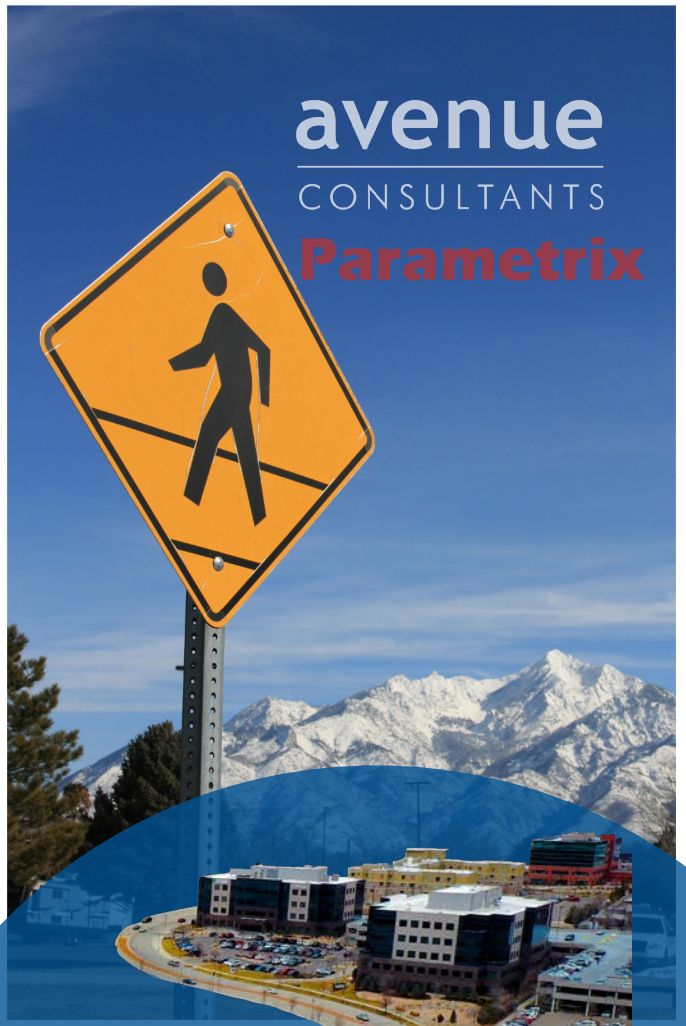

avenue
CONSULTANTS
Parametrix

Sandy
Transportation Master Plan
2021

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ACKNOWLEDGMENTS

Many thanks to the dedicated staff of Sandy City, community members who participated, and all who have contributed to develop the Transportation Master Plan.

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Special thanks to all the Sandy City residents who participated in the plan via surveys and comments. Your contributions helped shape the plan.

1 EXECUTIVE SUMMARY

Sandy City is experiencing a period of development and growth with land use and transportation. The Cairns Downtown is evolving into an increasingly inviting and walkable community center. Economic diversity can be seen from street corners and sidewalks. A robust active transportation (AT) network is being developed, providing alternative transportation options that promote healthier lifestyle choices for residents. This Transportation Master Plan (TMP) is intended to be an effective tool to help Sandy prepare for a future community that is connected, inviting, beautiful, and provides safe mobility options to everyone.

Organized into six sections, This TMP includes updated City wide **Goals and Policies** (section 2), analysis of **Existing Conditions** (section 3), model outputs included to help tell the story of **Future Conditions** (section 4), a myriad of community feedback through our **Public Outreach** (section 5), and finally a complete and phased **Capital Improvements Plan** (section 6), which includes guidance for implementation and funding for projects in Sandy.

This Plan focuses on improving safety across Sandy's transportation network. Discussion about pedestrians and bicyclists is found throughout this TMP. This document conveys the understanding that Right of Way (ROW) is public space and it should therefore be made available to, and shared by all transportation users. The Capital Improvements Plan addresses the need for improved safety, added facilities for multiple modes of transportation, and improving the overall comfort and connectivity of the community's transportation network.

Perhaps the most important part of the Transportation Master Plan is the Capital Improvement Projects. These projects represent the needs of the growing community.

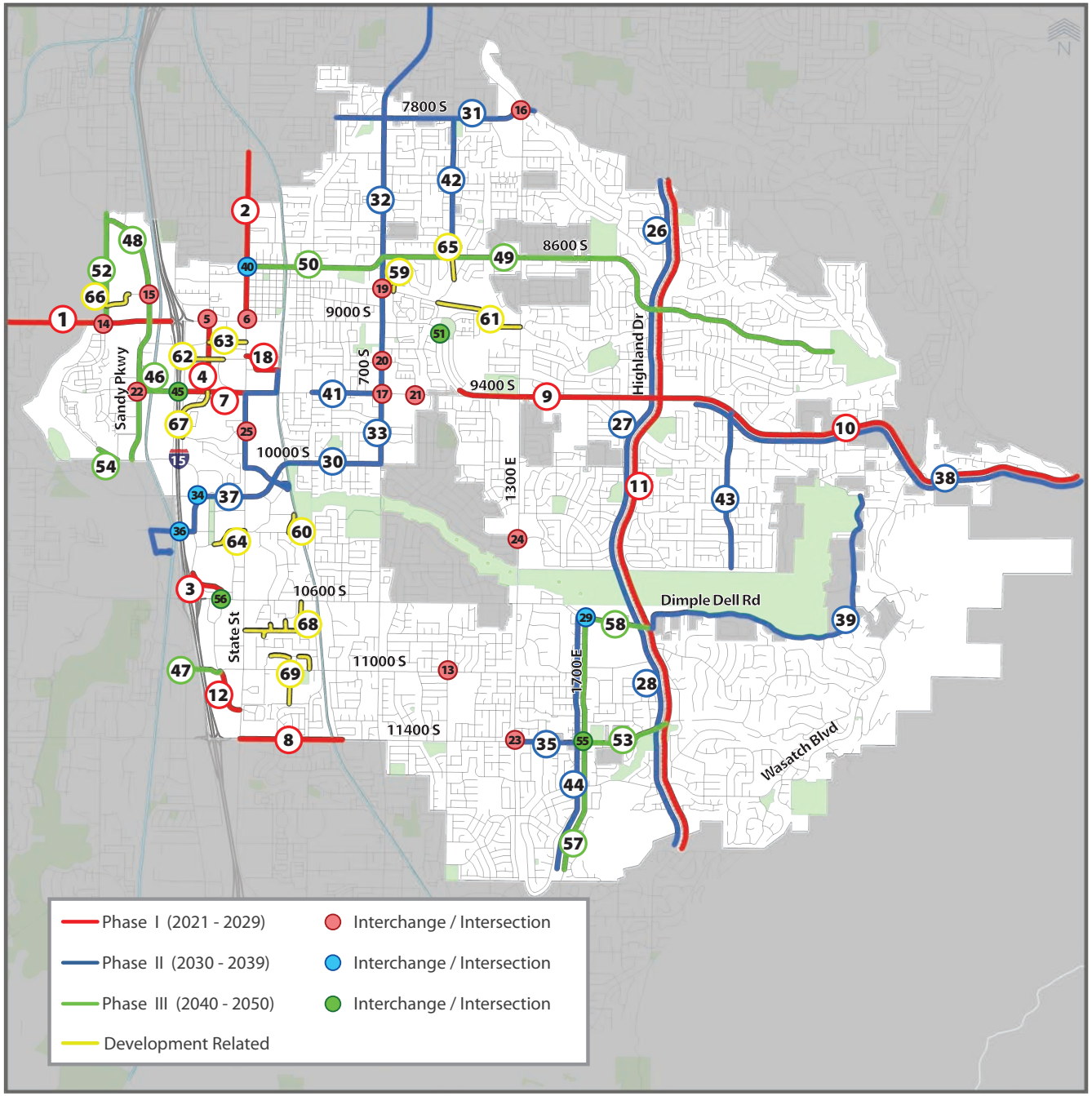
On the following four pages are Tables 1-1 through 1-4, which show the planned projects in Sandy by phase, and Figure 1-1, which is the map showing each project's location within the City.

Construction for an above ground parking structure is underway next to the light rail Sandy Civic Station. Parking for the station as well as future Transit Oriented Development (TOD) will be allowed at this raised parking facility.

The Sandy Transportation Master Plan includes widening projects, new roads, intersection improvements, transit, and active transportation facilities. This list is extensive with 65 projects and ensures that Sandy residents will have a future transportation network that is well functioning and stable.

The projects on this plan help support a variety of modes of transportation, increase community connections, assist economic growth, and encourage active transportation and transit use. Detailed lists of projects are on subsequent pages.

Figure1-1: Capital Improvements Map



Tables 1-1 through 1-4: Capital Improvements by Phase

	#	Project	Location	Type	Cost	Funding
2021-2029	1	9000 South	Redwood Road to I-15	Widening: 5/7 to 7 Lanes	$34,000,000	UDOT
	2	State Street	8000 South to 9000 South	Widening: 5 to 7 Lanes	$18,000,000	UDOT
	3	Monroe Street (Phase 3)	10600 South to I-15 Ramp	New Construction: 0 to 5 Lanes	$6,900,000	Development/Sandy/ WFRC
	4	Monroe Street (Phase 6)	9100 South to 9400 South	New Construction: 0 to 3 Lanes	$10,000,000	Sandy/WFRC
	5	9000 South / Monroe Street		Intersection Improvement	$8,000,000	Sandy/UDOT/WFRC/SLCo
	6	9000 South / State Street		Innovative Intersection	$8,000,000	UDOT
	7	9400 South	Monroe Street to State Street	Widening: 3/4 to 5 Lanes+ Bike Lanes	$3,500,000	Sandy/WFRC
	8	11400 S	State St to Camden Park Ln	Buffered Bike Lanes	$600,000	Development/Sandy/ Draper/WFRC
	9	9400 S	9375 S to Raintree Dr	Buffered Bike Lanes	$1,300,000	UDOT
	10	Little Cottonwood Rd	Raintree Dr to Little Cottonwood Canyon	Bike Lanes	$200,000	UDOT
	11	Highland Drive	North City Limit to 14600 South (Draper)	Environmental Study	$4,300,000	Sandy/Draper/WFRC
	12	AutoMall Drive	11000 South to State Street	Widening: 3 to 5 Lanes + Roundabout + Shoulder Bikeway	$7,000,000	Sandy/WFRC
	13	11000 South / 1000 East		New Roundabout	$1,500,000	Sandy
	14	9000 South / 700 West		Intersection Improvements	$6,000,000	Sandy/UDOT/WFRC
	15	Sandy Parkway (450 W) / Parkland Drive		New ThrU Turn Intersection	$2,000,000	WFRC/Sandy
	16	7800 South / 1300 East		Intersection Improvements	$2,500,000	WFRC/Sandy
	17	9400 South / 700 East		Intersection Improvements	$3,500,000	WFRC/Sandy
	18	9270 South	State St to 150 East	Roadway Realignment	$7,500,000	Sandy/WFRC
	19	Cy's Road (8800 S) / 700 East		New Traffic Signal	$350,000	UDOT
	20	9200 South / 700 East		New Traffic Signal	$350,000	UDOT
	21	9400 South / 840 East		New HAWK Signal	$250,000	Sandy
	22	9400 South / 500 West		New Traffic Signal	$350,000	Sandy
	23	11400 South 1300 East		Intersection Improvements	$3,500,000	Sandy
	24	1300 East / Sego Lily Dr		Intersection Improvement / Active Transportation	$800,000	Sandy
	25	Towne Ridge Parkway / State Street		Intersection Improvements	$1,300,000	Sandy
				Phase I Total Cost: $131,700,000		

	#	Project	Location	Type	Cost	Funding
2030-2039	26	Highland Drive (2000 East)	Creek Road to 9400 South	Potential Widening Pending EIS: 5 to 7 Lanes	$24,000,000	State/Federal
	27	Highland Drive	9400 South to Sego Lily	Potential Widening/ New Construction Pending EIS: 0-2 to 2-5 Lanes + Trail	$9,000,000	State/Federal
	28	Highland Drive	Sego Lily to Draper City Limit	Potential Widening/ New Construction Pending EIS: 0-2 to 2-5 Lanes + Trail	$81,700,000	State/Federal
	29	10600 South 1700 East		New Roundabout	$1,400,000	Sandy/WFRC
	30	Sego Lily Dr	South Jordan to 700 East & 700 East to Sandy Civic Center TRAX Station	Widen: 5 Lanes from 700 East to TRAX + Bike lanes from South Jordan to 700 East	$5,400,000	Sandy/WFRC
	31	7800 South	Approx. 415 E to Creek Rd	Widening: 3 Lanes + Trail	$12,800,000	Sandy/Midvale/ WFRC (Future RTP)
	32	700 East	7660 South to 9400 South	Widening: 5 to 7 Lanes + Buffered Bike Lanes	$35,600,000	UDOT
	33	700 E	9400 South to Sego Lily Dr	Buffered Bike Lanes	$400,000	UDOT
	34	10000 South / Monroe Street		Intersection Improvements	$2,000,000	Sandy
	35	11400 South	1300 East to 1700 East	Widening: 3 to 5 Lane	$5,100,000	Sandy/WFRC (Future RTP)
	36	10200 South I-15 Crossing		Bike / Pedestrian / Bus / Street Car Crossing	$24,000,000	Sandy/WFRC/ UDOT/UTA
	37	Sandy / South Jordan Circulator	Sandy Expo Station to South Jordan FrontRunner Station	Transit	$4,300,000	Sandy/WFRC/ UTA
	38	Little Cottonwood Rd	Raintree Dr to Little Cottonwood Canyon	Widening: 2 to 3 or 5 Lanes (depending on transit solution) + Bike Lanes	$31,500,000	UDOT
	39	Dimple Dell Road	Highland Drive Corridor to Mt. Jordan Road	Widening to minor collector + Bike Lanes + Multi-use Trail	$16,500,000	Sandy/WFRC (Future RTP)
	40	State Street /8680 South		Intersection Improvement / Move Signal from Main St, add raised median	$350,000	UDOT
	41	9400 South	300 East to 700 East	Widening: 5 Lanes	$4,000,000	Sandy/WFRC
	42	1000 East	7800 South to 8600 South	Widen: 3 Lanes + Bike Lanes + C&G + Sidewalk	$4,800,000	Sandy
	43	Eastdell Drive	9400 South to Glacier View Drive	Traffic Calming Installation + Signed Bike Route	$150,000	Sandy
	44	1700 East	10600 South to Draper	Widening: 5 Lanes - Dependant on Highland Drive Alignment	$20,400,000	Sandy
					Total Cost: $283,400,000	

