more likely to be used in larger numbers.

Project 4-1 funds the construction of 200 miles of complete streets outside of HCT corridors. Capital cost estimates for this project are based on planned Rainbow Boulevard street improvements and reconstruction; estimates for reconstruction, including right turn lanes, sidewalk widening, street trees, intersection improvements and ADA upgrades suggest a cost of $2.6M per mile.[3]

Figure 4-B Complete Street Design Concept

Source: NACTO

3 RTC Transportation Improvement Program Fiscal Year 2019-2022, Rainbow Blvd Improvements and Various Intersections Right Turn Improvements (January 9, 2020)

BENEFITS

Developing a more robust network of complete streets would rebalance how Southern Nevada prioritizes roadway space for all users, including drivers, pedestrians, bicyclists, and transit users. In communities around the United States, complete street investments have been successful in encouraging community and neighborhood economic development by creating more vibrant and comfortable public spaces that support retail activity.[1] Complete streets also support transit investments and ridership by improving safety and comfort for walking to and from bus stops.

CHALLENGES

Implementing Complete Streets infrastructure requires changing the status quo. While projects will maintain capacity for private automobile travel, the process of rebalancing roadway space across more users and modes can include removal of travel lanes, on-street parking and other amenities that may be perceived as a reduction in convenience and mobility to drivers. In particular, the removal of on-street parking can be a potentially difficult task politically but often results in a more efficient use of street space. Other common hurdles include:

- ☑ Existing land use patterns and zoning policies and programs that create design challenges for roadway retrofits
- ☑ Pedestrian and bike lane planning can be more nuanced, requiring specialist input
- ☑ Resistance from residents and business owners over street modification

Complete Streets programs should be developed and implemented with transit investments, so project and programs are coordinated, reflecting the full range of modes expected to use the roadway.

COMPANION STRATEGIES

For Project 4-1 to be most successful, it should be implemented in conjunction with other projects in Big Move 4, including:

- ☑ **Project 4-2:** Offer Mid-Block Pedestrian Crossings at Long Block Segments and High Traffic Volumes
- ☑ **Project 4-3:** Develop a Walkability Infrastructure Funding and Education Program

Figure 4-D Complete Street Concept for Boulder Highway

Source: RTC

1 "Capturing the Benefits of Complete Streets" National Center for Transit Research, Florida Department of Transportation, 2015.

NEXT STEPS

The On Board Plan assumes that the Complete Streets program will be implemented as a grant program, where RTC and the Metropolitan Planning Organization (MPO) set standards, provide grants, and incentivize projects and investments.

	Step	Lead Agency	Partner Agency
1	Build on RTC's 2012 Complete Streets study. Use existing transit investments to implement Complete Streets infrastructure (see **Figure 4-D**). Use planned investment as pilot program. Study impacts and benefits and report findings to public and private sector partners.	RTC	Local Jurisdictions
2	Develop/expand demonstration projects to include incremental Complete Streets projects, such as mid-block pedestrian crossing infrastructure near important activity centers and major transit infrastructure.	Local Jurisdictions	RTC
3	Use pilots and planned project investments to begin to develop standards and evaluation measures for a region-wide complete streets network, potentially using as a model the "STARS" metrics used by cities seeking develop more compact and complete communities.[4]	Local Jurisdictions	RTC
4	Use pilots and early opportunities to document the benefits and impacts of Complete Streets.	RTC	Local Jurisdictions
5	Identify funding source for Complete Streets program.	RTC	Local Jurisdictions
6	Develop program management plan that lays out funding amounts, project evaluation criteria, and project reporting mechanisms.	RTC	Local Jurisdictions
7	Issue a call for projects and move forward with grant program implementation.	RTC	Local Jurisdictions

PROJECT 4-2

Offer Mid-Block Pedestrian Crossings at Long Block Segments and High Traffic Volumes

OVERVIEW

Project 4-2 provides policies, design guidelines and grant funding to encourage jurisdictions to build mid-block crossings at long block segments and high traffic volumes. Mid-block crossings create a shorter, more direct, and more convenient path (desire line) for pedestrians to reach their destinations. Recommendations call for prioritizing locations for mid-block crossing investments at locations where (1) distances between street crossing is particularly long, (2) traffic volumes are significant, and (3) vehicle crash hotspots. Investments will support pedestrians and transit riders.

Timing for Completion	Medium-Term (6-10 years)	**Potential Funding Sources**	Local Sales Tax Motor Vehicle Fuel Tax FHWA • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grant (STBG) Program • Better Utilizing Investments to Leverage (BUILD) Grants
Implementing Agency	Lead: Local Jurisdictions Partners: RTC		

BACKGROUND

Walking trips almost always involve crossing streets. Many of Southern Nevada's roadways have long blocks, with intersections spaced at long intervals. In most cases, pedestrian crossings are limited to roadway intersections, meaning Southern Nevada pedestrians must walk long distances and take indirect and non-intuitive routes to cross the street and reach their destinations. When city blocks are large, forcing pedestrians to walk to the closest intersection discourages pedestrians by increasing travel times, distances, and convenience. RTC's 2012 Complete Streets Report characterizes the strategy as:

☑ **Midblock crossings** are crosswalks located midblock, not at an intersection. They provide locations for pedestrians to cross streets where the spacing of intersections is far apart or when the pedestrian's destination is immediately across the street. In these instances, pedestrians will tend to cross the street even when there is no crosswalk, exposing them to traffic where drivers may not expect them. Midblock crossings respond to this behavior by providing a safe connection. Installing midblock crossings is best only when there is a high amount of pedestrian activity occurring in a specific area. The design of midblock crossings may include high-visibility crosswalks, signals, warning signs, flashing lights, in ground warning lights, and curb extensions. Midblock

crossings should be considered where there is high pedestrian demand to cross, and where street and traffic conditions are adequate.

There are three characteristics of well-designed and placed midblock crossings:

- ☑ They are highly visible to motorists, bicycles, and pedestrians
- ☑ They reduce walking distance for pedestrian
- ☑ They contribute to pedestrian convenience

RTC's Bus stop guidelines prioritize locating bus stops on the far side of an intersection, to speed bus service and allow for quick transfer to bus lines serving the intersection. This allows passengers to cross at an adjacent signalized crosswalk. However, a significant number of bus stops are located midblock, relatively far away from a signalized crosswalk. Traffic laws expect pedestrians to cross at crosswalks, and as a practical matter, when intersections are spaced widely, the built environment inadvertently encourages pedestrians to cross illegally, putting them and motorists in danger.

Common ways to develop mid-block pedestrian crossings include a combination of roadway treatment and signal infrastructure:

- ☑ Create crosswalks and markings to direct pedestrians to crossings at predetermined locations.
- ☑ Build protected medians and pedestrian refuges in the middle of roadways to allow pedestrians to cross in stages. Medians and pedestrian refuges are also consistent with other strategies and programs, such as Complete Streets infrastructure.
- ☑ Install signalized crossings systems, including High-Intensity Activated crossWalK (HAWK) signals (as at UNLV—also known as Pedestrian Hybrid Beacons or PHBs) and Rectangular Rapid Flash Beacon (RRFB) signals, to stop vehicles and create safe passage for pedestrians (see Figure 4-E and photo on page 4-11).

Figure 4-E HAWK Signal Crossings

BENEFITS

Mid-block crossings facilitate direct, faster, and safer walking trips, making it easier for people to cross the street and complete short trips by foot, bike, and transit. Mid-block crossings also help concentrate development in neighborhood centers, improving access to shopping, services, and transit.

CHALLENGES

Nearly all sidewalks and crosswalks are located within public rights-of-way, with most owned or controlled by cities, counties, and states. Successful implementation of this strategy, therefore, requires a partnership between RTC and local jurisdictions. The project is designed so that RTC would provide site selection criteria, design guidelines and funding. Local jurisdictions would be responsible for final design and implementation. Success is contingent on RTC demonstrating leadership and collaboration among regional entities.

COMPANION STRATEGIES

For Project 4-2 to be most successful, it should be implemented in conjunction with other projects in Big Move 4, including:

- ☑ **Project 4-1:** Upgrade Streets to Be Safer for All Users (Complete Streets)
- ☑ **Project 4-3:** Develop a Walkability Infrastructure Funding and Education Program

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Develop pilot program to test mid-block pedestrian crossing infrastructure near important activity centers and major transit infrastructure. Pilot program could be developed as a partnership between RTC and member jurisdictions.	Local Jurisdictions	RTC
2	Use pilot project to develop standards and expectations.	Local Jurisdictions	RTC
3	Identify funding source for expanding pedestrian infrastructure program. Local jurisdictions can provide design, land acquisition and implementation. RTC leads planning and provides funding.	RTC	Local Jurisdictions
4	Develop program management plan that lays out funding amounts, project evaluation criteria, and project reporting mechanisms.	Local Jurisdictions	RTC
5	Issue a call for projects and move forward with grant program implementation.	RTC	Local Jurisdictions

A Rectangular Rapid Flash Beacon (RRFB) type midblock crossing
Image from RTC

PROJECT 4-3
Develop a Walkability Infrastructure Funding and Education Program

OVERVIEW

Project 4-3 establishes a grant program that will help jurisdictions create more crosswalks, sidewalks, bike lanes, and pedestrian/ bicyclist safety improvements in neighborhoods, near transit stops, and around shopping and commercial areas. It is also designed to support accessibility and walkability improvements at master plan developments. This investment will also establish an education and outreach program for helping the community-at-large (including drivers) understand the importance of pedestrian and bike safety measures (see Figure 4-F).

Timing for Completion	Long-Term (11-20 years) Jurisdictions	**Potential Funding Sources**	Local Sales Tax Motor Vehicle Fuel Tax FHWA • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grant (STBG) Program Public Private Partnerships
Implementing Agency	Lead: RTC Partners: Local Jurisdictions		

BACKGROUND

Making short trips on foot usually involves crossing the street at some point. In Southern Nevada, many streets were designed for auto use and have wide streets and large block lengths. This means pedestrians are forced to walk longer or wait for extended periods of time to cross the street at intersections. When rushing to get somewhere on time, people often opt to jaywalk to avoid spending extra time walking up to an intersection that would otherwise be out of their way.

Southern Nevada's 2017 Regional Bicycle and Pedestrian Plan offers strong guidance on measures RTC can take to improve pedestrian infrastructure. Project 4-3 helps to realize that regional planning effort by the establishment of a grant program to fund $5 million/year in pedestrian improvements such as the mid-block crossings discussed in **Project 4-2** and signage and wayfinding outlined in **Project 4-6**.

Source: City of Philadelphia

Figure 4-F Example poster from an education campaign for pedestrian safety

BENEFITS

Improvements to the pedestrian infrastructure will encourage and facilitate walking, creating better connections between people and nearby places (see example street crossing in photo at far right). Pedestrian connectivity improvements also strengthen the investments identified in nearly all other mobility strategies. Improvements in pedestrian infrastructure can have lower life-cycle costs than investments in other modes because, although the initial design and construction may be more expensive, sidewalks have low ongoing costs. Additionally, investing in pedestrian infrastructure can save money long-term; a 2012 America Walks Guide underscored the stark contrast of the cost of a curb extension ($50,000) or pedestrian signal ($1,200), compared with the National Safety Council's estimated cost of a pedestrian fatality of $4.3 million.[1]

CHALLENGES

While expanded sidewalk and crosswalks will help enhance connectivity in Southern Nevada, one of the primary impediments to walking trips in the region is the presence of wide and high-speed thoroughfares that pedestrians must cross to reach their destinations. While pedestrians and cyclists are always expected to follow traffic laws, enforcement and consequences for drivers can be more lackadaisical. Developing a more equitable enforcement environment for drivers helps level the playing field for non-motorized travelers.

1 Walkable Community A Guide for Citizens, Planners, and Engineers. America Walks, 2012.

COMPANION STRATEGIES

For Project 4-3 to be most successful, it should be implemented in conjunction with other projects in Big Move 4, including:

- ☑ **Project 4-1:** Upgrade Streets to Be Safer for All Users (Complete Streets)
- ☑ **Project 4-2:** Offer Mid-Block Pedestrian Crossings at Long Block Segments and High Traffic Volumes

Source: University of Illinois

Clearly demarcated pedestrian zones ensure seamless crossing.

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Complete the RTC's Regional Walkability Plan, to identify gaps, needs, and recommendations for walkability investments throughout Southern Nevada.	RTC	Local Jurisdictions
2	Track and document walkability investments in the built environment. Measure improvements and report as part of public health investments.	RTC	Local Jurisdictions
3	Develop and effectively implement pedestrian and cyclist safety campaign. Describe traffic laws, expectations, and penalties.	RTC	Local Jurisdictions
4	Create a "Walkability Roadshow" presentation to educate local agency representatives and staff on the program to kick-start investment. Member cities can empower local staff to tailor design needs and education campaigns to their city.	Local Jurisdictions	RTC
5	Track pedestrian and cyclist traffic violations together with traffic safety data. Report on progress and findings. Increase enforcement program, as necessary.	RTC	Local Jurisdictions

PROJECT 4-4

Make Bus Stops Inviting and Safe

OVERVIEW

Project 4-4 would create a comprehensive bus stop amenity improvement program to increase the safety, accessibility, and comfort of bus stops across the region. In Southern Nevada's desert climate, waiting for the bus is often the most uncomfortable part of a transit trip. That discomfort can be reduced with a few measures such as ample shade, clean seating, context-sensitive design, and well-lit evening trips. RTC already has a strong bus stop improvement program; this project would expand and accelerate those investments.

Timing for Completion	Medium-Term (6-10 years)	**Potential Funding Sources**	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax FTA Formula Funds • Urbanized Areas Formula Grants Program (Section 5307) • Bus-Bus Facility Formula (Section 5339(a)) FTA Discretionary Funds • Bus and Bus Facilities Program (Section 5339) FHWA • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grant (STBG) Program
Implementing Agency	Lead: RTC Partners: Local Jurisdiction		

BACKGROUND

Bus riders must feel safe and comfortable. Riders who have an enjoyable experience waiting for their bus are more likely to make future transit trips. Best practices for bus stop design include:

- ☑ Create easily identifiable branded stops
- ☑ Locate bus stops in clear, visible locations
- ☑ Ensure bus stop and bus stop access meet American With Disabilities Act (ADA) requirements
- ☑ Provide seating, shade, and climate considerations
- ☑ Include information on available services

The built environment in Southern Nevada varies considerably across the region. In general, however, outside of tourist areas, sidewalks are narrow and streets have few street trees. As a result, bus shelters need to create space for transit riders to feel safe from vehicle traffic and provide shading and amenities. Bus shelter designs need to account for the need to provide shade for a maximum amount of the day. Air conditioning or water misters at major stops can also help with temperature control.

BENEFITS

Safe, comfortable well designed bus stops enhance the transit experience, decreasing perceived wait times for transit services, while increasing ridership (see photos at right). Conversely, poorly designed bus stops make transit less attractive to potential new customers and make waiting at stops uncomfortable. The development of better bus stops can be a low-cost, high-reward strategy for attracting new riders and help retain existing ones.

CHALLENGES

RTC has a bus stop improvement program that has developed creative bus stop designs that work in Southern Nevada's climate and environment. An important challenge has been funding and the capacity of the region to expand its most successful designs to areas outside of the tourist areas.

Another critical challenge is the built environment. RTC's bus network operates on arterial roads, many of which have high vehicle speeds and narrow sidewalks. As a result, bus stops must be located close to the curb, putting waiting passengers uncomfortably close to fast-moving traffic. An expansion of RTC's existing programs to move stops back, as well as increased assistance in this area by local jurisdictions, could be particularly useful. For Project 4-4 to be most successful, it should be implemented in conjunction with a related program to move stops back from roads and protect them with bollards (see **Project 3-3**).

COMPANION STRATEGIES

Improving bus stops is a companion strategy for nearly all the On Board Mobility Plan. Key companion strategies include **Big Move 3:** Make All Travel Options Safer and More Secure.

Source: Exigo Architecture

Bus stops designed with full shade coverage for day and ample lighting at night. (El Paso, Texas)

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Expand RTC's bus stop design standards to include strategies for locating bus stops on arterial locations. Incorporate rider safety and comfort and expand tiered criteria for priority implementations.	RTC	Local Jurisdictions
2	Aim to meet design criteria for all stops by a to-be-established target date.	RTC	Local Jurisdictions
3	RTC and jurisdictions can prioritize improvements to bus stops with high ridership to reach the greatest number of daily boardings.	RTC Local Jurisdictions	

PROJECT 4-5

Develop Regional Mobility Hubs

OVERVIEW

Mobility hubs go beyond traditional transit stations or park and ride lots, addressing a variety of transportation needs (see concept drawing in Figure 8. They provide a focal point for a variety of transportation, including public transit, rideshare, first mile/last mile connections, carshare and bikeshare, and more. Successful mobility hubs support a multimodal transportation system, making transit service more welcoming to both daily and occasional riders. The Bonneville Transit Center in downtown Las Vegas is an example of a successful mobility hub. Project 4-5 builds upon the success of Bonneville Transit Center, expanding the region's network of high quality regional mobility hubs.

Timing for Completion	Medium-Term (6-10 years)
Implementing Agency	Lead: RTC Partners: Local Jurisdictions
Potential Funding Sources	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax FTA Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) • Bus-Bus Facility Formula (Section 5339(a)) FTA Discretionary Funds • Bus and Bus Facilities Program (Section 5339) • Better Utilizing Investments to Leverage (BUILD) Grants FHWA • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grant (STBG) Program • Better Utilizing Investments to Leverage (BUILD) Grants Public Private Partnerships

BACKGROUND

Mobility hubs offer the public a focal point for a variety of transportation, including public transit, rideshare, first mile/last mile connections, carshare and bikeshare, and more. Common Mobility Hub features include:

- ☑ Transit transfer opportunities
- ☑ Comfortable walking environment
- ☑ Context-sensitive design that is welcoming, safe, and intuitive
- ☑ Central location for private mobility services
- ☑ A neighborhood gathering space for commercial and residential lifeCities across the United States have started developing mobility hubs, either from scratch or through gradual improvements to existing stations and park-and-ride lots. The Mobility Hub concept has evolved over the years due to changing technology trends: from a connection point between transit and cars with good wayfinding signage to a nexus of many modes and services, including emerging mobility, and connectivity through Wi-Fi and smartphones.

In size, they range from large regional centers to small neighborhood centers. Project 4-5 focuses on the development of large regional centers

of mobility while Project 4-6 focuses on smaller neighborhood mobility hubs.

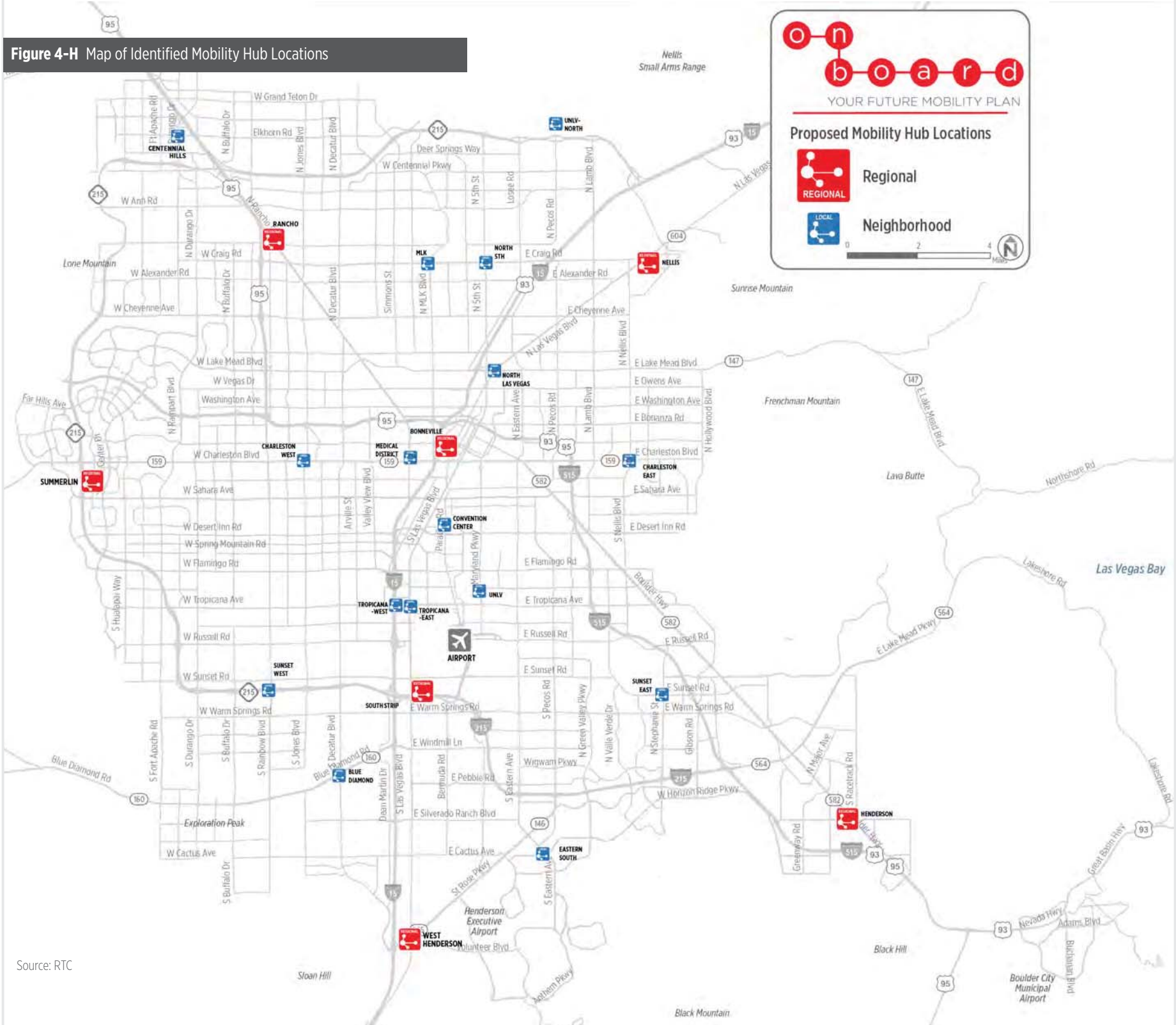
As part of the On Board cost estimation process, the project team has developed preliminary criteria and standards for Mobility Hubs (see Figure 4-I). These may need to be revisited to reflect needs and expectations of On Board investments. Also, as part of the planning process, local agencies and other stakeholders identified 7 potential locations for regional mobility hubs in Southern Nevada (see Figure 4-H). Hubs should be located on or near planned high capacity transit corridors and sited so transit vehicles are able to easily get to/from hubs.

BENEFITS

Mobility hubs connect people and transportation by optimizing travel choices. They improve mobility by providing options for first/mile last mile connections. As centers of community activities, they can support and be integrated into neighborhood community development.

Figure 4-G Mobility Hub Concept

Figure 4-H Map of Identified Mobility Hub Locations



Source: RTC

They can also be integrated with transit oriented development (TOD) strategies, stimulating economic investment.

CHALLENGES

The design and location of Regional Mobility Hubs is critical. Communities and neighborhoods can be wary of public investment generally and often in particular, public transit projects. A successful implementation approach will involve engaging community members in the design and layout of future facilities. Further, successful planning, design, and implementation of the first Mobility Hubs is paramount to moving forward with the overall network. Communities will also be interested in plans to ensure that facilities are well maintained over time.

The location of mobility hubs is paramount to their usability; in particular hubs need to be close to HCT and bus routes so transit vehicles can travel to/from hubs with minimal disruption. As a result, mobility hubs require acquiring real estate and/or retrofitting existing public real estate assets. As such, will require multiple stakeholders and longer planning horizons.

COMPANION STRATEGIES

For Project 4-5 to be most successful, it should be implemented in conjunction with other projects in On Board, including:

- ☑ **Project 4-6:** Develop Neighborhood Mobility Hubs
- ☑ **Project 4-7:** Improve Wayfinding in High Volume Pedestrian Locations
- ☑ **Big Move 1:** Build High Capacity Transit

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Begin presenting the concept of mobility hubs into regional and local planning discussions. Begin educating partners and stakeholders about potential benefits and solicit design ideas.	RTC	Local Jurisdictions
2	Incorporate a Regional Mobility Hub into an existing RTC transit corridor project. This may mean upgrading existing plans or merely changing terms used for passenger facilities.	RTC	Local Jurisdictions
3	Use an existing project to create design standards to develop a community-oriented, context-sensitive facility design that results in a successful Regional Mobility Hub.	RTC	Local Jurisdictions
4	Develop staffing and maintenance standards for Regional Mobility Hubs.	RTC	Local Jurisdictions
5	Incorporate Regional Mobility Hub standards and expectations into future transit corridor projects, including High Capacity Transit investments.	RTC	Local Jurisdictions
6	Build out a Regional Mobility Hub network as an integral part of High Capacity Transit projects and other efforts to increase transit quality.	RTC	Local Jurisdictions

PROJECT 4-6

Develop Neighborhood Mobility Hubs

OVERVIEW

Project 4-6 will create neighborhood mobility hubs that function at a smaller scale than regional mobility hubs—with enhanced amenities where many transportation services connect, including potentially high capacity transit, frequent transit, express routes, park and rides, rideshare services (Uber and Lyft), bikeshare, and e-scooters.

Timing for Completion	Long-Term (11-20 years)
Implementing Agency	Lead: RTC Partners: Local Jurisdictions
Potential Funding Sources	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax FTA Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) • Bus-Bus Facility Formula (Section 5339(a)) FTA Discretionary Funds: • Bus and Bus Facilities Program (Section 5339) • Better Utilizing Investments to Leverage (BUILD) Grants FHWA: • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grant (STBG) Program • Better Utilizing Investments to Leverage (BUILD) Grants Public Private Partnerships

BACKGROUND

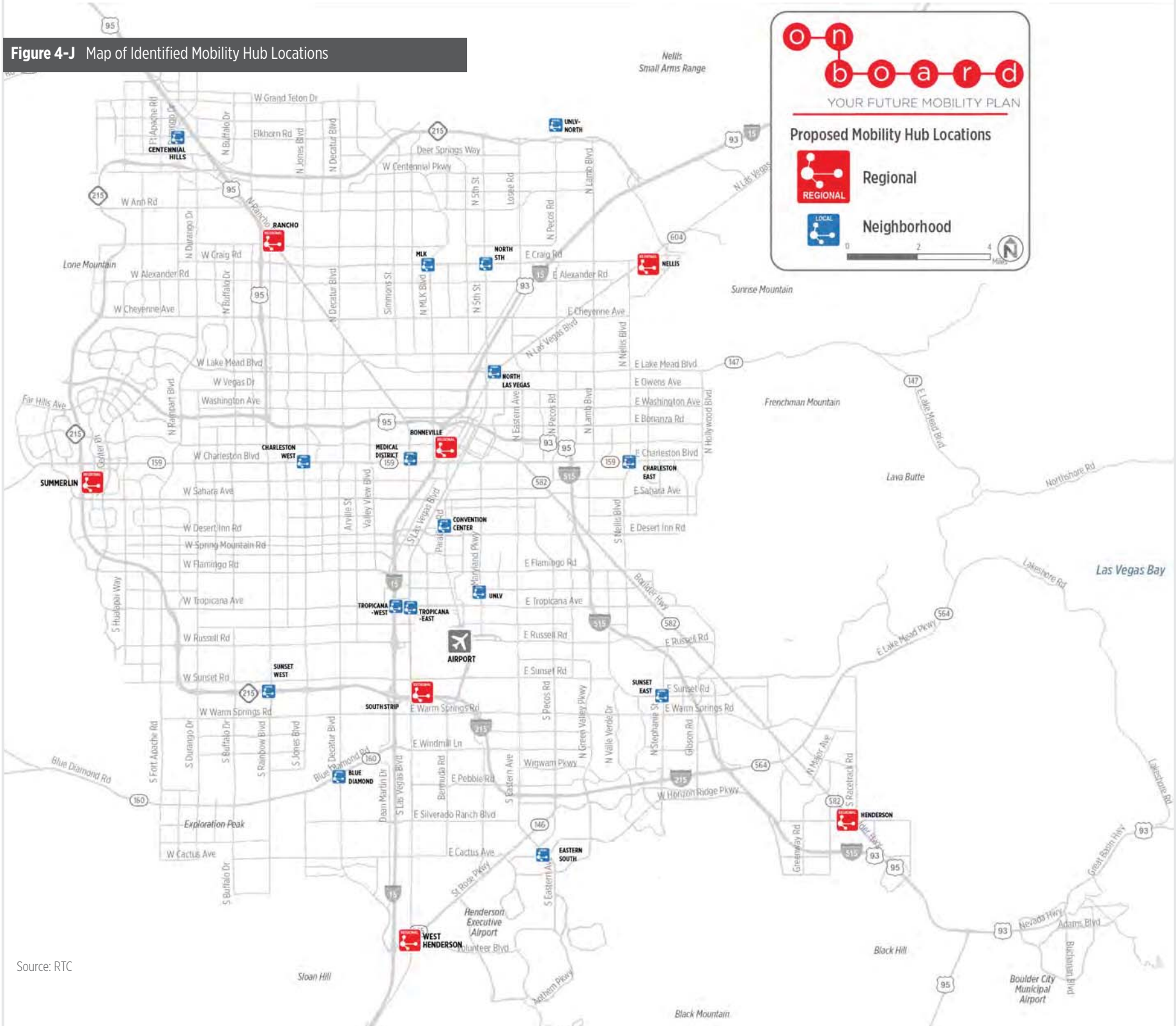
Neighborhood mobility hubs provide the same type of multimodal connectivity as regional mobility hubs, but at a smaller scale. While most intermodal connections are still possible at a neighborhood mobility hub, their smaller scale usually results in fewer amenities and lower expectations for on-site staffing.

As part of the On Board cost estimation process, the planning team has developed preliminary criteria and standards for Neighborhood Mobility Hubs (see Figure 4-I). These may need to be revisited to reflect needs and expectations of On Board investments. Also, as part of the planning process, local agencies identified 15 potential locations for neighborhood mobility hubs (see Figure 4-J). Mobility hubs, even neighborhood hubs, should be located on or close to high capacity transit and frequent transit corridors. They should be sited to so it is easy for buses to get to/from hubs

Figure 4-I Characteristics of Regional Mobility Hubs

	Amenity	Regional Mobility Hub	Neighborhood Mobility Hub
Basics 	Signage, Seating, Lighting, Paved/Accessible Area	✔	✔
Information 	Route Map, Transit System Map, Schedule Information (static and real-time), Local Area Information	✔	✔
	Unique Branding	✔	✔
Comfort 	Shelter, Shade, Trash Can	✔	✔
	Enclosed Waiting Area	✔	Possible
	Landscaping	✔	✔
	Restrooms, A/C, Water Misters	Possible	Possible
Connections 	Sidewalk, Bike Rack, Bikeshare, Scootershare	✔	✔
	Bike Storage, Bike Repair	✔	Possible
	Passenger, Rideshare, Microtransit Drop-Off/Pick-Up Area	✔	✔
	Carshare, Parking	Possible	Possible
Services 	Ticket Vending Machine, Offboard Payment	✔	✔
	Wifi, Outlets	Possible	Possible
	Package Lockers, Mailbox, Small Commercial Services	Possible	Possible
	Mixed-Use Development	✔	

Figure 4-J Map of Identified Mobility Hub Locations



Source: RTC

BENEFITS

Neighborhood mobility hubs play a vital role in connecting people and transportation to a range of travel choices, enhancing mobility by improving first/mile last mile connections. Neighborhood mobility hubs can also function as community centers and offer potential to promote district-level economic investment.

CHALLENGES

Implementing a regional mobility hub program has similar challenges to the regional program, but with smaller impacts. Successful mobility hubs, by definition, are a collaboration. This means their development will also require collaboration, across jurisdictions, public and private landowners, transit riders and community members. Neighborhood mobility hubs must also be located as close to bus routes as possible so transit operators can get to/from hubs as easily as possible.

Consistent with the regional program, the design, location and functionality of mobility hubs will be critical to gaining community support. These factors are critical to ensuring people use the facility. As part of planning new facilities, the RTC and its partners should include a robust community engagement process to ensure each facility is designed to meet needs and be context to the local environment.

COMPANION STRATEGIES

For Project 4-6 to be successful, it should be implemented in conjunction with other projects in On Board, including:

- ☑ **Project 4-5:** Develop Regional Mobility Hubs
- ☑ **Project 4-7:** Improve Wayfinding in High Volume Pedestrian Locations
- ☑ **Big Move 1:** Build High Capacity Transit

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Incorporate mobility hub locations into Southern Nevada Regional TOD Study process/map.	RTC	Local Jurisdictions
2	Begin presenting the concept of mobility hubs into regional and local planning discussion. Begin educating partners and stakeholders about potential benefits and solicit design ideas.	RTC	Local Jurisdictions
3	Incorporate Neighborhood Mobility Hubs into existing RTC transit projects and/or community development planning projects. This may mean upgrading existing plans or merely changing terms used for passenger facilities.	RTC	Local Jurisdictions
4	Use an existing project to create design standards and a context- and neighborhood-sensitive design.	RTC	Local Jurisdictions
5	Develop staffing and maintenance standards for Neighborhood Mobility Hubs.	RTC	Local Jurisdictions
6	Incorporate Neighborhood Mobility Hub standards and expectations into future transit corridor projects, including High Capacity Transit investments.	RTC	Local Jurisdictions
7	Build out Neighborhood Mobility Hub network as part of efforts to improve mobility and increase transit quality in Southern Nevada.	RTC Local Jurisdictions	Local Jurisdictions

PROJECT 4-7

Improve Wayfinding in High Volume Pedestrian Locations

OVERVIEW

Project 4-7 will improve wayfinding in neighborhoods in Southern Nevada. Wayfinding is the process people use to navigate within their communities as they move from place to place. Relying on cues and information about the environment, wayfinding supports travelers by letting them know where they are, locate where they want to go and develop a plan to travel. Wayfinding systems require installing compelling and dynamic signage, message boards, and interactive maps at transit stops and inside transit vehicles, and in high-volume pedestrian areas that provide live updates and assists riders and visitors in successfully navigating their communities.