	#	Project	Location	Type	Cost	Funding
2040-2050	45	I-15 Interchange	9400 South	New Construction	$60,000,000	UDOT
	46	9400 South	Sandy Parkway to 300 West	Widening: 3 to 5 Lanes+ Bike Lanes	$3,600,000	Sandy/WFRC (Future RTP)
	47	11000 South	Jordan Gateway to Auto Mall Drive	New Construction: 0 to 3 Lanes	$25,700,000	Sandy/South Jordan/UDOT/ WFRC
	48	Sandy Parkway	9800 South to 700 West	Widening: 5 Lanes + Bike Lanes	$26,600,000	Sandy/WFRC (Future RTP)
	49	8600 South	700 E to 1300 E	Widening: 3 Lanes + Bike Lanes	$10,900,000	Sandy/WFRC (Future RTP)
	50	8600 South	State St to 700 E and 1300 E to Approx. Falcon Way	Bike Lanes + Traffic Calming	$160,000	Sandy
	51	9000 South	Approx. Quarry Bend Drive	New Pedestrian Bridge	$1,700,000	Sandy/WFRC (Future RTP)
	52	700 West	9000 South to North City Boundary	Widening: 2 to 5 Lanes + trail on west side of road	$9,200,000	Development/Sandy
	53	11400 South	1700 East to Highland Drive Corridor	Widening: 2 to 3 Lanes	$8,000,000	Sandy/WFRC (Future RTP)
	54	Riverside Drive	Extension to 9800 South	New Construction: 0 to 3 Lanes	$6,100,000	Sandy/Draper/WFRC (Future RTP)
	55	11400 South / 1700 East		New Roundabout	$1,500,000	Sandy
	56	10600 South / Auto Mall Drive		Intersection Improvements	$3,000,000	Sandy/South Jordan/UDOT/ WFRC
	57	1700 East	10600 South to Draper	Corridor Improvements + Bike Lanes	$9,700,000	Sandy
	58	Dimple Dell Road	1700 East to Highland Drive Corridor	Widening: 2 to 5 Lanes + Trail	$6,000,000	Sandy
					Total Cost: $172,160,000	

	#	Project	Location	Type	Cost	Funding
Development Related	59	Green Way	Connection of Green Way, north of Cys Rd	New Construction: 0 to 3 Lanes	TBD	Development
	60	Beetdigger Blvd	Dry Creek Ridge to 10200 South	New Construction: 0 to 3 Lanes	TBD	Development
	61	Cy's Road	Harvard Park Road to 1300 East	New Construction: 0 to 2 Lanes	TBD	Development
	62	9270 South	Monroe Street to State Street	New Construction: 0 to 2 Lanes	TBD	Development
	63	9120 South	Monroe Street to State Street	New Construction: 0 to 2 Lanes	TBD	Development
	64	10200 South	Mall Ring Road to State Street	New Construction: 0 to 3 Lanes	TBD	Development
	65	Harvard Park Dr.	Approx. 8730 Harvard Park Dr. to 1000 East	New Construction: 0 to 2 Lanes	TBD	Development
	66	Parkland Drive Extension	700 W (8800 S)	New Construction: 0 to 2 Lanes	TBD	Development
	67	Monroe Street (Phase 5)	9400 South to Towne Ridge Parkway	New Construction: 0 to 3 Lanes	TBD	Development
	68	Neighborhood Projects	East Jordan Canal & 10600 S	New Construction: 0 to 3 Lanes	TBD	Development
	69	Neighborhood Projects	Crescent View Area	New Construction: 0 to 3 Lanes	TBD	Development

2 GOALS & POLICIES

The goals and policies outlined in this section are designed to promote transportation choices that provide real options in how we choose to get around and increase the number of easily reached destinations.

The goals and policies from the 2009 MTP were used as a starting point to develop this section of the report. These goals and policies have been reviewed and approved by the City's Committee.

STREETS

GOAL: Design, maintain, and operate streets that provide safe and effective movement of people and goods.

POLICIES:

1. **Multi-Modal Streets –** Design roadways to maximize use for all modes of transportation including: personal vehicles, trucks, transit, bicycles, and pedestrians. Encourage a practical balance between multiple modes while realizing that private passenger vehicles will continue to be the primary means of transportation for most residents.

2. **Intelligent Transportation Systems (ITS) –** Consider solutions that will increase capacity without necessarily increasing the number of roadways or travel lanes. Improve the efficiency of the transportation system by optimizing traffic signal timing and using ITS technologies.

3. **Street Improvements –** Minimize the negative impacts of traffic through the on-going monitoring and improvement of the overall transportation system.

4. **Coordination –** Coordinate the development and improvement of streets with adjacent jurisdictions, County, Wasatch Front Regional Council (WFRC) the Metropolitan Planning Organization, Utah Transit Authority (UTA), and the Utah Department of Transportation (UDOT).

5. **Access Management –** Implement access management practices that will promote safety and improve mobility on major roadways while providing an overall system that will support adjacent land uses. Encourage access spacing and consolidation on arterial streets.

6. **Design Standards –** Require all roads and roadway features to meet minimum design standards established by the American Association of State Highway and Transportation Officials (AASHTO); require all signs, pavement markings, and traffic control signals to meet standards established by the Manual of Uniform Traffic Control Devices (MUTCD), and related roadway standards established by State, Federal, or local law. Exceptions to applicable standards may be granted by the City Traffic Engineer on a case-by-case basis and shall demonstrate innovative superiority or other advantages over existing standards.

7. **Maintenance –** Consider maintenance aspects in the planning and design of the street system. Minimize life cycle costs through preventative maintenance.

SAFETY

GOAL: Build and maintain a safe transportation system.

POLICIES:

1. **Safety Improvements –** Improve safety through the use of signals, signs, street markings, and street lighting.

2. **Intersection Conflicts –** Decrease intersection conflicts to reduce the frequency and severity of transportation-related collisions.

3. **Traffic Calming –** Implement traffic calming practices to achieve appropriate vehicular speeds and pedestrian safety for residential, mixed-use, and multi-modal areas.

4. **Pedestrians –** Provide a safe pedestrian system. Enhance safety by reducing vehicle-pedestrian conflicts.

5. **Bicycles –** Provide a safe bicycle system. Enhance safety by reducing vehicle-bicycle conflicts.

6. **Railroad Crossings –** Work with State and railroad officials to identify ways to alleviate existing railroad crossing safety hazards. Consider flashing lights, mechanical arms, and/or grade separation at railroad crossings to reduce auto-train conflicts.

TRANSIT

GOAL: Increase transportation mode share and convenience of transit service within the city.

POLICIES:

1. **Coordination –** Increase coordination and collaboration with UTA by reviewing the City's land use plans and infrastructure improvement plans as they go through adoption and approval phases. Future transit services should expand in step with growth in the city.

2. **Transit Options –** Work with UTA to plan expansion options that are harmonious with the increased demand connected to future land use development.

3. **Transit Frequency –** Work with UTA to increase frequency of service so it is synchronized with the needs associated with future land use development.

4. **Downtown –** Encourage regional transit access into Sandys' downtown, along with local transit service within downtown, and connecting to the regional system.

5. **Transit Stops –** Provide good auto, bus, bicycle, and pedestrian access to existing and future transit stations and facilities. Encourage UTA to provide shelters and other amenities that improve the safety and comfort of transit passengers.

6. **Special Events –** Encourage use of transit for special events to relieve vehicular traffic and parking demand.

7. **Transit Oriented Development –** Encourage Transit Oriented Development (TOD). Require commercial development to consider integrating transit and alternative modes into site plans by accommodating/building transit stops and pedestrian connections.

BICYCLES & PEDESTRIANS

GOAL: Make walking and bicycling a viable, convenient, and safe mode of transportation.

POLICIES:

1. **Parks, Recreation, and Trails –** Support the goals and recommendations of the Parks, Recreation, and Trails Element of the Sandy City General Plan. Coordinate street improvement projects with construction of trails (bicycle, walking, equestrian, and multipurpose).

2. **Connectivity –** Improve the connectivity of sidewalks, trails, and paths. Provide and maintain a continuous and direct network of trails and on- street bicycle lanes and paths. Require new development and redevelopment plans to provide pedestrian connections to adjacent uses, transit facilities, and roadways.
3. **Expand Network –** Increase transportation choices by expanding the bike & pedestrian network with new trails and bike lanes as laid out in the Active Transportation Plan.

4. **Regional Facilities –** Coordinate with neighboring jurisdictions, UDOT, and the MPO to develop future bicycle facilities. Coordinate street improvement projects with construction of bicycle trails.

5. **Maintenance –** Consider maintenance and aesthetic aspects in the planning and design of sidewalks, trails, and recreational facilities.

PARKING

GOAL: Seek to achieve a better balance of parking facilities to see that they meet the needs and functional requirements of surrounding land uses and streets.

POLICIES:

1. **School Areas –** Work with schools to improve circulation at pick- up/drop-off areas and resolve parking issues as well as pick-up/drop-off issues.
2. **Downtown –** Encourage drivers to "park once" and get around using other modes (walking, transit, etc.) in downtown and other activity centers where multiple trip purposes can be accomplished with a single automobile trip.

3. **Special Events –** Develop a special event parking and circulation plan that considers available off-street and on-street parking and will minimize congestion during event peak traffic times.

TRAVEL DEMAND MANAGEMENT

GOAL: Relieve congestion by reducing vehicle miles traveled per capita.

POLICIES:

1. **Expand Transportation Choice –** Work creatively to provide viable options for how people get around like walking, biking, transit, scooters, rideshare, carpool, etc.
2. **Land Use Planning –** Integrate transportation and land use planning to reduce the length and frequency of vehicle trips and ensure that existing and planned transportation facilities meet the travel demands generated by surrounding land uses.

3. **Mode Choice Awareness –** Increase awareness of transportation mode choices and their consequences. Support UTAs' ride share and carpool efforts. Support UDOTs' park-and-ride lot program and the Travel Wise initiative.
4. **Alternatives to Travel –** Support infrastructure and technology improvements that better enable telecommuting, remote shopping, and other alternatives to travel.

The goals and policies described above should be used by city planners, engineers and community leaders on a regular basis as they evaluate transportation needs and alternatives. Additionally, this section along with the rest of the TMP should be updated as development and transportation alternatives change in the City.

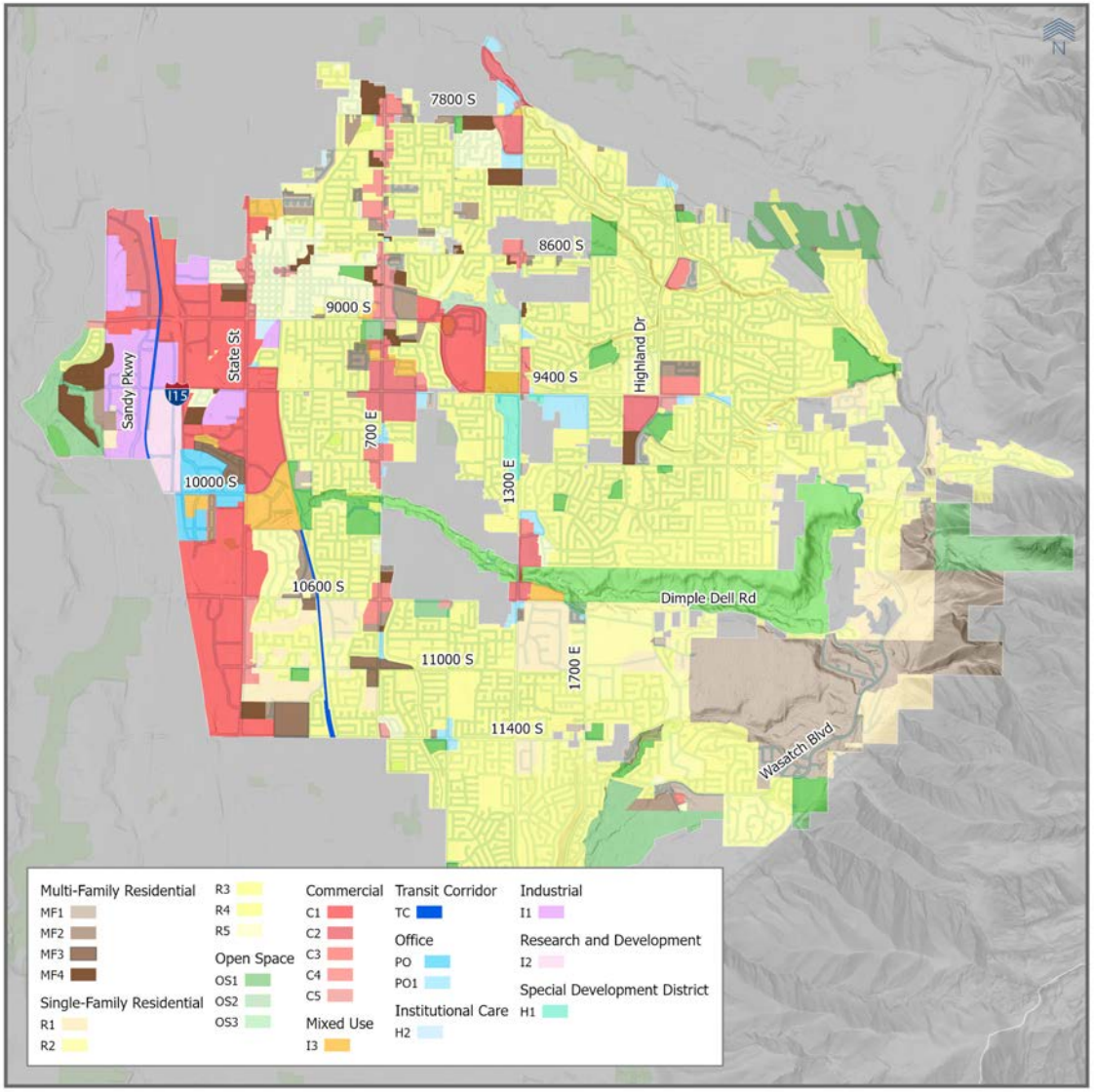
3 | EXISTING CONDITIONS

This chapter evaluates the existing transportation system within Sandy City and establishes the framework for the development of the transportation plan. This analysis includes a description of the land use as well as the demographics of Sandy City and how these factors affect the transportation system. This chapter details the existing conditions as of 2020.

Zoning and Land Use

In order to analyze the transportation system and plan for future growth, it is essential to understand zoning and land use patterns within the area. Travel is a daily requirement for most of the public as people travel from their homes to work, shopping, schools, health care facilities, and recreational opportunities. Zoning and land use patterns must function cohesively with the transportation system to support a high quality of life and promote economic development within Sandy. Figure 3-1 shows the location of each type of zoning in Sandy. The majority of the commercial zoning exists along the west side of the city, while the majority of single family housing is east of TRAX Light Rail. Some office and commercial zoning is peppered in with single family housing, but for the most part the area is devoted to homes. This means that the majority of workers must commute from their neighborhoods to go to work.