Timing for Completion	Long-Term (11-20 years)	**Potential Funding Sources**	Local Sales Tax Motor Vehicle Fuel Tax Transient Lodging Tax/Resort Corridor Room Tax FTA Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) FHWA: • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grant (STBG) Program Public Private Partnerships
Implementing Agency	Lead: Local Jurisdictions, Business Improvement Districts Partners: Clark County, Nevada Resort Association, RTC		

BACKGROUND

Successful wayfinding systems accomplish several goals, providing directions and information while creating a neighborhood or district image, marking edges or entry points, and giving information about directions, destinations, or the neighborhood in general (see example shown on next page).

Southern Nevada already has wayfinding systems in several tourist areas. Walking Las Vegas Boulevard can be the most iconic highlight of a Las Vegas visitor's experience. The TIBP recommended that a Resort Corridor-wide wayfinding system be implemented that includes a series of directional and destination signs installed throughout the Core Area to guide visitors to resort destinations and services. Project 4-7 would expand this program to include neighborhoods, commercial areas, and/or areas around large institutions. Less traveled areas may still include some basic informational signs or neighborhood markers.

Wayfinding cues include: Signs and maps, marked pathways, lighting, and landmarks—e.g., sculptures, fountains, distinctive buildings, gardens, benches, rest areas. Other features that support users' ability to find their way and reach destinations include completed sidewalks, ramps at transit stops, and pedestrian signals at crosswalks.

Source: RiteLite Signs

Good signage helps pedestrians navigate cities on foot (Concord, NC).

BENEFITS

Effective wayfinding improves efficiency, accessibility, and safety for visitors and residents of Southern Nevada alike. Wayfinding can effectively promote the Valley's exciting destinations by creating a sense of place for visitors and directing people to important destinations. Wayfinding improves mobility by providing navigation for people to access services like transit, parking, and other intermodal connections.

CHALLENGES

As stated, effective wayfinding can improve mobility. However, cluttered, or disorganized wayfinding can make places more difficult to navigate. As a result, it is important to implement wayfinding on a neighborhood basis, developed to meet the needs of each specific community. Building on existing wayfinding infrastructure and expanding to support less tourist-oriented neighborhoods and districts will be a challenge for Southern Nevada, requiring collaboration and cooperation among multiple stakeholders and jurisdictions.

COMPANION STRATEGIES

For Project 4-7 to be most successful, it should be implemented in conjunction with other projects in On Board, including:

- ☑ **Project 4-3:** Develop a Walkability Infrastructure Funding and Education Program
- ☑ **Project 4-4:** Make Bus Stops Inviting and Safe
- ☑ **Project 4-5:** Develop Regional Mobility Hubs
- ☑ **Project 4-5:** Develop Neighborhood Mobility Hubs
- ☑ **Project 4-7:** Improve Wayfinding in High Volume Pedestrian Locations

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Inventory existing wayfinding systems and protocols used in Southern Nevada. Evaluate strengths and weaknesses. Develop best practices.	Local Jurisdictions Business Improvement Districts Nevada Resort Association	RTC
2	Identify funding source to support wayfinding projects.	RTC	Local Jurisdictions Business Improvement Districts Nevada Resort Association
3	Inventory and prioritize areas for expanded wayfinding systems. Criteria used to prioritize wayfinding should reflect On Board investments, including transit investments but also investments in biking and walking infrastructure.	Local Jurisdictions Business Improvement Districts Nevada Resort Association	RTC
4	Conduct pilot project in high priority sites. Use best practices to guide implementation.	Local Jurisdictions Business Improvement Districts Nevada Resort Association	RTC
5	Develop grant program to expand wayfinding resources.	RTC Local Jurisdictions	Local Jurisdictions Business Improvement Districts Nevada Resort Association


VEGAS VALLEY RIM TRAIL
TO Destination I
VEGAS VALLEY RIM TRAIL
TO Destination I
VVRT
RIVER MOUNTAINS LOOP TRAIL
VVRT
VVRT
123.5 MILE
Off-street Blaze
Off-street Turn
On-street Confirmation
On-street Turn
Off-street Mile Marker

1 2 3 4 **5** 6 7

Expand Service to Seniors, Veterans, and People with Disabilities

5

BIG MOVE

Expand Service to Seniors, Veterans, and People with Disabilities

85%
rated Big Move 5 at least

RTC On Board Strategies Survey (January-March 2020)
11,221 respondents

Overview

Southern Nevada has repeatedly expressed its support for vulnerable residents, including older adults, veterans, and people with disabilities. Surveys conducted by the RTC underscore the importance of these services; in 2018, roughly half of all responses identified specialized senior services or improved paratransit as the RTC's most important service.

RTC currently provides several services designed to support seniors, veterans, and people with disabilities. These include ADA paratransit service, Silver STAR, Flexible Demand Response (FDR), the Veterans Medical Transportation Network, and the Downtown & Veterans, Medical Center Express (DVX) routes. RTC also offers a variety of discount programs that reduce the cost of using fixed route services for these populations. The On Board Plan would significantly increase investment in these services, including offering more service and increasing service quality.

The On Board Plan will significantly increase investment in services like ADA paratransit, Silver STAR, and the Veterans Medical Transportation Network that support seniors, veterans, and people with disabilities.

Transportation is a critical service for older adults, veterans, and people with disabilities to participate in community life, which includes holding jobs, traveling to appointments and healthcare services, and visiting friends and family members. Access to transportation services is also a fundamental part of "aging in place." Independent living programs and supportive land use and transportation policies allow older adults, people with disabilities, and veterans to live in their homes or residence of their choice for as long as they are able. Studies conducted by the U.S. Department of Housing and Urban Development (HUD) suggest that in addition to health and emotional benefits of independent living, delaying institutional care has yielded cost savings for taxpayers and health care systems.[1]

Transit agencies around the country, including the RTC, have been has been operating demand response services (i.e. ADA paratransit, flex routes, and dial-a-ride) at a minimum since 1991, with many operating paratransit since the Rehabilitation Act of 1973. These services provide "door-to-door" convenience but require that riders schedule trips in advance, typically at least 24 hours. They also require riders to reserve pickup and dropoff windows that can be up to 30 minutes. Riders often remain at a destination for an extended period of time, which greatly increases travel time.

As a result, traditional demand response service models, although they are valuable lifeline services for many, are not easy to use or as convenient as possible for riders. They are also expensive to operate and typically reserved for riders with mobility limitations and/or people living in low density, high need areas. Therefore, there is an opportunity to improve current service models to make them easier and more convenient to use and ideally also more cost, more cost effective for service providers.

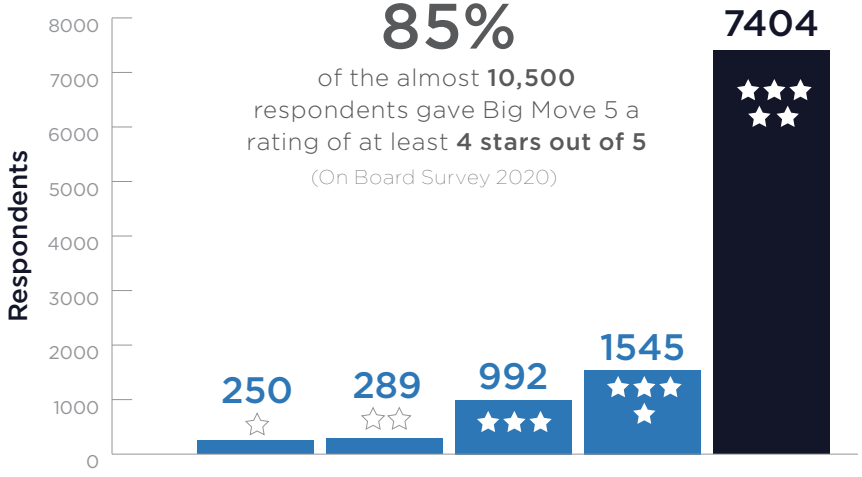
The On Board Plan recommends programs and projects that would enhance the RTC's existing portfolio of demand response services, including services used by seniors, veterans, and people with disabilities. These projects call for increasing regional investment in these services, so they are available more often and for more people. On Board also recommends strategies to improve service quality and operational efficiency. These strategies include app-based service delivery models that make it easier to book and pay for demand response trips, as well as vehicle tracking technology to make it easier for riders to know when their ride will arrive. These technologies are also designed to make it easier to schedule shared trips and increase the overall efficiency of the network.

1 Measuring the Costs and Savings of Aging in Place, Evidence Matters, Office of Policy Development and Research, Fall 2013.

On Board's **Big Move 5: Expand Service to Seniors, Veterans, and People with Disabilities** identified 6 projects to support this mobility strategy:

- **5-1: Double transportation services for seniors**
- **5-2: Double specialized transportation services**
- **5-3 Double service for veterans**
- **5-4 Provide full regional coverage for people with disabilities (ADA paratransit)**
- **5-5 Provide app-based reservations and fare payment for specialized services**
- **5-6 Provide app-based vehicle tracking for specialized service**

SURVEY FINDING



85%
of the almost **10,500** respondents gave Big Move 5 a rating of at least **4 stars out of 5**
(On Board Survey 2020)

Southern Nevada residents gave Big Move 4 and all of its associated strategies a rating of

4.5 out of 5 stars
(On Board Survey 2020)

Over half
of respondents report that specialized senior services and/or improved paratransit is the most important service that RTC provides
(On Board Vision Survey 2018)

Low-income residents, minorities, & women
in southern Nevada gave Big Move 5 an especially high rating of 4.6
(On Board Survey 2020)

55%
of respondents report that Southern Nevada should invest in transportation to improve access to jobs, housing, and medical services
(On Board Vision Survey 2018)

KEY BENEFITS

All mobility strategies generate benefits for individual travelers, the regional economy and the environment. The graphic below provides a relative scale of the benefits.

EFFECTIVENESS IN ADDRESSING REGIONAL PRIORITIES

Expanding Service for Seniors, Veterans, & People with Disabilities will directly help achieve the following priorities dentified through extensive public outreach with nearly 80,000 people and multiple surveys that had almost 25,000 combined responses:

REGIONAL MOBILITY PRIORITIES

1	Improved Road & Transit Safety	○
2	Fewer Traffic Jams	○
3	High Capacity Transit (including light rail)	◒
4	Better Connectivity	●
5	Well-Maintained Roads	○
6	Frequent Bus Service	◒
7	More Transportation Choices	●
8	Expanded Service for Seniors, Veterans, & People with Disabilities	●
9	Improved Job & Housing Access	●
10	Better Walking & Biking Conditions	○
11	New Modal Technologies & Investments	●
12	Expanded Transit Service Area	●
13	New Information Technologies	●
14	Better Transit Stops & Stations	◒
15	Improved Transit Security	◒

KEY | ● Strongest ◒ Strong ○ Less Strong

PROJECT 5-1

Double Transportation Services for Seniors

OVERVIEW

Silver STAR service connects residents in senior housing to the RTC transit network and major destinations like shopping centers. Project 5-1 will double the amount of service provided by RTC's Silver STAR service, including expansions in geographic coverage, populations served, service schedules, and frequency of service. Implementing this project includes investing in service operations as well as the number of vehicles assigned to the service.

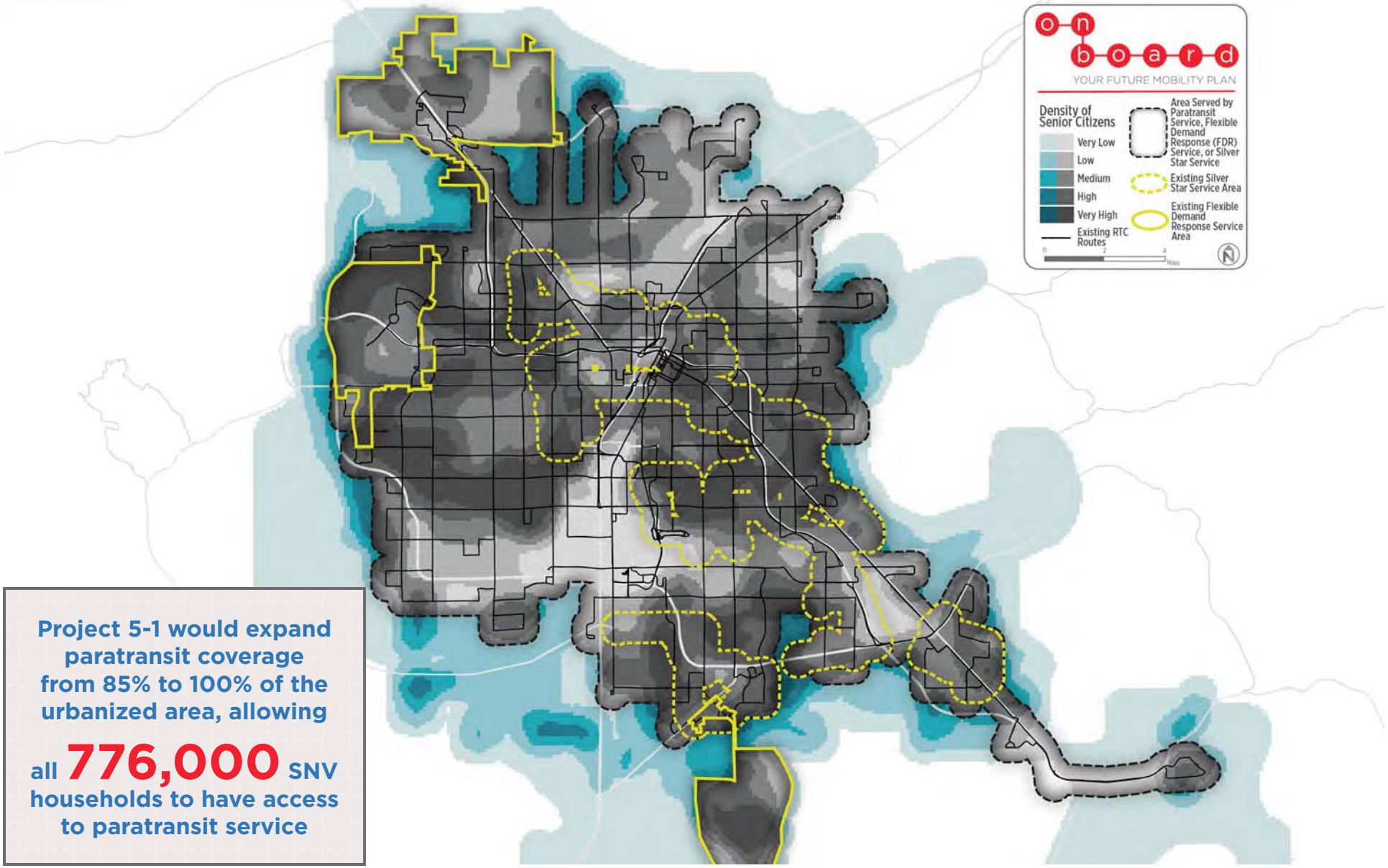
Timing for Completion	Near Term (1-5 Years)	**Potential Funding Sources**	FTA Formula Funding Programs (Section 5310) Enhanced Mobility for Older Adults and People with Disability Funds (Section 5307) National Institute of Food and Agriculture Grants Tobacco Settlement Funding Access and Mobility Partnership Grants National Aging and Disability Transportation Grants National Community Care Corps AARP Community Challenge Parsons Smart City Challenge Local sales tax Partnership programs Area Agency of Aging Medicaid/Medicare Health Care Providers
Implementing Agency	Lead: RTC Partners: Three Square, Southern Nevada Housing Authority, Clark County Social Service Department		

BACKGROUND

RTC's Silver STAR service currently consists of 12 routes, most of which are available in the eastern portion of the Southern Nevada valley. Silver STAR routes connect with the RTC fixed-route network to provide connections to a broader range of destinations. Despite the availability of these specialized services, significant gaps in service availability exist, including where services are available, when services are available, and how frequently buses arrive. Figure 5-A highlights the need for additional services aimed towards older adults; areas shown in dark grey and blue indicate a high density of older adults (aged 65 or greater), and the yellow lines show where RTC demand response services are available.

Most routes offer limited service availability, operating on a handful of weekdays with limited hours (typically 9:00 am to 2:30 pm). The fares on Silver STAR routes is set $0.50 per boarding, and riders can use transit passes for boarding. Silver STAR vehicles can accommodate up to two wheelchairs at a time. The service is open to the entire community but was designed with senior citizens in mind.

Figure 5-A Highest Concentrations of Older Adults (Age 65+) Compared with Silver STAR Routes and FDR Service Areas



Project 5-1 would expand paratransit coverage from 85% to 100% of the urbanized area, allowing all 776,000 SNV households to have access to paratransit service

BENEFITS

Expanding the geographic coverage area, service hours, populations served, and frequency of the Silver STAR service will benefit older adults and other community members by increasing service convenience, reliability, and ease of use. The investment will make it easier for older adults to live independently later in life, increasing their quality of life and reducing the costs of health care for individuals and taxpayers.

CHALLENGES

RTC already operates Silver STAR service which reduces the complication of expanding the program, especially if service expansion is conducted over several periods of time. Key challenges associated with service expansion will be purchasing and deploying vehicles, finding, hiring, and training drivers, and marketing the availability of service to target audiences.

COMPANION STRATEGIES

Project 5-1 is related to and will be planned in coordination with the following projects:

- ☑ **Project 5-w:** Double Specialized Transportation Services
- ☑ **Project 5-3:** Double Service for Veterans
- ☑ **Project 5-5:** Provide App-Based Reservations and Fare Payment for Specialized Services
- ☑ **Project 5-6:** Provide App-Based Vehicle Tracking for Specialized Services

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Identify funding sources and partnerships to pay for service expansion	RTC	
2	Conduct a needs assessment to prioritize service needs and expansion strategies (geographic coverage, expanded days and hours of operation, fares, and service frequency	RTC	Southern Nevada Housing Authority Clark County Social Service Department
3	Expand vehicle fleet to accommodate service expansion needs. Hire and train drivers	RTC	
4	Develop marketing strategies and media campaigns to educate people about service expansions and encourage use	RTC	Southern Nevada Housing Authority Clark County Social Service Department Three Square
5	Create a process of periodic evaluation, so that new Silver STAR services are reviewed and evaluated after a few months of operation. Make adjustments as necessary	RTC	

Image from istockphoto

PROJECT 5-2

Double Specialized Transportation Services

OVERVIEW

In addition to providing services targeted towards seniors, the RTC also operates Flexible Demand Response (FDR) service. FDR provides door-to-door service in areas where fixed-route service is limited. These routes are designed to provide transit for people living in low density communities. **Project 5-2 would double the amount of specialized transportation services in Southern Nevada.**

Timing for Completion	Near Term (1-5 Years)	**Potential Funding Sources**	FTA Formula Funding Programs (Section 5307) Enhanced Mobility for Older Adults and People with Disability Funds (Section 5310) Local sales tax Partnership programs Senior community property developers Area Agencies of Aging Medicaid/Medicare Health Care Providers
Implementing Agency	Lead: RTC Partners: Southern Nevada Housing Authority, Clark County Social Service Department, Three Square		

BACKGROUND

The RTC currently provides limited on-demand transportation service, branded as FDR, door-to-door in defined areas where there is little fixed-route service. This service is currently limited to three routes: Sun City Anthem, Sun City Summerlin, and Centennial Hills.

FDR routes run on specific days of the week, with most routes operating between 1 and 3 days per week. Service hours are also limited with individual routes operating between 5 and 8 hours per day. All residents are eligible to use FDR service, but the services are targeted towards senior citizens and require that individuals register for the program. Fares to use the service are set at $0.50 per one-way boarding and does not include a transfer to RTC fixed route services. Riders must pay an additional fare.

BENEFITS

Expanding the geographic coverage area, service hours, and frequency of the FDR service will benefit older adults and other community members by increasing service convenience, reliability, and ease of use. The investment will make it easier for older adults to live independently later in life, increasing their quality of life and reducing the costs of health care for individuals and taxpayers.

CHALLENGES

RTC already operates FDR which reduces the complication of expanding the program, especially if service expansion is conducted over several periods of time. Key challenges associated with service expansion will be purchasing and deploying vehicles, finding, hiring, and training drivers, and marketing the availability of service to target audiences.

COMPANION STRATEGIES

Project 5-2 is related to and will be planned in coordination with the following projects:

- ☑ **Project 5-1:** Double Transportation Services for Seniors
- ☑ **Project 5-3:** Double Service for Veterans
- ☑ **Project 5-5:** Provide App-Based Reservations and Fare Payment for Specialized Services
- ☑ **Project 5-6:** Provide App-Based Vehicle Tracking for Specialized Service

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Identify funding sources and partnerships to pay for service expansion	RTC	
2	Conduct a needs assessment to prioritize service needs and expansion strategies (geographic coverage, expanded days and hours of operation, and service frequency	RTC	Southern Nevada Housing Authority Clark County Social Service Department
3	Expand vehicle fleet to accommodate service expansion needs. Hire and train drivers	RTC	
4	Develop marketing strategies and media campaigns to educate people about service expansions and encourage use	RTC	Southern Nevada Housing Authority Clark County Social Service Department Three Square
5	Evaluate program to understand effectiveness and opportunities for improvement	RTC	

PROJECT 5-3
Double Service for Veterans

OVERVIEW

The RTC currently supports veterans through the Veterans Medical Transportation Network for Senior & Disabled Veterans plus a variety of supporting programs, such as express service to the Veterans Administration hospital, travel training, and fare discounts. Project 5-3 will double the amount of service and support provided to veterans transportation. Investments are designed to increase the availability of service and make it easier for veterans to access health facilities and community services.

Timing for Completion	Near Term (1-5 Years)	**Potential Funding Sources**	FTA Formula Funding Programs (Section 5307) Enhanced Mobility for Older Adults and People with Disability Funds (Section 5310) Local sales tax Partnership programs Veterans Administration Veteran health care services
Implementing Agency	RTC		

BACKGROUND

The RTC currently supports veteran transportation through a combination of programs and service. The largest of these is the Veterans Medical Transportation Network for Senior and Disabled Veterans (VMTN), which provides transportation for veterans and their caregivers traveling to medical services, including doctor's offices, hospitals, rehabilitation clinics, and other services approved by the Veterans Administration (VA). Services are available on weekdays between 7:00 a.m. and 5:00 p.m. Trip reservations must be made in advance.

Another veteran transportation program offered by RTC is the Downtown & Veterans Medical Center Express (DVX), a specialized express service that links the VA Hospital with downtown Las Vegas and the Bonneville Transit Center. The DVX is available on weekdays, weekends during the day, and holidays and operates with a 30-minute headway for much of the day.

Additional transportation services for veterans are provided by private companies and local non-profits, including Disabled American Veterans, U.S. Vets, Helping Hands of the Vegas Valley, Southern Nevada Transit Coalition, and Pahrump Valley Public Transportation.

BENEFITS

Expanding veterans service will support several goals, including meeting growing demand for VMTN service. Expanded services designed to meet the needs of veterans may includ express routes to key destinations and expansion of demand response services to serve veterans who are also older adults or living with a disability and may need a higher level of service. Service expansion may also include deeper discounts for fixed route services. The investment will make it easier for veterans to integrate into community life, access health care, and increase their quality of life.

CHALLENGES

RTC already operates several transportation services to support veterans. Expanding these programs would be relatively uncomplicated, especially if service expansion is conducted over several periods of time. Key challenges associated with service expansion will be purchasing and deploying vehicles, finding, hiring, and training drivers, and marketing the availability of service to target audiences.

Doubling the investment in veterans' services would also require development of new programs and services that have not yet been identified. Successfully accomplishing these goals would require additional research and analysis into veteran needs, recognizing veterans are a diverse group of individuals with different needs that would require a variety of solutions.

COMPANION STRATEGIES

Project 5-2 is related to and will be planned in coordination with the following projects:

- ☑ **Project 5-1:** Double Transportation Services for Seniors
- ☑ **Project 5-3:** Double Service for Veterans
- ☑ **Project 5-5:** Provide App-Based Reservations and Fare Payment for Specialized Services
- ☑ **Project 5-6:** Provide App-Based Vehicle Tracking for Specialized Services

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Conduct a needs assessment to understand the specific needs of the veteran population	RTC	VA of Southern Nevada Healthcare System Las Vegas Urban League
2	Design/develop a program of services and projects to support veterans	RTC	VA of Southern Nevada Healthcare System Las Vegas Urban League
3	Identify funding sources and partnerships to pay for service expansion	RTC	VA of Southern Nevada Healthcare System Las Vegas Urban League
4	Expand capital infrastructure, such as expand vehicle fleet or technology. Hire and train driver	RTC	

PROJECT 5-4

Provide Full Regional Coverage for People with Disabilities (ADA Paratransit)

OVERVIEW

Currently paratransit service is limited to residents who live within 3/4-mile of an existing RTC transit route. This project will expand paratransit service beyond the existing service area to ensure that 100% of residents within the urbanized area of Southern Nevada have access to paratransit service, greatly increasing mobility options for many of the region's most transit-dependent residents. Other RTC services such as FDR and Silver STAR may also support this goal.

Timing for Completion	Near Term (1-5 Years)	**Potential Funding Sources**	FTA Formula Funding Programs (Section 5307) Enhanced Mobility for Older Adults and People with Disability Funds (Section 5310) Local sales tax Partnership programs Medicaid/Medicare Workforce Training Programs
Implementing Agency	RTC		

BACKGROUND

The Americans with Disabilities Act (ADA) paratransit is available to customers who are unable to use the fixed route service because of a disability. ADA paratransit is directly connected to the fixed route service area; it is available to individuals traveling to destinations within 3/4 of a mile beyond RTC fixed route services at the same days and hours as fixed route services. The service is operated as demand response and door-to-door. Trips must be reserved, and people are eligible to use the service based on an evaluation process determined through an in-person functional ability assessment.

ADA paratransit service is available to individuals traveling within 3/4 of a mile of RTC's fixed route service. Although much of Southern Nevada's urbanized area has access to the service, some gaps remain (see Figure 5-B). This project would expand ADA paratransit service to urbanized Southern Nevada, effectively expanding the availability of service by 174 square miles. Potential riders would need to be certified as eligible for service, but expanded coverage would bring ADA paratransit service to an additional 300,000 individuals. Assuming roughly 8% of the population has a disability1, ADA ridership could expand by about 24,000 potential riders. The draft Coordinated Transportation Plan has also identified a potential premium paratransit fare for any expansion beyond the 3/4 mile service area, where the geographic area is determined through demand, equity, and other factors.

Figure 5-B Existing and Potential Expansion of Southern Nevada ADA Paratransit Service Area

100% of Southern Nevada's urbanized area would be served by the proposed paratransit service expansion area

BENEFITS

Strategy 5-4 will significantly increase the vehicles and operating funds available to deliver paratransit service so that 100% of the individuals with disabilities living in Southern Nevada's urbanized area would have access to ADA paratransit service. This expansion in service coverage would ensure that all the region's residents will have access to door-to-door accessible service, expanding their ability to travel to employment, health facilities, and community services.

Expanding the availability of ADA paratransit service will benefit individuals with disabilities living outside of the RTC fixed route service area. The investment will make it easier for individuals with disabilities to live independently, increasing their quality of life and reducing the costs of health care for individuals and taxpayers.

CHALLENGES

ADA paratransit is an expensive service to operate with a cost per trip of approximately $43.88 (National Transit Database, 2018). The cost per trip for individuals living outside of the fixed route service area will likely be higher due to longer travel distances and trip times. As a result, even though RTC already operates ADA paratransit service in much of the region, expanding the service will be expensive and may strain several of RTC's existing systems, requiring additional investments in vehicles, drivers and supporting technology.

Another important challenge associated with expanding ADA paratransit service is determining how to separate expanded service coverage from the underlying fixed route service. ADA paratransit service is specifically tied to fixed route service; this includes areas where fixed route service is available and the days and hours of operations. Expanding the geographic coverage of ADA service will need to consider service schedules and the financial feasibility of expanding service schedules in line with a reasonable and effective standard of service.

COMPANION STRATEGIES

Project 5-4 is related to and will be planned in coordination with the following projects:

- ☑ **Project 5-5:** Provide App-Based Reservations and Fare Payment for Specialized Services
- ☑ **Project 5-6:** Provide App-Based Vehicle Tracking for Specialized Service

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Determine service standard for ADA expansion, including service schedule but also wait time, in-vehicle times, etc	RTC	
2	Conduct operational analysis to understand investments (vehicles, technology, staffing) required to expand ADA paratransit service. Determine needs to expand functional assessment capacity to evaluate individuals with disabilities living in expanded service area	RTC	
3	Identify funding sources and partnerships to pay for service expansion. Financial planning may consider alternative service delivery models, such as partnerships with ride-hailing companies or other service providers. Potential incentives for ride-hail drivers providing an accessible vehicle, which are limited in availability, could also be explored	RTC	
4	Expand capital infrastructure, such as vehicle fleet or technology. Hire and train drivers		
5	Develop marketing strategies and media campaigns to educate people about service expansions and encourage use	RTC	

Image from istockphoto

PROJECT 5-5

Provide App-Based Reservations and Fare Payment for Specialized Services

OVERVIEW

Project 5-5 develops a platform to make specialized transit services easier to use by making it seamless to plan, book, and pay for trips. This project creates an app-based reservation and fare payment system like those used by Uber, Lyft, and other ride-hailing service providers.

Timing for Completion	Near Term (1-5 Years)	**Potential Funding Sources**	FTA Formula Funding Programs (Section 5307) Enhanced Mobility for Older Adults and People with Disability Funds (Section 5310) FTA Competitive Grant Programs Local sales tax
Implementing Agency	Lead: RTC Partners: Clark County Social Service Department; Nonprofits, such as Helping Hand, Las Vegas Urban League, Three Squares		

BACKGROUND

The RTC operates several demand response services, including ADA paratransit, Silver STAR, and FDR. These services currently require travelers to reserve a trip in advance (typically at least 24 hours) and in most cases, require individuals to book trips by phone or through the RideCheck online reservation system. This strategy would expand RideCheck or create a new app-based option for riders that allows them to book and pay for a trip through the app. It would also give riders the ability to request a trip without scheduling it in advance. The app could be complemented with reservations by phone for customers without access to a smartphone and data plan.

The project would build on a pilot program recently initiated by RTC, the On-Demand pilot program. This program is testing app-based reservation technology that gives a select group of ADA paratransit riders the ability to schedule a trip without reserving in advance. The pilot program operates in conjunction with all existing RTC services, and participation in the pilot program will not affect RTC paratransit eligibility. Passengers book service using the Lyft or Tango Car app on a smartphone or by calling RTC Customer Care. The wait time for using the service may be as little as five minutes.

Additionally, the draft Coordinated Transportation Plan identifies the potential development of a single app or site for regional trip planning, scheduling, and payment across multiple transportation providers. A regional app would also make information more readily accessible to customers seeking to understand the transportation options available throughout the region.

BENEFITS

Project 5-5 will make it easier to plan, book, and pay for trips by creating an app-based reservation and fare payment system like those used by ride-hailing and microtransit services. On-demand service results in greater convenience and flexibility when scheduling medical appointments, work schedules, and other trips and can result in much shorter wait times. Existing methods of booking service and paying fares will continue to be available.

Ride-hailing companies and app developers have technology for vehicle tracking. In 2020, several contracting models are available where the software can be licensed for an annual fee and a per vehicle charge.

CHALLENGES

Improving the paratransit trip experience may lead to more users of the system and more trips taken by individual users. The increased demand would, in turn, create more expense despite efforts toward savings.[1] In anticipation of this challenge, On Board includes improvements to fixed-route services to make them more accessible in order to help shift trips to other modes where possible.

COMPANION STRATEGIES

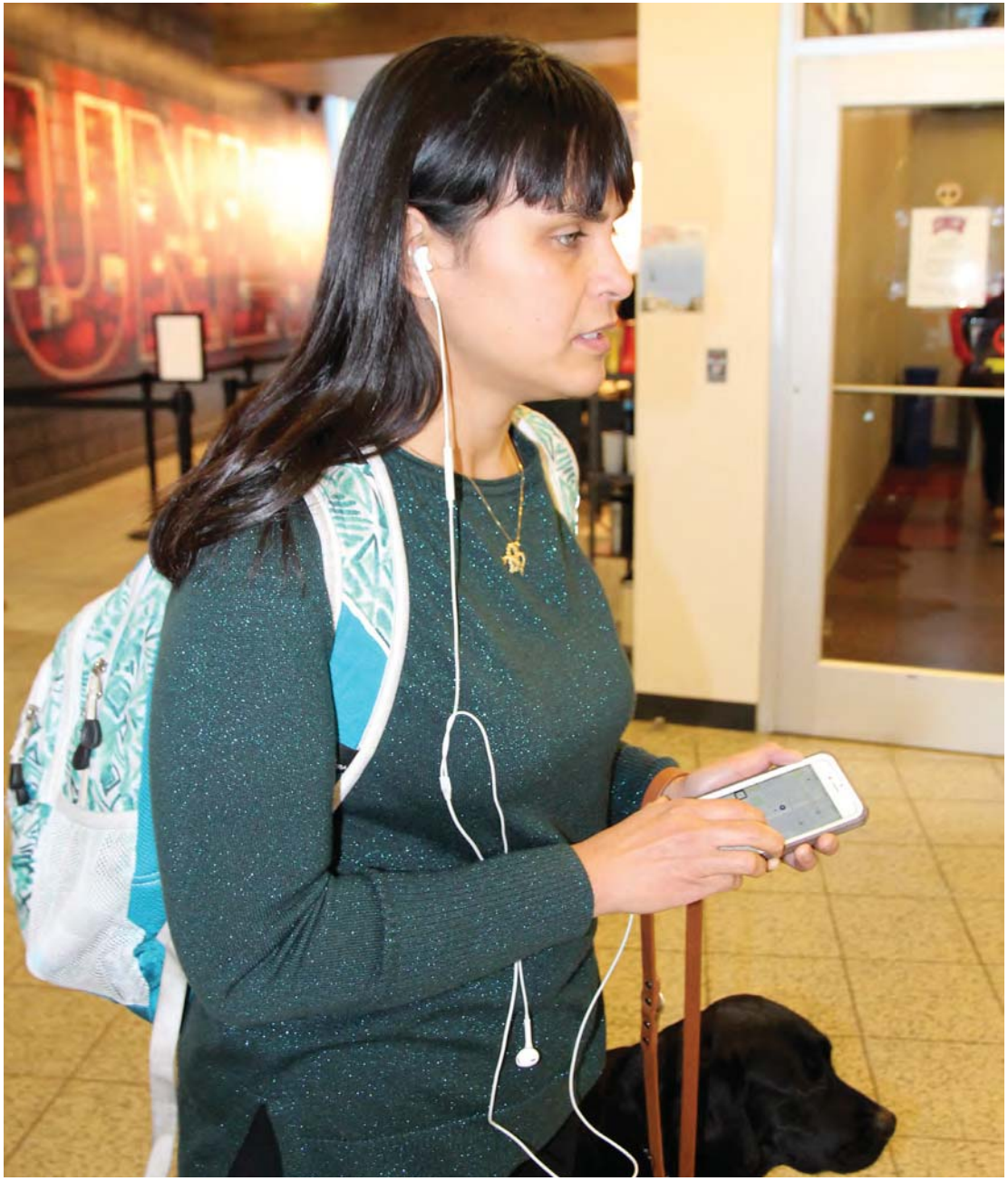
Project 5-5 is related to and will be planned in coordination with the following projects:

- ☑ **Project 5-1:** Double Transportation Services for Seniors
- ☑ **Project 5-2:** Double Specialized Transportation Services
- ☑ **Project 5-3:** Double Service for Veterans
- ☑ **Project 5-4:** Provide Full Regional Coverage for People with Disabilities (ADA Paratransit)
- ☑ **Project 5-6:** Provide App-Based Vehicle Tracking for Specialized Services

1 Intelligent Paratransit" 2016. https://wagner.nyu.edu/files/rudincenter/2016/09/INTELLIGENT_PARATRANSIT.pdf

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Use existing RideCheck and RTC pilot programs to determine the types of technologies and programs that best serve target markets (older adults, people with disabilities and veterans). Inventory accessibility needs and requirements	RTC	Clark County Social Service Department Nonprofits, such as Helping Hand, Las Vegas Urban League, Three Squares
2	Work with app developer to create a trip planning, booking and payment app. This app may be included in the existing RideCheck online reservation tool, rideRTC, or Transit app or may be a separate app for the target populations	RTC	Clark County Social Service Department Nonprofits, such as Helping Hand, Las Vegas Urban League, Three Squares
3	Conduct demonstration project to test effectiveness of app-based scheduling and payment. Evaluate changes in demand and operational impacts on service delivery	RTC	Clark County Social Service Department Nonprofits, such as Helping Hand, Las Vegas Urban League, Three Squares
4	Estimate impacts to RTC's existing service delivery models. This may include deploying more vehicles or developing partnerships with ride hailing companies to help meet the demand. Expand capital infrastructure and hire and train additional drivers as needed	RTC	Clark County Social Service Department Nonprofits, such as Helping Hand, Las Vegas Urban League, Three Squares
5	Work with partner organizations on fare payment models, so partner agencies can coordinate payment for trips booked by their clients on RTC services	RTC	Clark County Social Service Department Nonprofits, such as Helping Hand, Las Vegas Urban League, Three Squares
6	Developing marketing strategies, travel training, and media campaigns to educate people about service expansions and encourage use	RTC	Clark County Social Service Department Nonprofits, such as Helping Hand, Las Vegas Urban League, Three Squares



PROJECT 5-6

Provide App-Based Vehicle Tracking for Specialized Services

OVERVIEW

Project 5-6 will develop real-time vehicle tracking information via the internet and a transit booking app, so that users and caregivers know when to be ready for pickup and can track trips. Users of RTC's specialized service currently have a 30-minute window during which they can expect their vehicle to arrive. App-based vehicle tracking will improve the quality of RTC's specialized services and make them easier to use by shortening this service window and telling users when their vehicle will arrive. The app could also generate text or phone notifications to alert customers without access to smart phones and/or the internet. The app should also be developed for use by people with sensory (e.g. low vision) and cognitive disabilities.

Timing for Completion	Near Term (1-5 Years)	**Potential Funding Sources**	FTA Formula Funding Programs (Section 5307) Enhanced Mobility for Older Adults and People with Disability Funds (Section 5310) FTA Competitive Grant Programs Local sales tax
Implementing Agency	Lead: RTC Potential Partners: Clark County Social Service Department Nonprofits, such as Helping Hand, Las Vegas Urban League, Three Squares		

BACKGROUND

Today, users of RTC's paratransit service and veterans service are given a 30-minute time window during which they can expect to be picked up or dropped off. While the extended window is required for operational reasons, it is inconvenient for riders who must be ready to depart as much as 30 minutes before they get picked up on the end of each trip, potentially extending trip times by an hour. Vehicle tracking technology improves customer convenience by reducing their waiting and preparation time.

BENEFITS

Providing real-time vehicle tracking for specialized services improve service reliability, reduce total travel time, and will make the services easier and more convenient to use. The investment will make it easier for older adults and people with disabilities to live independently later in life, increasing their quality of life, and reducing the costs of health care for individuals and taxpayers.

Vehicle tracking technology can also be expanded to improve vehicle deployments and scheduling, increasing RTC's ability to group rides. Increasing ride sharing has the ability to increase service efficiency and help control costs.

Ride-hailing companies and app developers have technology for vehicle tracking. In 2020, several contracting models are available where the software can be licensed for an annual fee and a per vehicle charge.

CHALLENGES

Implementing vehicle tracking technology will significantly improve the convenience of demand response services. This may mean more people will use the service. The increased demand would, in turn, create more expense despite efforts toward savings. As a result, it is important that the vehicle tracking technology is also used to improve the efficiency of vehicle deployments to increase ride sharing and reduce the cost per trip. Without increases in cost effectiveness, the cost of providing more convenient demand response service could become prohibitive.

COMPANION STRATEGIES

Project 5-6 is related to and will be planned in co-ordination with the following projects:

- ☑ **Project 5-1:** Double Transportation Services for Seniors
- ☑ **Project 5-2:** Double Specialized Transportation Services
- ☑ **Project 5-3:** Double Service for Veterans
- ☑ **Project 5-4:** Provide Full Regional Coverage for People with Disabilities (ADA Paratransit)
- ☑ **Project 5-5:** Provide App-Based Reservations and Fare Payment for Specialized Services

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Use existing RTC pilot programs to determine the types of vehicle tracking technology that would best serve target markets (older adults, people with disabilities and veterans). Inventory accessibility needs and requirements, including universal design considerations and access for low-income populations without smart phones and/or internet	RTC	Clark County Social Service Department Nonprofits, such as Helping Hand, Las Vegas Urban League, Three Squares
2	Work with app developer to bring vehicle tracking technology into the trip booking and payment app. This app may be included in the existing rideRTC app or in a separate app for the target populations	RTC	Clark County Social Service Department Nonprofits, such as Helping Hand, Las Vegas Urban League, Three Squares
3	Work with app developer so that vehicle tracking technology can enhance RTC's scheduling practices and increase opportunities for sharing ride	RTC	Clark County Social Service Department Nonprofits, such as Helping Hand, Las Vegas Urban League, Three Squares
4	Conduct demonstration project to test effectiveness of vehicle tracking and trip scheduling functions. Evaluate changes in demand and operational impacts on service delivery.	RTC	Clark County Social Service Department Nonprofits, such as Helping Hand, Las Vegas Urban League, Three Squares
5	Estimate impacts to RTC's existing service delivery models. This may include deploying more vehicles or developing partnerships with ride hailing companies to help meet the demand. Expand capital infrastructure and hire and train additional drivers as needed	RTC	Clark County Social Service Department Nonprofits, such as Helping Hand, Las Vegas Urban League, Three Squares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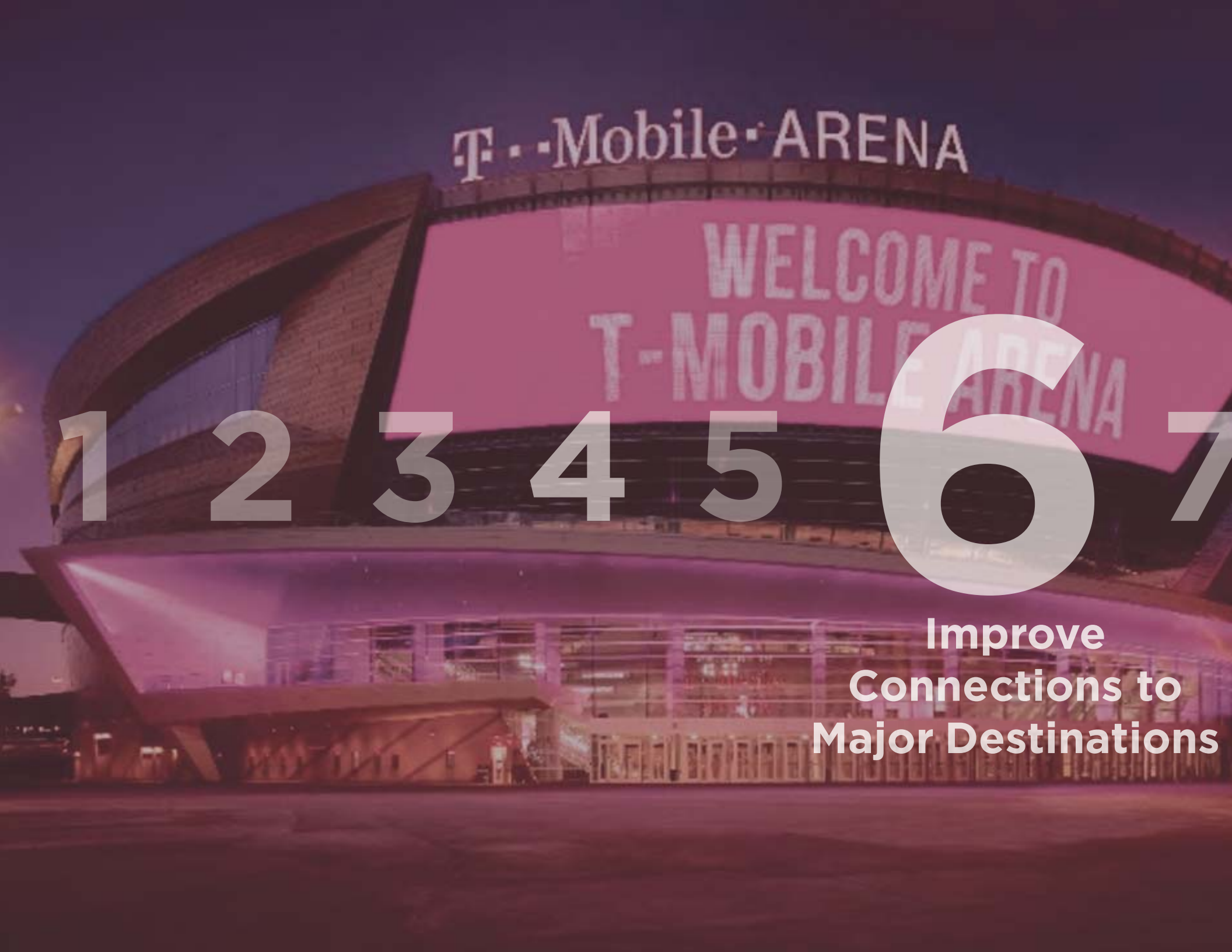


1 2 3 4 5 **6** 7

Improve Connections to Major Destinations

6

BIG MOVE

IMPROVE CONNECTIONS TO MAJOR DESTINATIONS

87%
rated Big Move 6 at least

RTC On Board Strategies Survey (January-March 2020)
11,221 respondents

OVERVIEW

On Board's Big Move #6 will improve connections to and between major destinations in Southern Nevada. New services will connect riders directly to important locations using a combination of express bus routes, commuter services, and game day and event shuttles. These improvements will help both visitors and workers. People visiting Las Vegas will be able to better navigate the RTC transit system, starting from when they arrive at the airport. The airport and other major event centers also employ many residents of the Valley, so improving services will help more workers get to and retain their jobs.

Big Move #6 will develop new mobility services and options for getting to the Resort Corridor, McCarran Airport, and Downtown Las Vegas, which are Southern Nevada's largest job centers. Expanding connections to these locations is a critical part of the region's future success. In the wake of COVID-19, when the region is focused on economic recovery, these routes

New services will connect riders directly to important locations using a combination of express bus routes, commuter services, and game day and event shuttles.

will help connect people and jobs. The Resort Corridor, McCarran Airport, and Downtown Las Vegas are vital destinations for transit service for the following reasons:

- ☑ The Resort Corridor is home to 42 major gaming properties that directly employ 100,000 gaming employees. The Strip is the destination of most of Southern Nevada's 42.9 million visitors and 6.3 million conventioneers.[1]

- ☑ McCarran International Airport supports approximately 250,000 jobs and is responsible for 18% of the area's gross domestic product. McCarran is further integrated into the regional economy because tourism and the hospitality industry are reliant on the ability of the airport to accommodate visitors arriving by air. The airport also supports Las Vegas's position as the top trade show destination for 25 consecutive years. The future development and success of Southern Nevada is directly linked to the Clark County Aviation System.[2] Moreover, Clark County residents benefit from the convenience of having easy access to a major international airport. In 2018, Clark County residents took 4.6 million trips from McCarran.[3]

- ☑ Downtown Las Vegas is the region's central business district and accommodates a diversity of economic activity, including gaming and tourist attractions as well as government, residential, and retail developments. Downtown also includes the Las Vegas Medical District, which is the largest concentration of health care services, and the financial district.

1 Las Vegas Convention and Visitor Authority.
2 McCarran International Airport.
3 Ibid.

On Board's **Big Move 6: Improve Connections to Major Destinations** consists of 7 individual projects:

6-1: Provide Rapid Bus Services to McCarran Airport

6-2: Develop Airport Mobility Hub

6-3: Serve Both Terminals with All Airport Connections

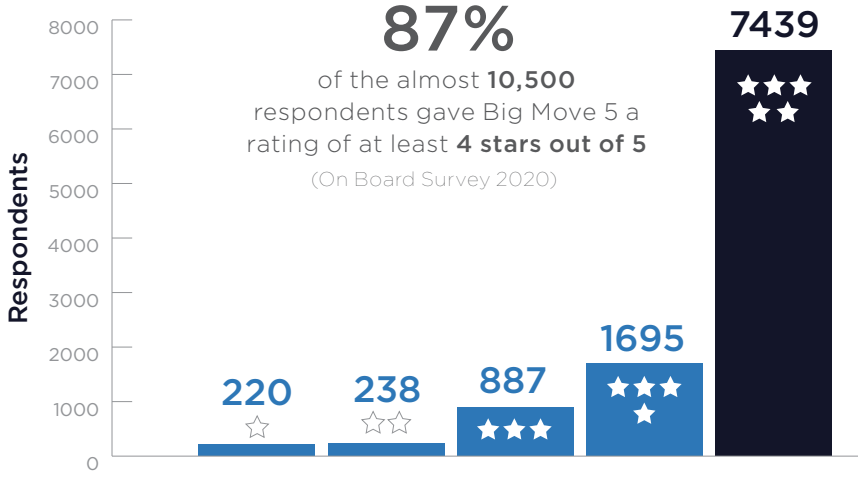
6-4: Improve Transit-Related Airport Wayfinding and Onsite Information

6-5: Implement Express Routes to Resort Corridor or Downtown

6-6: Improve Commuter Facilities & Services: Develop Park-and-Ride Lots with Express Service Connections to Major Destinations

6-7: Provide Game Day and Major Event Shuttles

SURVEY FINDING



Southern Nevada residents gave Big Move 4 and all of its associated strategies a rating of

4.5 out of 5 stars

(On Board Survey 2020)

About 57%

of Southern Nevadans told RTC that service improvements should prioritize making service more "frequent and fast" and/or serve "major destinations

(RTC On Board User Survey and On Board Vision Survey 2018)

Minority, & low-income residents

of Southern Nevada gave Big Move 6 an especially high rating of 4.6

(On Board Survey 2020)

Nearly 50%

of survey respondents asked for better service to the strip and downtown

(On Board Vision Survey 2018)

KEY BENEFITS

All mobility strategies generate benefits for individual travelers, the regional economy and the environment. The graphic below provides a relative scale of the benefits.

EFFECTIVENESS IN ADDRESSING REGIONAL PRIORITIES

Improving Connections to Major Destinations will directly help achieve the following priorities identified through extensive public outreach with nearly 80,000 people and multiple surveys that had almost 25,000 combined responses:

REGIONAL MOBILITY PRIORITIES

1	Improved Road & Transit Safety	◒
2	Fewer Traffic Jams	●
3	High Capacity Transit (including light rail)	●
4	Better Connectivity	●
5	Well-Maintained Roads	○
6	Frequent Bus Service	●
7	More Transportation Choices	●
8	Expanded Service for Seniors, Veterans, & People with Disabilities	◒
9	Improved Job & Housing Access	●
10	Better Walking & Biking Conditions	◒
11	New Modal Technologies & Investments	●
12	Expanded Transit Service Area	●
13	New Information Technologies	○
14	Better Transit Stops & Stations	●
15	Improved Transit Security	●

KEY | ● Strongest ◒ Strong ○ Less Strong

PROJECT 6-1

Provide Rapid Bus Service to McCarran Airport

OVERVIEW

Project 6-1 will provide Rapid Bus between downtown Las Vegas, the Resort Corridor and McCarran International Airport. Prior to the COVID-19 pandemic, the SDX operated between the Resort Corridor, Downtown Las Vegas and the Las Vegas Premium Outlet Mall, but did not provide connections to McCarran Airport. The service was stopped during the pandemic; low visitation levels meant ridership on the SDX dropped dramatically.

On Board anticipates that some form of Rapid Bus type service on Las Vegas Boulevard will be restored as the region's economic recovery permits. This project would enhance that service by providing connections to McCarran Airport.

Timing for Completion	Near Term (1-5 Years)	**Potential Funding Sources**	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax Airport Revenues and Parking Fees Urbanized Areas Formula Grants Program (Section 5307) FHWA Funds Congestion Management Air Quality (CMAQ) Surface Transportation Block Grants (STBG)
Implementing Agency	Lead: RTC Partners: McCarran International Airport, Clark County Department of Aviation		

BACKGROUND

McCarran Airport is a large market for transit for both workers and travelers. Transit service to and from McCarran Airport is currently very limited, and consequently, fewer people travel to and from the airport on transit than in most other cities. Transit has only about 1% of mode share at McCarran Airport, compared to 3-12% at other major cities.

RTC's existing routes provide service to the airport from:

- ☑ Two outer locations—Centennial and Summerlin—on Centennial Express and WAX Westcliff Airport Express
- ☑ Two parts of the core—Paradise Road and Maryland Parkway—on Routes 108 and 10

Throughout the On Board process, stakeholders identified better transit service to McCarran Airport as one of the region's most pressing needs, with an urgency placed on connections between the Resort Corridor and the airport. One strategy to improve connection would be to develop Rapid Bus service. Improved service may be provided by re-instated the SDX or a new similar type of service.

Project 6-1 implements enhanced bus service identified in RTC's Resort Corridor High Capacity Transit Feasibility Study (March 2019). Service would provide direct, frequent services and include articulated vehicles with dedicated

branding, luggage storage areas and shelves Other amenities may include:

- ☑ Ticket vending machines for off-board ticketing at all stops, providing on-board ticket verification
- ☑ Modified sidewalks to provide level boarding
- ☑ •Lengthen stops designed for 40 ft. long Deuce buses to provide access to all doors for longer vehicles. Station improvements would also eliminate bus pull-outs to reduce bus maneuvering
- ☑ Traffic signal priority for buses
- ☑ Reduced conflicts with right-turning vehicles by providing right-turn pockets, installing vehicle/pedestrian signals on right-turns at driveways, and constructing grade separations at driveways and cross-streets

BENEFITS

Providing Rapid Bus service to the airport would connect three major destinations in Southern Nevada with premium service. It would expand travel choices for travelers and workers and reduce congestion on some of Southern Nevada's busiest corridors. Enhanced bus stops and traffic signal priority would provide speedy service between the airport and the Resort Corridor.

RTC's Resort Corridor High Capacity Transit Feasibility Study (March 2019) found that previous service could serve 10,200 daily passengers. These levels of ridership, which were calculated before COVID-19 indicate that the route may operate with a profit (i.e. farebox revenues would exceed operating costs).

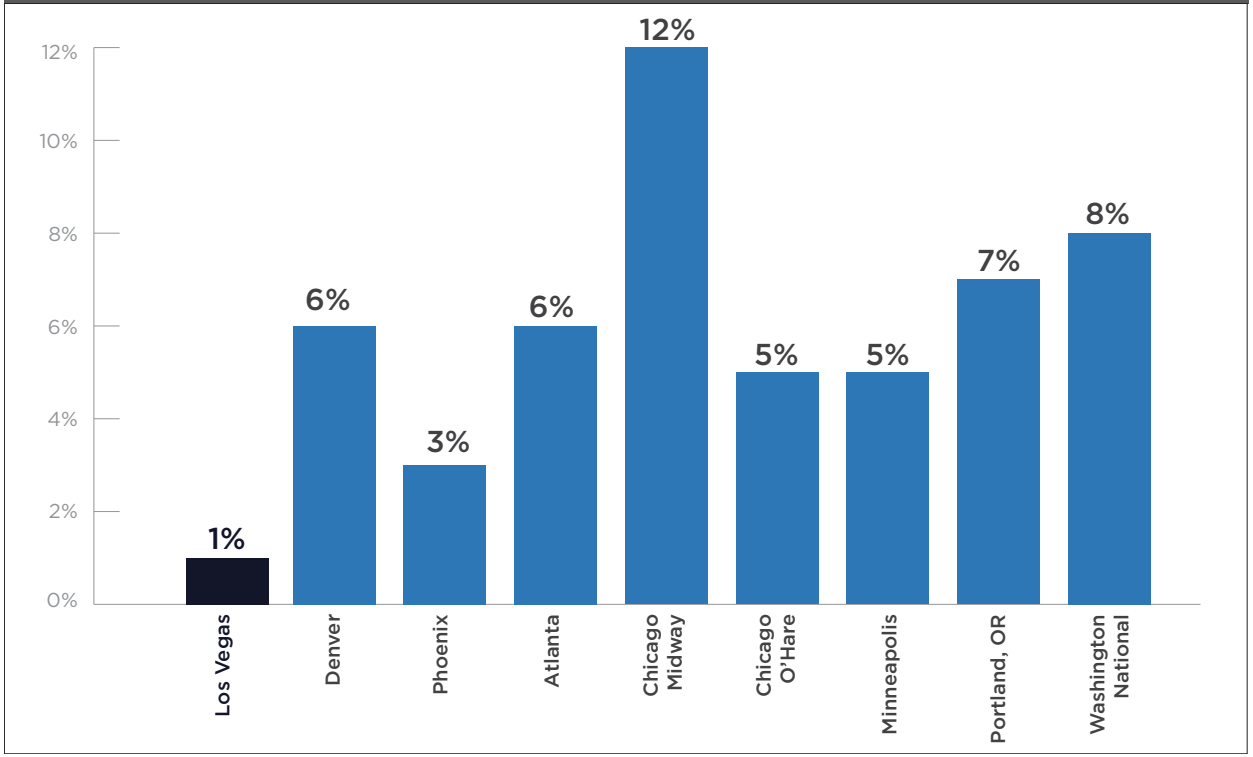
CHALLENGES

The RTC has successfully attracted tourists to premium bus services, including the Deuce and SDX. Transit service between McCarran Airport and the Resort Corridor, however, has been less successful. The lack of ridership results in part because bus service departs from a bus stop in the lower level of the parking garage. As a result, at a minimum, additional investments in airport wayfinding are required to successfully drive visitors to use new Rapid Bus service.

Another challenge with operating Rapid Bus service to the airport is determining if one or both terminals should be served (see also Project 6-3). Serving both terminals is more convenient for the riders but the travel time required to operate between the terminals is a significant penalty for visitors and workers in a hurry to get to their hotels or homes.

SDX alignment changes recommended in Project 6-1 mean Las Vegas Boulevard south of Tropicana Boulevard would lose SDX service. Deuce service, however, would continue to serve this segment of Las Vegas Boulevard; further investments associated with **Big Move 2-3** and **2-4** would increase service frequency on the Deuce.

Figure 6-A Transit Mode Shares at Major Airports



COMPANION STRATEGIES

Project 6-1 is related to and will be planned in coordination with the following projects:

- ☑ **Project 6-2:** Develop Airport Mobility Hub.
- ☑ **Project 6-3:** Serve Both Terminals With All Airport Connections.
- ☑ **Project 6-4:** Improve Transit-Related Wayfinding and Onsight Information.
- ☑ • **Project 6-4:** Improve Transit-Related Wayfinding and Onsight Information. Project 6-4 is particularly important to the success of Project 6-1, because it will provide the wayfinding and information necessary to make airport service successful with visitors.

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Begin coordination and negotiation with McCarran International Airport regarding increased transit services and improving wayfinding	McCarran International Airport Clark County Department of Aviation	
2	Analyze Resort Corridor to Airport Rapid Bus SDX service characteristics to determine changes in routing and operational requirements, including vehicle access and egress routing at both terminals	RTC	McCarran International Airport Clark County Department of Aviation
3	Improve wayfinding and transit passenger facilities in the airport	McCarran International Airport Clark County Department of Aviation	
4	Launch extended airport SDX service and gather feedback on service schedule and reliability	RTC	McCarran International Airport Clark County Department of Aviation

MaCarran International Airport
Image from RTC

PROJECT 6-2

Develop Airport Mobility Hub (TIBP: McCarran Multimodal Transportation Center)

OVERVIEW

Project 6-2 develops a mobility hub at McCarran Airport, providing a centralized transportation hub for airline passengers, airport workers, and other travelers with easy access to a full suite of transportation options in one location, including potential light rail, local and express buses, BRT, taxis, limos, shuttles, and ride-hailing. This transportation hub would connect directly to airport Terminals 1 and 3 via an extension of the existing people mover systems.

The proposed multimodal site is north of the McCarran International Airport between Swenson Street and Paradise Road. The portion of the property suitable for this transportation hub is comprised of three contiguous and currently vacant parcels totaling approximately 13.8 acres, owned by the Clark County Department of Aviation.

To enhance the facility beyond merely centralizing transportation options, the multimodal center could also offer retail options as well as bag check service and/or ticketing, so passengers would not need to carry their luggage on the people mover system. Prominent wayfinding systems, as recommended in Project 6-4, would be implemented throughout the hub to help travelers make informed decisions about travel options.

Timing for Completion	Medium Term (6-10 Years)	**Potential Funding Sources (recommended by TIBP)**	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax Naming Rights and Advertising Parking Fees Airport Revenues FTA Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) • Bus Facility formula Funds (Section 5339(a))	**Potential Funding Sources (recommended by TIBP)** *(continued)*	FTA Discretionary Funds • Bus and Bus Facilities Program (Section 5339) FHWA Funds • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grants (STBG) Public Private Partnerships
Implementing Agency	Lead: Clark County Department of Aviation/ McCarran International Airport Partners: RTC				

BACKGROUND

McCarran International Airport does not have adequate space to accommodate additional transportation service providers to connect directly with the airport. Roadway and curbside space are currently constrained, with little room for planned growth. At the same time, without additional landside transportation access modes, growth will be constrained well below the projected capacity of 55 million annual passengers. The lack of space and transportation needs include high capacity transit between the airport and the Strip, as well as other car-based, transit, and multimodal options, all housed at a new mobility hub servicing the airport.

BENEFITS

Approximately 86% of visitors arriving at McCarran International Airport are bound for destinations within the core area of Southern Nevada, with the vast majority traveling to the Resort Corridor (71%, with the remaining passengers divided among the Las Vegas Convention Center, and Downtown Las Vegas.[1] A multimodal transportation hub would offer multiple benefits:

- ☑ Shifting all transportation options to a centralized location and providing real-time transit information allows passengers to select from a wider range of transportation options
- ☑ A more expansive transportation center with many amenities can provide a better transportation experience for the region's travelers
- ☑ A multimodal transportation hub serves the needs of workers who will easily be able to make transit connections to their workplaces in a single location, facilitating workforce and workplace connectivity
- ☑ Environmental benefits accrue by reducing idling time at improved passenger loading areas and by encouraging adoption of high capacity transit through ease of access

CHALLENGES

Finding the most efficient route to create new transit connections to the airport will be challenging, as will meeting height restrictions in the direct airport vicinity. Further, successfully directing transit and private transportation services to an off-site facility is paramount to ensure passengers have a full range of easily accessible transit options in a single, centralized location. Finally, if advance bag check services are desired at the transportation center, participation and coordination in planning and operations between airlines, airport staff, and TSA officials will be necessary for effective check-in operations.

COMPANION STRATEGIES

Project 6-2 is related to and will be planned in coordination with the following projects in Big Move 6:

- ☑ • **Project 6-1:** Provide Rapid Bus service to Airport
- ☑ **Project 6-3:** Serve Both Terminals with All Airport Connections
- ☑ **Project 6-4:** Improve Transit-Related Airport Wayfinding and Onsite Information

This hub will connect to high capacity transit lines built as part of Big Move 1:

- ☑ **Project 1-1:** Finish Maryland Parkway HCT Project
- ☑ **Project 1-5:** Phase 1 Rapid Bus Route Paradise Road
- ☑ **Project 1-9:** Phase 2 Rapid Bus Route Tropicana Avenue

This airport mobility hub will be a part of the broader regional mobility hub network built in Big Move 4:

- ☑ **Project 4-5:** Develop Regional Mobility Hubs
- ☑ **Project 4-6:** Develop Neighborhood Mobility Hubs

1 TIBP.

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Identify the appropriate working group and stakeholders to lead implementation	McCarran International Airport Clark County Department of Aviation	RTC
2	Analyze SDX service characteristics to determine changes in routing and operational requirements, including vehicle access and egress routing at both terminals	McCarran International Airport Clark County Department of Aviation	RTC
3	Coordinate with the development of the high capacity system in Big Move 1	McCarran International Airport Clark County Department of Aviation	RTC
4	Evaluate location alternatives and develop a conceptual building program that specifies the quantity and use of the space	McCarran International Airport Clark County Department of Aviation	RTC

Allegaint Stadium
Image from RTC

PROJECT 6-3

Serve Both Terminals with Airport Transit Connections

OVERVIEW

Project 6-3 will provide transit service to both Terminal 1 and 3 on routes that serve McCarran International Airport. It also funds the purchase of two additional buses each on Routes 108, 109, and the Centennial Express so that service frequencies can be maintained. RTC currently operates four services to and from McCarran Airport, only one of which serves both terminals. Extending service to both terminals will fill an important gap in existing airport service and make service easier to understand and use for visitors and employees.

Timing for Completion	Near Term (1-5 Years)	**Potential Funding Sources**	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax Parking Fees Airport Revenues FTA Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) FHWA Funds: • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grants (STBG)
Implementing Agency	Lead: RTC Partner: McCarran International Airport, Clark County Department of Aviation		

BACKGROUND

McCarran Airport has two terminals Terminal 1 and Terminal 3. In 2018, nearly 50 million passengers traveled through McCarran. While most passengers traveled through Terminal 1, more than 14 million passengers traveled through Terminal 3. This equates to an average daily demand of about 38,000 air travelers, not including employees.[1]

Before the COVID-19 pandemic, RTC operated four services to and from McCarran Airport, only one of which serves both terminals:

- ☑ 108 Paradise (Terminal 1 only)
- ☑ 109 Maryland Parkway (Terminal 1 only)
- ☑ Centennial Express (Terminal 3 only)
- ☑ WAX Westcliff Airport Express (both terminals)

Given the inconvenience of transferring between terminals, few passengers will be willing to transfer to a different terminal to catch the bus. Serving only one terminal makes service confusing and limits the number of passengers who can conveniently use it. At the same time, serving both terminals inconveniences riders traveling between the South Strip Transfer Terminal and Maryland Parkway. Serving the second terminal will add between

1 McCarran International Airport www.mccarran.com/Business/Statistics

6 and 8 minutes per direction for these riders, significantly eroding service quality. In the Wake of the COVID-19 pandemic, the future of some of the airport services may be in question. When service is reinstated, it may provide an opportunity for

BENEFITS

In the same manner that virtually all other ground transportation options serve both terminals, transit service should also serve both locations. Considering relative passenger volumes and assuming that employee proportions are similar, adding service to Terminal 3 on routes that now only serve Terminal 1 could increase ridership by 41% at little additional cost, based on initial ridership projections. Ridership projections also find that adding Terminal 1 service on CX Centennial Express could increase ridership by more than 200%. Serving both terminals also makes routes more convenient and easier to understand for all riders and potential riders.

Access to McCarran Airport is one of the biggest gaps in Southern Nevada's mobility network. Investing in strategies that improve connections will significantly increase regional connectivity. The airport is one of the region's largest employers. Making it easier to get to work at the airport will improve the quality of life for residents. Encouraging employees to take the bus can also free up parking space for airport passengers. Moreover, improved access to both terminals can discourage single occupant commuting to the airport. Changing this behavior will have an impact on regional environmental goals, including emissions and congestion.

CHALLENGES

One of the critical challenges with serving both terminals is the impact on travel time, especially for riders not boarding or alighting at the airport. Serving the second terminal will add between 6 and 8 minutes per direction, which significantly increases existing riders. Expanding the service must consider the benefit to new riders against the cost to existing riders.

Curb space is limited at both terminals, which means that it is difficult for multiple buses to pick up and drop off passengers at the same time, or for buses to layover at the airport stops. RTC may need to negotiate with airport entities to increase curb space, and schedules and service characteristics will likely need to be adjusted to efficiently use available curb space.

Wayfinding to and information about transit services are limited at McCarran Airport. To make transit service to both terminals more successful, RTC and the airport can work together to improve stop amenities and branding, marketing, and information.

COMPANION STRATEGIES

Project 6-3 is related to and will be planned in coordination with the following projects:

- ☑ **Project 6-1:** Provide Rapid Bus Service to McCarran Airport
- ☑ **Project 6-2:** Develop Airport Mobility Hub (TIBP: McCarran Multimodal Transportation Center)
- ☑ **Project 6-4:** Improve Transit-Related Airport Wayfinding and Onsite Information

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Improve wayfinding to bring potential riders to new or improved transit stops	McCarran International Airport Clark County Department of Aviation	RTC
2	Begin coordination with airport entities to discuss potentially increasing curb space at existing Terminal 1 and Terminal 3 stops, or identifying new stop locations	RTC	McCarran International Airport Clark County Department of Aviation
3	Adjust service schedules for the four existing routes to account for additional travel time due to stopping at both terminals and to efficiently use curb space	RTC	McCarran International Airport Clark County Department of Aviation

PROJECT 6-4

Improve Transit-Related Airport Wayfinding and Onsite Information

OVERVIEW

Project 6-4 will enhance the travel experience and ease of navigating the transportation system at McCarran International Airport through the development of enhanced bus stop facilities, wayfinding signs and maps, and real time transit information. Real time transit information is communicated via digital screens that display departure and arrival times of connecting ground transportation modes. This comprehensive wayfinding project will also provide onsite information for visitors for how to use the transit system and how to pay transit fares with a mobile smartphone app.