Figure 3-1: Existing Zoning



Source: Sandy City

Figure 3-2: Land Use by Percentage

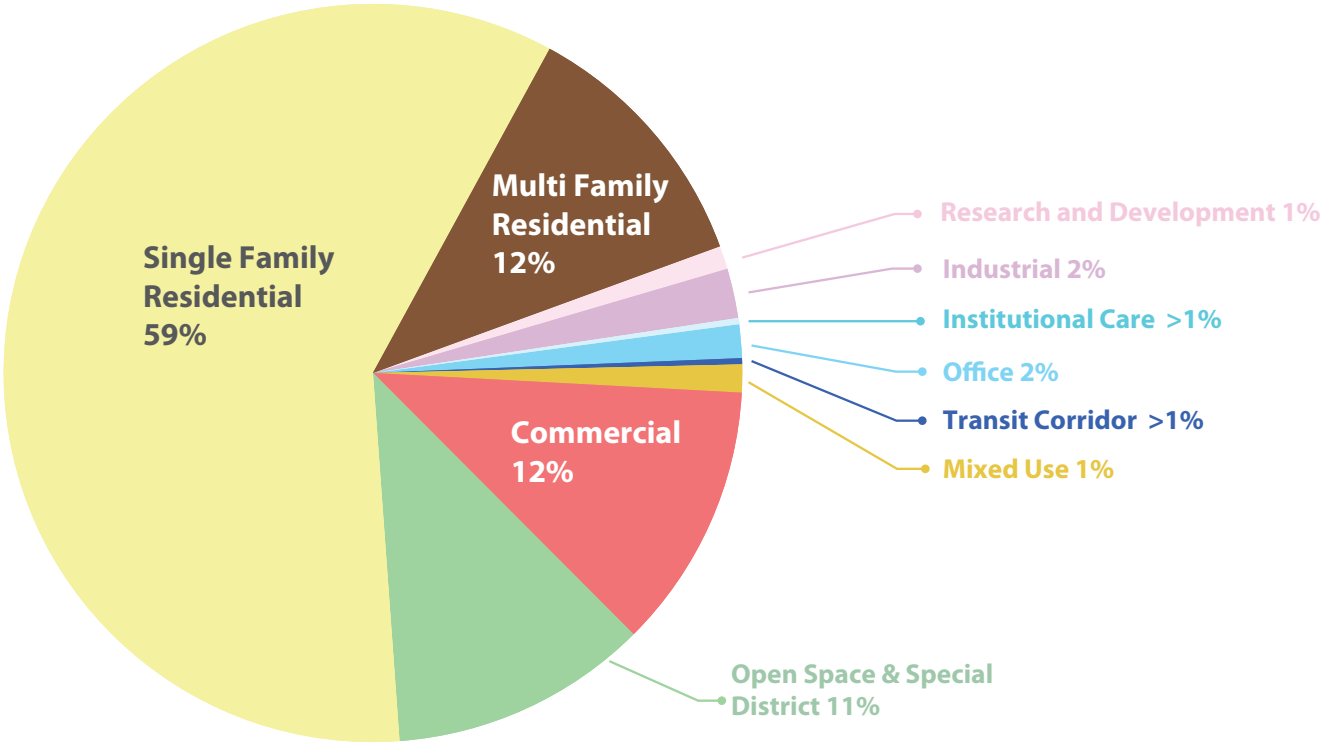


Figure 3-2 is a chart showing that Sandy's zoning is mostly single family residential making it primarily a bedroom community. The Commercial zoned footprint and the area zoned for open space is close to equal, both hovering over 10%.

Mixed Use zoning is currently at 1%, with the largest portion located next to the Sandy Civic Center Trax Station and within walking distance to the western most portion of Dimple Dell Regional Park. Mixed use zoning can allow for many needs and wants *(from housing, to groceries, to entertainment)* to be met for a large amount of people while simultaneously being located on a small geographic footprint. It is seen as part of the solution to environmental conservation and open space preservation, while promoting better air quality due to a reduced need for vehicle trips and a lower carbon footprint per person. In mixed use areas active transportation and transit become more legitimate and viable means of transportation, increasing mode-split and improving community health by providing more opportunities for walking and biking, decreasing the amount of time a person is sedentary on a regular basis. The Cairns Downtown area plans are for a large mixed use area.

Demographics

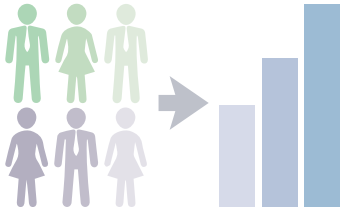
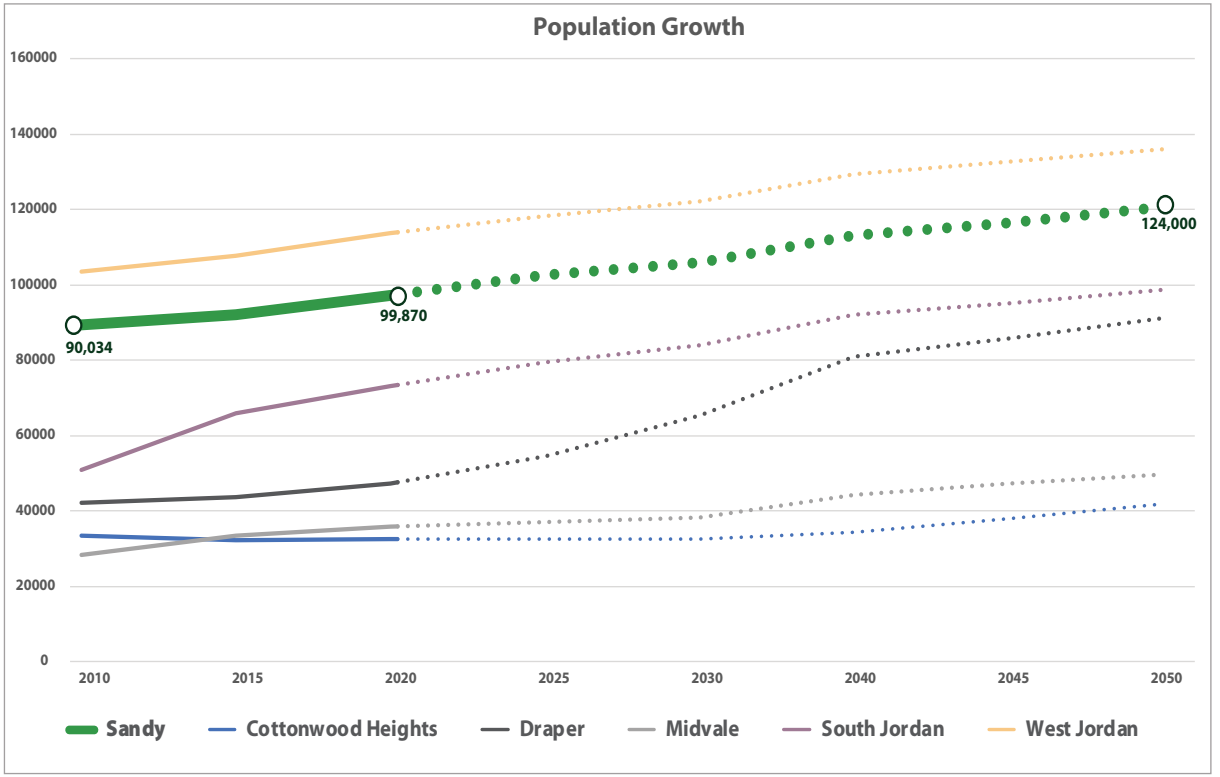


Figure 3-3: past, present, and estimated future population growth

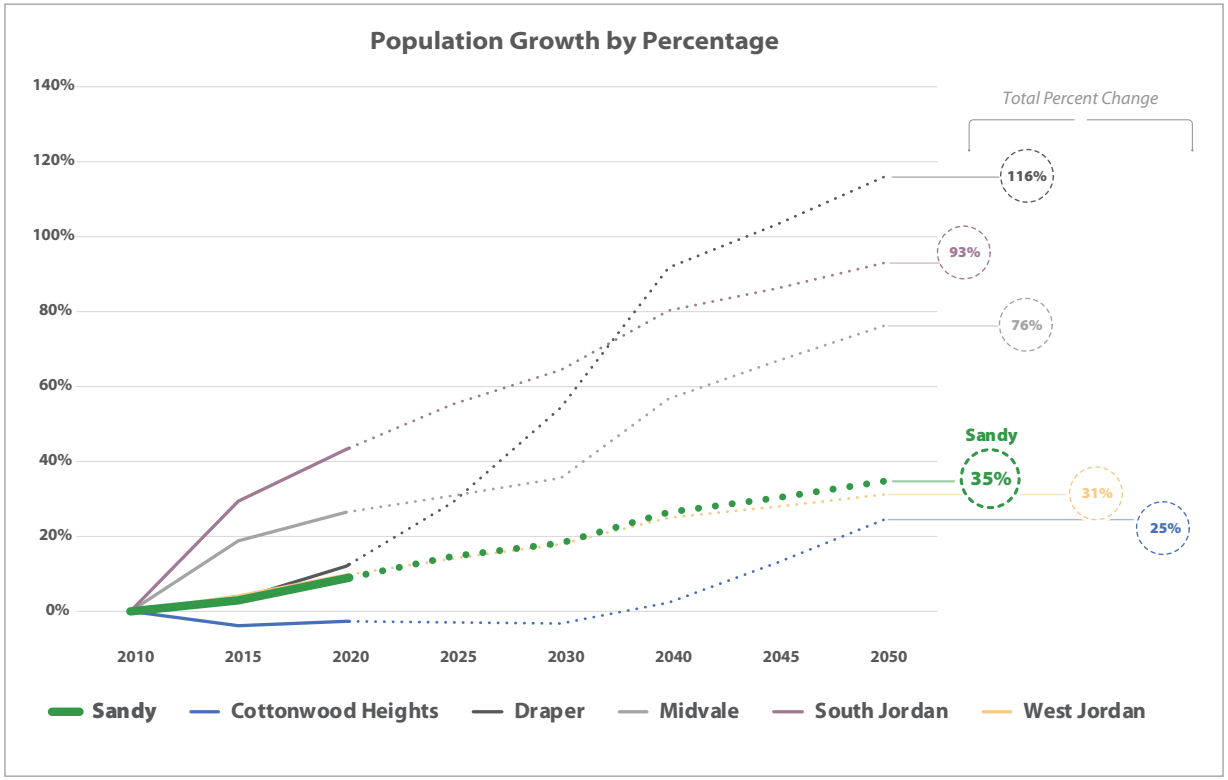


Source: US Census & WFRC TAZ Model

Population

Sandy's population in 2010 was about 90,000 and has been steadily increasing over the last decade. Currently, in 2020, it is close to reaching 100,000 residents making it the 6th largest city in Utah. This moderately paced growth is predicted to continue into 2050 where the population will be at or around 120,000. Figure 3-3 shows Sandy's past, present, and estimated future population growth. The neighboring cities of Draper, Midvale, Cottonwood Heights, and South & West Jordan, are shown to provide context and comparison. When considering a transportation plan it is highly beneficial to account for the surrounding and regional growth because a transportation system certainly does not exist within a vacuum. Sandy's central location in the Valley as well the regional attractions it offers such as the Rio Tinto Stadium, The South Town Mall, and the Hale Center Theater, as well as it being a gateway city to the Cottonwood Canyons are all "pull" factors that bring traffic into the City

Figure 3-4: Past Present and Future growth by Percent



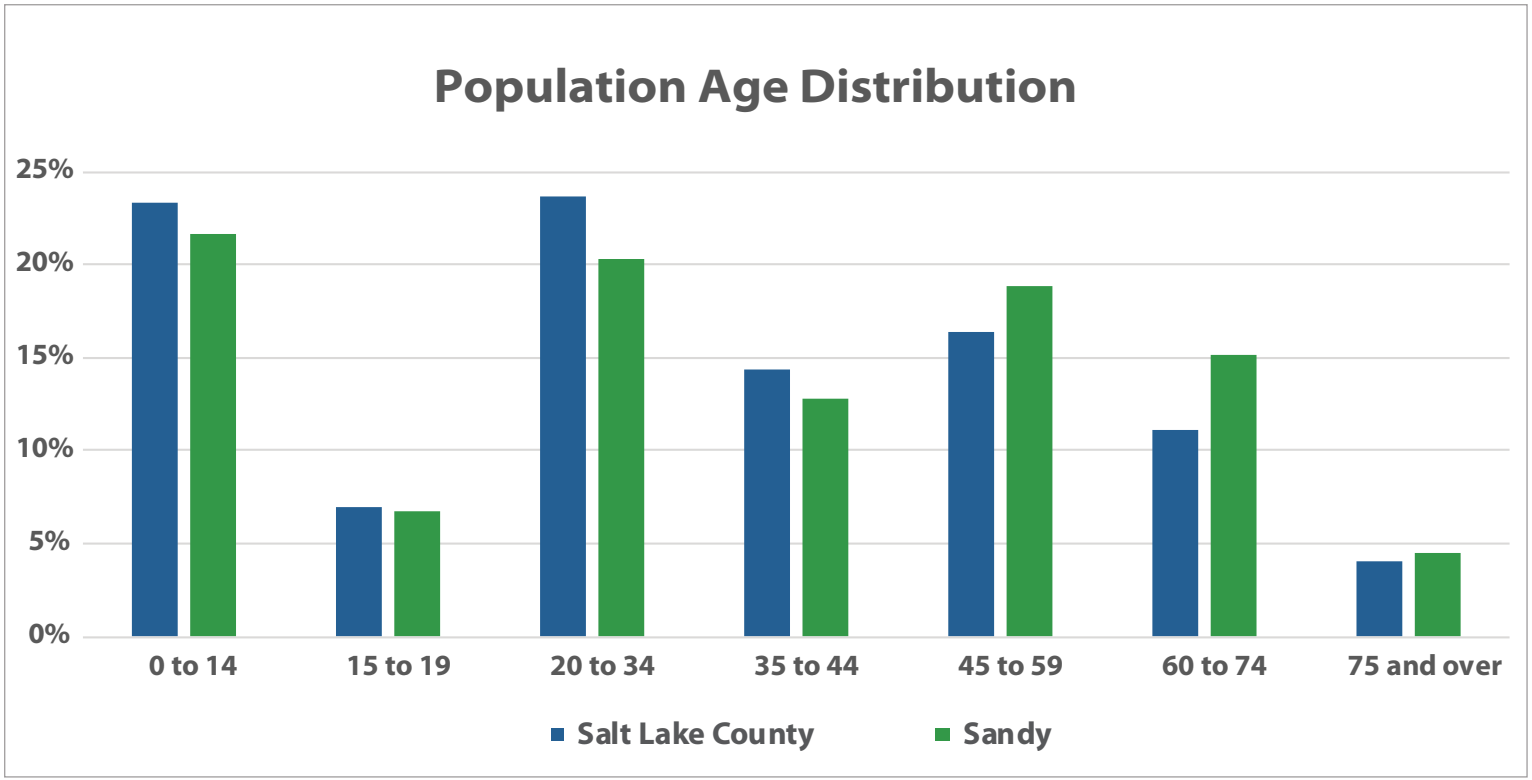
Source: US Census & WFRC TAZ Model

Figure 3-4 is a graph representing the overall percent change between 2010 and 2050 for the City of Sandy as well as Draper, Midvale, Cottonwood Heights, and South & West Jordan.

Sandy's population is predicted to grow by 35% by the year 2050. Growth at this rate can be significant and will affect the transportation system, however it is indicative that the city is already more built-out than other cities within the constraints of its current and future zoning and land use.

In comparison, Midvale's population will only reach approximately 50,000 by 2050, however this is a 76% increase from 2010. Draper's population will crest above 90,000, which will be a 116% increase, and West Jordan, the 4th largest city in Utah, is predicted to have a population over 136,000, but this will only be a 31% increase in growth.

Figure 3 - 5: Population by Age Category



Source: US Census; American Community Survey 1yr estimates

Population and Age

Different age groups have different transportation needs and can impact the system in unique ways. Age may influence where a person lives, what their daily travel routines are, or what type of transportation they require to meet their needs.

Figure 3-5 shows the most up-to-date age distribution available from the US Census. Sandy's age distribution is compared against the larger area of Salt Lake County. All segments are similar in percentages, however Salt Lake County has a slightly younger population.

For example, in the greater Salt Lake County area, those who are between the ages of 20 and 44 comprise 38% of the overall population, while in Sandy 20 to 40 year olds only represent 33% of the City's population.

In comparison, residents of Sandy who are between the ages of 45 and 74 make up 34% of the City's population, while for greater Salt Lake County the same age range totals only 28% of the whole population.