Timing for Completion	Near Term (1-5 Years)	**Potential Funding Sources**	Local Sales Tax Motor Vehicle Fuel Tax Parking Fees Airport Revenues
Implementing Agency	Lead: McCarran International Airport/Clark County Department of Aviation		

BACKGROUND

When air travelers arrive in a new city, they are unfamiliar with the local transit system. RTC airport stops are currently at Ground Level Zero at Terminal 1 and the departures level of Terminal 3. In both cases, while the stops include a shelter and offer some passenger information, information about public transit in the airport itself is limited. There is minimal visible signage about public transportation in the arrivals and baggage claim areas. As a result, the transit stops at both terminals are difficult to find.

The lack of information limits the usefulness of the airport services. Employees are repeat travelers to the airport and can invest time to learn where the bus stop is located and how to use the service. In contrast, most airport passengers are unfamiliar with McCarran Airport and are dependent on wayfinding and information to find and use public transportation. Without effective wayfinding for transit, visitors will defer to using a taxi or ride-hail service.

BENEFITS

Signage that directs travelers to the bus stop will help encourage riders to use transit and provide them simple to understand information about where transit can take them, when to expect service, and how to pay for fares. As at other important stops, real-time information will make service easier to use and understand.

Increasing the presence of transit at the airport can improve visibility for transit for the entire Valley. If visitors see that transit is an option at the airport, they may be more likely to use transit during the remainder of their visit to Las Vegas.

CHALLENGES

Project 6-4 requires coordination between RTC and the Airport, including permission from the Airport to increase wayfinding signage to transit services. Transit services may also be competing with other shuttles, ride-hailing companies, and taxis for the usage of signage and curb space.

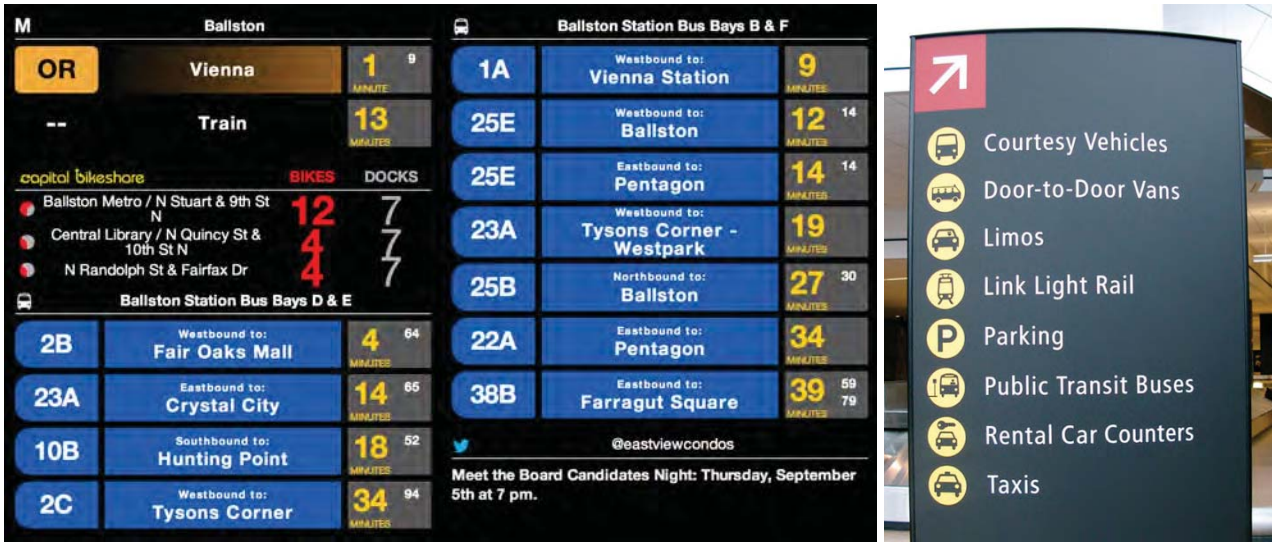
COMPANION STRATEGIES

Project 6-4 is related to and will be planned in coordination with the following projects:

- ☑ **Project 6-1:** Provide Rapid Bus Service to McCarran Airport
- ☑ **Project 6-2:** Develop Airport Mobility Hub (TIBP: McCarran Multimodal Transportation Center)
- ☑ **Project 6-3:** Serve Both Terminals with All Airport Connections

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Initiate conversation with McCarran Airport about land access, airport growth, and opportunities for collaboration	RTC	McCarran International Airport Clark County Department of Aviation
2	Improve wayfinding with increased emphasis on directions to public transit	McCarran International Airport	RTC Clark County Department of Aviation
3	Upgrade signage and information with real-time information	McCarran International Airport	RTC Clark County Department of Aviation



Real-time information in Washington, D.C. Metro (left) and wayfinding sign at Seattle-Tacoma Airport (right).

Washington image from Nelson\Nygaard; SEA-TAC image from Oran Viriyincy, flickr

PROJECT 6-5

Implement Express Routes to Resort Corridor or Downtown

OVERVIEW

Project 6-5 will implement new express routes to the Resort Corridor that serve similar outlying destinations to existing express routes that terminate in Downtown Las Vegas. Express buses are designed to provide fast, limited stop service to major activity and job centers. They serve park-and-ride lots or mobility hubs. New express routes in Southern Nevada will provide one seat service from outlying areas to major activity centers.

Currently, RTC provides commuter express on five routes:

- ☑ Centennial – Downtown Las Vegas – Airport
- ☑ Westcliff – Suncoast to Airport via Westcliff and Bonneville Transit Centers
- ☑ Henderson – Downtown Las Vegas via I-515
- ☑ Veterans Medical Center – Downtown Las Vegas

The 2016 Transportation Investment Business Plan identified potential new express routes to the Resort Core along:

- ☑ Blue Diamond Road
- ☑ South Las Vegas Blvd
- ☑ I-215/CC-215

Reference figure number shows in green the destinations that On Board has identified for additional express route opportunities. These currently unserved areas are to the north and east of the Resort Corridor and Downtown areas. Note that this map is conceptual and not intended to show actual routing, but rather new connections that could warrant express service.

Timing for Completion	Medium Term (6-10 Years)	**Potential Funding Sources**	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax Transient Lodging Tax/Resort Corridor Room Tax FTA Formula Funds: Urbanized Areas Formula Grants Program (Section 5307) FHWA Funds Congestion Management Air Quality (CMAQ) Surface Transportation Block Grants (STBG)
Implementing Agency	Lead: RTC Partners: Local Jurisdictions, Nevada Resort Association, Culinary Union		

BACKGROUND

RTC currently runs four commuter express routes to downtown Las Vegas, which is the region's second largest job center. Two of these routes continue on to the Resort Corridor, which is the region's largest job center.

There are two major considerations related to serving Resort Corridor jobs:

- ☑ A large proportion of employees must enter and exit their workplaces via employee entrances, most of which are not currently served by transit. As described in the Service to Resort Corridor Employee Entrances section, it would be possible to serve these locations via local shuttles from Resort Corridor mobility hubs. (These are proposed as part of **Big Move #7**.)

- ☑ Few people are willing to use transit when two or more transfers are required. The strategy to provide shuttles from mobility hubs would work well for people who live along east-west routes that bisect the Resort Corridor, since they would just transfer once to a shuttle to get to work. However, many Resort Corridor employees commute from areas beyond these routes, effectively everyone north of Alta Drive/Stewart Avenue and south of Sunset Road. Under the existing transit network, these employees would need to make two transfer, once between buses and once to a mobility hub shuttle, to get to their jobs.

To provide better service, RTC could develop options that enable employees to get to work with one or no transfers. The way to do this for employees who live beyond the east-west routes would be to provide express services directly to mobility hubs on the Resort Corridor.

Pre-COVID, RTC operated four routes that are designed primarily to serve commuters (and two also serve the airport):

- ☑ CX Centennial Express
- ☑ DVX Downtown & Veterans Medical Center Express
- ☑ HDX Henderson & Downtown Express
- ☑ WAX Westcliff Airport Express

The future of the services in the wake of the COVID-19 pandemic is uncertain. Public health concerns have required many workers to work at home; early signs suggest these trends will continue through 2020 at a minimum. In early 2020, all four of these routes served downtown and the Bonneville Transit Center, and two Centennial Express and Westcliff Airport Express – extended through part of the Resort Corridor. With the development of employee shuttles that operate to and from downtown, these routes would also be able to serve Resort Corridor employees through connections at mobility hubs and a limited amount of direct service.

Post-COVID, these new express routes would extend the convenience of these existing express routes to a larger portion of the Valley. In 2040, the largest number of work trips will be made to the Resort Corridor from outer areas. As described earlier, nearly all these trips would require two transfers if made via the grid network. To provide one seat or one transfer service, new express routes could be developed from these areas. New express routes to the Resort Corridor would provide connections to employee entrances via shuttle service connections at mobility hubs.

Routes from the north would connect to shuttle routes at the Convention Center Mobility Hub, and routes from the south would connect at the Tropicana-West and Tropicana-East Mobility Hubs.

BENEFITS

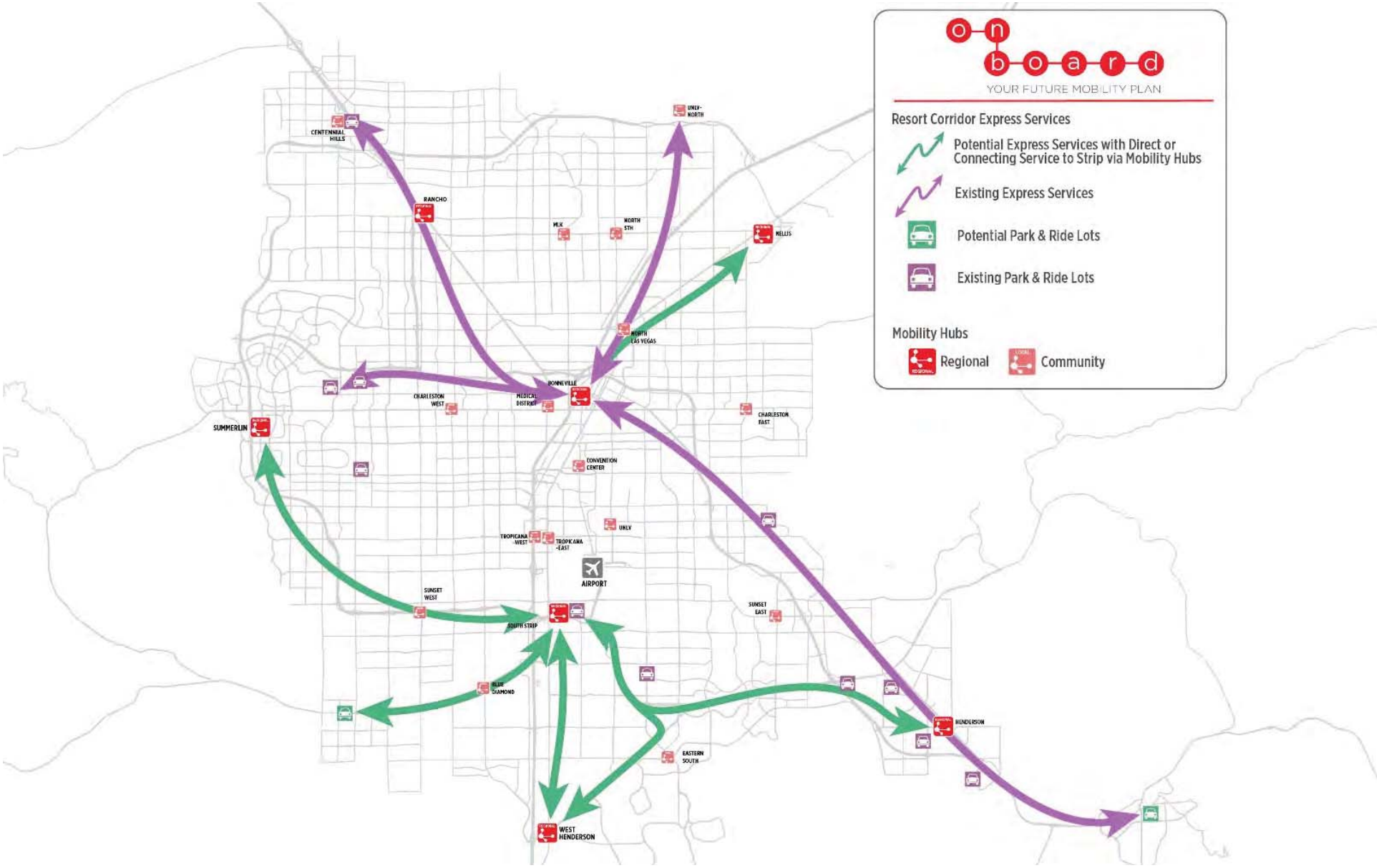
New express routes would better connect residents to Southern Nevada's major employment center. They would also make trips much faster and more comfortable by eliminating at least one transfer. Through providing more affordable, reliable, and fast connections to the Resort Corridor, residents of the Valley will be able to access more job opportunities.

Improving transit for employees along The Strip also benefits employers, especially their ability to hire and retain workers, without having to expand employee parking. Lastly, shifting commuters on to transit will reduce congestion and greenhouse gas emissions. Improving service for Resort Corridor employees will result in more productive workers who spend less of their income on getting to/from work.

CHALLENGES

RTC's current express services perform worse than its other services, with lower than average passenger per revenue vehicle hour levels. However, ridership has the potential to be much larger to The Strip than to Downtown, since The Strip is a much larger employment center and destination for entertainment. For these new express services to perform well, they must be paired with effective marketing and improved

Figure 6-B Resort Corridor Express Services



transit amenities, so that people know about the service and are more comfortable while using it.

COMPANION STRATEGIES

Project 6-5 is related to and will be planned in coordination with the following projects:

- ☑ **Project 6-6:** Improve Commuter Facilities & Services: Develop Park and Ride Lots with Express Service Connections to Major Destinations

This new express route created in Project 6-5 will directly connect to mobility hubs built as part of Big Move 4:

- ☑ **Project 4-5:** Develop Regional Mobility Hubs
- ☑ **Project 4-6:** Develop Neighborhood Mobility Hubs

The routes will also connect to transit services and amenities that improve mobility for Resort Corridor employees, as outlined in Big Move 7:

- ☑ **Project 7-1:** Develop Mobility Hubs Focused on Resort Corridor & Downtown Connections
- ☑ **Project 7-2:** Develop Direct Service Shuttles to "Back of House" Resort Corridor Employee Entrances
- ☑ **Project 7-3:** Construct Pedestrian Connections for Grade-Separated "Back of House" Locations on West Side of Strip

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Conduct an express routes market analysis to understand which regional services will effectively connect major residential and employment centers	RTC	Local Jurisdictions Nevada Resort Association Culinary Union
2	Using the results of the market analysis, create a schedule for the implementation of the new express services, ensuring that new services meet or exceed express bus service guidelines	RTC	Local Jurisdictions Nevada Resort Association Culinary Union
3	Implement first round of new routes	RTC	Local Jurisdictions Nevada Resort Association Culinary Union

PROJECT 6-6

Improve Commuter Facilities & Services: Develop Park-and-Ride Lots with Express Service Connections to Major Destinations

OVERVIEW

Project 6-6 will build high quality park-and-ride facilities throughout Southern Nevada—potentially with private development partnerships—to facilitate the use of the express services introduced in Project 6-5, and potentially with high capacity transit and regular bus service routes. High quality park-and-ride lots that are well located can serve multiple modes of transportation and play a significant impact in reducing the number of single occupancy vehicles on the roadway. The 2016 Transportation Investment Business Plan identified potential new park-and-ride lot locations across the region that would connect to new express routes. On Board continues this analysis and identifies additional locations north and east of the Resort Corridor and Downtown area.

Timing for Completion	Medium Term (6-10 Years)	**Potential Funding Sources** *(continued)*	Parking Fees Airport Revenues FTA Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) • Bus Facility formula Funds (Section 5339(a)) FTA Discretionary Funds • Bus and Bus Facilities Program (Section 5339) FHWA Funds: • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grants (STBG) • Public Private Partnerships
Implementing Agency	Lead: RTC Partners: Local Jurisdictions, Private Partners		
Potential Funding Sources	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax Naming Rights and Advertising		

BACKGROUND

Express bus services typically focus on passengers who are spread out across suburban areas, so they rely on passengers getting themselves to one of the limited stops. Most express bus riders drive to these stops, so providing park-and-ride lots at those locations reduces barriers to their travel and increases opportunities to attract new riders.

Frequently, park-and-ride lots belong to local businesses, churches, or other organizations that have agreed to share their lots with transit agencies. These lots are often not conveniently located and require riders to travel out of direction to reach them. To maximize ridership, park-and-ride lots should be located at places that reduce overall travel times for passengers, which means a location that is between their origin and destination. This often requires the development of purposely built park-and-ride lots rather than shared locations. Park-and-ride lots can ultimately serve multiple modes of transportation and play a significant impact in lowering the number of single occupant vehicles on the roadway.

On Board will construct several high quality park-and-ride lots in the Valley, equipped with:

- ☑ Parking
- ☑ Shelter and air-conditioned waiting areas
- ☑ Benches and seating areas

- ☑ Service information and maps
- ☑ Potentially retail or other commercial activities

Benefits

Well located and high-quality park-and-rides will make the express services introduced in Project 6-5 even more successful by drawing more people to those services. These express routes will better connect residents to Southern Nevada's major employment center and will make trips much faster and more comfortable by eliminating at least one transfer. New express routes will also provide a more affordable mobility option to Resort Corridor workers.

Park-and-ride lots are also useful beyond transit trips. For example, park-and-rides are good locations to park a car and join a carpool trip. The removal of many single occupancy vehicles off the road will also reduce congestion and greenhouse gas emissions.

CHALLENGES

Park-and-ride lots will only draw high ridership if they are well located along an express route. Inconvenient siting will result in long combined driving and transit travel times that are not time competitive with solo driving. Additionally, obtaining land to build these park-and-rides in good location may be difficult. Park-and-ride lots should be located between residential areas and employment centers, and buses should travel directly from the lot to the destination.

COMPANION STRATEGIES

Project 6-6 is related to and will be planned in coordination with the following projects:

- ☑ **Project 6-5:** Implement Express Routes to Resort Corridor or Downtown

This project complements programs in Big Move 8:

- ☑ **Project 8-7:** Expand Travel Demand Management (TDM) Programs

Park-and-rides can also be situated within or near mobility hubs built as part of Big Move 4:

- ☑ **Project 4-5:** Develop Regional Mobility Hubs
- ☑ **Project 4-6:** Develop Neighborhood Mobility Hubs

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	In conjunction with a more in-depth commuter services market analysis, identify or confirm where to site new park-and-rides	RTC	Local Jurisdictions Private Partners
2	Create a timeline for prioritizing park-and-ride locations	RTC	Local Jurisdictions Private Partners
3	Begin reaching out to potential private developers		Local Jurisdictions Private Partners
4	Begin building first park-and-ride projects	Local Jurisdictions Private Partners	RTC

PROJECT 6-7

Provide Game Day and Major Event Shuttles

OVERVIEW

Project 6-7 will provide game day and other event express transit services from more areas of Southern Nevada and to more major events, compared to existing services. The RTC currently provides express service to Vegas Golden Knights games and events at the Las Vegas Motor Speedway. In the future, RTC will provide service to major events at Allegiant Stadium. This program will enable RTC to potentially provide dedicated event service to other major events like the Consumer Technology Association's CES Event at the Las Vegas Convention Center and the National Finals Rodeo at the Thomas & Mack Center at UNLV.

Timing for Completion	Near Term (1-5 Years)	**Potential Funding Sources**	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax Naming Rights and Advertising Parking Fees Sponsorships FTA Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307)
Implementing Agency	Lead: RTC Partners: Major Event Centers		

BACKGROUND

Public transit, and transportation in general, is typically planned to serve daily activities. However, there are many special events that attract very large volumes of people and traffic. These can often be well served by transit. In Southern Nevada, current examples include Vegas Golden Knights games, NASCAR, and major concerts. Starting in 2020, they will also include Raiders games and major events at Allegiant Stadium. Examples from other cities that could come to Southern Nevada include the Stanley Cup and Super Bowl. Special event service is typically designed specifically for each event or venue.

RTC will provide increased service and special services to two types of major events:

☑ Sports Events: In the near future, this will include Golden Knights and Raiders games and NASCAR races. Further into the future, this type of service will potentially include major league baseball or basketball games, as well as major sports tournaments. Games for sports teams usually draw large crowds to stadiums, which have limited and expensive parking. Transit service may be extended to these stadiums on game days, or more frequent service may be added. Temporary transit priority can also be implemented on game days to speed movement of buses into and out of stadium areas.

- ☑ Concerts and Shows: These would include events with high attendance, including events at Allegiant Stadium, and potentially other high attendance events at the Las Vegas Convention Center, Las Vegas Speedway, and/or the Thomas & Mack Center at UNLV.

BENEFITS

The benefit of game day and major event shuttle services is that they efficiently move people to and from high attendance events and eliminate the need for more parking. Many visitors to major events find dedicated event service stress-free since it eliminates the need to find parking and sit in traffic.

Having a plan to provide increased transit service for existing major events helps RTC prepare for future events. These plans act as models that can be adapted, especially for recurring large events, such as a Super Bowl, sports draft, or other major sporting event.

CHALLENGES

Major event service is most successful when implemented in conjunction with transit priority for shuttles. Transit priority can be a challenge to provide in high-congestion environments like those around stadiums.

Special event services also need effective marketing strategies so that potential passengers know about the services. Effective marketing would likely include collaborating with the event host.

COMPANION STRATEGIES

Project 6-7 is related to and will be planned in coordination with the following projects:

- ☑ **Project 6-6:** Improve Commuter Facilities & Services: Develop Park and Ride Lots with Express Service Connections to Major Destinations
- ☑ **Project 4-5:** Develop Regional Mobility Hubs
- ☑ **Project 4-6:** Develop Neighborhood Mobility Hubs

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Update RTC's Special Events strategy and develop details regarding sponsorship costs to increase service	RTC	Major Event Centers
2	Begin reaching out to major institutions and work on creating lasting partnerships for multiple events	RTC	Major Event Centers

1 2 3 4 5 6 7

Provide Reliab Transit for Resort Corrido Employees

7

BIG MOVE

Provide Reliable Transit for Resort Corridor Employees

87%
rated Big Move 7 at least

RTC On Board Strategies Survey (January-March 2020)
11,221 respondents

OVERVIEW

The Resort Corridor is the largest employment center in Southern Nevada, with 24% of regional employment and 27% of private sector jobs[1]. As the region's densest job center, it should be one of the region's strongest transit markets—but transit ridership among employees commuting to and from work is relatively low. The On Board Mobility Plan includes strategies to ensure people can easily and reliably get to work, enhancing employer access to a large regional employment pool. An important part of this strategy involves improving transit access to the Resort Corridor. Improving transit access to these jobs will ensure that Southern Nevada remains an affordable place to live and an attractive and competitive job center. These investments will be important during periods of economic growth, and are also a critical part of regional economic recovery from the COVID-19 pandemic. As the region transitions back to work, ensuring reliable and affordable access

1 The Economic Impact of Southern Nevada's Tourism Industry and Convention Sector, June 2019 0 Revised Economic Impact Series Brief (Applied Analysis).

The On Board Mobility Plan includes strategies to ensure people can easily and reliable get to work to the region's largest employment center.

to employment will help prevent people from falling into poverty and homelessness.

The Resort Corridor (Las Vegas Boulevard) has been well served with several frequent transit routes, including the SDX and the Deuce. There are also multiple high frequency routes that operate on streets intersecting Las Vegas Boulevard, including Tropicana, Flamingo, and Sahara avenues. Yet despite these options, there are still important reasons why few Resort Corridor employees use transit to commute to work. For example, employees have access to free parking at many resorts, reducing their incentive to use transit. Another major impediment is that employees must enter and exit resorts via employee entrances located behind the resorts. These entrances are not accessible from RTC transit service on Las Vegas Boulevard.

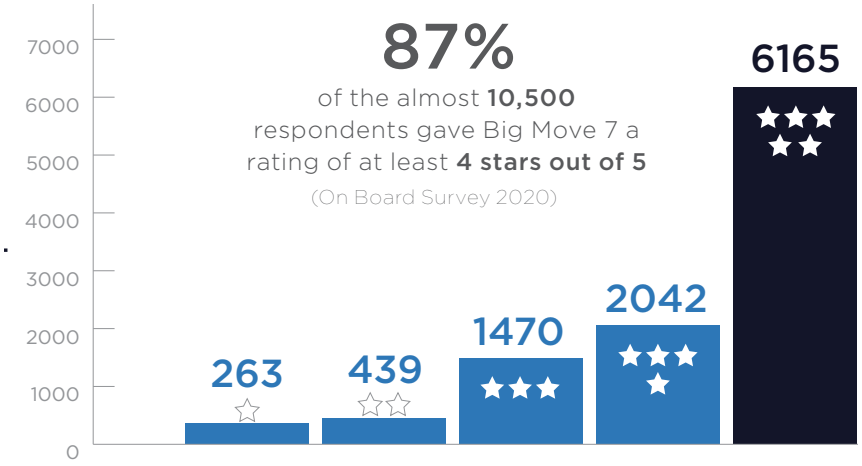
On Board's Big Move 7: Provide Reliable Transit for Resort Corridor Employees combines transit improvements with major infrastructure investments to expand the region's access to Southern Nevada's largest job center. It consists of three projects:

7-1: Develop Mobility Hubs Focused on Resort Corridor & Downtown Connections.

7-2: Develop Direct Service Shuttles to "Back of House" Resort Corridor Employee Entrances.

7-3: Construct Pedestrian Connections for Grade-Separated "Back of House" Locations on West Side of Strip.

SURVEY FINDING



87%
of the almost **10,500** respondents gave Big Move 7 a rating of at least **4 stars out of 5**
(On Board Survey 2020)

Southern Nevada residents gave Big Move 7 and all of its associated strategies a rating of

4.3 out of 5 stars
(On Board Survey 2020)

55%
of survey respondents supported improving access to jobs, housing, and medical services
(On Board Vision Survey 2018)

Low-income residents, minorities, & women
in southern Nevada gave Big Move 7 an especially high rating of 4.4
(On Board Survey 2020)

Nearly half (44%)
of survey respondents supported reducing costs for lower income communities
(On Board Survey 2020)

KEY BENEFITS

All mobility strategies generate benefits for individual travelers, the regional economy and the environment. The graphic below provides a relative scale of the benefits.

EFFECTIVENESS IN ADDRESSING REGIONAL PRIORITIES

Providing Reliable Transit for Resort Corridor Employees will directly help achieve the following priorities identified through extensive public outreach with nearly 80,000 people and multiple surveys that had almost 25,000 combined responses:

REGIONAL MOBILITY PRIORITIES

1	Improved Road & Transit Safety	◒
2	Fewer Traffic Jams	●
3	High Capacity Transit (including light rail)	●
4	Better Connectivity	●
5	Well-Maintained Roads	○
6	Frequent Bus Service	●
7	More Transportation Choices	●
8	Expanded Service for Seniors, Veterans, & People with Disabilities	○
9	Improved Job & Housing Access	●
10	Better Walking & Biking Conditions	◒
11	New Modal Technologies & Investments	●
12	Expanded Transit Service Area	●
13	New Information Technologies	○
14	Better Transit Stops & Stations	●
15	Improved Transit Security	●

KEY | ● Strongest ◒ Strong ○ Less Strong

PROJECT 7-1

Develop Mobility Hubs Focused on Resort Corridor & Downtown Connections

OVERVIEW

The On Board Plan recommends developing a regional network of mobility hubs (see **Big Move #4** Make Short Trips Easier). Designed to create regional and local focal points for transit services, these hubs facilitate transfer and connection activity between other travel modes, such as rideshare, carshare, and bikeshare. Successful mobility hubs—designed to be welcoming, safe and comfortable to both daily and occasional riders—assure travelers that if they get to a mobility hub, they'll be able to get to their final destination.

Serving Resort Corridor employment is challenging. Transit routes serve Las Vegas Boulevard through the heart of the Resort Corridor, but employee entrances are on the back of the resorts—hard to reach by bus, foot or bicycle. On Board addresses this by developing a smaller network of mobility hubs, providing access to the back of Resort Corridor entrances. Accessible from RTC's bus network, the hub network will create opportunities for employees to pivot to other modes for their first/last mile connections, which may include shuttle service (see **Project 7-2**), bikeshare, rideshare or carpools.

The network of mobility hubs around the Resort Corridor includes development of 4 new mobility hubs plus the Bonneville Transit Center (see Figure 7-A), including locations at the:

- South end of the Resort Corridor
- Las Vegas Convention Center
- East side of Tropicana Avenue
- West side of Tropicana Avenue

Timing for Completion	Medium-Term (6-10 years)	**Potential Funding Sources**	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax Transient Lodging Tax/Resort Corridor Room Tax FTA Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) • Bus-Bus Facility Formula (Section 5339(a)) FTA Funds: • Bus and Bus Facilities Program (Section 5339) FHWA: • Health Care Providers Public Private Partnerships
Implementing Agency	Lead: RTC and Resort Corridor Stakeholders Partners: Clark County, City of Las Vegas Nevada Resort Association, Culinary Union		

BACKGROUND

The Bonneville Transit Center (BTC) offers a local example of a mobility hub. The BTC is a major transfer point for several of RTC's bus routes; it also offers an air conditioned waiting area, ticket sales, bike share and bike repairs, and a handful of parking spaces—with priority given to hybrid fuel vehicles. The facility is also located close to downtown Las Vegas, within walking distance of housing, retail and restaurants. The BTC is a model for future mobility hub development recommended under the On Board Mobility Plan.

Big Move 7 is focused on providing reliable transit to Resort Corridor employees via mobility hubs that create a comfortable, safe and reliable transfer point where workers can switch between RTC regular routes and a proposed network of shuttles (see **Project 7-2**); they could also use micro-mobility or other modes to travel the last mile or so to get to work.

BENEFITS

Mobility hubs will create a network of transfer points for employees and visitors to transfer between fixed route services and first/last mile connections that will get them to their destination. As Southern Nevada invests in high capacity transit, the mobility hubs will increase in importance, connecting residents and visitors to high quality, frequent and reliable transit services.

In the short-term, improving transportation access to jobs on the Resort Corridor is a critical part of regional economic recovery and growth. As people return to work and tourists return to Las Vegas in the wake of the COVID-19 pandemic, employers will need access to a large pool of workers. Likewise, people living in Southern Nevada will need to safely and reliably travel to jobs. A strategy of affordable travel options will become increasingly important to prevent workers and families from falling into poverty and homelessness.

CHALLENGES

Implementing the proposed network of mobility hubs will face challenges, one of the largest of which is the need to acquire and develop land in the vicinity of the Resort corridor. Mobility hubs work best when they are located strategically close to high capacity transit and other frequent bus networks as well as developed pedestrian and bicycle facilities and infrastructure. Finding and securing these locations in the most densely developed areas of Southern Nevada will likely be complicated.

Successful mobility hubs also require partnerships with a cross section of mobility providers, including carshare, rideshare and bikeshare partners. The RTC has successfully developed similar partnerships in the past.