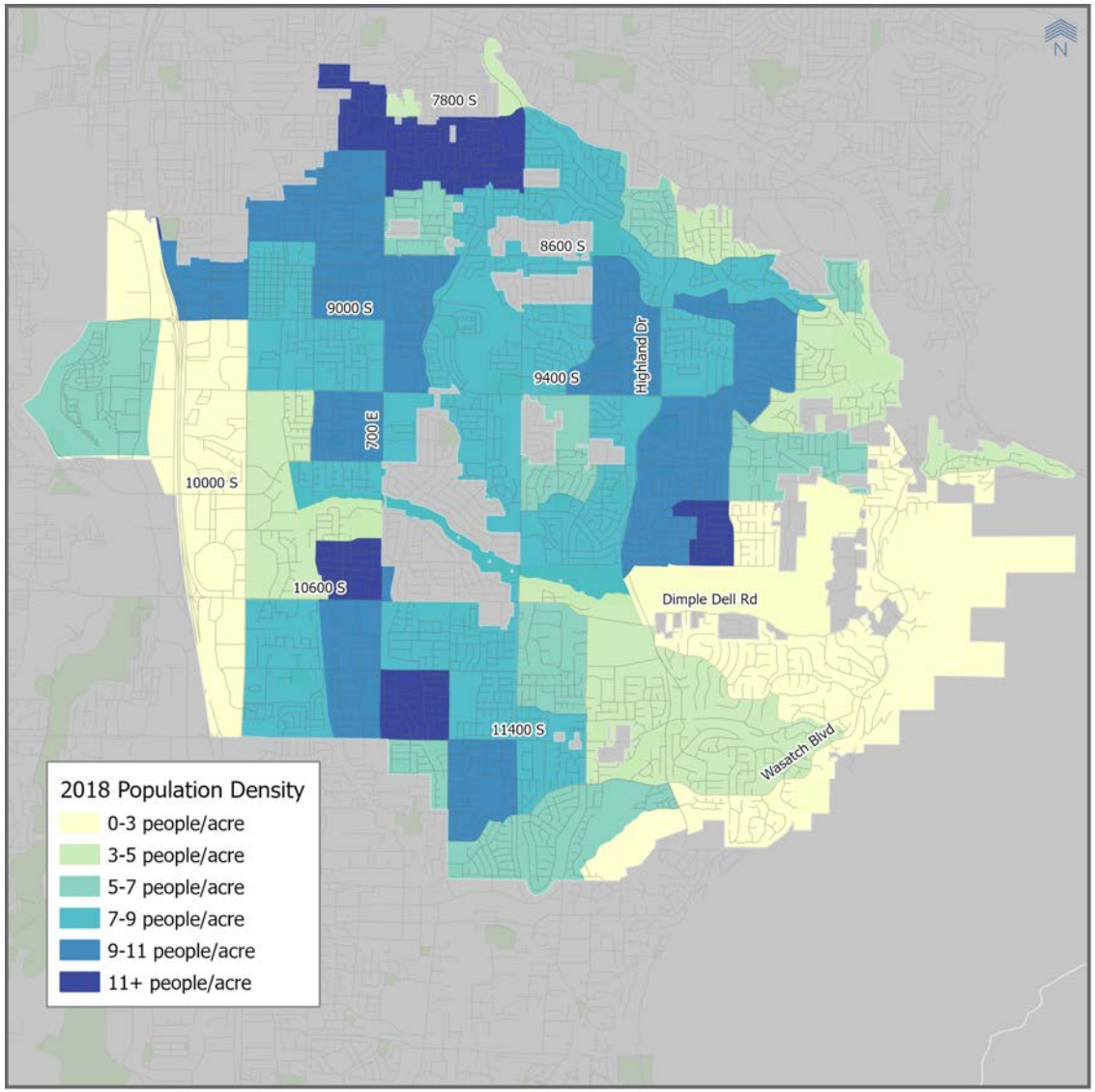
Population by Location

Figure 3-6 shows Sandy's population broken into census block groups. The most densely populated areas in Sandy are located in and around the middle of the City, including the north central city border down to the south border. The lowest density areas are found along the east side where zoning is predominately residential and near I-15 where commercial development is high.

While fewer residents live on the east side, these people need to travel further to reach most destinations, whether it be for shopping, work, or recreation. For most residents living on the east, to reach these destinations means making mostly single occupancy vehicle trips, which is a major element of congestion.

The transportation behavior of residents is affected by the connections that exist between their home (origin) and their desired destinations. As Sandy and the greater front range continues to grow, a frequently updated TMP is necessary to ensure that the transportation network is meeting the needs of the population by supporting economic development, keeping communities connected, and providing real world mobility options.

Figure 3 - 6: Population by Census Tract



Source: US Census American Community Survey 2018 5-year estimates

Housing

Table 3-1: Persons per Households

Persons Per Households		
	2010	2018
Sandy	3.1	3.0
Salt Lake County	2.9	3.1
Utah	3.1	3.0

Table 3-2: Number of Households

Number of Households			
	2010	2018	Percent Change
Sandy	29,092	32,107	9.4
Salt Lake County	357,013	390,308	9.3
Utah	952,370	1,066,131	12.1

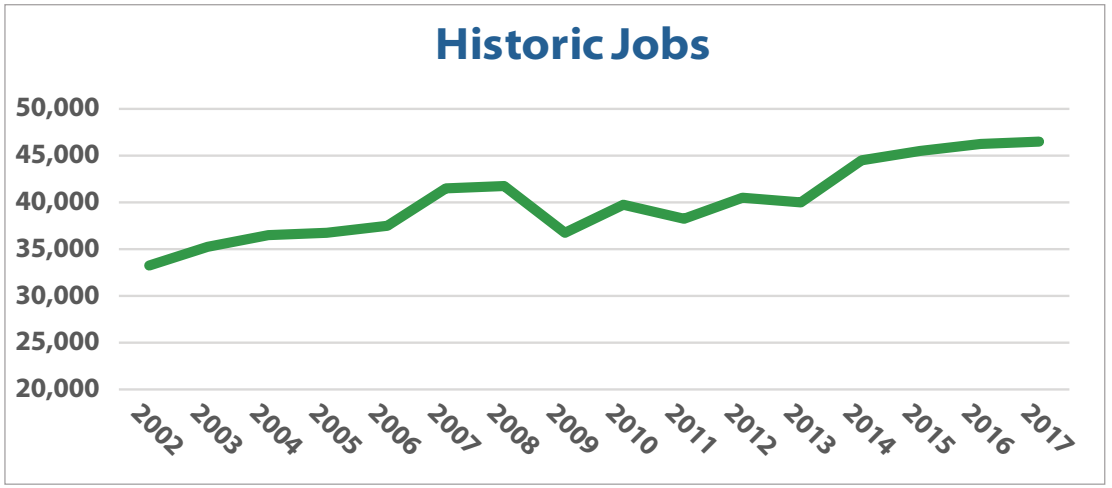
Source: US Census; 2010 & American Community Survey estimates

Although population is an important indicator in developing a transportation plan, households and housing provide a broader picture of how residential growth will affect transportation demand. The number of trips on the transportation network is estimated largely on the number and size of households. Table 3-1 and Table 3-2 summarize the household size in Sandy while comparing this data with Salt Lake County and the entire state of Utah. Sandy person per household average has been 3 individuals in 2010 and 2018, by US Census American Community Survey estimates. This is the same for Salt Lake County and the state of Utah.

Sandy's people per household average in 2018 is higher than the national average of 2.63, however, it mirrors the state of Utah. In general, larger household sizes will have a greater impact on the transportation system and may own more personal vehicles used for single occupancy trips.

Employment

Figure 3 - 7: Employment Trends



Source: US Census; https://onthemap.ces.census.gov/

Sandy has seen the number of jobs with its borders increase along with its population and housing stock. In 2002 there were 33,413 people employed in Sandy and by 2017 there was 46, 405, which is a 38.9% increase in employment within the city. This job growth reflects Sandy's changing and evolving built environment and urban form. While it is still predominantly a bedroom community, it is increasingly becoming a place that offers more economically. Figure 3- 7 shows the employment numbers in Sandy from 2002 to 2017

Table 3 - 3 shows the top major employers in Sandy. The top two employers in Sandy are in the healthcare / medical field, and the 3rd top employer is the Canyons Educational Foundation. The other top employers are involved in either the financial industry or technology.

Table 3 - 3: Top Employers in Sandy

Top Employers			
Firm	Industry	# of Employees	Address
Becton, Dickinson and Company	Global medical technology company	1,000 - 1,999	9450 South State Street
Alta View Hospital	Medical / Healthcare	500 - 999	9660 South 1300 East
Canyons Education Foundation	Public School	500 - 999	9361 South 300 East
Comcast of Willow Grove	Media /Technology	500 - 999	9602 South 300 West
E Trade Securities LLC	Financial Services	500 - 999	150 Civic Drive Center
Incontact, INC	Software/cloud-based call center	500 - 999	75 West Towne Ridge Parkway
Mountain America FCU	Credit Union/ Financial	500 - 999	9800 South Monroe Street

Source: Dept. of Workforce Services

The majority of the top employers in Sandy are located within or close to the defined Cairns Downtown boundary. Collectively, these businesses can bring thousands of vehicles into a relatively centralized location adding a major impact to the local transportation system. Figure 3-8 shows the locations of the top employers in Sandy.

This density can create congestion. Strategies to alleviate congestion created from specific employers can be implemented either solely by employers or in partnership with public agencies such as UDOT, whose TravelWise program works with private organizations to promote travel demand strategies (TDM) such as carpooling, shifting commuting times to and from work, and first and last mile strategies involving multi-modal transportation, such as ride share, transit, and bicycling.

Table 3 - 4: Employment by Industry Sector

Top Industry Sectors		
Industry Sector	**# Employed**	**% Employed**
Retail Trade	8,006	17.3%
Health Care and Social Assistance	4,246	9.1%
Finance and Insurance	4,021	8.7%
Professional, Scientific, & Technical Services	3,949	8.5%
Administration & Support, Waste Management and Remediation	3,915	8.4%
Accommodation and Food Services	3,886	8.4%
Educational Services	3,792	8.2%
Construction	3,013	6.5%
Information	2,413	5.2%
Manufacturing	2,300	5.0%
Arts, Entertainment, & Recreation	1,695	3.7%
Other Services (excluding Public Administration)	1,491	3.2%
Wholesale Trade	1,299	2.8%
Real Estate and Rental and Leasing	1,047	2.3%

Source: Dept. of Workforce Services

Figure 3-8: Location of Top Employers

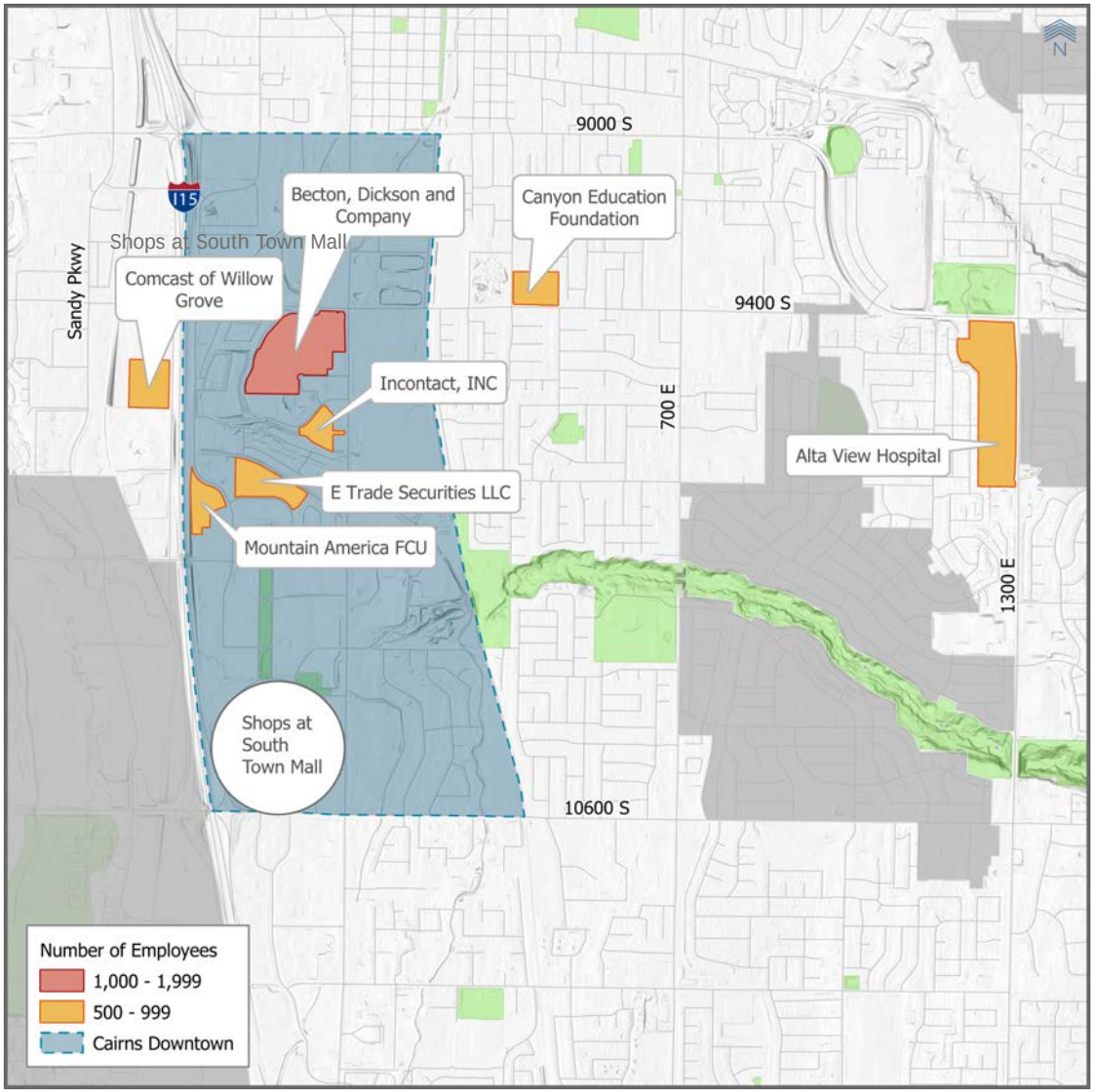
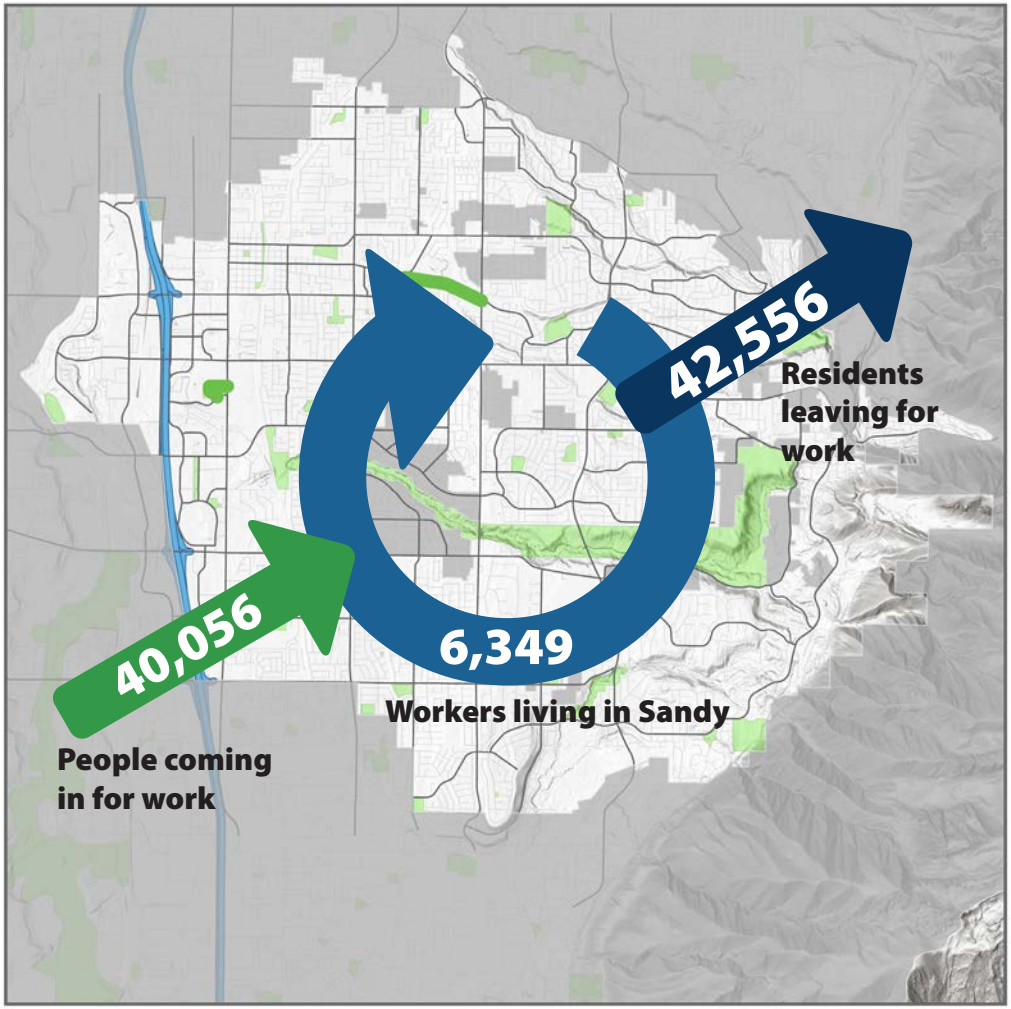


Figure 3 - 9 shows worker in-flow and out-flow for Sandy in 2017, which is the most up-to-date data available through the US Census Bureau's Center for Economics. Sandy strikes an almost equal balance between the number of workers who live in Sandy and travel elsewhere for work and those who live outside of Sandy but enter the city for work.

Out of the total number of people employed in the city, 6,349 both live and work in Sandy or 13.7% of the total work force.

Sandy continues to encourage economic development and growth that incorporates mixed use zoning and transit oriented development, the amount of employment opportunities will continue to increase, and potentially the amount of people who both work and live in Sandy.

Figure 3-9: Worker In-flow and Out-flow in Sandy

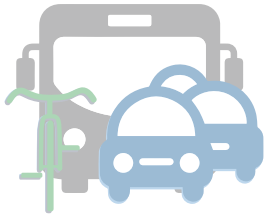


Source: US Census; https://onthemap.ces.census.gov/

Table 3- 5: Sandy vs Salt Lake City; In-flow and Out-Flow

City	Enter for Work	Live & Work in City *(& Percent of Total Working Population in City)*	Leave for Work
Sandy	**40, 056 86%**	**6,349 14%**	**48,905**

Transportation System



Roadway functional classification is a means to categorize how a roadway functions and operates based upon a combination of characteristics. Streets provide for two distinct and competing functions: mobility and land access. As mobility increases, land access decreases and vice versa as shown in Figure 3- 10. Both functions are vital, and no trip is made without both.

Roadway functional classification does not define the number of lanes required for each roadway's automobile capacity. For instance, a collector street may have two, three, or four lanes, whereas an arterial street may have up to nine lanes for motorized traffic. The number of lanes is a function of the expected automobile traffic volume on the roadway and serves as the greatest measure of roadway capacity for vehicles.

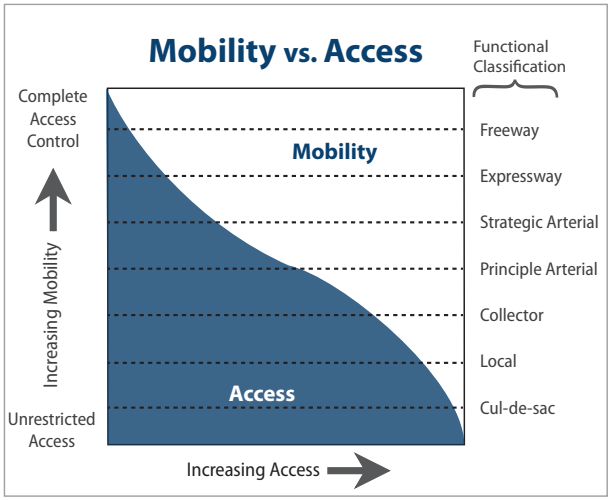
There are four primary classifications of roadways, with descriptions in Table 6

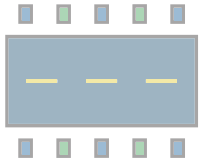
Arterials – Arterial facilities are designed to serve a high level of mobility providing fast flowing through-traffic movement but with low level land-access service. The traffic controls and facility designs are primarily intended to provide efficient through movement. 1300 East, 700 East, State Street, and 9000 South are examples of arterials in Sandy. Arterials frequently provide the most direct route from A to B not only for automobiles but also for pedestrians, bicyclists and transit. These roads may offer wide shoulders that can accommodate buffered or separated bike lanes and can be choice locations for bus stops.

Collectors – Collector facilities are intended to serve both through and land-access functions in relatively equal proportions. For longer, through trips requiring high mobility such facilities are inefficient. Instead they are used for shorter trips requiring increased access to destinations. Sego Lily, Wasatch Boulevard, and 1700 East are examples of collectors in Sandy. For the bicyclist or pedestrian, collectors can offer a comfortable level of safety and a number of route choices because of lower vehicle speeds and a variety of access options to potential destinations.

Local Streets – Local streets primarily serve land-access functions. Local street design and control facilitates the movement of vehicles onto and off the street system from land parcels. Through movement is difficult and is discouraged by both the design and control of this facility. This level of street network is likely to provide the highest level of comfort to bicyclists and pedestrians. Local roads will have the lowest speeds and be mostly absent of large vehicles.

Figure 3- 10: Mobility vs Access





Access Management

Access management is a term that refers to providing and managing access to land development while maintaining traffic flow and being attentive to safety issues. It includes elements such as driveway spacing, signal spacing, and corner clearance. Access management is a key element in transportation planning, helping to make transportation corridors operate more efficiently and carry more traffic without costly road widening projects. Access management offers local governments a systematic approach to decision-making, applying principles in a uniform, equitable, and consistent way throughout the jurisdiction. It is recommended that the City adopt an Access Management Program.

Principles of Access Management

Constantly growing congestion, concerns with traffic safety, and the ever increasing cost of upgrading roads, generate interest in managing access to the highway system and surface streets. Access management is the process that provides access to land development while simultaneously preserving the flow of traffic on the surrounding road system in terms of safety, capacity, and speed. Access management attempts to balance the need to provide good mobility for through-traffic with the requirements for reasonable access to adjacent land uses.

Arguably the most important concept in understanding the need for access management is to understand that movement of traffic and access to property are competing priorities. No facility can move traffic very well and provide unlimited access at the same time. Extreme examples of this concept are the freeways and the cul-de-sac. The freeway moves traffic very well with few opportunities for access, while the cul-de-sac has unlimited opportunities for access, but doesn't move traffic very well. In many cases, accidents and congestion are the result of streets trying to serve both mobility and access at the same time.

A good access management program will accomplish the following:

- ***Limit the number of conflict points at driveway locations.***
- ***Separate conflict areas.***
- ***Reduce the interference of through-traffic.***
- ***Provide enough spacing for at-grade, signalized intersections.***
- ***Provide adequate on-site circulation and storage.***

Access management attempts to put an end to the seemingly endless cycle of road improvements followed by increased access, increased congestion, and the need for more road improvements.

Poor planning and inadequate control of access can quickly lead to an unnecessarily high number of direct accesses along roadways. Take for example the movements that occur on and off roadways at driveway locations, when those driveways are too closely spaced, it becomes difficult for through-traffic to flow smoothly at desired speeds and acceptable levels of safety. The American Association of State Highway and Transportation Officials (AASHTO) states, "the number of accidents is disproportionately higher at driveways than at other intersections…thus their design and location merits special consideration." Studies have shown that anywhere between 50 and 70 percent of all crashes that occur on the urban street system are access related.

Fewer points of direct access, greater separation of driveways, and better driveway design and location are the basic elements of access management. There is less need for through-traffic to brake and change lanes to avoid turning traffic when these techniques

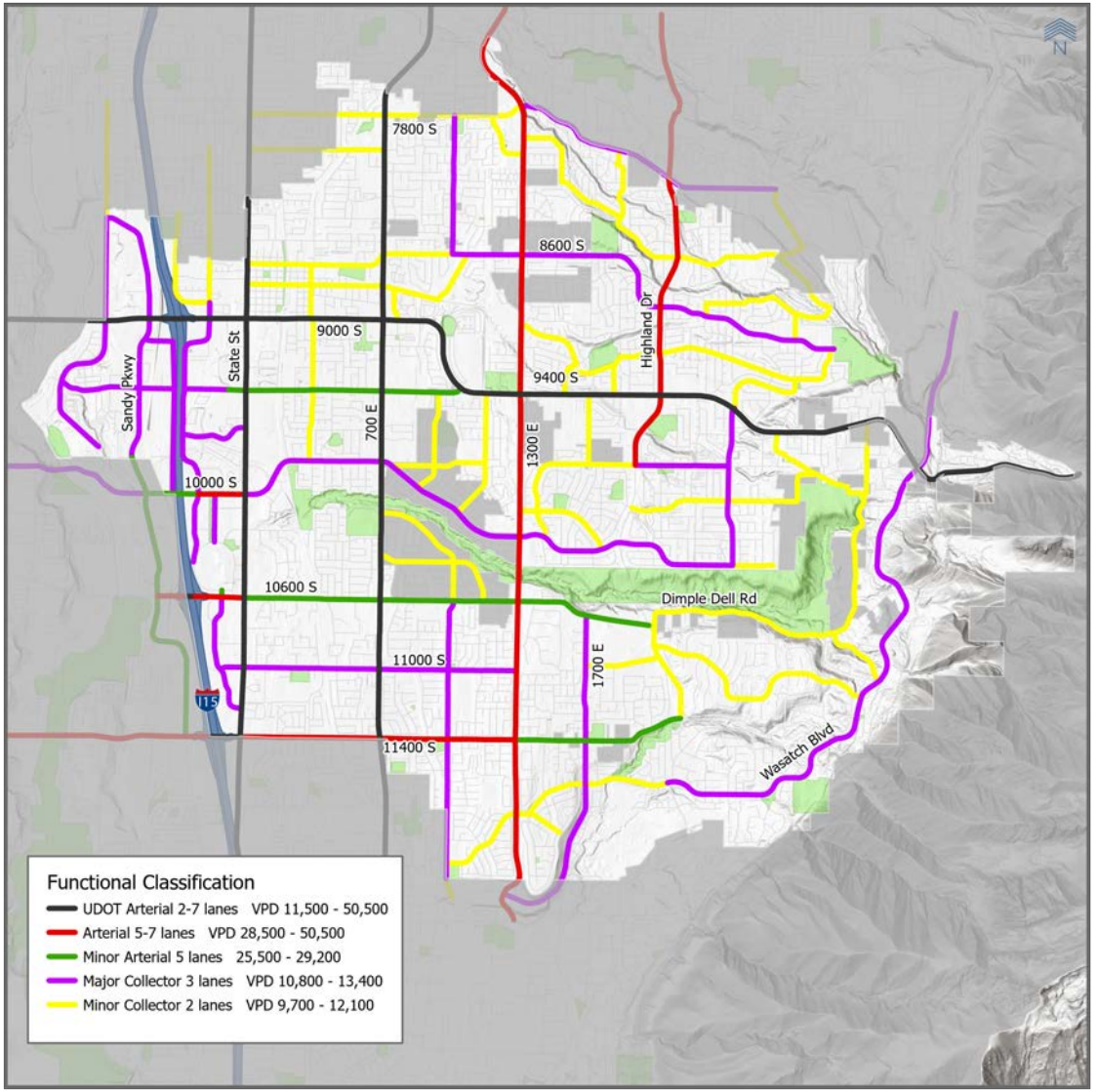
are implemented uniformly and comprehensively. Table 3- 6 provides the general characteristics that define each category within the roadway functional classification. This hierarchy is not entirely set in stone, as one city will have multiple sub-categories, such "major" and "minor" collectors or arterials. Trip length, design speed, lane width and average daily trips can all be part of the equation necessary to properly determine a roadway's best classification.

The connectivity of residential streets to collectors and arterials is important when providing a balance between mobility and access for a community. More access to homes can help disperse traffic and reduce congestion along arterial and larger collector roads.

Table 3-6: Characteristics of Roadway Functional Classification

	General Characteristics of Functional Classification			
	Freeway & Expressway	Arterial	Collector	Residential Street
Function	Traffic movement	Traffic movement, land access	Collect & distribute traffic between streets & arterials, land access	Land Access
Typical % of Surface Street System	Not applicable	5 - 10%	10-20%	60-80%
Continuity	Continuous	Continuous	Continuous	None
Typical % of Surface Street System Vehicle Miles Carried	Not applicable	40 - 65%	10-20%	10-25%
Direct Land Access	None	Limited: Major generators only	Restricted: Some movements prohibited; number & spacing of driveways controlled	Direct Access
Minimum Roadway Intersection Spacing	See City's Engineering Standards and Specifications			
Speed Limit	See City's Engineering Standards and Specifications			
Parking	Prohibited	Discouraged	Limited	Allowed