COMPANION STRATEGIES

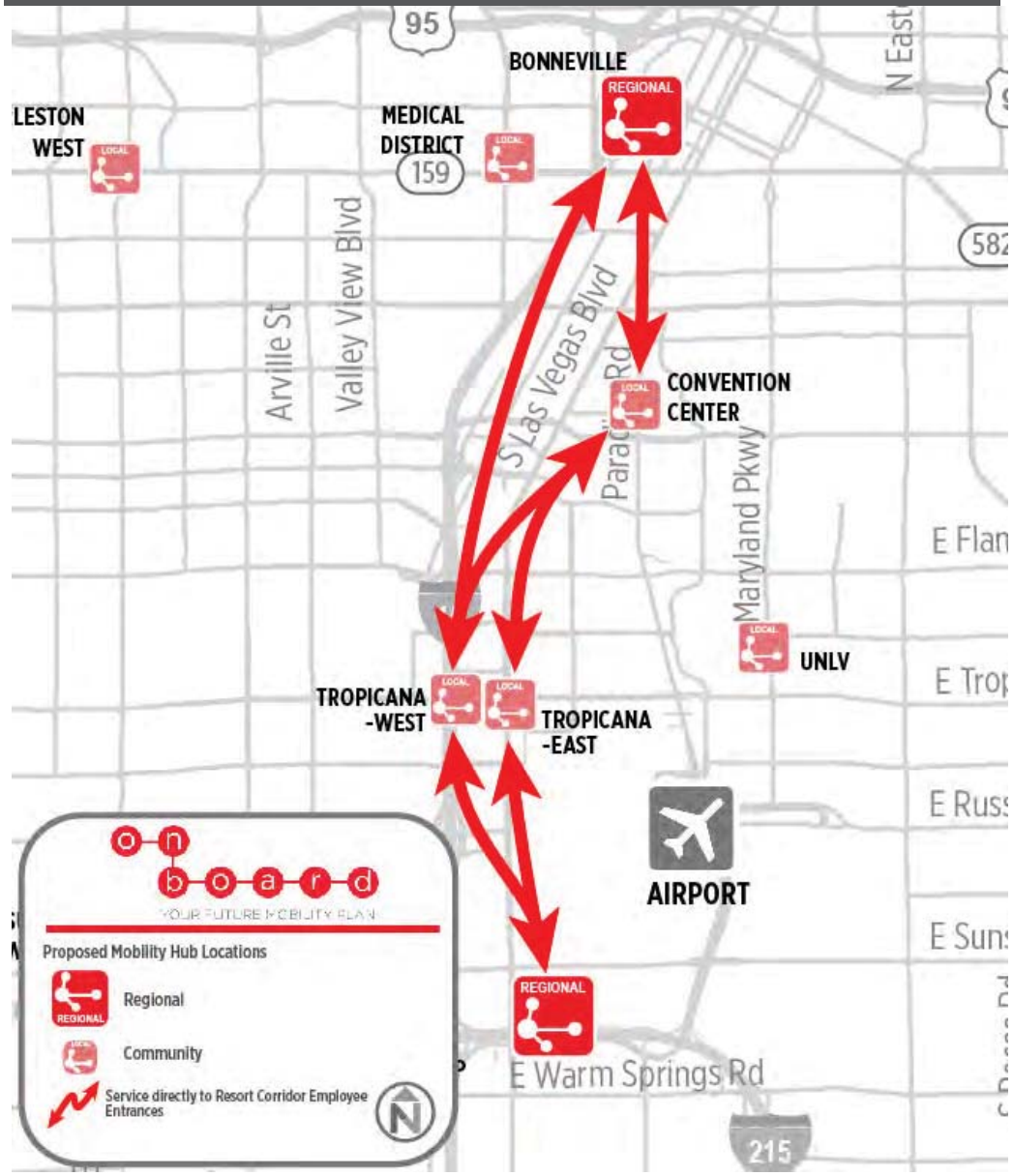
Project 7-1: Develop Mobility Hubs Focused on Resort Corridor & Downtown Connections is related to and will be planned in coordination with the following projects:

- ☑ **Project 7-2:** Develop Direct Service Shuttles to "Back of House" Resort Corridor Employee Entrances
- ☑ **Project 7-3:** Construct Pedestrian Connections for Grade-Separated "Back of House" Locations on West Side of Strip

Project 7-2 is also related to and will be planned in coordination with the overall strategy laid out om the following Big Moves:

- ☑ **Big Move 1:** Build High Capacity Transit System
- ☑ **Big Move 3:** Make Short Trips Easier

Figure 7-A Proposed Locations of Resort Corridor Mobility Hubs



NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Develop mobility hub concept. Begin presenting the concept of mobility hubs into regional and local planning discussion and start educating partners and stakeholders about benefits. Discuss design ideas.	RTC	Clark County City of Las Vegas Nevada Resort Association Culinary Union
2	Develop mobility hub implementation strategy, which includes real estate acquisitions. Identify critical and optional elements and differences between regional and neighborhood mobility hub.	RTC	Clark County City of Las Vegas
3	Develop staffing and maintenance standards for Regional and Neighborhood Mobility Hubs.	RTC	Clark County City of Las Vegas
4	Implementation could begin as part of existing RTC transit corridor project and develop mobility hub as pilot/ demonstration project. This may mean upgrading existing plans or merely changing terms used for passenger facilities.	Clark County City of Las Vegas	RTC
5	Use existing project to create design standards, develop community oriented, context sensitive facility and build regional and/or neighborhood hubs.	RTC	Local Jurisdictions
6	Incorporate regional and neighborhood mobility hub standards and expectations into future transit corridor projects, including High Capacity Transit investments.	RTC	Local Jurisdictions
7	Build out the Resort Corridor's Neighborhood Mobility Hub network as part of other Big Move 7 projects and Big Move 1 High Capacity Transit projects.	RTC	Local Jurisdictions

PROJECT 7-2

Develop Direct Service Shuttles to "Back of House" Resort Corridor Employee Entrances

OVERVIEW

Project 7-2 will deploy shuttle services that connect Resort Corridor employee entrances with mobility hubs located at the north and south ends of the Strip. Shuttles are designed to offer last mile/first mile connections to "back of house" employee entrances and will be operated as frequent services, departing from mobility hubs every 5-10 minutes and offering service spans up to 24 hours a day, although their service could also be targeted to main shift change periods. Figure 7-B shows a schematic of how shuttle services may be structured.

Shuttle service is part of the overall strategy to increase the accessibility of employment and make transit a viable option for Resort Corridor employees. Resort corridor employment shuttles are expected to be especially important as Southern Nevada emerges from the COVID-19 pandemic and employers start to re-hire and redeploy their workforce. Financial hardships imposed by the pandemic will almost certainly result in some workers losing access to a private automobile. These workers will need convenient and safe transportation to re-engage with the workforce.

Timing for Completion	Medium-Term (6-10 years)	**Potential Funding Sources**	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax Transient Lodging Tax/Resort Corridor Room Tax FTA Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) • Bus Facility formula Funds (Section 5339(a)) FTA Discretionary Funds: • Bus and Bus Facilities Program (Section 5339) FHWA Funds Congestion Management Air Quality (CMAQ) Public Private Partnerships
Implementing Agency	Lead: RTC, Resort Corridor Stakeholders Partners: Clark County, City of Las Vegas, Nevada Resort Association, Culinary Union		

BACKGROUND

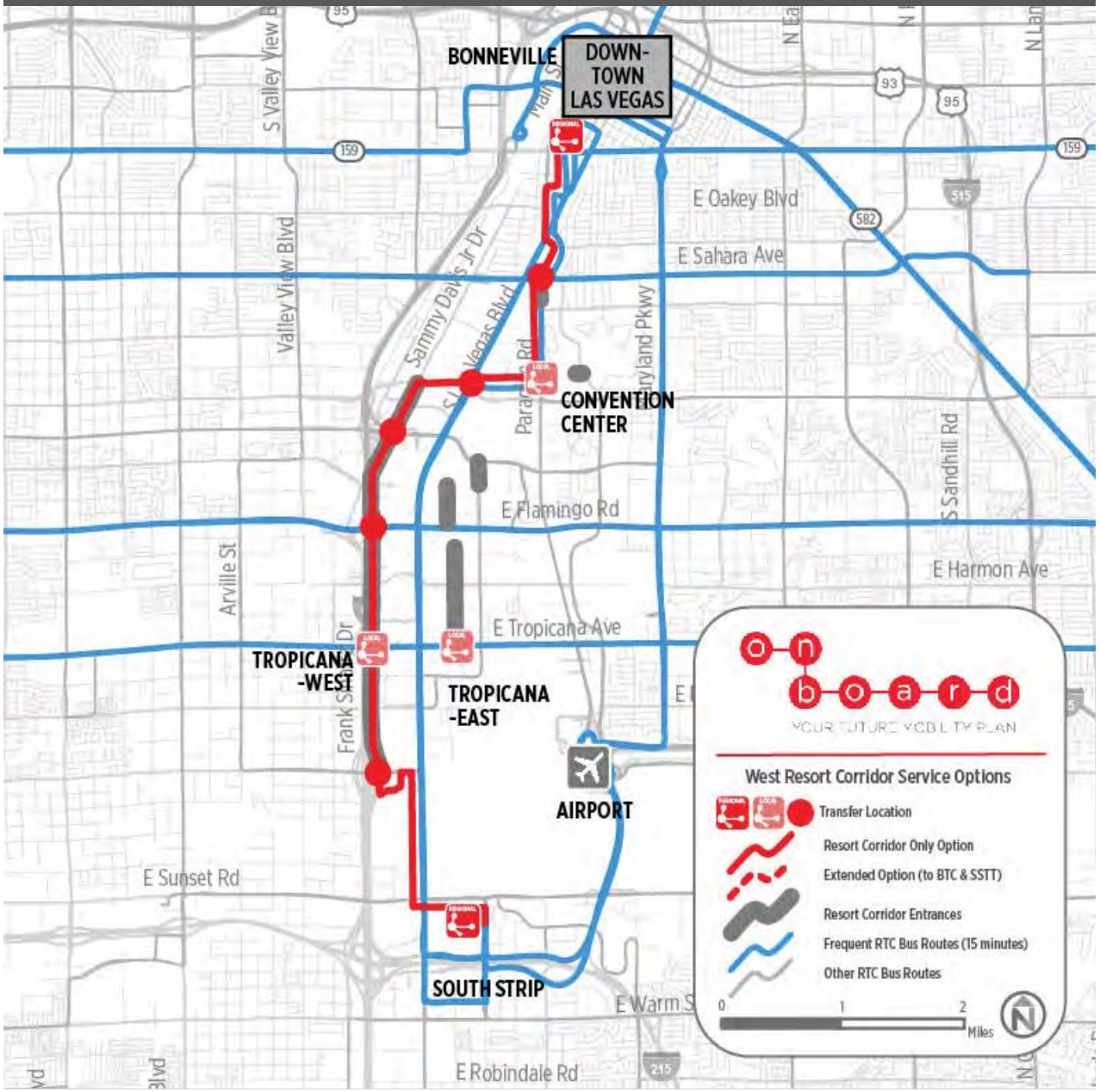
While the Resort Corridor is the largest employment center in Southern Nevada—with approximately 24% of the region's jobs—relatively few employees use transit to get to work. Employees do not take transit to their Resort Corridor jobs for a number of reasons, including frequent availability of free parking on site, and inaccessibility of employee "back of house" entrances, located at the rear of resorts and away from the main corridors well-served by RTC bus routes (see Figure 7-C). As mentioned, the Resort Corridor (Las Vegas Boulevard) is well served with several frequent transit routes and there are multiple high frequency routes operating on streets that intersect with Las Vegas Boulevard (Tropicana, Flamingo, and Sahara). However, while these services bring workers close to resort facilities, access is still challenging. In many cases the pedestrian environment is not safe for walking and in other cases, connections are inaccessible.

Direct shuttle services are designed to fill the gap between existing RTC services and Resort Corridor employee entrances by operating between these entrances and mobility hubs at the north and south end of the Strip.

Figure 7-C Parking and Employee Entrance Access Road on the East Side of the Resort Corridor

Image from moondoggie71 via flickr

Figure 7-B Indicative Back of House Shuttle Service and Connections to Mobility Hubs



BENEFITS

The primary benefit of the Resort Corridor direct service shuttles is two-fold: improving accessibility to jobs on the Resort Corridor for workers, and workforce access for employers. Shuttles combined with the network of mobility hubs will increase the feasibility of commuting by transit to the Resort Corridor and Downtown Las Vegas and improve commutes for resort corridor employees already using transit.

Resort Corridor employee shuttles should be especially important in the region's economic recovery from the COVID-19 pandemic. When resorts begin to re-open and tourists return to Las Vegas in large numbers, the region will need increasing numbers of people to return to work. Depending on the depth and length of the pandemic and subsequent recession, some workers may have lost access to a private automobile, or a single car may be shared by multiple family members. Offering reliable, convenient and easy to use bus service will support workers' return to work, help the region recover faster and prevent families and individuals from falling into poverty and homelessness.

A significant shift of resort employee travel to alternative modes like transit could allow new agreements with employee unions that could reduce the need for resorts to dedicate valuable land to employee parking. Making additional land available for revenue generation could help strengthen the economic potential for some resorts and the regional economy.

CHALLENGES

There are a handful of challenges facing the successful implementation and operation of Resort Corridor employee shuttles. While shuttle services would ensure most jobs on the Resort Corridor are accessible from most of Southern Nevada, they may be a hard sell for some riders. Shuttles are intended to be frequent, but operating costs indicate that service frequency will need to be matched with shift changes and other times when demand is highest. Even with frequent service, the shuttle network requires a transfer at either the south or north end of the trip, a step some riders may be reluctant to make. Funding partnerships with resort properties could increase the feasibility of these shuttles and provide benefits to both employees and employers.

Another challenge reflects the fragmented street network and layout of the resorts. In some cases, shuttles would need to travel in and out of resort properties to reach employee entrances, increasing travel times. In other cases, especially on the west side of the Strip, shuttle riders could be dropped off within walking distance of employee entrances, but sidewalks are incomplete or unavailable. While it is possible to improve access roads and sidewalks, improvements on a combination of public and private property would require partnerships between multiple stakeholders.

The vehicle-focused roadway infrastructure on the back side of the resort facilities is challenging to navigate as a pedestrian. Several streets, including Sammy Davis Jr and Frank Sinatra drives do not have at-grade pedestrian connections with most east-west streets that cross the Resort Corridor. On Board includes **Project 7-3** to construct pedestrian connections for grade-separated "back of House" locations on the west side of the Strip.

COMPANION STRATEGIES

Project 7-2: Develop Direct Service Shuttles to "Back of House" Resort Corridor Employee Entrances is related to and will be planned in coordination with the following specific projects:

- ☑ **Project 7-1:** Develop Mobility Hubs Focused on Resort Corridor & Downtown Connections
- ☑ **Project 7-3:** Construct Pedestrian Connections for Grade-Separated "Back of House" Locations on West Side of Strip

Project 7-2 is also related to and will be planned in coordination with the overall strategy laid out om the following Big Moves:

- ☑ **Big Move 1:** Build High Capacity Transit System
- ☑ **Big Move 2:** Expand Transit Service to Maximize Access to Jobs and Housing
- ☑ **Big Move 3:** Make Short Trips Easier

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Develop service plan for shuttle services. Work with the Resort Corridor unions to understand shift times and travel patterns. Design shuttles around work shifts, identify routings, and develop marketing plan.	RTC	Clark County City of Las Vegas Nevada Resort Association Culinary Union
2	Support transit alignment with shaded waiting areas.	RTC	Clark County City of Las Vegas
3	Work with employers to consider free or reduced transit passes for Resort Corridor employees	RTC	Nevada Resort Association Culinary Union
4	RTC will ensure shuttle routing connects directly with new pedestrian connections created as part of **Strategy 7-3**	RTC	Clark County City of Las Vegas
5	Roll out shuttle service from Bonneville transit center and the South Strip transit center to the back of house Resort Corridor entrances via the east and west access roads	RTC	Clark County City of Las Vegas

PROJECT 7-3

Construct Pedestrian Connections for Grade-Separated "Back of House" Locations on West Side of Strip

OVERVIEW

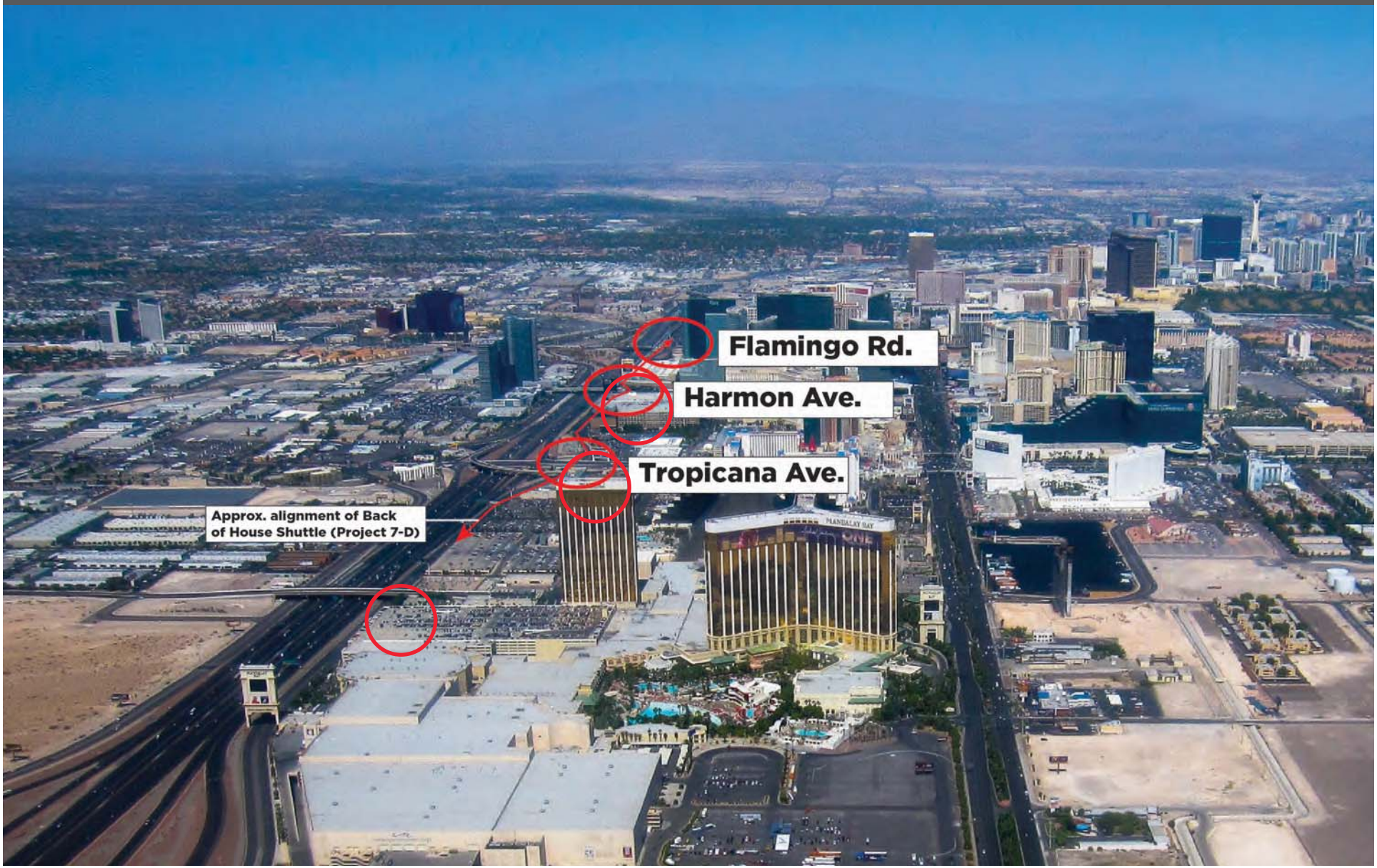
Project 7-3 will build pedestrian connections between Frank Sinatra Drive, which runs behind the Resort Corridor, and the east-west corridors that cross the strip (Tropicana, Hacienda and Harmon Avenues) (see Figure 7-D). Currently, the roadways are grade-separated making them inaccessible for walkers and cyclists. This means that transit riders, including people using future High Capacity Transit routes, cannot access employee entrances along Frank Sinatra Drive. Building pedestrian connections would add stairs, ramps, and elevators, facilitating connections both to regular RTC services and to potential new direct shuttle services.

Timing for Completion	Medium-Term (6-10 years)	**Potential Funding Sources**	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax Transient Lodging Tax/Resort Corridor Room Tax FTA Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) • Bus Facility formula Funds (Section 5339(a)) FTA Discretionary Funds • Bus and Bus Facilities Program (Section 5339) FHWA Funds • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grant (STBG) Program Public Private Partnerships
Implementing Agency	Lead: RTC, Resort Corridor Stakeholders Partners: Clark County, Nevada Resort Association, Culinary Union		

BACKGROUND

Several employee entrances for properties on the west side of the Resort Corridor are located along Frank Sinatra Drives. As described in **Project 7-1**, these entrances could be served by local bus service or new direct shuttles operating between the Bonneville Transit Center (BTC) and the South Strip Transit Terminal (SSTT). Unfortunately, Frank Sinatra Drive does not have an at-grade intersection with the major east/west corridors that cross the Resort Corridor. This makes it difficult—and in some case, impossible—for passengers on east-west transit routes (i.e., Tropicana) to transfer to shuttles operating on the west side of the Strip. Constructing pedestrian connections at key intersections will solve this problem by providing access between east-west roadways and shuttle services operating at Frank Sinatra Drive via stairs, ramps, and elevators (see Figure 7-E for example design). Building these connections create a simpler, faster, and safer connection.

Figure 7-D Potential Locations for Pedestrian Connections on West Side of the Resort Corridor



BENEFITS

Pedestrian connections between east-west corridors and Frank Sinatra are the final piece of the puzzle required to make Resort Corridor employment accessible by allowing employees to use existing RTC services on Tropicana and Sahara to connect with Frank Sinatra Drive. Potentially boarding a shuttle or possibly walking to work, depending on their destination, these improvements would allow connections between direct shuttle routes (Project 7-2) and existing services, giving potential riders more options to find the route combinations that work best for them.

Creating transit links to the west side of the Resort corridor opens access to jobs at several major resorts, restaurants, shops and hotels. Because the shuttles would connect with the wider transit network, the connections would increase job access and opportunities for workers and likewise expand the labor pool for employers. When Las Vegas is booming, encouraging workers to take the bus helps manage congestion. During times of economic recovery, offering transit access gives people more options for getting to work.

CHALLENGES

Building stairs, ramps, and elevators to create connections between grade-separated roadways usually requires retrofitting existing systems and infrastructure, which can be complicated. Even effectively designed connections can be inconvenient and cumbersome for pedestrians to use, especially individuals with disabilities. In addition to capital investments, pedestrian bridges and ramps require ongoing maintenance to ensure facilities are safe, clean and comfortable for pedestrians. Additionally, maximizing the usefulness of these facilities requires companion investments in pedestrian and bicycle infrastructure near these intersections.

COMPANION STRATEGIES

Project 7-3: Construct Pedestrian Connections for Grade-Separated "Back of House" Locations on West Side of Strip is related to and will be planned in coordination with:

- ☑ **Project 7-1:** Develop Mobility Hubs Focused on Resort Corridor & Downtown Connections
- ☑ **Project 7-2:** Develop Direct Service Shuttles to "Back of House" Resort Corridor Employee Entrances

Project 7-2 is also related to and will be planned in coordination with the overall strategy laid out om the following Big Moves:

- ☑ **Big Move 1:** Build High Capacity Transit System
- ☑ **Big Move 3:** Make Short Trips Easier

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Conduct needs assessment on infrastructure gaps at key intersections. Prioritize gaps based on highest needs.	RTC	Clark County City of Las Vegas Nevada Resort Association Culinary Union
2	Identify targeted intersections and plans for roadway and interchange improvement projects. Partner with relevant agencies when projects are being planned, designed and constructed.	RTC	Clark County City of Las Vegas
3	Plan and design connecting infrastructure. Planning process will include collaborations with adjacent property owners. Designs must consider ADA and intersections with other pedestrian infrastructure.	Clark County City of Las Vegas	RTC Clark County Department of Aviation
4	Identify funding sources and construct facilities.	Clark County City of Las Vegas	RTC
5	Use signage and wayfinding to direct travelers to facilities.	Clark County City of Las Vegas	RTC

Resort Corridor Partnerships

Big Move #7 identifies projects that will make commuting by transit to the Resort Corridor faster, easier and safer. Supporting Resort Corridor employees is a priority shared by the RTC, Clark County and the Nevada Resort Association. As Big Move #7 is implemented, there will be opportunities to partner with private transportation operators such as the Las Vegas Monorail. The Las Vegas Monorail already provides convenient, safe and efficient access with many of the stations near employee entrances of many east Resort Corridor employees. There are also monorail stations within a short walk of frequent east/west RTC routes on Sahara Avenue, Flamingo Road and Tropicana Avenue. Successful implementation of Big Move #7 will require partnerships with Resort Corridor stakeholders.

Las Vegas Monorail
Image from ReviewJournal.com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BIG MOVE

Leverage New Technology to Improve Mobility and Sustainability

RTC On Board Strategies Survey (January-March 2020)
11,221 respondents

OVERVIEW

Emerging transportation technologies are creating new opportunities for RTC to improve and augment all modes of transportation across Southern Nevada. On Board includes a variety of projects and recommendations that would leverage new, emerging, and next generation technologies that are already influencing and will continue to change the way we travel. These systems will make it easier to plan, book or schedule, and pay for trips and travel; they will create more ways to track and watch vehicles arrive at their destinations, and integrate travel choices across a variety of modes, such as transit, rideshare and micro mobility. There are also a multitude of technologies that will change our vehicles and roadways, including connected and autonomous vehicles and alternative fuels and fueling systems.

On Board is a mobility plan for the next twenty years, during which time new technologies will become commonplace.

Emerging technologies will be expanded and improved, and we will begin to see next generation systems in widescale testing and implementation. On Board is designed to prepare Southern Nevada to move forward with new systems and technologies as they prove viable and effective. RTC and Southern Nevada's transportation providers can begin to prepare for these technologies and future proof investments so the region can adapt and respond.

The following 10 projects showcase how RTC and regional partners can adopt new technologies into Southern Nevada's transportation system over both the short-term and long-term timeframes. Complete project or program-level planning will be conducted as each project is fully developed and as specific technologies become more feasible.

- ☑ Provide Real-Time Information at High Volume Transit Stops
- ☑ Improve Payment Options and Information Sharing
- ☑ Develop and Implement "Mobility as a Service" Program and Platform
- ☑ Develop Public Electric Vehicle Charging Network
- ☑ Shift to Electric Transit Vehicles
- ☑ Develop Solar Charging for RTC Transit Vehicles
- ☑ Expand Travel Demand Management (TDM) Programs
- ☑ Implement "FAST OS" (RTC Freeway and Arterial System of Transportation Technology Roadmap)
- ☑ Shift to Autonomous Transit Vehicles as Technology Permits (10+ years)
- ☑ Monitor and Incorporate Emerging Transportation Technologies and Update Road Designs as Needed

PUBLIC HEALTH, TECHNOLOGY AND TRANSIT SYSTEMS

While the length of economic recovery from the COVID-19 pandemic remains unknown, we do know that transit, like many industries, will need to change. Transit agencies must figure out how to address safety concerns, continue to serve customers that rely on transit, attract other customers back, and prepare for a new transportation paradigm. And they must do so while maintaining financial viability and continuing to meet their public mission.

While OnBoard lays out a roadmap for mobility improvements and investments, in the immediate term, RTC faces the difficult challenge of how to "right size" service, attract riders back and manage transit operations costs. As the RTC begins to assess the impacts of the COVID-19 pandemic and move forward with On Board investments, there will be opportunities to use technology and marketing to address public health concerns. A handful of best practices related to addressing public health concerns on public transit systems have emerged over the past few weeks. Two of these best practices are called out here, but are not included as formal projects because they were identified outside of the OnBoard planning process.

BEST PRACTICE: CREATING A CLEAN BRAND

Public transit is not the only industry challenged to attract customers back to their services. The hospitality industry, for example, has moved swiftly to demonstrate their commitment to public health and high standards for cleanliness. The Hilton brand of hotels, for example, is promoting the "Hilton CleanStay" program, which includes a collaboration between Hilton, the Mayo Clinic's Infection Protection and Control Team, and RB, the maker of Lysol and Dettol.

There is potential for the transit industry to adapt this strategy and create a new "clean brand" to promote updated standards and commitment to protecting public health. The brand provides opportunities to package and announce changes in cleanliness in ways that are proactive and accessible. Developing a clean brand is also a lower cost strategy with potential for a big impact on riders and non-riders.

BEST PRACTICE: ULTRAVIOLET LAMPS

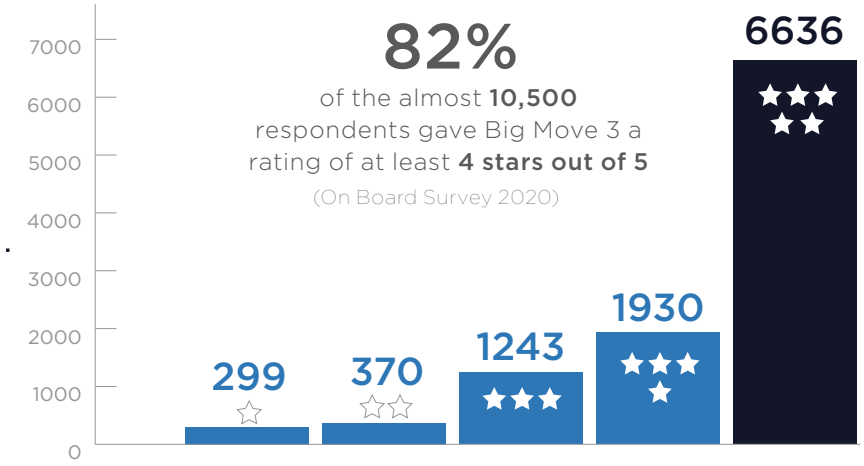
Large transit agencies in the United States, including the MTA in New York City, are piloting the use of ultraviolet lamps to disinfect trains, buses, stations, and crew facilities. The lamps use UVC, which is safe for humans but kills the virus responsible for COVID-19. These systems are used in hospital operating rooms and offer potential to clean more effectively. Individual devices are relatively inexpensive (estimated at less than $10,000 per device) and offer potential for cost savings over the long run. RTC may consider developing a pilot project to test similar technology on their buses, transfer facilities, and staff rooms. Success with this technology will also help RTC bolster its "clean brand" and response to the pandemic.[1]

1 MTA spends $1 million to test disinfecting NYC subways with UV Light: It's like a UV chamber

Figure 8-A Example of UVC lamp placed in subway car (MTA, New York City)

Image from MTA New York City Transit

SURVEY FINDING



82%

of the almost **10,500** respondents gave Big Move 3 a rating of at least **4 stars out of 5**

(On Board Survey 2020)

Southern Nevada residents gave Big Move 8 and all of its associated strategies a rating of

4.4 out of 5 stars

(On Board Survey 2020)

50%

of Southern Nevadans want RTC to incorporate new transportation technologies

(RTC Access2040 Vision Survey 2016)

49%

of survey respondents say that new technologies would encourage them to take a new mode of travel

On Board Vision Survey 2018

KEY BENEFITS

All mobility strategies generate benefits for individual travelers, the regional economy and the environment. The graphic below provides a relative scale of the benefits.

EFFECTIVENESS IN ADDRESSING REGIONAL PRIORITIES

Improving Regional Connections to Major Destinations will directly help achieve the following priorities identified through extensive public outreach with nearly 80,000 people and multiple surveys that had almost 25,000 combined responses:

REGIONAL MOBILITY PRIORITIES

1	Improved Road & Transit Safety	●
2	Fewer Traffic Jams	●
3	High Capacity Transit (including light rail)	●
4	Better Connectivity	○
5	Well-Maintained Roads	○
6	Frequent Bus Service	◒
7	More Transportation Choices	●
8	Expanded Service for Seniors, Veterans, & People with Disabilities	●
9	Improved Job & Housing Access	●
10	Better Walking & Biking Conditions	○
11	New Modal Technologies & Investments	●
12	Expanded Transit Service Area	○
13	New Information Technologies	●
14	Better Transit Stops & Stations	◒
15	Improved Transit Security	●

KEY | ● Strongest ◒ Strong ○ Less Strong

The MTA in New York City is conducting a pilot project testing the use of UVC lighting to clean subway car and kill traces of COVID-19 virus.
Image from MTA New York City Transit

PROJECT 8-1

Provide Real-Time Information at High Volume Transit Stops

OVERVIEW

Project 8-1 will deploy digital signs at transit stops to provide real-time information about bus arrival and departure times. These signs are designed to help riders better plan their trips. Information displayed will likely include:

- ☑ Bus arrival estimates for all bus routes assigned to the stop
- ☑ Expected travel times to major destinations
- ☑ Rider alerts for planned and emergency service changes
- ☑ Bus transfer information, including for nearby stops

These signs can also include information that goes beyond transit services, such as wayfinding, nearby activity centers, public events, and advertisements. Figure 8-B shows an example of real-time information signage

Timing for Completion	Near Term (1-5 years)	**Potential Funding Sources**	Local Transit Sales Tax Federal Transit Administration (FTA) Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) • Bus-Bus Facility Formula (Section 5339(a)) Federal Transit Administration Discretionary Funds • Accelerating Innovative Mobility (AIM) Grants • Future FTA Mobility Grant Funding Public-Private Partnerships
Implementing Agency	Lead: RTC Partners: Local jurisdictions		

BACKGROUND

RTC currently provides real-time information through the following tools and methods:

- ☑ Ride Tracker on the RTC website
- ☑ Transit app
- ☑ RideRTC app
- ☑ RideRTC mobile text messaging service
- ☑ Google Transit Data Feed (GTDF) for Google Maps and third-party developers

Figure 8-B Real-time information signage example (Cambridge, MA)

Image from Soofa

Though useful for planning and timing travel before arriving at a bus stop, these services require the use of a cell phone and/or internet access. As a result, people who do not have access to a cell phone or internet, for any number of reasons ranging from a dead or dying battery, concerns about data use, or not owning a phone, cannot use these services. Project 8-1 will deploy digital signage at high-volume stops to give information access for anyone waiting at that stop or walking past it.

BENEFITS

With real-time information signage at transit stops, riders can see when their bus is arriving, and other alerts, without having to search on their phone or download an app. With knowledge of how long they must wait, riders can make informed decisions, such as where to wait at night when they may feel less safe. Having information about bus transfers, especially if it includes how to walk to a nearby stop to complete their transfer, can help increase rider confidence and ease of transfers.

Placing non-transit information on these digital signs may also improve wayfinding for people after they exit buses at these high-volume bus stops. By providing information on nearby activity centers or key destinations, people will be encouraged to walk more to explore these locations. Similarly, easy access to information about bike share or micro mobility options may increase their utilization. RTC or local jurisdictions can also earn advertising revenue through these signs. Lastly, having this technology at high-volume bus stops denotes a more premium level of service, increasing the attractiveness of transit.

CHALLENGES

For this technology to work well, automatic vehicle location (AVL) technology must be well-maintained, since giving inaccurate information may cause riders to lose trust in the system. There must also be adequate space to install the digital signs, taking care not to block sidewalks. Additionally, if RTC and local jurisdictions choose to sell advertising space on these signs, they must be careful that the advertisements do not overshadow crucial transit or mobility information. The agencies will also likely need to create guidelines for selecting activity centers, public events, or other destinations to highlight.

COMPANION STRATEGIES

Project 8-1: Provide Real-Time Information at High Volume Transit Stops is related to and will be planned in coordination with the following projects:

- ☑ **Project 8-2:** Improve Payment Options & Information Sharing
- ☑ **Project 4-4:** Make Bus Stops Inviting and Safe
- ☑ **Project 4-5:** Develop Regional Mobility Hubs
- ☑ **Project 4-6:** Develop Neighborhood Mobility Hubs

Project 8-1 is also related to and will be planned in coordination with the overall strategy laid out in the following Big Moves:

- ☑ **Big Move 1:** Build High Capacity Transit
- ☑ **Big Move 4:** Make Short Trips Easier

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Create criteria to select bus stops to put real time signage, based on volume of boardings and alightings, space availability, and other metrics	RTC	Local Jurisdictions
2	Rank chosen bus stops in order of priority	RTC	Local Jurisdictions
3	Choose signage type and supplier for first phase of bus stops	RTC	Local Jurisdictions
4	Develop a policy for advertisements and potential public-private partnerships to partly fund this program	RTC	Local Jurisdictions
5	Launch the first series of digital signs and collect feedback before launching more	RTC	Local Jurisdictions

PROJECT 8-2

Improve Payment Options & Information Sharing

OVERVIEW

Project 8-2 will improve payment options and customer information about available services by providing the following:

- ☑ Real-time electronic update signs at transit stops
- ☑ Fare payment with mobile devices to pay fares
- ☑ Trip planner that includes information about other complementary services such as rideshare

These services will make it easier to plan and pay for trips, creating a more convenient experience for RTC riders.