Figure 3-11: Sandy's Existing Functional Class



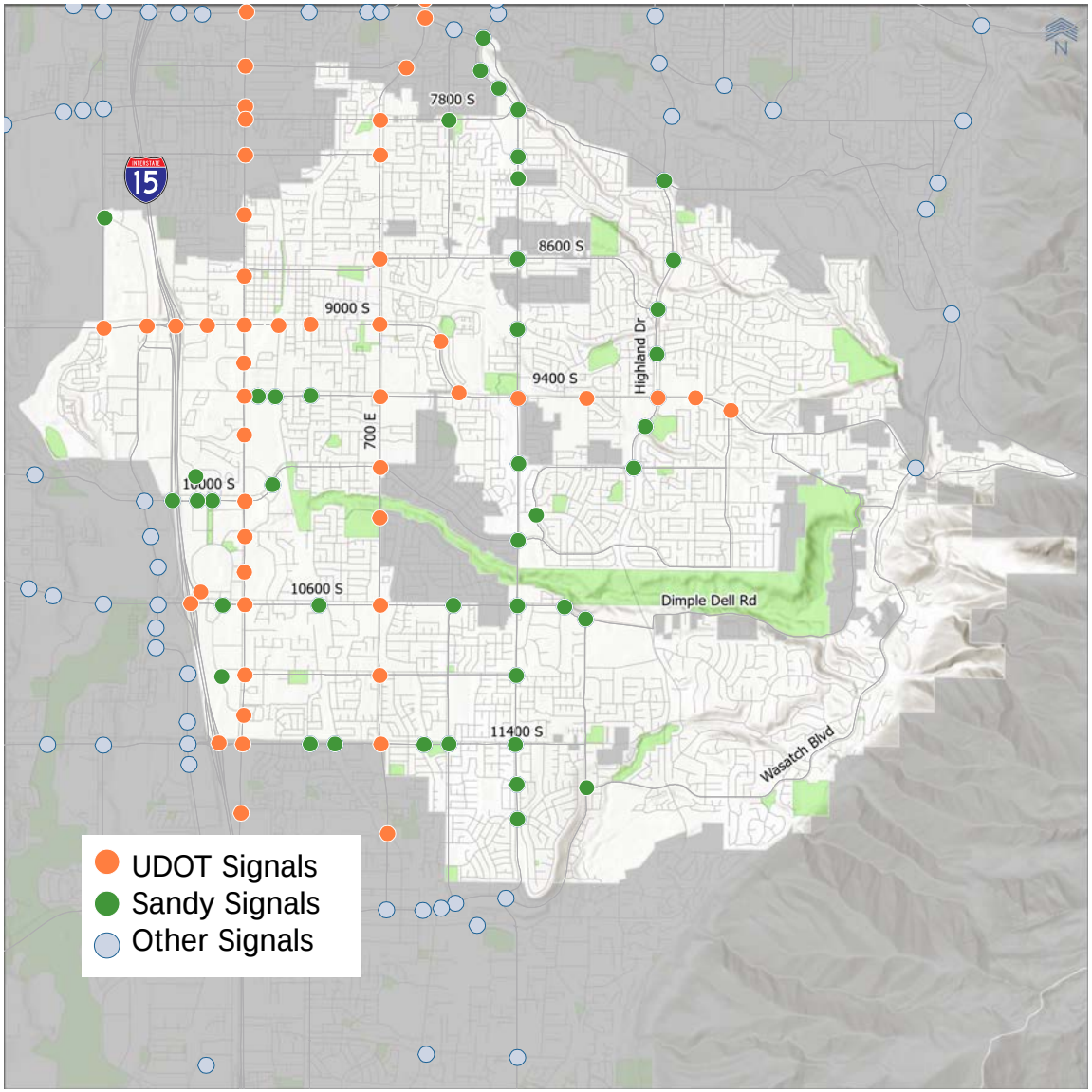
Signals

Sandy City is a regional destination for employment, commercial, and entertainment as well as home to a significant number of residents. Its traffic signal network is vital to the mobility of those traveling around the city.

There are 79 signals in Sandy including 39 UDOT signals and 43 Sandy signals as seen in Figure 3-12.

Sandy recently went through a process to optimize and coordinate signal timing throughout the city. This process has reduced vehicle delays at traffic signals, benefiting transportation users by providing more efficient commutes and reducing vehicle emissions at intersections.

Figure 3-12: Traffic Signals in Sandy



As Seen in Figure 3-12, signals that are owned by Sandy are found along the following corridors:

Signal Corridors:

1300 East - Creek Road (7300 South) to Draper Parkway (12200 South)

1. *Creek Road (7300 South) - 25% Sandy, 25% Cottonwood Heights, 50% Midvale*
2. *7485 South- 50% Sandy, 50% Midvale*
3. *7600 South*
4. *7800 South (Forbush Ln)*
5. *8160 South 1300 East - Fire Flasher*
6. *8020 South (High Point Pkwy)*
7. *8600 South*
8. *Waters Ln*
9. *Ridgemark Dr (9780 South)*
10. *Sego Lily Dr (10230 South) - 50% Sandy, 50% White City*
11. *10600 South*
12. *11000 South*
13. *11400 South*
14. *Sanders Road (11600 South) - HAWK signal*
15. *Hidden Valley Drive (11845 South)*

Highland Drive- Creek Road (8100 South) to 9500 South

1. *Creek Road (8100 South) - 25% Sandy, 50% Cottonwood Heights,25% County*
2. *Viscounti Drive (8600 South)*
3. *Newcastle Drive (8890 South)*
4. *Falcon Way (9150 South)*
5. *9600 South (Horne Depot-1980 East)*

9400 South - State Street to SR-209

1. *50 East - HAWK signal*
2. *150 East - Trax/Pedestrian Crossing*
3. *300 East*

10000 South- 500 West to Beetdigger Boulevard

1. *300 West- 50% Sandy, 50% South Jordan*
2. *Monroe Street (240 West)*
3. *Centennial Parkway (170 West)*
4. *Beetdigger Boulevard (150 East 9900 South)*

10600 South - Automall Drive (120 West) to 1700 East

1. *Automall Drive (120 West)*
2. *300 East - Trax/Pedestrian Crossing*
3. *1000 East (Carnation Dr) - 50% Sandy, 50% White City*
4. *1300 East - Part of 1300 East corridor*
5. *11400 South 300 East - 50% Sandy, 50% Draper*
6. *1550 East - HAWK signal*
7. *1700 East (Dimple Dell)*

11400 South - State Street to 1300 East

1. *300 East - 50% Sandy, 50% Draper*
2. *400 East -Trax/Pedestrian Crossing, 50% Sandy, 50% Draper*
3. *900 East - HAWK signal*
4. *1000 East*
5. *1300 East (Part of 1300 East corridor)*

Additionally, seven individual signals which are not part of these corridors are located at:

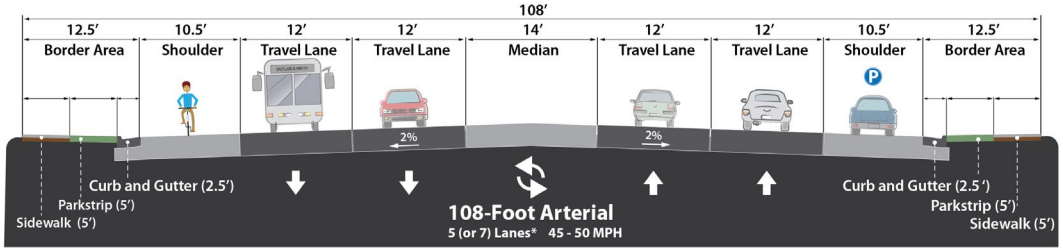
Individually Optimized:

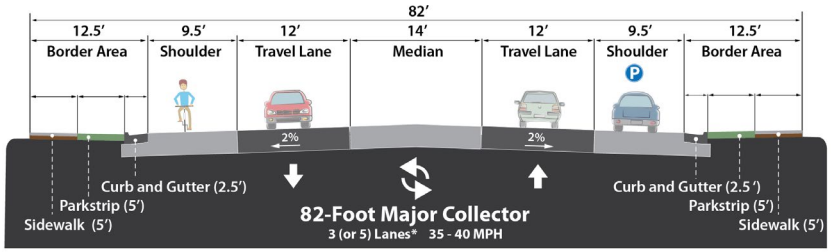
1. *7800 South 1000 East - 50% Sandy, 50% Midvale*
2. *8145 South Sandy Parkway (700 West) - 50% Sandy, 50% Midvale*
3. *9800 South 1910 East - 4-way flasher*
4. *10075 South 1435 East - 4-way flasher*
5. *Monroe Street Civic Center Drive*
6. *11000 South Automall Drive*
7. *Wasatch Blvd 1700 East*

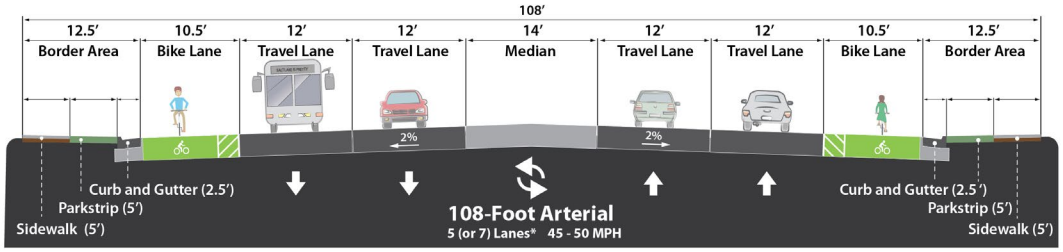
Sandy City Street Cross-sections

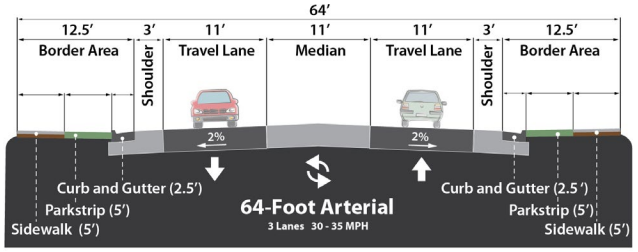
Sandy City has cross-section drawings of typical streets, as well as other design guidelines such as cul-de-sacs, bulb-outs, and intersection sight distance. These are found on the City website: https: *//www.sandy.utah.gov/395/Standard-Specifications*

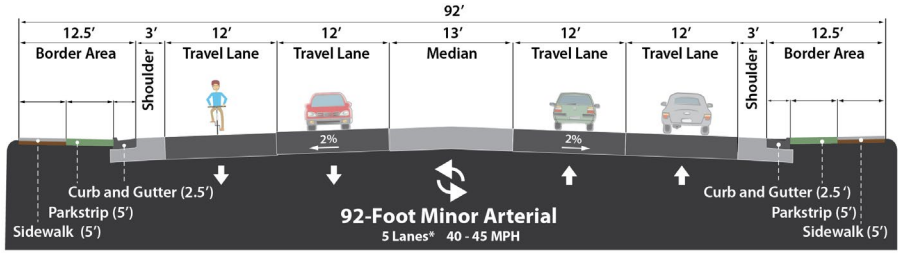
Figure 3-13: Sandy City Typical Cross-sections

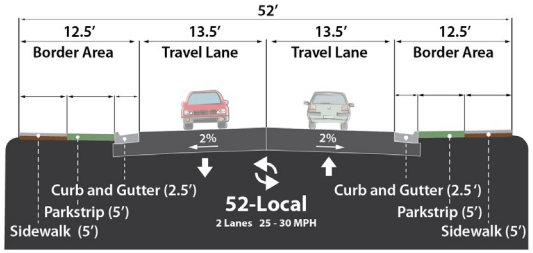












* The 108-foot arterial may be striped to accommodate six lanes and the 82-foot major collector way be striped to accommodate four lanes. Lane increases will be made when warranted by traffic volumes. Parkstrip widths may increase to 8 feet with engineer approval.

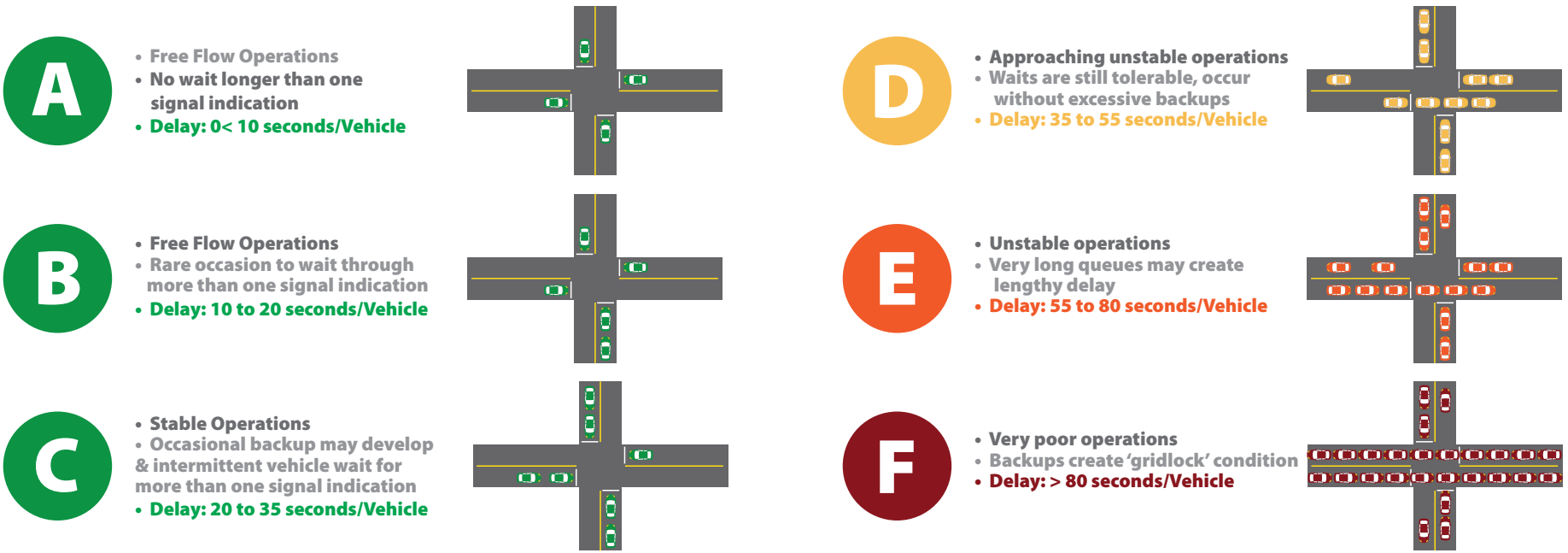
Level of Service

Roadway level of service is typically displayed in the relationship between the traffic volume and the roadway capacity (generally the number of lanes), or a V/C ratio. This ratio is represented as a letter grade ranging from A-F, much like letter grades assigned in school.

A-C are generally considered free-flowing traffic operations, and while some congestion occurs at LOS D, the transportation system is assumed to be adequate (not failing) at this level. Figure 3-14 explains what conditions need to exist to receive a particular letter grade.

LOS D was identified as the planning goal for Sandy in the peak traffic hours, meaning that LOS E and F are unacceptable. Although LOS D is a planning goal, roadway LOS may vary on a street-by-street basis. Roadway capacity cannot be scaled to exactly fit demand since demand varies by time of day, day of week, and time of year.