Timing for Completion	Near Term (1-5 years)	**Potential Funding Sources**	Local Transit Sales Tax Federal Transit Administration (FTA) Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) Federal Transit Administration Discretionary Funds: • Accelerating Innovative Mobility (AIM) Grants • Mobility on Demand (MOD) Sandbox Program • Future FTA Mobility Grant Funding Public-Private Partnerships
Implementing Agency	RTC		

BACKGROUND

RTC riders and potential riders can currently access fare payment and transit information through the following ways:

- ☑ RideRTC app (Figure 8-C), which can be used to buy transit passes, use transit passes, plan trips, and get real time information. App users must use a credit card to purchase passes, and single ride residential passes cannot be purchased on the app. The trip planning function only includes transit trips
- ☑ RTC website, for information on where to buy passes and to order a paratransit pass

Figure 8-C RideRTC App

- ☑ In-person at Bonneville Transit Center, the RTC Admin Building, or at approved vendors (who may charge extra fees)
- ☑ At ticket vending machines at major transit centers and park-and-rides for one way and day passes
- ☑ On board vehicles
- ☑ Uber app, which can be used to buy and redeem transit passes

An added complication to RTC fare payment is that each of the sources above offers a different subsect of passes (visitors versus residential, one day versus weekly or monthly). Project 8-2 aims to streamline fare payment, as well as offer trip planning information. The updated fare payment and trip information platform may also be expanded to include other modes like rideshare as the RTC moves closer to Mobility as a Service (see Project 8-3).

Updates to fare policies and fare media are increasingly important in the wake of the COVID-19 pandemic and public health concerns about touching things where the virus could linger. This could be a concern to both passengers and drivers who may be required to touch a farebox or handle cash. In the short-term, RTC responded by implementing rear-door boarding and not collecting fares, reducing interactions between drivers and passengers and the need to touch the farebox. It is unclear if this is a sustainable strategy over the long term, especially considering the RTC currently earns 47.8% of its revenue through fares.[1] As a result, there are immediate term opportunities to simplify fare structures and advance a cashless fare strategy.

1 RTC Fiscal Year 2020 Budget Overview (https://www.rtcsnv.com/about/fiscal-year-2020/)

BENEFITS

Expanding the capabilities of the RideRTC app will give more riders and potential riders additional options for how they pay for rides and buy passes, including cash. In addition to RTC's existing partnership with Uber for riders to buy transit passes on the Uber app, RTC could also explore accepting transit fare payments from other mobile wallets, such as Apple Pay and Google Pay. Fare capping is a related strategy that creates a more equitable way to reach the cost of a monthly pass (see Project 2-9).

Integrating other modes into the trip planner expands the reach of transit by connecting fixed route service to a wider range of first mile/last mile options. Showing these options together as an integrated trip journey makes it easier for people to see how a complete trip can be made and compare/contrast the advantages of different mode choices. Improving payment options and information sharing also makes it easier for visitors to use the transit system and helps make the region more economically competitive.

CHALLENGES

Developing and implementing fare payment systems and technologies raises issues about service development and maintenance. Some of the technology required to fully bring Project 8-2 to completion may be best developed through partnering with a technology company rather than in-house. That said, RTC would benefit from not paying the full costs of developing systems and instead take responsibility for adapting existing technologies to their needs. This approach shares costs more reasonably and helps ensure technology kinks are worked out before RTC adopts the technology.

Though most Americans have cell phones, mobile data access and credit card ownership is less guaranteed. Thus, RTC should take care to maintain analog methods of fare payment, including allowing cash payments on board buses, at fare machines, and/or at major transit centers.

COMPANION STRATEGIES

Project 8-2: Improve Payment Options & Information Sharing is related to and will be planned in coordination with the following projects:

- ☑ **Project 8-1:** Provide Real-Time Information at High Volume Stops
- ☑ **Project 8-3:** Develop & Implement "Mobility as a Service" Program and Platform
- ☑ **Project 2-9:** Implement Transit Fare Capping Program
- ☑ **Project 5-5:** Provide App-Based Reservations and Fare Payment for Specialized Services
- ☑ **Project 5-6:** Provide App-Based Vehicle Tracking for Specialized Services

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Review RTC's fare policy, fare structures, and fare media	RTC	
2	Evaluate cashless fare systems, including mechanisms to use cash to pay for fares on the RideRTC app and/or adding a mobile wallet to pay for single rides	RTC	
3	Discuss changes to RideRTC app with app developer	RTC	
4	Evaluate opportunity to fare media strategy with related systems and strategies, such as fare capping and mobility as a service	RTC	Local Jurisdictions
5	Beta test improved RideRTC app and collect feedback	RTC	Local Jurisdictions

Las Vegas Convention Center People Mover

The Las Vegas Convention and Visitors Authority (LVCVA) is currently partnering with The Boring Company to construct and operate the Las Vegas Convention Center (LVCC) underground people mover to transport convention attendees throughout the 200-acre convention center campus. Unique features of the people mover include the use of modified Tesla electric vehicles for passenger transportation and high speed tunnel boring machines that dig narrow tunnels up to 40 feet below the surface. The LVCVA underground people mover will be comprised of two vehicular tunnels with an expected total length of approximately one mile each, and is designed to replace a 15 minute walk with a two minute ride. As of June 2020, the first tunnel had been completed; the people mover is scheduled to open in January 2021 as part of the Consumer Electronics Show (CES).

When it opens, the Las Vegas Convention Center people mover will be the first commercial transportation project completed by the Boring Company. After assessing operations and feedback from this first project, the system will have the potential in the future to expand and link key visitor attractions throughout Las Vegas, such as Downtown Las Vegas, Las Vegas Strip, McCarran International Airport and beyond.

Image from Las Vegas News Bureau/Las Vegas Convention and Visitor Authority

PROJECT 8-3

Develop & Implement "Mobility as a Service" Program and Platform

OVERVIEW

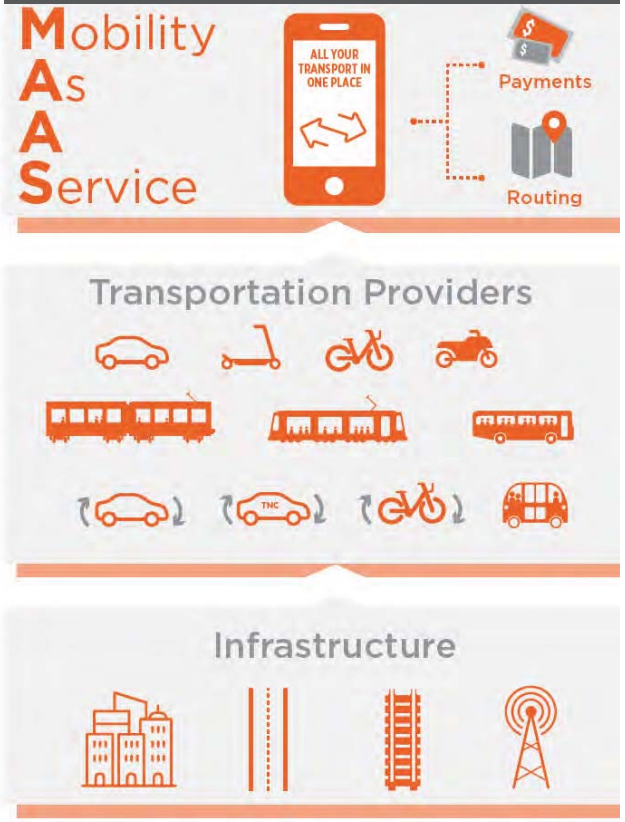
Project 8-3 will deliver an integrated single platform, Mobility as a Service (MaaS), that will provide integrated information, access abilities and payment options for multiple transportation services, such as transit, car share, ride share, and micro mobility (bicycles, scooters, etc.). Southern Nevada residents and visitors will be able to use this platform for all their transportation needs.

Full implementation of MaaS (Figure 8-D) consists of the following:

- ☑ Multiple options: the abillity to combine and choose among many different transportation options, including transit, bikeshare, scooter-share, rideshare, and more
- ☑ Trip planning: advanced trip planning that provides information on all available options, including location and cost
- ☑ Booking and paying: ability to purchase tickets for all options via the app, ability to purchase short and long term passes that combine multiple transportation modes, provision of demand-based pricing including surges and discounts
- ☑ Unlocking and using: using phone to enter transit or to unlock shared vehicles
- ☑ Real-time information: provides real-time information on service changes, emergencies, and other needed knowledge for using all available transportation options.

Timing for Completion	Medium Term (6-10 Years)	**Potential Funding Sources**	Local Transit Sales Tax Federal Transit Administration (FTA) Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) Federal Transit Administration Discretionary Funds: • Accelerating Innovative Mobility Grants • Mobility on Demand (MOD) Sandbox Program Future FTA Innovation Grants
Implementing Agency	RTC		

Figure 8-D Mobility as a Service Components



BACKGROUND

The RideRTC app combines the ability to plan and pay for transit trips, which provides significant convenience for riders and visitors. Developing MaaS will require adding modes and features that would provide the integration of services that allow customers to plan and pay for their complete trip.

Other transit service platforms such as Transit App and Google Maps are starting to test out their multi-modal trip planning capabilities, expanding information beyond transit and walking. Once the technology becomes available, MaaS can make travel by alternative modes much easier and simpler for residents and visitors.

BENEFITS

Implementing MaaS will improve trip planning and travel for everyone. Adding the full complement of information, access options and payment methods gives people more options, especially for first mile/last mile connections. It will encourage existing riders to use transit more often and brings additional riders into the RTC system. Convenience and time-saving benefits will accrue to Southern Nevada residents as well as visitors.

Technology development costs could potentially be shared by the private sector. However, if the technology development costs are transferred to the private sector, private sector partners will expect a portion of the ongoing revenues, potentially up to 10% of the revenue generated through development of the technology

CHALLENGES

MaaS presents a series of technical, operational, and competition-related challenges:

- ☑ On the technical side, one entity must be responsible for developing and managing the app. This could be a third party that combines and presents information as a for-profit venture, or it could be a transit system that contracts with a developer to create a local app.
- ☑ Beyond development of the app, all service providers included in the app must be able to share and access data. This means systems for providing information and collecting fares/fees must be compatible. Both RTC and other transportation providers will likely need to develop new technical capabilities that they do not currently have.
- ☑ For competitive reasons, some private companies may not want to give travelers the option to choose their mode and a competitor's mode in the same app. As MaaS as a concept matures, competing platforms will likely emerge and agencies and providers may be forced to choose between competing platforms.
- ☑ Private sector partners may be willing to absorb technology development costs, but only if they position themselves to share in the ongoing benefits. Some technology developers have expected a cost sharing agreement where they receive 10% of fare revenues or rental fees.

COMPANION STRATEGIES

Project 8-3: Develop & Implement "Mobility as a Service" Program and Platform is related to and will be planned in coordination with the following projects:

- ☑ **Project 8-2:** Improve Payment Options and Information Sharing
- ☑ **Project 2-5:** Rideshare Partnerships for First Mile/Last Mile Connections to Transit in Suburban Areas
- ☑ **Project 2-7:** Rideshare Partnerships for Non-Suburban First Mile/Last Mile Services
- ☑ **Project 2-9:** Implement Transit Fare Capping Program
- ☑ **Project 5-5:** Provide App-Based Reservations and Fare Payment for Specialized Services
- ☑ **Project 5-6:** Provide App-Based Vehicle Tracking for Specialized Services

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Improve the RideRTC app as outlined in Project 8-2	RTC	RTC
2	Monitor technology companies and peer cities as they pilot components of Mobility as a Service and troubleshoot any obstacles	RTC	Local Jurisdictions
3	As technology companies approach full MaaS capabilities, decide between contracting a developer to create an in-house MaaS application or to join into a third-party application	RTC	
4	Convene and negotiate with other transportation providers regarding data sharing, information sharing, and subscription bundles	RTC	Local Jurisdictions
5	Launch a pilot and gather feedback	RTC	Local Jurisdictions
6	Continue to focus on public interest and regional mobility needs when evaluating different platforms; encourage open-source software and data solutions so that competition occurs by providing service enhancements, and not through limiting access to data and options	RTC	Local Jurisdictions

Integrated mobility apps will allow people to use the same app to pay transit fares, unlock bike share and book other travel options.

PROJECT 8-4

Develop Public Electric Vehicle Charging Network

OVERVIEW

Project 8-4 would build a regional, public access electric vehicle charging network across the Valley. The network of charging stations will be integrated with photovoltaic solar panels, potentially allowing the panels to provide shade for the vehicle and generate renewable energy, which can be sent to the grid and used to offset vehicle charging costs.

These public access electric vehicle chargers would be placed near major activity centers and spread across the Valley. Potential locations include all park-and-rides and mobility hubs, as well as municipal parking lots and on-street parking spots. Through partnerships with private entities, chargers could also be placed on private lots. Installing chargers could be done through a staggered timeline, focusing on major public areas first.

Timing for Completion	Short Term (1-5 Years)	**Potential Funding Sources**	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax Federal Transit Administration (FTA) Formula Funds: • Urbanized Areas Formula Grants Program (Section 5307) Federal Highway Administration (FHWA) Funds • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grant (STBG) Program US Department of Energy Grants Volkswagen Settlement Funds Public Private Partnerships
Implementing Agency	Lead: Local Jurisdictions Partner: RTC		

Figure 8-E Curbside Electric Vehicle Charging

Image from visitor7 via Wikimedia Commons

BACKGROUND

Electric vehicles (EV) are currently charged mostly at home, although worksites are the second most common location for charging infrastructure[1]. Overall, however, the network of charging stations is small, especially when compared with the network of fueling stations available to gasoline-powered vehicles. Indeed, access to fueling stations is a main contributor to concerns that EV owners – and potential EV owners – have about refueling and "range anxiety" and is a major reason more people have not switched over to EVs. Even the additional visibility of a charging network can have a substantial impact on adoption rates for electric vehicles.

Project 8-4 would greatly expand the region's network of electric vehicle charging. In 2020, non-home based EV chargers in Las Vegas are primarily located within hotel and resort parking lots, with a smaller but sizeable number located in parking lots of municipal and public buildings. Chargers located within hotel parking lots are not completely available to the public, given valet parking and hotel guest restrictions. Before the COVID-19 outbreak and subsequent economic impacts, many local gas stations were planning to start providing some type of EV charging capacity; the status of those plans is unknown at the time of this writing.

Most existing EV chargers are powered by the general electric grid. Electricity in Nevada is still primarily generated from natural gas, with only 26% from renewable sources[2], although renewable sources are gradually trending upward.

1 U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Electric Vehicles (https://www.energy.gov/eere/electricvehicles/electric-vehicles)

2 U.S. Department of Energy, Energy Information Administration Nevada State Profile ()https://www.eia.gov/state/analysis.php?sid=NV

BENEFITS

If paired with an effective marketing campaign, building out the public access EV charging network will likely increase adoption of EVs by reducing concerns that charging infrastructure is too limited or inaccessible. Increased EV usage reduces local emissions of pollutants and greenhouse gases. Including solar panels with the chargers can provide shade and ensures that the systems will reduce emissions associated with energy production.

CHALLENGES

Creating a network of electric vehicle chargers requires buy-in from those who own parking lots or spaces to put these chargers, which includes both private landowners and local jurisdictions. Creating a comprehensive network means the RTC and local jurisdictions must partner with landowners across the region to encourage and support installing EV chargers. Installations must also coordinate with the electric utility provider, since these chargers will be connected to the grid, even if the installations also produce their own solar energy.

While the addition of photovoltaic panels will produce electricity, the amount produced by an EV charger is not large enough to supply enough electricity to efficiently and reliably charge an EV. While the technology could advance, existing configurations would connect both the solar panels and vehicle charging systems to grid. Lastly, switching from gasoline-powered cars to electric vehicles, compared to public transit, does not reduce congestion and many of the problems associated with congestion.

COMPANION STRATEGIES

Project 8-4: Develop Public Electric Vehicle Charging Network is related to and will be planned in coordination with the following projects:

- ☑ **Project 4-5:** Develop Regional Mobility Hubs
- ☑ **Project 4-6:** Develop Neighborhood Mobility Hubs
- ☑ **Project 6-6:** Improve Commuter Facilities & Services: Develop Park and Ride Lots with Express Service Connections to Major Destinations

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Conduct an EV charger needs assessment and locations analysis. Determine the best locations	RTC Local Jurisdictions	
2	Develop funding source and adjust implementation schedule to align with funding	Local Jurisdictions	RTC
3	Identify specific locations for installations, potentially including at both public and private properties	Local Jurisdictions	
4	Select EV charging technolog	Local Jurisdictions	RTC
5	Advance implementation, potentially with initial installations implemented as a demonstration project	Local Jurisdictions	RTC

On Board calls for expanded electric vehicle charging locations.

PROJECT 8-5

Shift to Electric Transit Vehicles

OVERVIEW

Project 8-5 will transition RTC buses to zero-emission electric buses to improve local air quality, lower greenhouse gas emissions, and reduce transit vehicle maintenance and fuel costs. Battery electric buses also ensure a smoother and quieter ride, creating a more premium experience for RTC riders across the entire network.

Shifting to electric transit vehicles requires changes in operations, maintenance, and infrastructure. Maintenance facilities would be upgraded to charge and maintain new electric buses, which will likely require different design and electrical connections than existing facilities. Transit schedules will also shift to accommodate the needs of electric buses in terms of charging time and vehicle ranges.

Timing for Completion	Medium Term (6-10 Years)	**Potential Funding Sources**	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax Federal Transit Administration Discretionary Funds • Bus and Bus Facilities Program (Section 5339) • FTA Low or No Emission Vehicle Program (Section 5339(c)) Federal Highway Administration (FHWA) Funds: • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grant (STBG) Program US Department of Energy Grants Volkswagen Settlement Funds
Implementing Agency	RTC		

Figure 8-E SDX Battery Electric Bus Pilot

BACKGROUND

RTC began the process of transitioning to a cleaner fuel fleet in 2007, switching its diesel buses to compressed natural gas (CNG) buses. CNG buses now make up over 70% of the RTC fleet and approximately 87% of RTC's fixed route miles operated in FY2020 were with CNG vehicles. Even though CNG buses are more environmentally sustainable than diesel buses, they still generate greenhouse gas emissions and degrade air quality. The next step in this progression would be to transition to a zero emission fleet, potentially using battery electric buses, which run on electricity and can be charged on-route or in the maintenance facility. This switch may require changes to operations and service planning because charging cycles may be different from refueling cycles and different equipment is required. The electricity grid also must be prepared for an increased load.

In mid-2019, RTC partnered with New Flyer and Proterra, two battery electric bus manufacturers, to test their vehicles on the Strip and Downtown Express (SDX) route for a few days. Both buses performed well, maintaining operations and air conditioning for the whole day with a range of around 120 miles on a full charge. As battery electric bus technology improves and is more widely adopted, Project 8-5 would convert RTC's entire fleet to battery electric buses.

BENEFITS

Electrifying RTC's buses will reduce air and noise pollution from buses and provide a smoother ride. Operations and maintenance costs will also likely decrease since electricity costs less than fuel, and battery electric buses are simpler to maintain than conventional buses. For riders, buses will feel more comfortable, and the smoother ride ensures a more relaxing ride.

Shifting to electricity also creates the potential for these buses to be powered by renewable sources, such as solar. Project 8-5 can help RTC's jurisdictions and the state of Nevada reach any existing or future climate goals

CHALLENGES

In other cities that have piloted or adopted battery electric buses, the technology has not yet delivered on the performance promised by manufacturers. Based on the testing in 2019, RTC determined that electric buses using current technology were compatible with about half of the RTC's current routes. RTC must consider the following challenges while planning operations of electric buses:

- ☑ **Range:** current electric buses get around 120 miles on a full charge, while some buses on RTC routes are deployed for more than 250 miles on a single assignment.
- ☑ **Charging:** buses can be charged on route and/or in the depot. Depending on vehicle and battery technology, RTC may need to adjust vehicle scheduling.
- ☑ **Air conditioning:** given the hot climate of Southern Nevada, buses will need to be air-conditioned, which strains the battery and impacts range.
- ☑ **Electricity:** RTC will need to negotiate with the electric utility provider for both general electricity rates and demand charges that may occur through charging when electricity is in high demand. The existing grid may also need to be retrofitted to supply increased power to the bus facilities.

Lastly, on the capital expenses side there are two important considerations: First, battery electric buses are more expensive to purchase than diesel or CNG buses. Second, the capital costs for developing the bus charging and maintenance infrastructure need to be carefully planned to minimize the costs associated with operating two different bus fleets – CNG and EV – with different drive technologies and fueling systems.

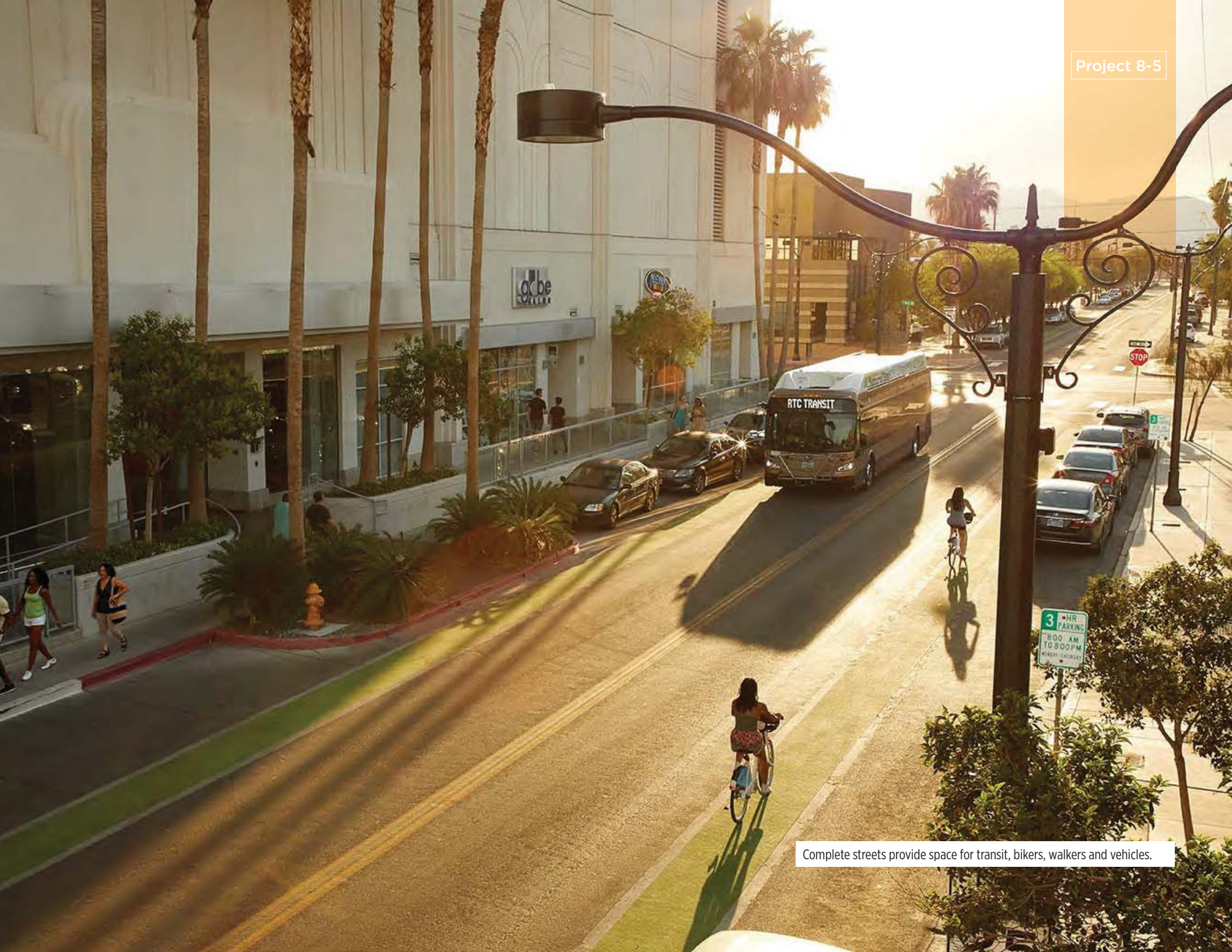
COMPANION STRATEGIES

Project 8-5: Shift to Electric Transit Vehicles is related to and will be planned in coordination with the following projects:

- ☑ **Project 8-6:** Develop Solar Charging for RTC Vehicles
- ☑ **Project 8-9:** Shift to Autonomous Transit Vehicles as Technology Permits
- ☑ **Project 8-5 is also related to and will be planned in coordination with the overall strategy laid out in the following Big Moves:**
- ☑ **Big Move 1:** Build High Capacity Transit
- ☑ **Big Move 2:** Expand Transit Service to Maximize Access to Jobs and Housing

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Conduct a bus fleet electrification transition study to determine the changes needed to the electricity grid and bus maintenance facilities	RTC	Local Jurisdictions
2	Use the transition study to develop implementation plan and identify how electric buses could be incorporated into RTC services.	RTC	Local Jurisdictions
3	Update vehicle procurement process and begin to replace retiring vehicles with electric buses. Expand internal systems and processes, including driver training, vehicle fueling systems, maintenance protocols and vehicle deployment practices	RTC	
4	Retrofit corridor and maintenance facilities to accommodate electric vehicles	RTC	Local Jurisdictions
5	Integrate electric transit vehicles into RTC services	RTC	Local Jurisdictions



Complete streets provide space for transit, bikers, walkers and vehicles.

PROJECT 8-6

Develop Solar Charging for RTC Transit Vehicles

OVERVIEW

Project 8-6 will install a solar charging system to complement RTC's transition to an electric bus fleet. This would include building solar panels at RTC's bus storage and maintenance facilities, as well as at large transit stops. These panels will feed into the electricity grid and in the future, panels could feed an energy storage system. Solar panels will also provide shade and cover for individuals and vehicles.

Solar cells will charge during the day, when the sun is out, while most buses are best charged at night, when less buses are running on the streets. Since on-site battery storage technology is not yet robust, RTC would probably have these solar panels feed into the grid and power other facilities in Southern Nevada during the day and draw from the grid to charge its buses at night. This approach would create an offset mechanism to use solar power most effectively, while continuing to charge buses in an energy efficient manner.

Lastly, RTC would partner with private solar providers to install and maintain the panels in exchange for the cost of electricity. This approach would keep upkeep costs low for the agency and ensure the solar panel technology is always up-to-date.

Timing for Completion	Medium Term (6-10 Years)	**Potential Funding Sources**	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax Federal Transit Administration (FTA) Formula Funds: Urbanized Areas Formula Grants Program (Section 5307) Federal Highway Administration (FHWA) Funds Congestion Management Air Quality (CMAQ) Surface Transportation Block Grant (STBG) Program US Department of Energy Grants Volkswagen Settlement Funds Private Public Partnerships
Implementing Agency	RTC Private Solar Provider and/or NV Energy		

Figure 8-F Solar Canopy Roof

Image from Lou Hernandez

BACKGROUND

Project 8-6 outlines a strategy for RTC to shift its fleet to all battery electric buses. However, power generation in Nevada is primarily through natural gas, with renewable resources making up only 26% of electricity sources[1]. To make transit vehicles truly emissions-free, RTC will need to source its electricity from renewable sources, such as solar power.

Solar power technology has improved dramatically over the last decade, both in terms of efficiency and cost. Over the next two decades, technology will continue to improve, and panels will need less surface area to produce greater amounts of electricity.

BENEFITS

This project will advance RTC towards a 100% clean energy fleet, decreasing greenhouse gas emissions at the point source of fossil fuel extraction. By partnering with a private company to install and maintain the panels in exchange for purchasing solar electricity from this company, RTC will not have to be responsible for capital or maintenance costs or keeping the technology up to date. By selling electricity to the grid, RTC will also be able to reduce their electricity costs overall. Finally, the panels will provide shade and cover for vehicles and people working on site.

Project 8-6 will help Nevada and RTC's jurisdictions meet their current or future climate goals. Investing in environmental sustainability would also reinforce RTC's image as an environmental leader among residents and visitors alike. Lastly, Southern Nevada has a sunny climate well suited for solar energy.[2]

1 U.S. Department of Energy, Energy Information Administration Nevada State Profile https://www.eia.gov/state/analysis.php?sid=NV

2 Best Cities in America for Solar Energy, Patch Magazine, April 5, 2018. https://patch.com/us/across-america/here-are-americas-winners-solar-energy

CHALLENGES

RTC's solar charging system will probably be connected to the grid, rather than directly to bus chargers. The intensity of some transit vehicle charging requirements, variability in solar energy and costs of energy storage technology will present a coordination challenge. Investing in solar arrays will need to be done in conjunction with regional distribution utilities, so the distribution network can be adapted to accommodate planned changes. RTC will also need to work with the electric utility provider to adapt their infrastructure and negotiate rates.

COMPANION STRATEGIES

Project 8-6: Develop Solar Charging for RTC Transit Vehicles is related to and will be planned in coordination with the following projects:

- ☑ **Project 8-5:** Shift to Electric Transit Vehicles
- ☑ **Project 4-5:** Develop Regional Mobility Hubs
- ☑ **Project 4-6:** Develop Neighborhood Mobility Hubs

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Conduct a bus fleet electrification transition study to determine the changes needed to the electricity grid and bus maintenance facilities	RTC	Local Jurisdictions
2	Use the transition study to develop implementation plan and identify the first corridors to pilot battery electric bus operation	RTC	Local Jurisdictions
3	Update vehicle procurement process and begin to replace retiring vehicles with electric buses. Expand internal systems and processes, including driver training, vehicle fueling systems, maintenance protocols and vehicle deployment practices	RTC	
4	Retrofit corridor and maintenance facilities to accommodate electric vehicles	RTC	Local Jurisdictions
5	Launch electric transit vehicle pilot on first corridors	RTC	Local Jurisdictions

PROJECT 8-7

Expand Travel Demand Management (TDM) Programs

OVERVIEW

Project 8-7 would expand Travel Demand Management (TDM) programs to improve mobility alternatives and increase awareness about them, thereby indirectly disincentivizing single occupant driving. These programs include both infrastructure and programmatic components, such as:

- ☑ Subsidized transit passes
- ☑ Encouragement of telecommuting or non-traditional work schedules
- ☑ Gamification of programs with discounts and prizes
- ☑ Carpool and/or vanpool incentives
- ☑ Park-and-ride lots
- ☑ Guaranteed Ride Home program, which allows participants to get reimbursed for a taxi or rideshare service in an emergency when they need to get home midday

TDM programs are typically conducted through major employers or institutions, or a group of employers and institutions in a Transportation Management Association (TMA). RTC would partner with employers, institutions, and TMAs to create robust TDM programs. RTC would also expand its own TDM programs to capture more workers who do not belong to one of these employers or institutions. Project 8-7 increases the funding for all these efforts.

Timing for Completion	Near Term (1-5 years)	**Potential Funding Sources**	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax Federal Highway Administration (FHWA) Funds • Congestion Management Air Quality (CMAQ) • Surface Transportation Block Grant (STBG) Program Public Private Partnerships
Implementing Agency	Major Employers RTC		

Figure 8-G Club Ride Advertisement

BACKGROUND

RTC currently operates a TDM program called Club Ride (Figure 8-G) aimed at improving air quality and encouraging commuting to work by carpooling, vanpooling, transit, walking, biking, and motorcycling, as well as telecommuting and compressed work weeks. RTC works with employers to create custom TDM programs that can include:

- ☑ EZ Rider transit passes: discounts on bulk purchases of passes for employees
- ☑ Preferential parking at employment sites for carpool and vanpool participants
- ☑ Guaranteed Ride Home: free rides home during the day in the case of an emergency
- ☑ Ride matching service for employees to find carpool and vanpool groups
- ☑ Marketing of the program

People who do not work for an employer participating in Club Ride can still be a part of the program. By joining Club Ride, either online or through the Club Ride App, participants can access a rewards program where they can report carpool or non-driving commutes, then receive discounts and enter raffles. All participants also have access to Guaranteed Ride Home, free ride matching, and park-and-rides. Club Ride is currently funded through federal CMAQ and local matching funds.

As shown in Figure 8-H, Southern Nevada is home to several major employers and institutions that RTC can target for co-creating TDM programs, including but not limited to:

- ☑ Resorts along the Strip
- ☑ Nellis Air Force Base
- ☑ University of Nevada Las Vegas
- ☑ Hospitals across the Valley

The COVID-19 pandemic and associated "shelter in place" and "social distancing" requirements is creating a new cohort of workers who are growing accustomed to working from home. Further, even as restrictions associated with the pandemic are lifted, many people will continue to work from home on a part-time basis. This creates an opportunity to expand and support TDM strategies to a wider audience.

BENEFITS

TDM programs lead to fewer people driving private automobiles and more people on transit, feet, bikes, and shared modes of travel. As these non-driving modes increase, traffic congestion decreases, and air quality improves. This effect has been well-documented during the widespread "shelter in place" periods during the COVID-19 outbreak. For employers, these TDM programs can ensure that employees get to work and improve hiring and retention. For employees, TDM programs allow for more comfortable commutes, plus new job opportunities previously unreachable without a car.

Project 8-7 also brings about an opportunity for RTC to build long-lasting relationships with major employers in the region. Cultivating these relationships can create opportunities for collaboration in the future on various initiatives.