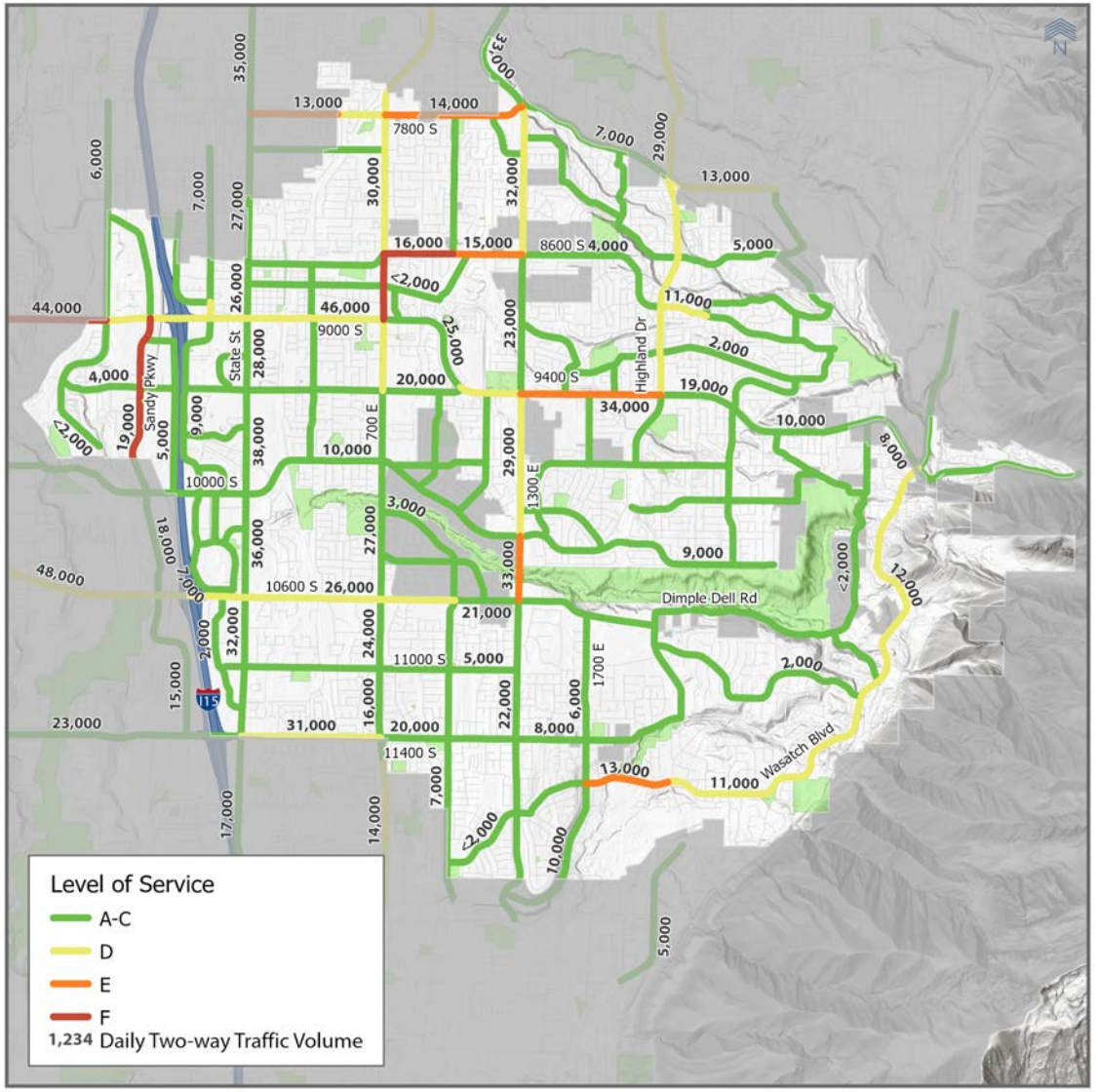
Figure 3-14: Characteristics of Level of Service



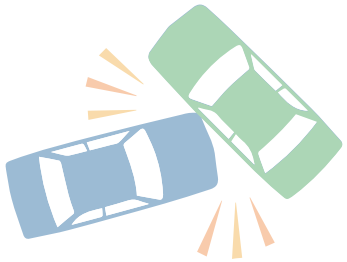
While the travel demand model is used to predict future traffic and level of service, it can also be used to estimate current conditions. Figure 3-15 shows existing conditions LOS within Sandy from the 2019 base model. Green roads have little or no traffic congestion corresponding to LOS A, B or C, while orange and red roads have "peak hour" traffic congestion.

Currently, portions of 700 East, 8600 South, and Sandy Parkway are shown to experience the highest levels of congestion during the peak hours. Other roads that can have notable peak hour congestion are 7800 South, 9400 South, 1300 East at Dimple Dell, and Wasatch Boulevard east of 1700 East. The other roadways in Sandy have free flow operations, and while a handful of these roads experience LOS D, this delay is still deemed tolerable.

Figure 3-15: Existing Level of Service



Safety



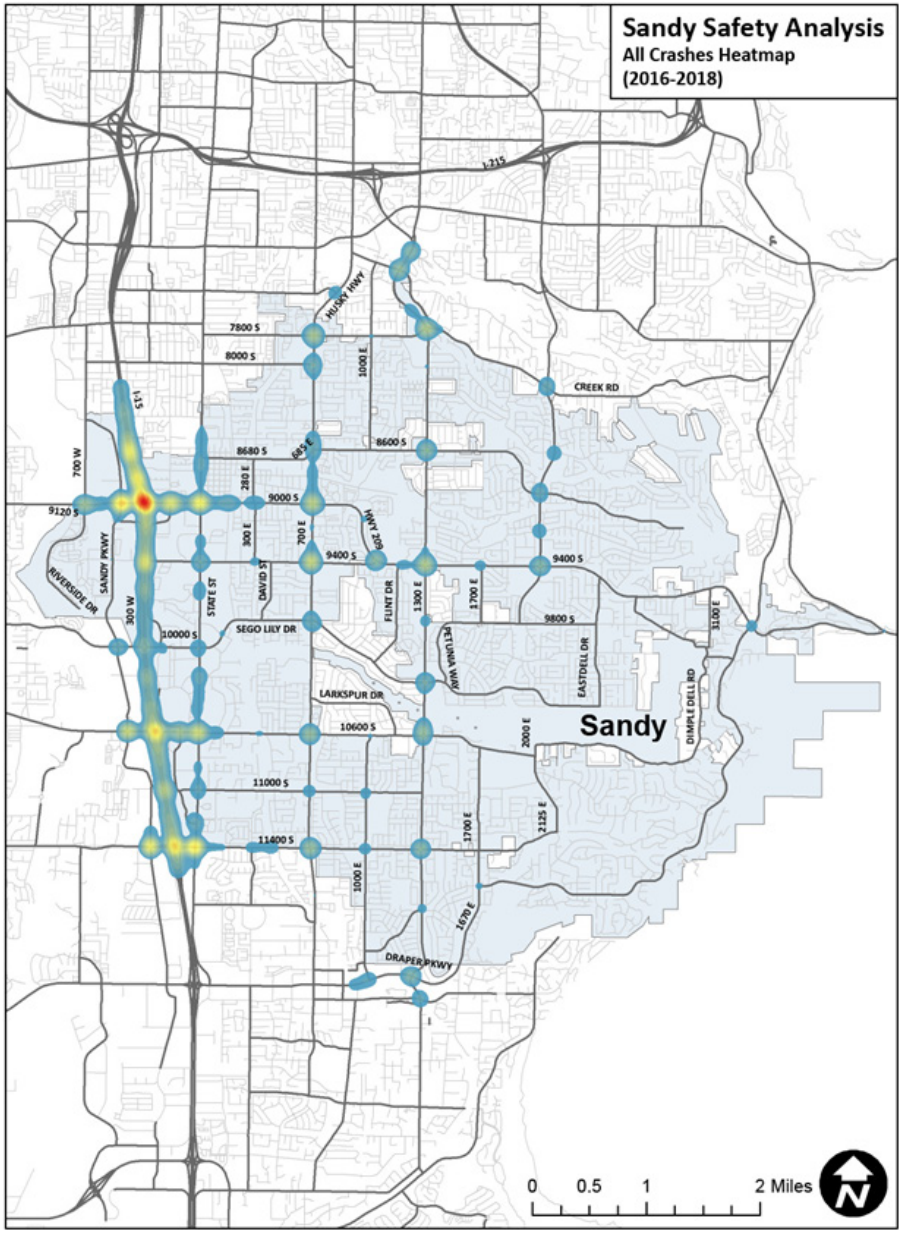
City-wide Crashes

Using recent years of crash data (2016-2018) from the Utah Department of Transportation (UDOT)[a] Traffic & Safety Division, historic crash patterns and conditions were analyzed within Sandy City to develop project and policy recommendations.

In total there were 6,887 reported crashes within the city boundary. Figure 3-13 is a heat map of crash locations illustrating the highest concentrations of crashes within the city. The most predominant crash concentration occurred at the I-15 interchanges of 9000 South, 10600 South, and at the intersection of 11400 South and State Street.

[a] While 2019 crash records are available, they have been found to be incomplete and would miss-represent conditions if used in this analysis.

Figure 3- 16: City wide crashes heatmap



Note: Confidential: This data may be protected under 23 USC 409

Fatal and Serious Crashes

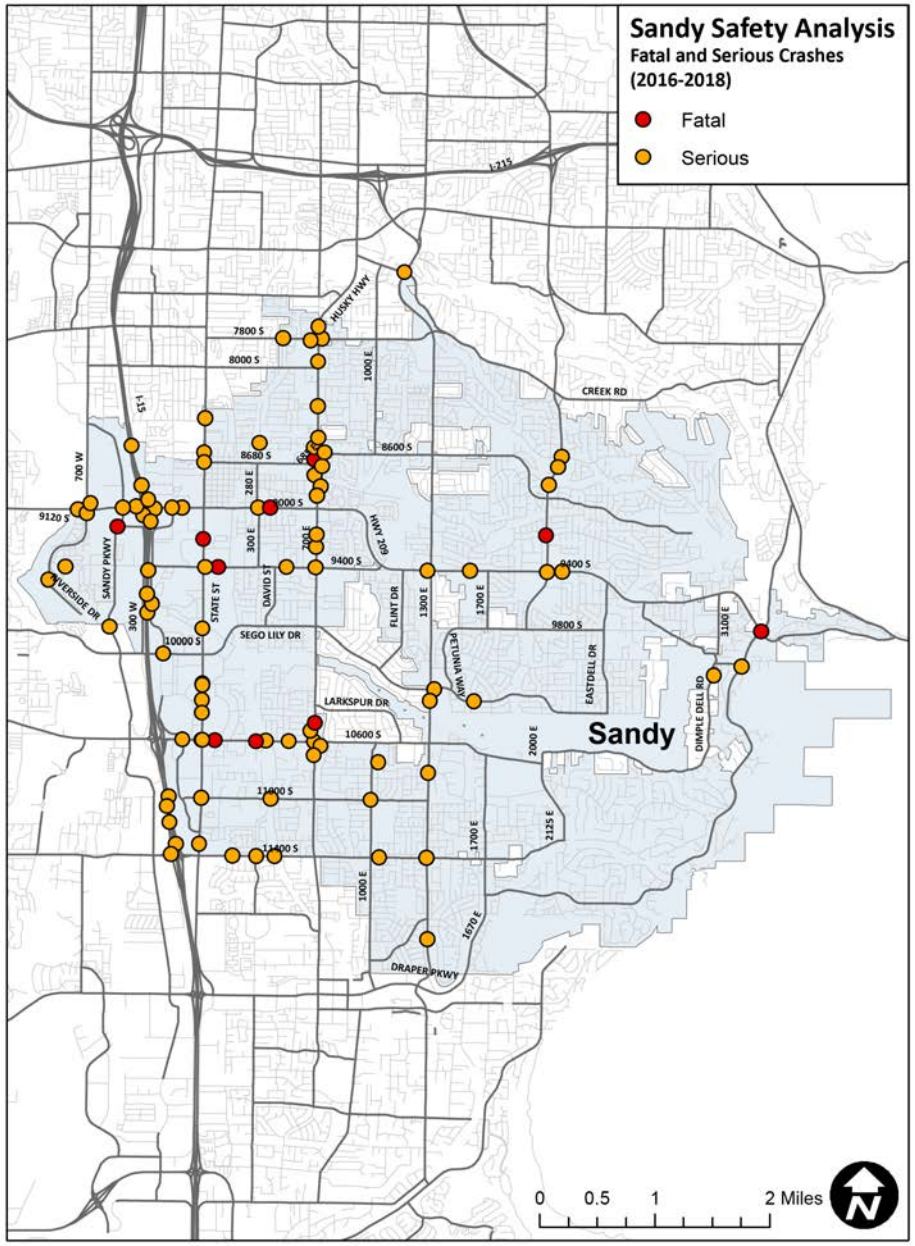
Crash severity is reported according to a five-category scale ranging from no injury to fatality. There is considerable emphasis in Utah among safety agencies, transportation planners and engineers to eliminate fatal crashes. However, the low frequency of fatal crashes can result in an insufficient sample size to identify meaningful patterns. As a result, the next level of crash severity, serious injury crashes, is often included in a crash severity analysis.

Figure 3-17 illustrates the fatal and serious injury crashes in Sandy City. For the analysis period, there were 10 crashes with a fatality and 94 serious injury crashes. The number of fatal and serious injury crashes in Sandy City as a percentage of total crashes is 1.5 percent, just below Salt Lake County at 1.8 percent. By comparison, this is approximately double Draper's fatal and serious injury crashes, similar to South Jordan and Midvale, and much lower than West Jordan as shown in Table 3- 7.

Table 3-7: Fatal and Serious Injury Crashes

Fatal and Serious Injury Crashes	
West Jordan	241 (4.0%)
Salt Lake County	1,474 (1.8%)
South Jordan	63 (1.7%)
Sandy	**104 (1.5%)**
Midvale	46 (1.3%)
Draper	34 (0.7%)

Figure 3-17: Fatal and Serious Crashes



Bicycle Involved Crashes

For 2016-2018, 55 vehicle crashes involving a cyclist occurred in Sandy City. Figure 3-18 symbolizes the locations of these crashes by crash severity. There were no recorded bicyclist fatalities during the study period, however, there were several serious injury incidents -- all of which occurred along major roads (collectors and arterials). Only three of the 55 incidents occurred on minor (local) roads.

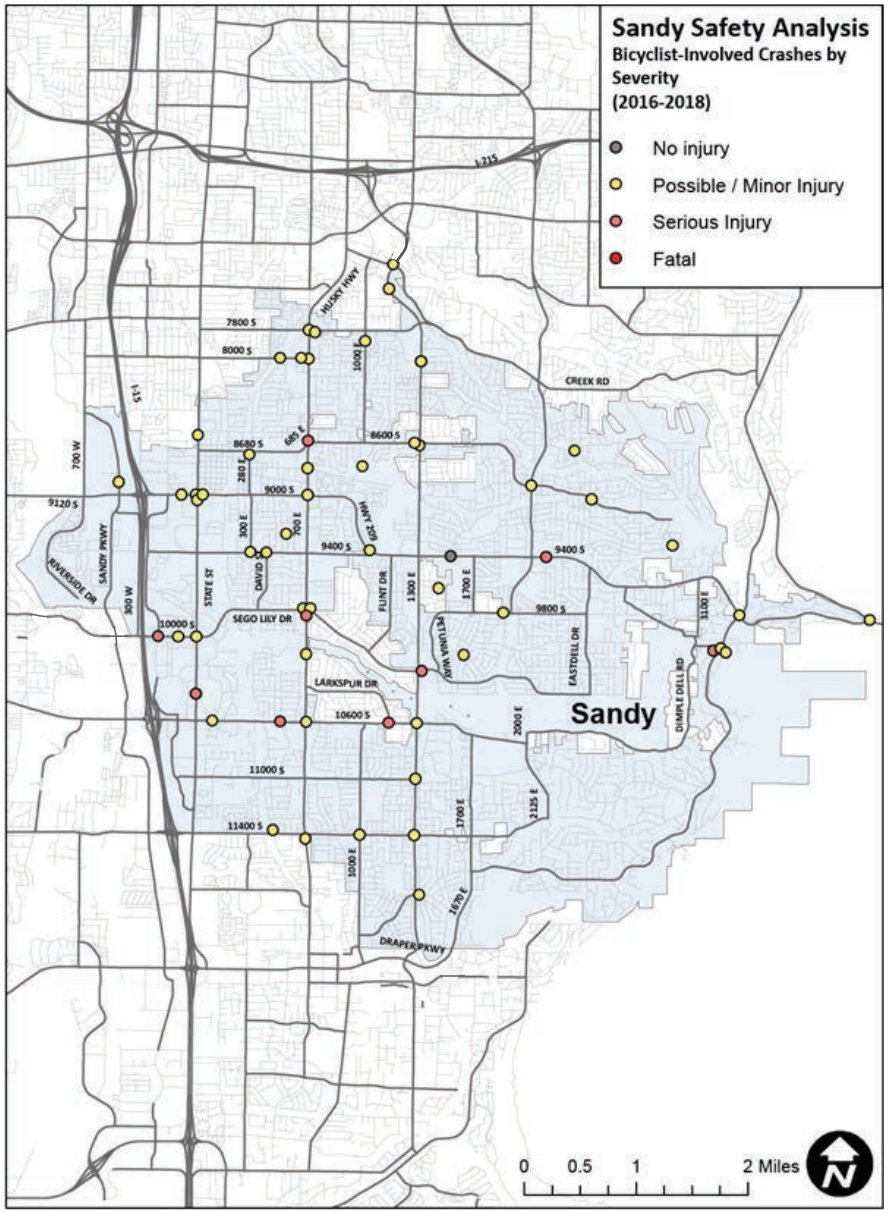
Most bicyclist incidents occurred during the day with clear, dry weather conditions. Also, most incidents occurred at street intersections. This suggests that the designed speed of roadways and the design of intersections (and accommodations for bicyclists) could be a contributing factor.