COMPANION STRATEGIES

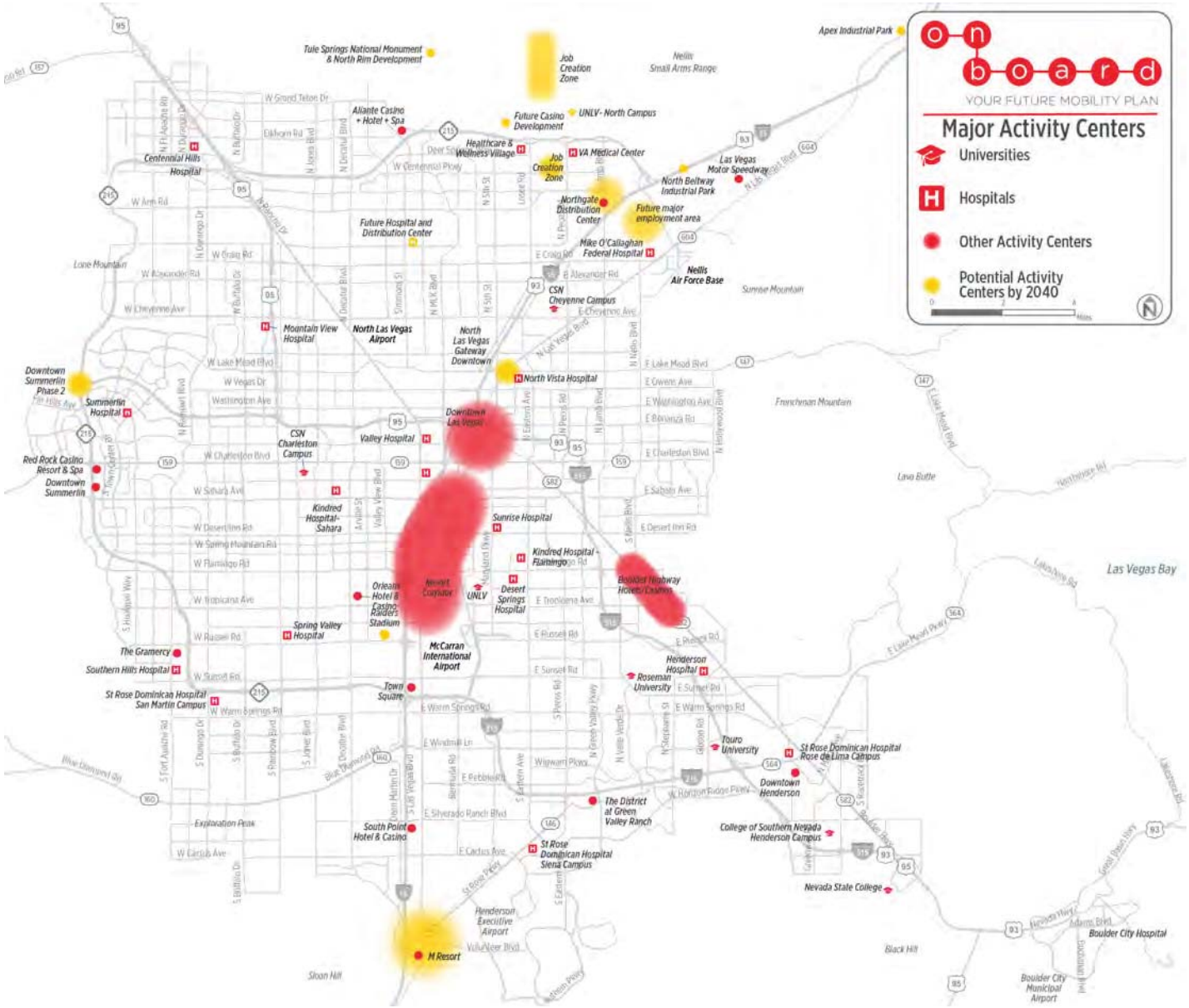
Project 8-7: Expand Travel Demand Management (TDM) Programs is related to and will be planned in coordination with the following project:

- ☑ **Project 6-6:** Improve Commuter Facilities & Services: Develop Park and Ride Lots with Express Service Connections to Major Destinations

Project 8-7 is also related to and will be planned in coordination with the overall strategy laid out in the following Big Move:

- ☑ **Big Move 4:** Make Short Trips Easier

Figure 8-H: Major Activity Centers in Southern Nevada



NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Increase dedicated RTC staff time to coordinate with major employers to design a TDM program	RTC	
2	Create several packages that employers and institutions can buy into, including discounted transit passes, program management assistance, and carpool incentives	RTC	Major Employers
3	Document telecommuting during the COVID-19 outbreak to build materials that can be used to encourage and continue programs during the post-outbreak period	RTC	Major Employers
4	Determine major employers of the Valley and reach out to propose partnership	RTC Major Employers	Local Jurisdictions
5	Improve marketing of TDM programs by collecting and utilizing success stories from employers and employees	RTC Major Employers	Local Jurisdictions

PROJECT 8-8

Implement "FAST OS" (RTC Freeway and Arterial System of Transportation Technology Roadmap)

OVERVIEW

Project 8-8 will provide an efficient and safe traffic signal network by implementing innovative and emerging technologies related to big data, traffic signal operations and performance, and multimodal traffic operations. These technologies will be used to improve RTC's existing Freeway and Arterial System of Transportation (FAST). Components of this "FAST OS" technology roadmap will include:

- ☑ Traffic signal operations
- ☑ Traffic monitoring
- ☑ Transit signal priority
- ☑ Pedestrian signal priority
- ☑ Innovative ramp meters
- ☑ Dynamic signage
- ☑ Real time location tracking of crashes and dangerous conditions

As the Valley grows over the next few decades, FAST OS will help alleviate predicted levels of congestion, while ensuring streets and highways are safe for all users.

Timing for Completion	Long Term (10+ years)	**Potential Funding Sources**	Local Sales Tax Motor Vehicle Fuel Tax Transient Lodging Tax/ Resort Corridor Room Tax (potentially) Federal Highway Administration (FHWA) Funds Congestion Management Air Quality (CMAQ) Transportation Alternatives Program (TAP) Public Private Partnerships
Implementing Agency	RTC		

BACKGROUND

Freeway and Arterial System of Transportation (FAST) is RTC's Intelligent Transportation System (ITS) program. Designed to both monitor and control traffic, FAST is one of the first truly integrated ITS operations in the country. FAST includes the following components:

- ☑ Monitoring traffic conditions through video monitoring and inductive loop detection
- ☑ Controlling traffic through signals, ramp meters, and dynamic signage

Other RTC innovations that influence traffic management include:

- ☑ Waycare, a technology that compiles and analyzes data to report in real-time the location of accidents and to predict where congestion and dangerous driving conditions may occur
- ☑ Nexar, which is an app that uses smartphone dash cams to provide real-time alerts to prevent vehicle, cyclist, and pedestrian crashes
- ☑ HAAS Alert, which allows smart devices to broadcast the location of construction and emergency vehicles and work zones to other drivers through platforms such as the Waze traffic app

RTC's FAST Technology Roadmap (FAST OS) will implement innovative and emerging technologies to improve both the monitoring and control

of traffic. The Roadmap will build on these technologies and continue to pilot new ones as they become available.

BENEFITS

FAST OS can be implemented gradually or rapidly as technology becomes available. This flexibility will allow FAST to efficiently improve traffic conditions as the region grows and to accelerate programs when needed. Expanding current technologies like ramp meters, variable messaging, and other tools across the freeway network can help ensure that freeways flow smoothly at peak hours

The FAST OS system will also bring more innovative solutions to preventing crashes between cars, people walking, and people biking. For crashes that do occur, technology enables a quick system of alerting the rest of the transportation network.

CHALLENGES

Many of these technologies are costly to implement, and existing congestion across Southern Nevada will continue with the predicted increase in population. At each intersection and along each corridor, RTC will likely have to prioritize a certain mode of transportation, such as driving, transit, or walking. For example, transit signal priority may cut certain signal cycles short, delaying cars. At the same time, pedestrian signal priority and transit signal priority are not easily implemented at the same intersection.

COMPANION STRATEGIES

Project 8-8: Implement "FAST OS" (RTC Freeway and Arterial System of Transportation Technology Roadmap) is related to and will be planned in coordination with the following projects:

- ☑ **Project 8-9:** Shift to Autonomous Transit Vehicles as Technology Permits
- ☑ **Project 8-10:** Monitor and Incorporate Emergency Transportation Technologies and Update Road Designs as Needed

Project 8-8 will be planned in coordination with the overall strategy laid out in the following Big Move:

- ☑ **Big Move 4:** Make Short Trips Easier

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Monitor emerging ITS technologies	RTC	
2	Incorporate technologies that seem viable into shorter-term plan	RTC	Major Employers
3	Acquire and pilot these technologies as they come into existence	RTC	Major Employers
4	Continue to monitor emerging ITS technologies and continually update the FAST Technology Roadmap to implement these technologies	RTC Major Employers	Local Jurisdictions

PROJECT 8-9

Shift to Autonomous Transit Vehicles as Technology Permits (10+ years)

OVERVIEW

Project 8-9 will test autonomous transit vehicle technologies as they are developed. It will also implement autonomous vehicle technologies, as their use may be warranted in Southern Nevada, after they have been proven safe for passengers and roadway users, have reached cost-effectiveness, and have demonstrated efficiency to maximize regional benefits.

Through tracking autonomous transit vehicle technology and deployments, RTC can identify industry leaders and partner with them to run tests and pilots. These tests can help inform what changes may be needed in terms of service planning and infrastructure.

Timing for Completion	Long Term (10+ Years)	**Potential Funding Sources**	Local Transit Sales Tax Local Sales Tax Motor Vehicle Fuel Tax Federal Transit Administration Discretionary Funds • Bus and Bus Facilities Program (Section 5339) • FTA Low or No Emission Vehicle Program
Implementing Agency	RTC		

BACKGROUND

Autonomous transit vehicle technologies have been in the works for many years. Some cities are currently testing out small autonomous shuttles, and autonomous full-sized buses are still in the prototype phase. Extensive testing is needed before these vehicles can replace any part of RTC's fleet.

The USDOT has recently awarded a $5.3 million grant to RTC and the City of Las Vegas for a federal demonstration project called GoMed for an autonomous circulator between downtown Las Vegas and the Medical District.

BENEFITS

Through dedicating resources to testing autonomous transit vehicles, RTC will have a better understanding of the operational, infrastructure, and regulatory frameworks needed to fully adopt this technology once it becomes viable.

Tests and pilots of autonomous vehicles can also be used as a marketing tool, showcasing the innovative nature of RTC. These tests can be conducted concurrently with other public engagement efforts, improving the visibility of transit in the Valley.

CHALLENGES

Autonomous transit vehicle technologies are currently far from full adoption, especially without a driver monitoring and ready to take control of the vehicle. Regulatory frameworks are also not yet in place for adoption of autonomous transit vehicles.

At the beginning of adoption, riders may feel a concern for safety, whether perceived or real. RTC must work with existing riders and potential riders to alleviate safety concerns, as well as adapt infrastructure to ensure the safety of riders, drivers, and people walking or biking on the streets.

COMPANION STRATEGIES

Project 8-9: Shift to Autonomous Transit Vehicles as Technology Permits is related to and will be planned in coordination with the following projects:

- ☑ **Project 8-5:** Shift to Electric Transit Vehicles
- ☑ **Project 8-6:** Develop Solar Charging for RTC Transit Vehicles
- ☑ **Project 8-10:** Monitor and Incorporate Emergency Transportation Technologies and Update Road Designs as Needed

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Monitor autonomous transit vehicle technology	RTC	
2	If an opportunity to test the technology becomes available, partner with these companies to test the vehicles on Southern Nevada streets	RTC	Local Jurisdictions
3	If initial tests are promising, design and launch a pilot program on an RTC route, through leasing programs rather than purchasing the vehicles	RTC	Local Jurisdictions

PROJECT 8-10

Monitor and Incorporate Emerging Transportation Technologies and Update Road Designs as Needed

OVERVIEW

Project 8-10 will ensure roads are ready for self-driving vehicles through improvements in pavement markings, lighting, maintenance, and communications equipment. Once autonomous vehicle technology is readily available, Southern Nevada will be prepared for rapid adoption with these road improvements.

RTC will continue to monitor the autonomous vehicle industry and research on changing street configurations. As these cars become more ubiquitous, RTC will gradually implement the emerging technologies and road designs.

Timing for Completion	Long Term (10+ Years)	**Potential Funding Sources**	Local Sales Tax Motor Vehicle Fuel Tax Transient Lodging Tax/ Resort Corridor Room Tax (potentially) Federal Highway Administration (FHWA) Funds • Congestion Management Air Quality (CMAQ) • Transportation Alternatives Program (TAP) Public Private Partnerships
Implementing Agency	RTC and local public works departments		

BACKGROUND

Technology for self-driving vehicles has been in development over the past decade and will continue to be researched and tested for the foreseeable future. Once a critical threshold of cars adopts autonomous technology, the infrastructure needed on roads will be different from existing conditions. With sensors rather than human vision controlling the trajectory of these vehicles, there will likely be different requirements for pavement markings, lighting, roadway maintenance, and communications equipment. There are not currently best practices for these infrastructure changes, so an effort should be made to track the latest technology over the next two decades.

Nevada was the first state in the country to approve a law that authorized self-driving cars on public roads. There are several testing sites around the state. RTC and Southern Nevada jurisdictions can learn from these testing sites, as well as through partnerships with car and technology companies.

BENEFITS

By putting resources into tracking emerging transportation technologies, RTC will be ready to adopt technology for self-driving vehicles in a proactive rather than reactive way. RTC will also be able to make a more informed decision about which technologies to adopt or promote first and which to wait for continued improvements.

Shifting to all autonomous vehicles presents an opportunity to reprioritize streets for people rather than cars, so there will be more space to build pedestrian and bike infrastructure. Additionally, streets will be safer, due to decreased car crashes from human error and increased space for people walking and biking.

CHALLENGES

Advancements in self-driving technology and associated roadway improvements are very unpredictable, so it is difficult to forecast when and how these technologies can be implemented in the future. Additionally, it is possible (although unlikely) that autonomous vehicles may come into reality in a way that requires more street space, rather than less.

COMPANION STRATEGIES

Project 8-10 is closely tied to **Project 8-8** and **Project 8-9**, since traffic management will be changed greatly due to electric transit and other vehicles. Additionally, once autonomous vehicles are put in place, **Big Move 4:** Make Short Trips Easier may look very different based on the new street design required to accommodate autonomous vehicles.

Project 8-10: Monitor and Incorporate Emerging Transportation Technologies and Update Road Designs as Needed is related to and will be planned in coordination with the following projects:

- ☑ **Project 8-8:** Implement "FAST OS" (RTC Freeway and Arterial System of Transportation Technology Roadmap)
- ☑ **Project 8-9:** Shift to Autonomous Transit Vehicles as Technology Permits

Project 8-10 is also related to and will be planned in coordination with the overall strategy laid out in the following Big Move:

- ☑ **Big Move 4:** Make Short Trips Easier

NEXT STEPS

	Step	Lead Agency	Partner Agency
1	Monitor emerging transportation technologies, as well as their first adopters	Local Jurisdictions	RTC
2	Based on the successes and challenges of these first adopters, test, and pilot these strategies in the context of Southern Nevada	Local Jurisdictions	RTC
5	Begin to incorporate these technologies into Southern Nevada's built environment	Local Jurisdictions	RTC

NEXT STEPS


Aria
PLANET HOLLYWOOD
PAY BEFORE BOARDING
DEUCE ONLY STOP
NORTHBOUND
IB: ERIC DLUX | MONDAY

NEXT STEPS

MOVING FORWARD TO IMPLEMENTATION

As On Board shifts its focus from planning to implementation, initial steps consist of:

01. Developing a funding plan (see also Appendix A)
02. Creating a detailed short-term implementation plan
03. Moving forward with project development for the first HCT projects
04. Incorporating recommendations into upcoming roadway projects
05. Future-proofing the plan with ongoing adjustments to technology recommendations and strategies

DEVELOP FUNDING PLAN

On Board will require major investments in Southern Nevada's transportation infrastructure and programs. Some improvements may begin immediately using eligible funding sources. However, larger projects and service upgrades will require funding that goes beyond what is currently available. Consistent with how the Fuel Revenue Indexing program developed a source of funding for road-related improvements, RTC and the region will need to develop new funding sources for On Board's projects.

There are potential funding options, but no single approach that works for every region. However, there is no single approach that works for every region. Instead, Southern Nevada will need to develop a mobility funding plan that will engender broad-based support from the public and community leaders (see Appendix A for an overview of existing and potential funding programs).

DEVELOP A DETAILED SHORT-TERM IMPLEMENTATION PLAN

On Board presents implementation timeframes for recommended projects and programs within the 8 Big Moves in terms of the short term (the next 10 years) and long term (beyond 2030). RTC and its partners will need to develop a more detailed short-term implementation plan that specifies schedules for implementation and key milestones, responsible parties, and funding sources, among other elements.

BEGIN PROJECT DEVELOPMENT FOR FIRST HIGH CAPACITY TRANSIT LINES

The High Capacity Transit element of On Board includes LRT and BRT lines that would be strong candidates for Federal Transit Administration New Starts funding, as well Rapid Bus lines that would be strong candidates for Small Starts funding. FTA requires that these projects undergo a project development process that consists of developing and reviewing alternatives and selecting a Locally Preferred Alternative (LPA). This process can take 12 to 18 months and full implementation of HCT lines can take eight to 10 years. RTC will need to begin project development for the highest priority HCT lines soon.

INCORPORATE HCT ELEMENTS INTO UPCOMING ROADWAY PROJECTS

Roadway improvements are currently planned in some of the corridors where HCT is also planned and may precede HCT development. Incorporating HCT elements into the roadway improvement projects can expedite transit improvements and result in cost savings. The first opportunity will be along Boulder Highway, where early implementation of bus lanes would benefit existing service and expedite the development of full BRT service.

FUTURE-PROOF THE PLAN

On Board reflects the best and most up-to-date information about consumer and transportation system technologies available at the time it was developed. It reflects insights into short-term consumer technologies, such as Mobility as a Service (MaaS), fare capping, and application-based reservation systems, and recommends projects that will take advantage of emerging technologies related to autonomous and connected vehicles, electrification, and clean energy. The pace and schedule for advancing these systems and technologies is not well known. Other factors not directly considered by On Board include the region's desire to be at the leading edge of technology development and the extent to which some of the interest in leading may be hampered by economic factors resulting from COVID-19.

In all cases, however, as implementation progresses, transportation stakeholders in Southern Nevada need to monitor emerging technologies and transportation disruptions, identify "trigger points" for when to make course corrections, and keep the plan "future proof" as it is implemented.


DOCUMENT LIBRARY
TRANSIT ORIENTED DEVELOPMENT BRIEFING BOOK
AN ANALYSIS OF EMERGING TECHNOLOGIES
HIGH CAPAC TRANSIT BRI BOOK
AN ECONOMIC IMPACT ANALYSIS
STATE OF THE SYSTEM REPORT
POLICY AND FUNDING PEER REVIEW
HIGH CAPA TRANSIT FEA STUDY
Boulder Highway Hotels/Casinos
582
E Russell Rd
Henderson Hospital
Roseman University
E Sunset Rd
E Warm Springs Rd
St Rose Dominican Hospital Rose de Lima Campus
Horizon Ridge Pkwy
Downtown Henderson
College of Southern Nevada Henderson Campus
Greenway
515
93

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TECHNICAL ANALYSIS

The On Board Plan culminates in 8 Big Moves and 64 individual projects. It was developed through a planning process that combined several technical analyses that were documented throughout development of the plan. These separate but coordinated and integrated efforts included:

01 **The High Capacity Transit Briefing Book**, created in 2018, to provide an overview of high capacity transit (HCT) and specific modal technologies (light rail, streetcar, Bus Rapid Transit, and Rapid Bus). The report also outlines how high capacity transit benefits Southern Nevada through service enhancements and transit-oriented development.

02 **A State of the System Report,** published in 2018, that analyzed Southern Nevada's existing transit services and examined the underlying market and needs for expanded transit service. The System also identified opportunities for HCT investment.

03 **A Policy and Funding Peer Review** that identified best practices from peer regions and agencies to guide RTC's efforts as it moves forward with planning and implementing HCT. It also examined HCT-supportive policies and programs, like land use policies, complete streets, and transit funding and financing. The report was published in March 2018.

04 **A Transit Oriented Development Briefing Book**, which created a land use and urban design vision for the station areas along planned HCT corridors. The TOD analysis also laid out a framework for moving forward with transit-oriented growth and development in Southern Nevada. The Briefing Book was published in January 2019.

05 An analysis of **Emerging Technologies** to help RTC and Southern Nevada identify ways to use and prepare for technology to make HCT a more attractive mode. The report focused on the impacts of an autonomous future on transit vehicles and service deliveries. It was produced in 2018.

06 **The High Capacity Transit Feasibility Study**, which lays out a strategy for developing HCT in Southern Nevada. This report identifies key corridors, transit service technologies, and accompanying investments needed to create a successful HCT network. This document was completed in 2019.

07 **An Economic Impact Analysis** that analyzed and reports on the combined economic impact of the investments described in On Board, its 8 Big Moves and 64 supporting projects. The Economic Impact Analysis was published in June 2020.

COMMUNITY ENGAGEMENT ACTIVITY

On Board was prepared with input from stakeholders (representatives from local governments, business and tourist organizations, nonprofit agencies, and regional authorities), elected officials, and over 80,000 Southern Nevada residents. Stakeholders were involved in numerous meetings, workshops, and presentations, while residents participated in multiple surveys and attended over 250 events. This input revealed how residents feel about existing and emerging technologies, like ride-hailing, autonomous vehicles, and using mobile applications to plan, book, and pay for more of their trips. Input from stakeholders and the public also provided information on impressions of high capacity transit and the importance of investments in expanded mobility options. Community engagement activities were organized around three phases with reports available for each phase:

- ☑ **Phase 1: State of the System –** The initial round of engagement focused on understanding residents' perceptions of Southern Nevada's existing transportation network. Surveys asked questions about the types of improvements needed and where additional services are required, and tested attitudes about technology. The findings and insights were used to develop the State of the System.
- ☑ **Phase 2: Mobility Vision –** The second round of engagement focused on understanding residents' vision for the future of mobility in Southern Nevada. Questions posed at pop-up events, community meetings, and surveys asked about future modes of travel, investment preferences, and their goals and priorities for Southern Nevada's transportation network.
- ☑ **Phase 3: Draft Recommendations –** The third round of engagement focused on understanding residents' attitudes and opinions on the draft recommendations emerging from On Board. In part because of the COVID-19 pandemic, most community engagement in this final round was conducted virtually, using an online survey that asked respondents to rate individual strategies and projects. Over 12,000 people completed the surveys, which included a broad cross section of Southern Nevada's population.

APPENDICES

APPENDIX A

POTENTIAL FUNDING SOURCES

On Board consists of 8 Big Moves, which are articulated with 64 projects. Combined, these policies, projects, and strategies will strengthen mobility and improve transit in Southern Nevada. Mobility improvements and transit investments can be funded in many ways. There is no one size fits all solution, so the key to advancing projects will be to prioritize exiting funding sources and, potentially, to develop new ones. Any new funding program may consist of a single source or package of sources, but in call cases funding strategies must be designed so they receive high levels of political and public support.

In June 2020, the RTC's transit and mobility programs are funded through a combination of federal grants, fares and advertisements and local revenues in the form of gas tax and sales taxes. Federal grants, especially funds available through the Federal Transit Administration (FTA) are an important source of funds for public transportation programs.

The federal transportation bill, Fixing America's Surface Transportation (FAST) Act, which governs programming and funding, was authorized for fiscal years 2016 through 2020. This means future federal funding programs is not clear. Under the current program structures, however, RTC's share of FTA's Urbanized Area Formula Grants Program (Section 5307) would increase as population increases and as segments of dedicated transitways are constructed and overall service levels increase.

TRANSIT FUNDING IN SOUTHERN NEVADA

The State of Nevada does not provide revenues to support mobility improvements or transit programming. As a result, funding to support On Board must be raised locally. Factors to consider as part of an On Board implementation plan include:

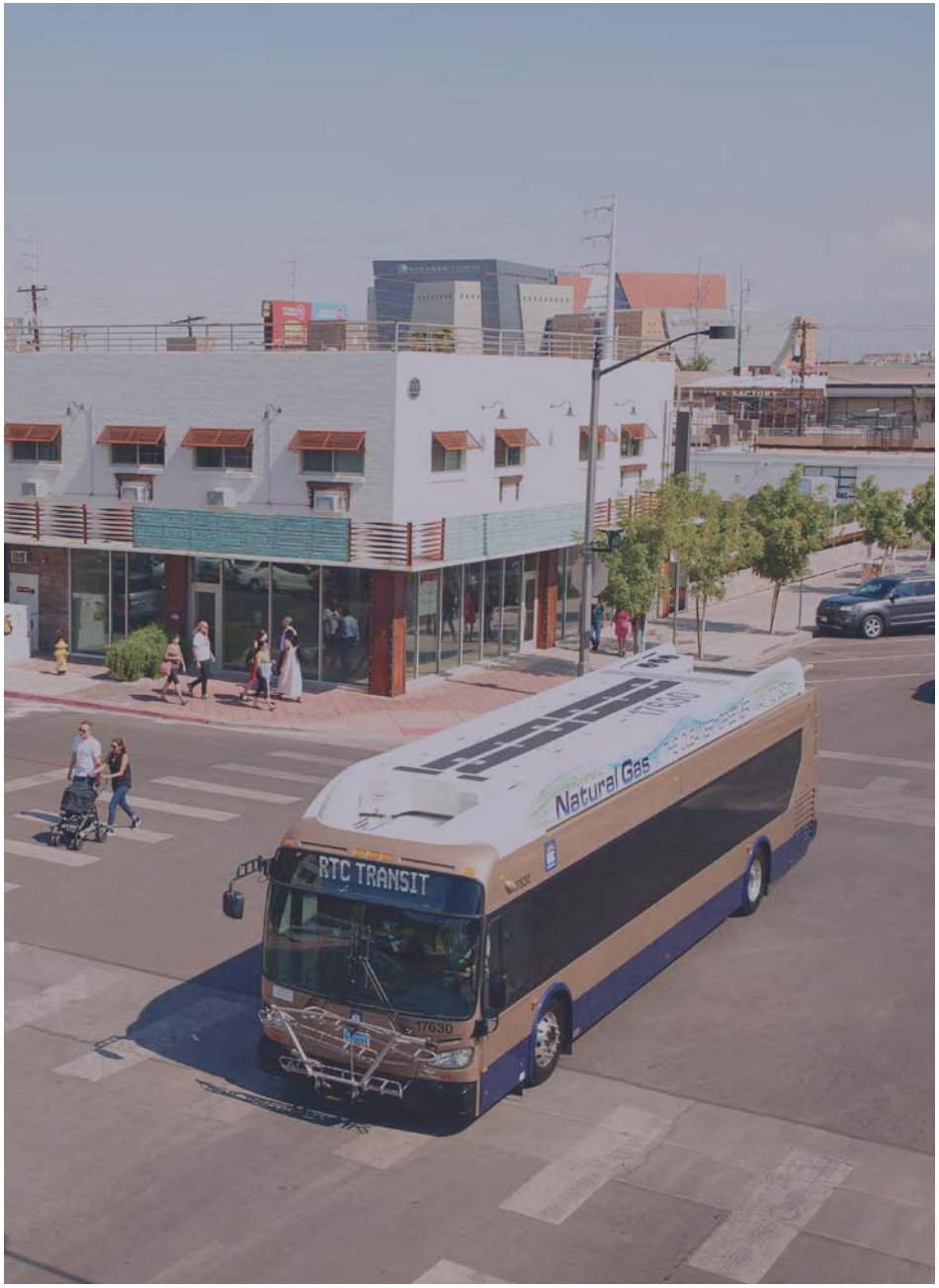
- ☑ In the United States, the most common way to fund mobility and transit expansion programs is using sales taxes. Sales taxes are often preferred because they are one of the few single sources that can generate sufficient levels of funding to support capital and operating programs. They have also been proven to have generally high levels of public support. Recent state legislation provides RTC with authorization to seek a sales tax increase for transportation improvements through the end of 2024.
- ☑ Special Assessment Districts (whether on a specific district, corridor, or broader municipal level) can also generate large amounts of funding, usually for specific projects, and often for High Capacity Transit projects.
- ☑ Other sources - like taxes on vehicle licenses, parking fees or other transportation related programs - are important but are usually used to fund ongoing costs or as a supplement to sales taxes.

This appendix provides insights into how the On Board improvements could be funded. It presents an overview of funding sources currently used in Southern Nevada to support mobility programs and transit investments. This appendix also describes different types of funding programs used nationally to support mobility and transit investments.

FEDERAL FUNDING SOURCES

The federal government is a major funder of mobility and funding programs nationally; many of these programs can be used to advance On Board. Primary sources will include Federal Transit Administration (FTA), Federal Highway Administration (FHWA), and Federal Aviation Administration (FAA) funding. In general, FTA funding can be used for transit purposes, FHWA funding for roadway projects, including pedestrian and bicycle improvements and some transit programs, and FAA funding for airport-related improvements, including access improvements. Federal funding may also be available through the U.S. Departments of Homeland Security and Energy, as well as other departments that have clear interests in transportation investments.

The overview of federal transportation programs presents the best information available at the time the report was published (June 2020). Potential changes to the funding programs and the way they are used are subject to the next federal transportation bill; the current legislation (Fixing America's Surface Transportation FAST Act) expires in 2020. COVID-19 has also significantly disrupted transit operations and funding. In March 2020, Congress passed the Coronavirus Aid, Relief and Economic Security (CARES) Act, which provided federal funding for transit operations. In June 2020, it is too early to understand how funding sources, distributions, and uses may be impacted.



U.S. DEPARTMENT OF TRANSPORTATION (U.S. DOT)

The U.S. DOT is organized by mode with individual administrations overseeing investment and development of their assigned mode, e.g., Federal Transit Administration, Federal Highways Administration, and the Federal Aviation Administration. Each administration (or agency) oversees formula and competitive grant programs that direct federal resources to local communities. Agency goals that span multiple departments, like multimodal and intermodal programs, are typically administered by a single agency. An exception to this rule is the Better Utilizing Investments to Leverage Development (BUILD) grants; this program is administered by the Office of the Secretary of Transportation.

As mentioned, at the time this report was prepared (June 2020), the current federal transportation bill, Fixing America's Surface Transportation (FAST) Act was authorized through fiscal year 2020, or September 30, 2020. While most of these funding programs have remained intact for several decades, the future of individual federal grant programs is not guaranteed.

OFFICE OF THE SECRETARY OF TRANSPORTATION

Better Utilizing Investments to Leverage Development (BUILD) grants

In 2020, the U.S. DOT announced a $1 billion grant program to upgrade transportation infrastructure, which can be used for planning and capital investment in surface transportation infrastructures. Grants are awarded on a competitive basis and can be used for roads, bridges, transit, rail, ports, or intermodal transportation projects that have a significant local or regional impact. Evaluation criteria includes safety, economic competitiveness, quality of life, environmental sustainability, state of good repair, innovation, and partnership. Southern Nevada did not receive a BUILD grant in 2019, but in 2018 the region was awarded $5.3 million for an automated circulator and connected pedestrian safety project.

FEDERAL TRANSIT ADMINISTRATION (FTA)

The FTA provides funding for public transit through a combination of formula and discretionary programs. In 2020, these programs are funded through the Fixing America's Surface Transportation (FAST) Act, which funds programs through fiscal year 2020. Prior to COVID, FTA funds accounted for about 80% of RTC's transit capital costs and less than 1% of transit operating expenses.

FTA FORMULA FUNDS

FTA formula funds, as the name implies, are allocated to transit systems on a formula basis, with formulas generally based on system size, population, and population density. The most important programs for Southern Nevada are:

- ☑ Urbanized Areas Formula Grants Program (Section 5307)
- ☑ Enhanced Mobility for Seniors & Individuals with Disabilities (Section 5310)
- ☑ State of Good Repair Formula Grants (Section 5337)
- ☑ Bus-Bus Facilities Formula (Section 5339(a))

Urbanized Areas Formula Grants Program (Section 5307)

Section 5307 provides funding to public transit systems in Urbanized Areas (UZA) for public transportation capital, planning, and job access and reverse commute projects. Funding is allocated through a formula based on fixed guideway vehicle revenue miles, fixed guideway passenger miles, bus vehicle revenue miles, bus passenger miles, population, and population density. This is RTC's primary source of annual federal capital funds; in FY 2020, RTC received $36.9 million in Section 5307 funds. Increased levels of service along fixed guideway segments would lead to increased funding from this program.

For more information, see: https://www.transit.dot.gov/funding/grants/urbanized-area-formula-grants-5307.

Enhanced Mobility for Seniors & Individuals with Disabilities (Section 5310)

Section 5310 provides funding to improve mobility for seniors and individuals with disabilities. The program supports transportation services planned, designed, and carried out to meet the special transportation needs of seniors and individuals with disabilities. Eligible projects include both traditional capital investment and nontraditional investment beyond the Americans with Disabilities Act (ADA) complementary paratransit services. In 2020, RTC received $1.8 million in Section 5310 funding.

For more information, see: https://cms7.fta.dot.gov/funding/grants/enhanced-mobility-seniors-individuals-disabilities-section-5310.

State of Good Repair Formula Grants (Section 5337)

Section 5337 provides funding to states through a statutory formula for projects that maintain, rehabilitate, and replace fixed guideway and high-intensity bus system, as well as to implement transit asset management plans. In FY 2020, RTC received $2.75 million in Section 5337 funds.

For more information, see: https://www.transit.dot.gov/funding/grants/state-good-repair-grants-5337.

Bus-Bus Facility Formula (Section 5339(a))

Section 5339(a) provides funding to states and transit agencies through a statutory formula to replace, rehabilitate, and purchase buses and related equipment and to construct bus-related facilities. In FY 2020, RTC received $4.3 million in Section 5339(a) funds.

For more information, see: https://www.transit.dot.gov/funding/grants/busprogram.

FTA DISCRETIONARY FUNDS

FTA discretionary programs provide funding through a competitive process to support major improvements that would not be achievable through formula allocations.

Buses and Bus Facilities Program (Section 5339)

The Section 5339 Bus and Bus Facilities program, which is a compliment to the Section 5339(a) formula program described above, provides funding through a competitive process to replace, rehabilitate, and purchase buses and related equipment and to construct bus-related facilities. This program is designed to provide funding for major improvements to bus transit systems that would not be achievable through formula allocations. Since FY2016, RTC has received one Section 5339 grant for $7.5 million to replace camera systems on fixed route, paratransit, and alternative transportation vehicles to improve safety and operating efficiencies. RTC is also using funds to install a new paratransit bus wash and upgrade the existing fixed route bus wash system at its Sunset Maintenance Facilities, which will also improve maintenance and operations.

For more information, see: https://www.transit.dot.gov/bus-program.

Low or No Emission Vehicle Program (Section 5339(c))

The Low or No Emission competitive grant program provides funding to state and local government authorities for the purchase or lease of zero-emission and low-emission transit buses as well as acquisition, construction, and leasing of required supporting facilities. The FAST Act set aside $55 million per year for the purchase of low or no emission vehicles through fiscal year 2020.

For more information, see: https://cms7.fta.dot.gov/funding/grants/lowno

Capital Investment Grants/New Starts (Section 5309)

Section 5309 is the major source of federal funding for new "fixed-guideway" rail and BRT projects, with fixed-guideway defined as rail, a separate right-of-way for the use of public transportation or high occupancy vehicles, or a catenary and right-of-way usable by other forms of transportation. RTC has received $171 million in New Starts funding. There are two types of New Starts projects:

- ☑ New Starts, which are projects with total project costs is greater than $300 million or projects with total New Starts funding equals or exceeds $100 million.
- ☑ Small Starts, which are projects with total projects costs less than $300 million or total Small Starts funding is less than $100.

Additional requirements for light rail and BRT projects are shown in Table 1.

By statute, New Starts can fund up to 80% of project costs. However, in practice, 50% has become the maximum and, more recently, federal officials have been signaling shares closer to 30%. Despite the lower federal share, the New Starts program will remain an important source of funding for light rail and/or BRT projects in Southern Nevada.

For more information, see: https://www.transit.dot.gov/capital-investment-grants-5309

Pilot Program for Transit Oriented Development (TOD) Planning (Section 20005(b))

The Pilot Program for TOD Planning is designed to improve public transportation by providing for local communities to integrate land use and transportation planning with a new fixed guideway or core capacity transit capital investment. The grant program will fund planning work that improves economic development and ridership, multimodal connectivity, and accessibility, improve access for walkers and bikers and engage the public sector. RTC received a $300,000 award through the Pilot Program for TOD Planning in 2018 to fund a TOD plan for Maryland Parkway.

For more information, see: https://www.transit.dot.gov/TODPilot

Table 1 New Starts Service Requirements

		LRT	BRT	Rapid Bus[1]
1	>50% dedicated lanes	✓	✓	
2	Queue lanes and TSP			✓
3	Rail or "rail-like' service	✓	✓	✓
4	Faster Service	✓	✓	✓
	Defined Stations	✓	✓	✓
5	**Weekday Frequency and Spans:**			
	15 min service throughout the day	✓	✓	✓
	OR			
	10 min peak; 20 min off-peak	✓	✓	✓
	14 hours of weekday service	✓	✓	✓
	Weekend Frequencies and Spans:			
	30 min service throughout the day	✓	✓	✓
	10 hours of weekend service	✓	✓	✓
6	Unique branding	✓	✓	✓

1 In FTA terminology, Rapid Bus is "Corridor-Based BRT.

Accelerating Innovative Mobility (AIM)

The AIM program is designed to support innovation throughout the transit industry by promoting forward-thinking approaches to improve transit system design, service, and financing. The program funds cooperate agreements that can accelerate the development, implementation and adoption of innovative technologies, practices, and service models to improve mobility and enhance the riders experience.

For more information, see: https://www.transit.dot.gov/AIM

FEDERAL HIGHWAY ADMINISTRATION (FHWA)

FHWA funds are provided to improve and maintain roads and associated facilities and in limited cases for transit improvements.

- ☑ National Highway Performance Program (NHPP)
- ☑ Surface Transportation Block Grants
- ☑ Congestion Management Air Quality (CMAQ)

FHWA funds are allocated to states on a formula basis, and then sub-allocated within states based on population. In Southern Nevada, the sub-allocated funds flow through and are programmed by RTC.

National Highway Performance Program (NHPP)

The National Highway Performance Program (NHPP) is the largest of the FHWA programs and is designed to support the improvement of the condition and performance of the National Highway System (NHS), which includes Interstate System highways and bridges as well as nearly all other major highways. NHPP funds can also be used for bicycle and pedestrian infrastructure and intelligent transportation systems (ITS). The Nevada Department of Transportation (NDOT) is the lead agency for planning, programming, and implementing NHPP. In general, NHPP funds can be used for up to 80% of project costs for non-Interstate-related projects.

At present, and over the four year span of RTC's 2019 – 2022 Transportation Improvement

Program (TIP), all NHPP funds are programmed for highway projects. Going forward, this source could potentially provide funding for On Board bicycle and pedestrian and ITS projects.

For more information, see: www.fhwa.dot.gov/fastact/factsheets/nhppfs.cfm.

Surface Transportation Block Grants (STBG)

The Surface Transportation Block Grant program (STBG) provides flexible funding that is designed primarily to preserve and improve the conditions and performance of the nation's highway system. However, it also includes a Transportation Alternatives component, in which a portion of total funds are set aside for construction, planning, and design of on-road and off-road trail facilities for pedestrians, bicyclists, and other nonmotorized forms of transportation, including sidewalks, bicycle infrastructure, pedestrian and bicycle signals, traffic calming techniques, lighting and other safety-related transportation projects to achieve compliance with the Americans with Disabilities Act (ADA). In Nevada, STBG funds can generally be used to fund up to 95% of project costs.

In FY 2018, the State of Nevada received approximately $108 million in STBG funds, of which $4.9 million was set aside for Transportation Alternatives projects. Of this, Southern Nevada received approximately $35 million in total, of which $1.7 million was set aside for Transportation Alternatives. Between 2019 and 2022, RTC has programmed the use of the Transportation Alternatives funds for a variety of trail, pedestrian, and safety-related projects. Going forward, this source could be used to provide funding for On Board projects in the same areas.

For more information on the STBG program in general, see: www.fhwa.dot.gov/fastact/factsheets/stbgfs.cfm.
For more information on the Transportation Alternatives component, see: www.fhwa.dot.gov/fastact/factsheets/transportationalternativesfs.cfm

Congestion Management Air Quality (CMAQ)

The CMAQ program provides funding for transportation projects and programs to help meet the requirements of the Clean Air Act. Funding is available for capital projects to reduce congestion and improve air quality for areas that do not meet the National Ambient Air Quality Standards for ozone, carbon monoxide, or particulate matter (nonattainment areas) and for former nonattainment areas that are now in compliance (maintenance areas). Any type of project is eligible for CMAQ funding if it reduces congestion and/or improves air quality, including transit, pedestrian, and bicycle projects. In addition, to help startup new transit services, CMAQ funds can be used to fund operations for up to three years.

CMAQ funds can generally be used for up to 95% of total project costs in Nevada. However, they can provide up to 100% funding for some safety projects that include an air quality or congestion relief component (e.g., carpool/vanpool projects).

In fiscal year 2019, Southern Nevada received approximately $27 million in CMAQ funds, and between 2019 and 2022, RTC has programmed the use of the CMAQ funds for a variety of projects, including trail, pedestrian, bicycle, and intersection improvements, but also to purchase part of the RTC's compressed Natural gas (CNG) bus fleet.

For more information, see https://www.fhwa.dot.gov/fastact/factsheets/cmaqfs.cfm

FEDERAL AVIATION ADMINISTRATION (FAA)

Passenger Facility Charge (PFC) Program

The FAA's Passenger Facility Charge (PFC) Program enables airports to charge a fee of up to $4.50 per emplaning passenger to fund projects that enhance safety, security, or capacity; reduce noise; or increase air carrier competition. Eligible projects include airport access projects that meet the following conditions:

- ☑ The road or facility may only extend to the nearest public highway or facility of sufficient capacity to accommodate airport traffic
- ☑ The access road or facility must be located on the airport or within a right-of-way acquired by the public agency; and
- ☑ The access road or facility must exclusively serve airport traffic.

PFCs have been used to fund many rail services to airports, including San Francisco International, MSP International Airport (Minneapolis-Saint Paul), Portland International Airport, Newark International Airport, and John F Kennedy International Airport (New York).

McCarran International Airport already charges the allowable maximum of $4.50 per passenger, and thus the fee cannot be raised to generate new revenue. In 2019, the fee generated $96.8 million.

DEPARTMENT OF HOMELAND SECURITY

The Department of Homeland Security provides funding to state, local, tribal, and territorial governments as well as transportation authorities to improve the nation's readiness in preventing, protecting against, responding to, recovering from, and mitigating terrorist attacks, major disasters, and other emergencies. Grants are designed to address immediate security needs and ensure public safety.

Transit Security Grant Program (TSGP)

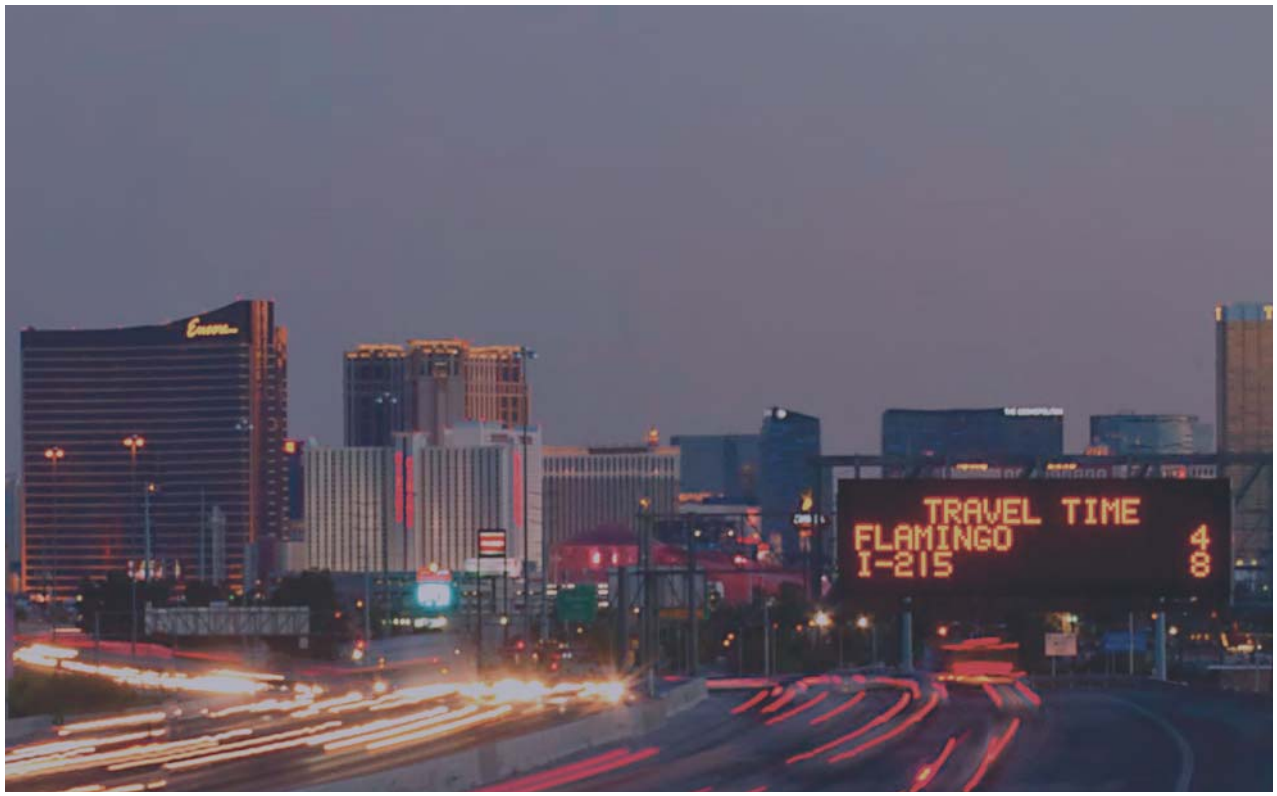
DHS provides $88 million nationally to owners and operators of transit systems to protect critical surface transportation, and the traveling public, from acts of terrorism, and to increase the resilience of transit infrastructure. Grant program priorities include enhancing the protection of soft targets and crowded places. They can be used for security cameras, access controls (including fencing, gates, and barriers, such as bollards). There are no matching funds required for these funds and RTC is identified as an eligible recipient of TGSP funds.

EXISTING STATE FUNDING

Nevada currently provides funding for highway and highway-related projects but not for transit. The major state sources of highway funds are:

- ☑ State gas tax
- ☑ Special/Alternatives Fuels Tax
- ☑ General funds
- ☑ General sales tax
- ☑ Vehicle/truck registration and license fees
- ☑ Occupational and business licensing fees
- ☑ Governmental service taxes
- ☑ Passenger carrier excise fees

As stated above, these sources are directed toward highway and highway-related projects. They are important to the On Board program because many On Board projects can be implemented as part of roadway projects – for example, bus lanes and bus stop, pedestrian, bicycle, and safety improvements.



EXISTING LOCAL FUNDING

TRANSIT FUNDING

There are three major local sources of transit funding: local sales tax, fare revenues, and transit advertisements.

Local Sales Tax

In 1991 Clark County residents approved a 1/4 cent local sales tax for transit, and in 2003 approved and additional 1/4 cent for roads and transit, split equally between the two to produce the current total rate for transit of 3/8 cent. These funds are also often referred to as Question 10 funds. In FY 2019, local sales taxes generated $166.4 million. These revenues are largely used for transit operations but could potentially be used for any of the transit and transit-related On Board projects.

Passenger Fares

Passenger fares are RTC's second largest source of transit revenue, generating $76.3 million in FY 2019. In June 2020, however, RTC fare revenues are significantly reduced due to ridership impacts related to the COVID-19 pandemic. In addition, as a public health measure to reduce contact between passengers and equipment, RTC operated fare free in the spring 2020. While ridership and revenues are expected to recover, they will almost certainly be reduced in FY2020 and FY2021.

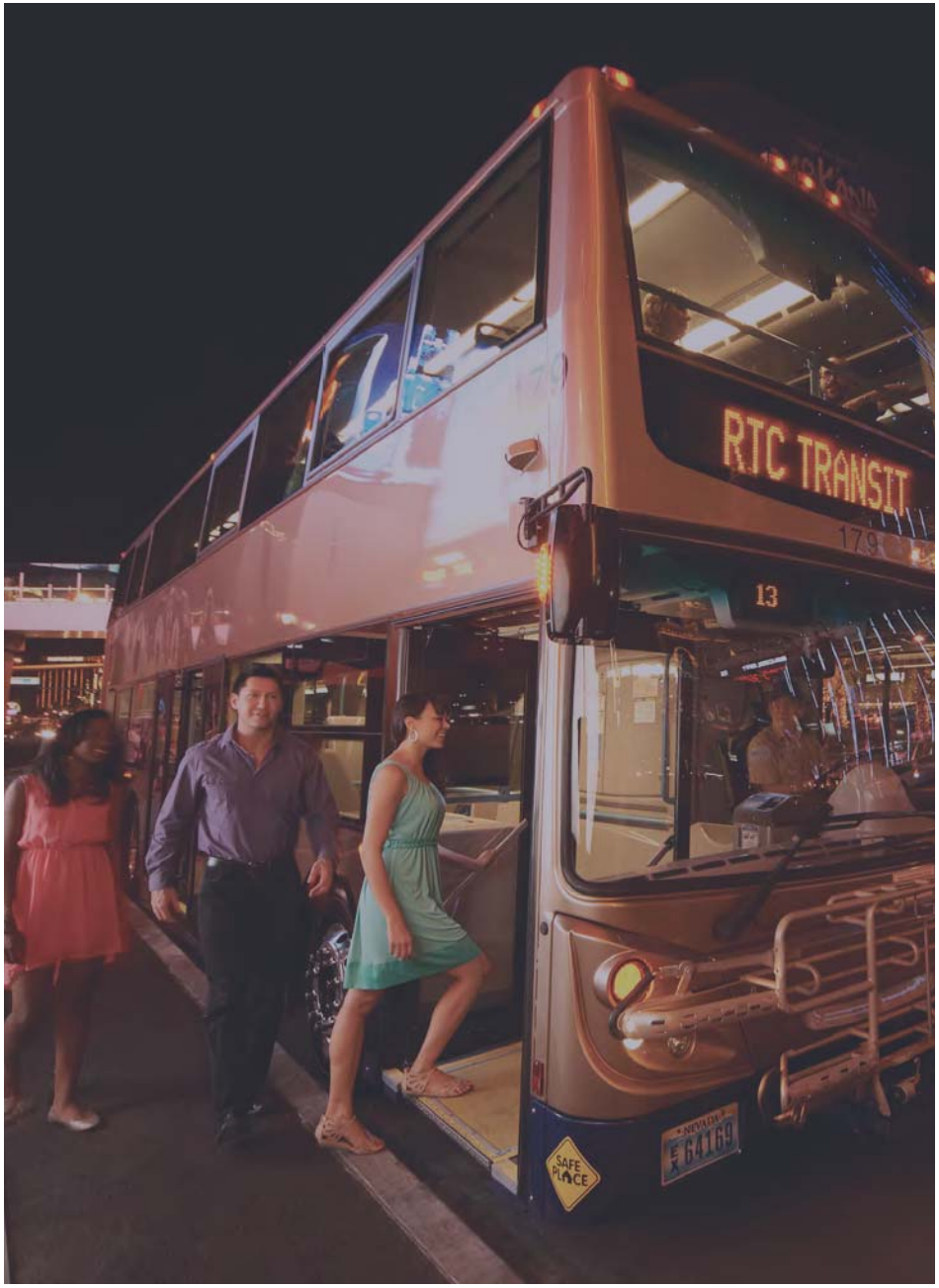
Transit Advertising

Transit advertising revenues are a smaller, but important, source of revenue. In FY 2019, advertisements on buses and at transit facilities generated $3.4 million.

STREETS AND HIGHWAYS FUNDING

There are four local sources of funding for streets and highways:

- ☑ Local sales tax
- ☑ Motor vehicle fuel tax



☑ Jet aviation fuel tax

☑ Petroleum Clean-Up funds

These funds can only be used for projects in the public right of way or projects that enhance vehicular movements. In some cases, funds may be used for pedestrian and bicycle improvements if they are implemented as part of roadway improvements projects and support overall vehicular movements.

Local Sales Tax

The 2003 sales tax vote described above provides 1/4 cent for roadway improvements. In FY 2019, local sales taxes generated approximately $50 million for roadway improvements.

Motor Vehicle Fuel Tax

Until 2014, Clark County imposed a local motor vehicle fuel tax of 9¢ per gallon. In FY 2019, this tax generated $75.8 million.

Fuel Revenue Indexing

In 2014, voters approved "Fuel Revenue Indexing," or FRI, which annually increased the 9¢ per gallon fuel tax based on the Producer Price Index (PPI). The incremental revenues above the 9¢ rate are referred to as FRI funds, and sometime as "Fuel Tax indexing." The initial measure ran through 2016 but was then extended by voters to run through 2026. In FY 2019, the FRI increases generated $105.7 million.

Jet Aviation Fuel Tax

Clark County imposes a 1¢ per gallon tax on jet aviation fuel. In FY 2019, this tax generated approximately $4 million. The COVID-19 pandemic reduced the demand for air travel significantly, which led to reductions in jet aviation fuel taxes. The pandemic is expected to reduce fuel tax revenues for the next 18 to 24 months.

Combined Transient Lodging Tax/Resort Corridor Room Tax

Clark County imposes a 1% tax on rooms that is primary designed to fund Resort Corridor improvements. These funds are for projects related to building and maintaining sidewalks, streets, avenues, boulevards, highways, bridges, and other public rights-of way used primarily for vehicular traffic. Clark County uses these funds to make transportation improvements within the Resort Corridor, including using tax revenues as security for bonds issued to fund Resort Corridor improvements.

POTENTIAL NEW FUNDING SOURCES

Mobility improvements and transit investments are funded in a variety of ways. Standard strategies for raising funds are through general taxes levied on the overall population (sales and property taxes); taxes focused on specific areas that will receive most of the investment (special assessment districts); and taxes on transportation sources (tools, licenses/vehicle registration and ride hailing). There are also several examples of communities taxing themselves in a variety of creative ways. The following section highlights some of the most common options.

GENERAL TAXES (SALES AND PROPERTY)

Sales Taxes

Sales taxes are the most important source of funding at many transit systems and are frequently used to fund major transit expansion programs. Indeed, Southern Nevada already has a sales tax that supports transit investments. As shown in Table 2, the 3/8 cent local sales tax for RTC is lower than those used at other major U.S. cities.

Table 2 Use of Sales Taxes for Operations

City/Transit System	Sales Tax Rate
RTC of Southern Nevada	**0.375%**
Boston/MBTA	1.0%
Denver/RTD	1.0%
Los Angeles/LA Metro	2.0%
San Diego/MTS	0.5%
Wake County (Raleigh), North Carolin	0.5%
Phoenix/Valley Metro	0.7%
Salt Lake City/UTA	1.2%
Seattle/King County Metro	1.4%
Dallas/DART	1.0%

Sales taxes are also the most common way to fund major expansion programs, and examples include:

- ☑ **Denver Metro Area:** Denver RTD's FasTracks program produced one of the most aggressive transit expansions in the country. The major funding source was a 0.4% sales tax that was authorized by voters in 2004 for what was then a $4.7 billion-dollar expansion program. Through FasTracks, RTD has developed new light rail and commuter rail services and expanded bus services. At present, the total sales tax in the City of Denver is 8.3%.

- ☑ **Maricopa County, AZ:** In Maricopa County, AZ, which includes Phoenix, voters approved Prop 400, which authorized a 0.5% sales tax for transportation (roadway and transit improvements). This vote was largely responsible for the development of the Phoenix metro area's light rail line, as well as bus service improvements.

- ☑ **Phoenix, AZ:** More recently, in 2015, voters in the City of Phoenix passed Prop 104, which increased the local sales tax for transit from 0.4% to 0.7%. This tax is in addition to the county-wide Prop 400 sales tax and will be used to expand light rail and BRT, and to increase service frequencies and spans on local bus routes. The total sales tax in Phoenix is now 8.6%

- ☑ **Los Angeles, CA:** In 2018, voters in Los Angeles County approved a $61.5 billion, 40-year program of comprehensive transportation improvements (Measure M). Of the $61.5 billion, $29.9 will be used for bus and rail services, and $1.9 billion for regional rail services. The measure will be funded largely through an increase in the sales tax for transit from 0.5% to 1%. The total sales tax in Los Angeles County is 9.5%.

- ☑ **Puget Sound, WA:** In 2016, voters in the Seattle area approved a package of revenue increases to fund a $53.8 billion expansion of Sound Transit's light rail system, the construction of two BRT lines, and commuter rail improvements. This initiative – Sound Transit 3, or ST3 – increased the local sales tax by 0.5%. The current total sales tax in the City of Seattle is 10.3%.

- ☑ **Broward County, FL:** In 2018, voters in Broward County, FL authorized a one percent sales tax increase to fund $15.6 billion in transit improvements. Of the $15.6 billion, $9.0 billion will be to develop new light rail lines, and the remainder will go toward new and enhanced local bus routes, expanded paratransit and community shuttle services, bike lanes, transit signal priority, and roadway drainage to prevent flooding. The total sales tax in Broward County is now 7.0%

Historically, sales taxes for transit have been well supported by voters. The American Public Transportation Association (APTA) reports that 70% of transit funding initiatives pass.[2]

In 2017, the state authorized Regional Transportation Commissions to increase their local sales taxes for transportation projects (NRS 277A.470), through a process that would need to culminate in a vote to be held before the end of 2020. In 2019, the deadline was extended to the end of 2024. This authorization could potentially provide the largest source of new funding for On Board projects, and a 0.5% local sales tax increase could generate approximately $220 million per year. The following steps would be required to increase the sales tax:

- ☑ Prepare recommendations that specify the proposed rate for the recommended tax, the period during which the recommended tax will be imposed, and the type and location of the transportation projects the recommended tax will support.

- ☑ Submit the recommendations to the board of county commissioners. Upon the receipt of recommendations, the board of county commissioners may, at the next general election, submit a question to the voters of the county asking whether the recommended

tax should be imposed in the county.

☑ The question submitted to the voters must specify the proposed rate for the recommended tax, the period during which the recommended tax will be imposed, and the type and location of the transportation projects the recommended tax will support.

Property Taxes

Smaller municipal transit systems often use general funds for transit, including property taxes earmarked for transit. For larger transit systems, the use of property taxes is usually through the development of Special Assessment Districts (see below). This reflects the fact that property taxes are almost always levied at a local level, which makes regional or statewide approaches difficult. Some exceptions include:

☑ **Puget Sound, WA:** The recent Sound Transit 3 initiative included a 25¢ per $1,000 of assessed value increase in property taxes.

☑ **Southeast Michigan:** the Suburban Mobility Authority for Regional Transportation (SMART) is supported by a property tax millage levied on communities in three counties (Oakland, Macomb Wayne (not including the City of Detroit)). Residents in all three counties vote to renew the tax every 4 years.

☑ **Fort Worth, TX:** The City Council is considering the use to property taxes to fund transit improvements. The city already levies a 1% local sales tax, half of which is used to fund transit and half of which is used to fund police services. The state caps local sales tax levies at 1%, which is the reason that the city is considering the use to property tax funds.

Local Assessment (General Fund)

Some transit districts assess local communities in return for service each year. For example, in **Massachusetts,** communities served by the MBTA are assessed based on a state-mandated formula that considers local population, service provided by other transit authorities, and proximity to Boston. The amount each community pays does not correlate to the level of service received. MBTA assessments represented about 8% of the FY19 budget and cannot increase more than 2.5% annually. In **Connecticut**, transit systems rely even more heavily on municipal contributions. The method for assessing these contributions vary by district.

SPECIAL ASSESSMENT DISTRICTS

One common way to fund major projects is to develop special assessment districts in the area that is served by and benefits from the transit improvement. The taxes are typically based on property value, or sales, special business fees, or other measures of value. Examples include:

☑ **Kansas City, MO:** Kansas City has developed Transportation Development Districts (TDDs) to fund construction and operation of its streetcar line. The TDD consists of areas of approximately 1/2 mile to each side of the line. The first TDD was approved by voters within the proposed district and funded development of current streetcar line. In 2017, voters approved the creation of a second district to extend the line 3.8 miles southward. The TTDs impose a variety of taxes and fees:

- ☐ 1% sales tax within the TDD boundary
- ☐ A special assessment (property taxes) on real estate within the TDD boundary, with maximum rates as follows:
  - 48¢ for each $100 of assessed value for commercial property
  - 70¢ for each $100 of assessed value for residential property
  - $1.04 for each $100 of assessed value for property owned by the City
  - 40¢ for each $100 of assessed value for real property exempt from property tax, such as religious, educational, charitable, etc. property, but only on market value more than $300,000 and less than $50 million.
- ☐ An assessment on surface pay parking lots within the TDD boundary (not garages and not free parking lots). The maximum rate for the supplemental special assessment on surface pay parking lots is $54.75 per space per year.

☑ **Minneapolis, MN:** Via legislative action, several communities have been designated as a Regional Taxing District with a property tax levy for transit capital purposes. The area is a subset of a seven county area that can expand based on service agreements. The funds are used for debt service on bonds issued by the Metropolitan Council, with the bonds used primarily for transit fleet maintenance and replacement, and some facilities.

☑ **Northern Virginia:** In northern Virginia, two counties created Special Assessment Districts to fund the extension of rapid transit service from Washington, D.C. to Dulles International Airport:

- Fairfax County established a special tax district on commercial and industrial properties in 2004 to fund the county's portion of Phase 1 of the extension. The district consists of most of the Tysons Corner Urban Center and an area around the Phase 1 stations and assesses a property tax of 22¢ per $100 of assessed value. In 2009, the county established a second special tax district consisting of the area around its Phase 2 stations. In that district, the property tax rate started at 5¢ per $100 and increased five cents each year to 20¢ in FY 2014.
- Loudoun County implemented a "Metrorail Service District" to pay for its portion of Phase 2 of the project. That district consists of properties around the Phase 2 stations in Loudoun County with a levy of 20¢ per $100 of value.

☑ **Columbus, OH:** In 2018, a downtown assessment district in Columbus provides free transit passes for downtown workers. An estimated 14,800 out of 30,000 eligible workers in the district have registered for the pass and made about 25,000 weekly trips during the first year of the program. Bus ridership during rush hour increased by about 24%. Funding is matched by the local planning commission.

Tax Increment Financing (TIF) Districts

Tax Increment Financing Districts are like Special Assessment Districts in that districts are created to encompass areas that will benefit from transit improvements. However, in these districts, rather than increasing taxes, the new property tax revenue generated because of increases in property value are used to fund the transit improvements. This approach is often preferred by property owners as tax rates do not increase (although taxes paid do increase due to increased property values). A disadvantage of TIFs compared to Special Assessment Districts is that revenue amounts are much more speculative.

Two examples include:

☑ **Miami, FL:** In 2018, Miami-Dade created a Tax Increment Financing District that encompassed approximately two-thirds of the county. The TIF is forecast to generate $1.8 billion over 30 years for transit improvements, including the expansion of rapid transit service.

☑ **Dallas, TX:** In Dallas, a 559 acre TIF district was created that encompasses eight DART rail stations. A total of $328 million in TIF revenue is projected over the 30-year life of the TIF district. The revenues will be spent on public infrastructure such as streets, sidewalks, lighting, and landscaping intended to encourage redevelopment of the station areas with walkable, mixed-use development.

TRANSPORTATION TAXES

Motor Vehicle Taxes/Vehicle Registration Fees

Different forms of vehicle taxes are frequently used to fund roadway projects and occasionally to fund transit. Transit examples include:

☑ **Minnesota:** Minnesota generates transportation funding through a 6.5% sales tax on motor vehicles. This is in lieu of a general sales tax. The funds are used for both highways and transit, with a minimum of 40% directed to transit. On a statewide basis, this tax funds 40% of transit operating costs.

☑ **Puget Sound,** WA: Residents of three counties in the Seattle area impose a Motor Vehicle Excise Tax (MVET) that is charged upon purchase or annual license renewal of a new or used car. The rate is 1.1% of the vehicle's assessed value.

☑ **Alameda, CA:** Alameda, which is in the San Francisco Bay Area, charges a vehicle registration fee of $10 per year, 25% of which is dedicated to transit.

☑ **San Francisco, CA:** San Francisco charges a $10 annual fee that is used for transportation improvements, including transit.

Tolls

Toll revenues are also occasionally used to fund transit:

☑ **Northern Virginia:** In 2017, for a variable toll, Virginia began letting single occupancy vehicles use its HOV lanes and dedicates $10 million per year of the revenue to transit.

☑ **San Francisco, CA:** The Golden Gate Bridge Highway and Transportation District runs the Golden Gate Bridge and Golden Gate Transit. Tolls collected on the bridge provide funding for over one-third of transit costs.

☑ **New York City, NY:** The New York City area's Metropolitan Transportation Authority, or MTA, operates rapid transit, commuter rail, bus service, and seven bridges and tolls. In 2018, toll revenues contributed $1.8 billion toward MTA's $15 billion budget, over 95% of which was for transit.

Toll roads are currently not permitted in Nevada, and as such, the use of tolls to fund On Board projects would need to be part of a much larger tolling initiative.

Taxes on Rideshare Trips

Cities and states are beginning to impose taxes on rideshare trips, in part because increases in ridesharing are increasing financial strains on transit systems.

- ☑ **Massachusetts** currently has a 20¢ tax on rideshare trips, with 5¢ designated for taxis, 10¢ going to cities and towns, and the final 5¢ designated for a state transportation fund which includes funding for transit. This fee, in total, generates $16 million per year. The Governor of Massachusetts has recently proposed raising this tax to $1.00 per trip, with 30% for cities and towns and 70% for transportation purposes, mostly for transit. A $1.00 tax is estimated to generate $73 million per year.
- ☑ In January 2020, Seattle enacted a 57¢ tax on rideshare trips with the funds directed toward affordable housing initiatives and new streetcar service.
- ☑ In 2016, Chicago enacted a 72¢ per trip tax on rideshare trips to fund transit infrastructure. In January 2020, it revised this tax to a set of rates that range from 65¢ for shared trips in neighborhoods to $3 for private trips in downtown during peak periods. The tax rate changes are expected to generate an addition $40 million per year.

Nevada currently levies a 3% tax on rideshare trips, but these revenues are not available for local transportation projects.

Rental Car Taxes

Rental car taxes are implemented in various ways, such as, for example, sales taxes or on a per rental basis. They are often more acceptable to residents as they are largely imposed on visitors.

- ☑ **Allegheny County, PA,** which is where Pittsburgh is located, imposed a $2 tax on vehicle rentals to fund Port Authority services.
- ☑ In 2016, voters in Wake County, North Carolina approved the Wake County Transit Plan, which included a funding program comprised of a 1/2 cent local options sales tax, a tax on vehicle rental cars and a vehicle registration tax.

Clark County currently levies a 2% tax on rental cars, but the funds are not dedicated to transportation improvements.

Parking

A few cities generate transit revenue through taxes on commercial parking. Two include:

- ☑ **San Francisco, CA,** imposes a tax of 25%.
- ☑ **Seattle, WA,** imposes a tax of 12%.
- ☑ As described above, **Kansas City's** Transportation Development Districts levy a $54.75 annual tax on surface parking spaces that charge a fee.

Many transit agencies also collect parking fees at park-ride lots to help offset the cost of transit operations.

OTHER MOBILITY AND TRANSIT TAXES

Communities across the United States are using a variety of creative and innovative ways to support mobility and transit projects.

Real Estate Transfer Fees:

In a few cases, real estate transaction fees are used to fund transit. For example:

- ☑ **Virginia** has a deed-recording fee that that ranges from $21 to $54 that is used to support local bond issues for transit projects.
- ☑ **Florida** charges a real estate documentary tax of $0.70 per $100 of the transaction value, 10% of which is used to match federal New Starts funds.

Payroll/Employment Taxes

In 2018, the State of Oregon implemented a payroll tax of 0.1% to fund transit. This tax must be paid by all working residents of Oregon, no matter where they work, and by all non-residents who work within Oregon.

Hotel/Motel Taxes

The 2016 Let's Move **Nashville** campaign would have imposed a tax on hotels and motels that would have started at 1.4% of the room rate and over time increased to 3.75%. As described above, Clark County already levies a lodging tax, with part of the proceeds directed toward Resort Corridor transportation improvements.

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