As shown in Table 3-8, the percent of all crashes involving a bicyclist is similar in Sandy to South Jordan City and West Jordan, but higher than Midvale and Draper. The rate for the county as a whole is high at just over one percent.

Table 3-8: Bicycle Involved Crashes

Bicycle Involved Crashes	
Salt Lake County	838 (1.0%)
Sandy	**55 (0.8%)**
South Jordan	29 (0.8%)
West Jordan	49 (0.8%)
Midvale	17 (0.5%)
Draper	25 (0.5%)

Figure 3-18: Bicycle Involved Crashes



Note: Confidential: This data may be protected under 23 USC 409

Pedestrian Involved Crashes

For 2016-2018, 84 vehicle crashes involving a pedestrian occurred in Sandy City. Figure 3 -19 symbolizes the locations of these crashes by location. Clusters are hard to define because crashes are spread across the city, but they are largely concentrated within the western half of the city, west of 1300 East. There are several clusters of crashes located at intersections, with 52 of the 84 (62 percent) of the incidents being labeled as "Intersection-related". The largest cluster of pedestrian crashes occurred at the 9400 South and 700 East intersection.

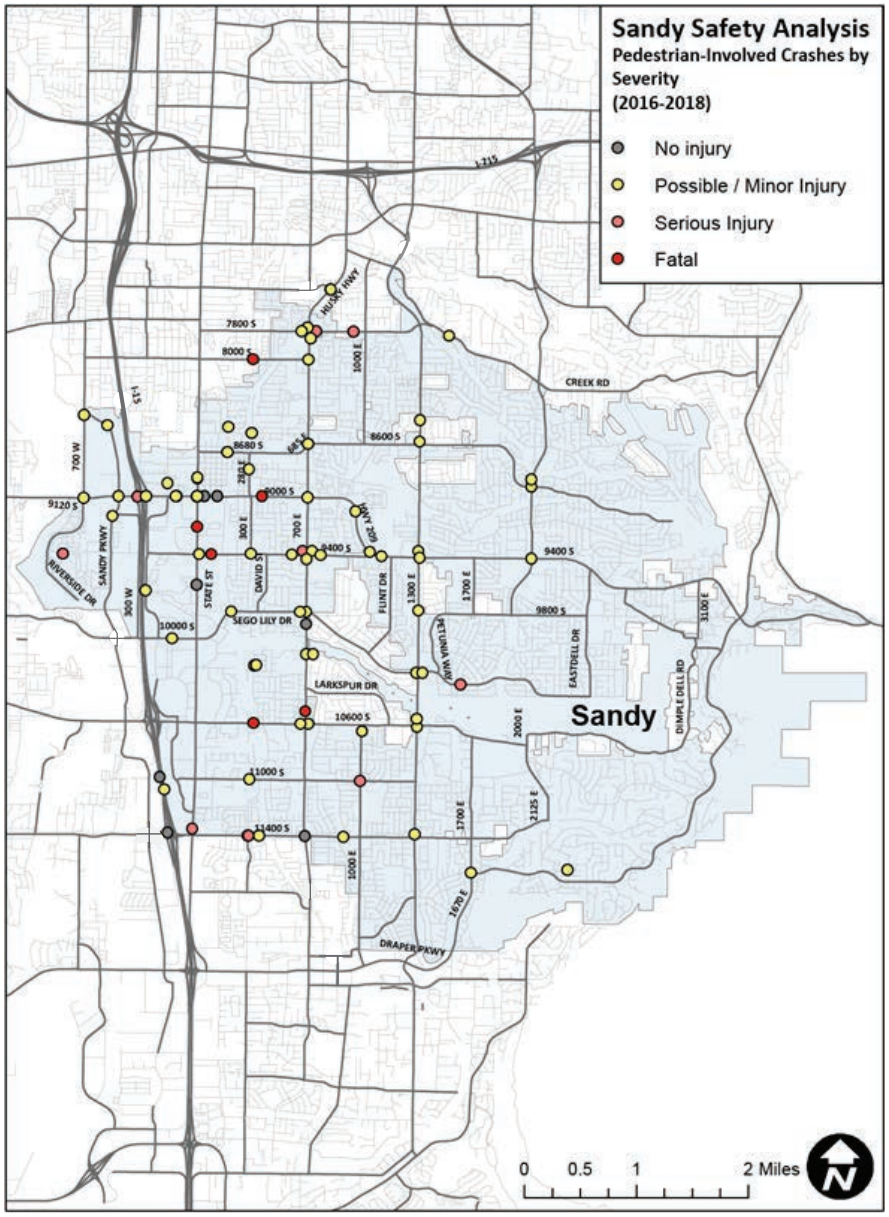
Furthermore, 66 out of 84 (79 percent) crashes occurred along large roads, such as major collectors and arterials. 9400 South in particular had the highest number of pedestrian-related incidents. Traffic speed and volume along these larger streets are likely contributing factors. Pedestrian-related crashes also had a higher mortality rate than bicycle-related incidents, with a total of five pedestrian fatalities during the study period (compared to zero bicyclist fatalities). Significantly more pedestrian incidents occurred at night (37 percent) compared to bicyclist incidents (13 percent). This suggests that lighting conditions play a more critical role when it comes to pedestrian safety.

The percent of all crashes involving a pedestrian is higher in Sandy City than in South Jordan, Draper and higher than in Salt Lake County as a whole (see Table 3-9). West Jordan and Midvale both have higher rates. The more urban nature of these communities and Sandy City may play a role in this trend.

Table 3-9 Pedestrian Involved Crashes

Pedestrian Involved Crashes	
Midvale	59 (1.6%)
West Jordan	90 (1.5%)
Sandy	**84 (1.2%)**
Salt Lake County	1,310 (1.0%)
South Jordan	31 (0.8%)
Draper	22 (0.4%)

Figure 3 - 19: Pedestrian Involved Crashes



Note: Confidential: This data may be protected under 23 USC 409

Non-state Route Crashes

A large concentration of the vehicle activity in Sandy City occurs on state routes. As such, most crash hotspots occur on state routes or at junctions with state routes where Sandy City has limited influence to correct potential design deficiencies leading to high crash rates. Consequently, it is helpful to look at crashes off state routes to isolate potential hotspots where the city can influence change. Figure 3-20 shows a heat map of non-state route crashes within Sandy City.

Non-state corridors that stand out are 1300 East, 10600 South, Sandy Parkway, 9400 South, 11400 South, and Highland Drive. Table 3-10 shows intersection hotspots within the city that do not involve a state road. Most of these hotspot intersections occur along notable high-traffic corridors, with the biggest hotspot occurring at the intersection of 7800 South and Union Park Avenue.

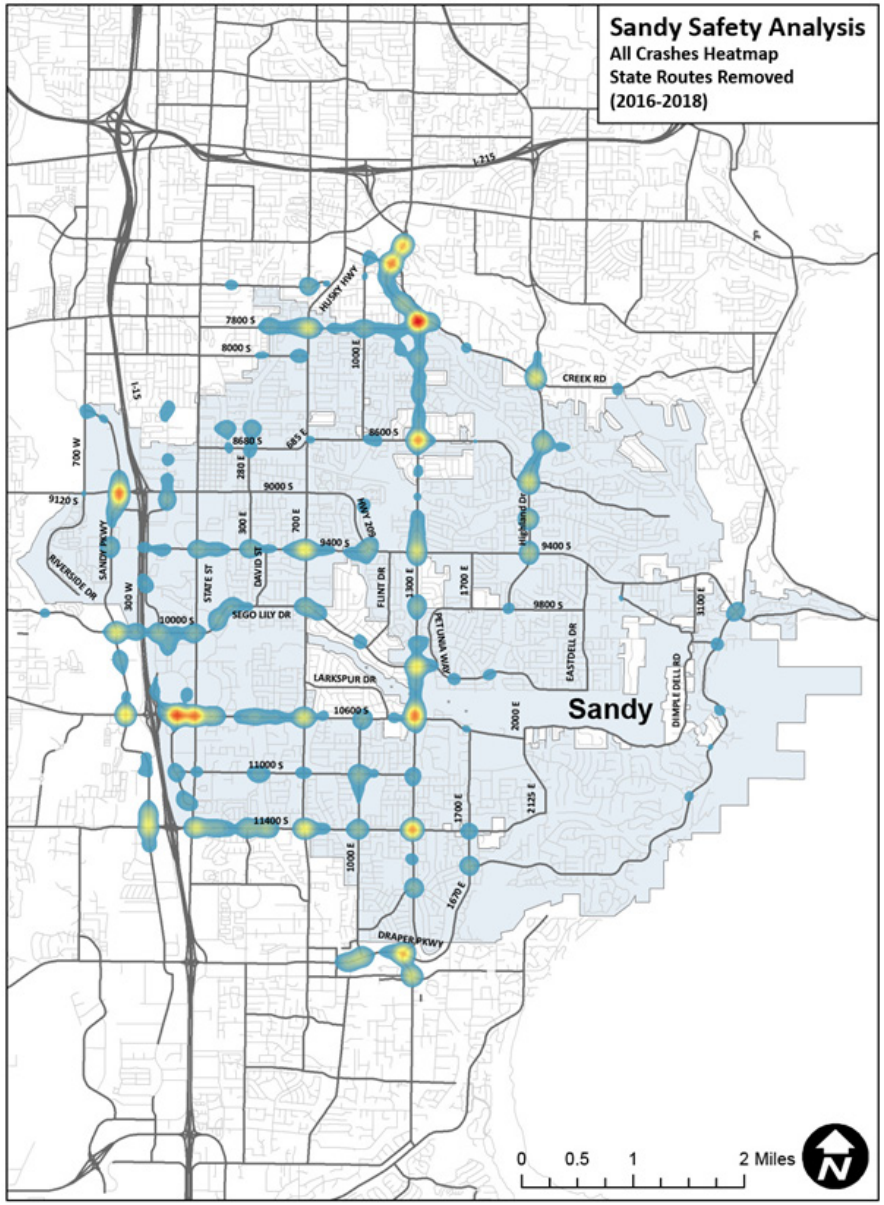
Table 3-10: Non-state Route Intersection Crashes

Location	Total Crashes
7800 South and 1300 East/Union Park Avenue	76
10600 South and Auto Mall Drive	69
10600 South and 1300 East	58
11400 South and 1300 East	55
8600 South and 1300 East	48

Table 3-11: Non-state Route Crashes by Million Vehicle Miles Driven

Location	Crashes	Rate
Sandy Parkway	198	2.24
10600 South	433	2.17
Highland Drive	167	2.03
11400 South	231	1.97
1300 East	524	1.30

Figure 3-20: Non-state Route Crashes



Note: Confidential: This data may be protected under 23 USC 409

7800 South and Union Park Avenue

This intersection represents the largest crash hotspot with 76 crashes between 2016 and 2018. Figure 6 shows crashes by crash type. The most predominate crash type was angle with 42 crashes, 55 percent of the total. Weather conditions are not a contributing factor with a majority of crashes occurring while clear, dry, and in daylight. With steep grades on the eastern leg and curvatures at all approaches, sight distance may be a contributing factor. Additionally, age may be a factor, with teenage and older drivers contributing to 25 percent and 24 percent of all crashes respectively. There were no fatal or serious injury crashes.

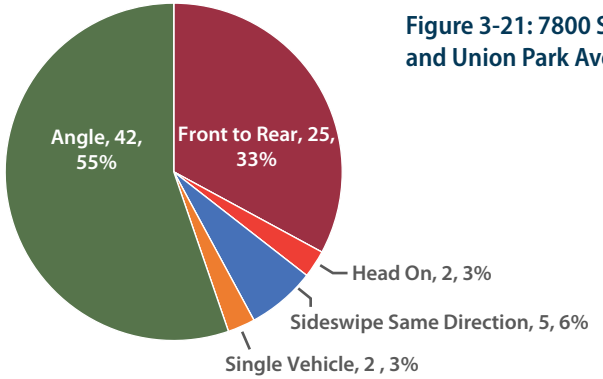


Figure 3-21: 7800 South and Union Park Ave

10600 South and Auto Mall Drive

There were 69 crashes at this intersection between 2016 and 2018. Figure 3-22 shows crashes by crash type. The most predominate crash type at this intersection was front to rear, accounting for 46 percent of all crashes. This is a heavily congested area and is less than a quarter mile from the I-15 interchange to the west, all contributing to a condition where front to rear crashes are expected. There was one serious injury crash and no fatal crashes.

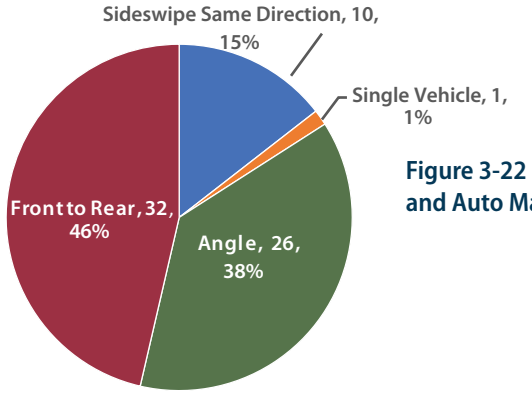


Figure 3-22 10600 South and Auto Mall Drive

10600 South and 1300 East

There were 58 crashes at this intersection between 2016 and 2018. Figure 3-23 shows crashes by crash type. Here again front to rear is the predominant crash type, with 41 percent of all crashes. Dual left turns at all four approaches creates an intersection with many conflict points, with one third of crashes being angle. Nearby Alta high school contributes to one third of all crashes involving a teenage driver while 24 percent also involved an older driver. There was one bicycle and two pedestrian crashes. No fatal or serious injury crashes were reported.

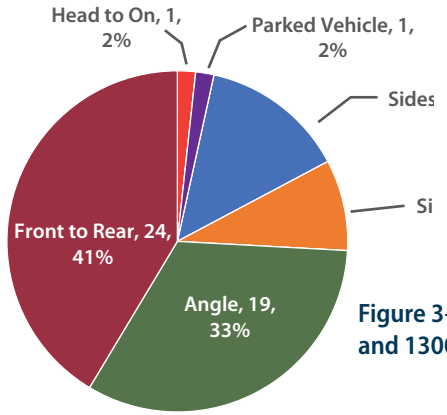


Figure 3-23: 10600 South and 1300 East

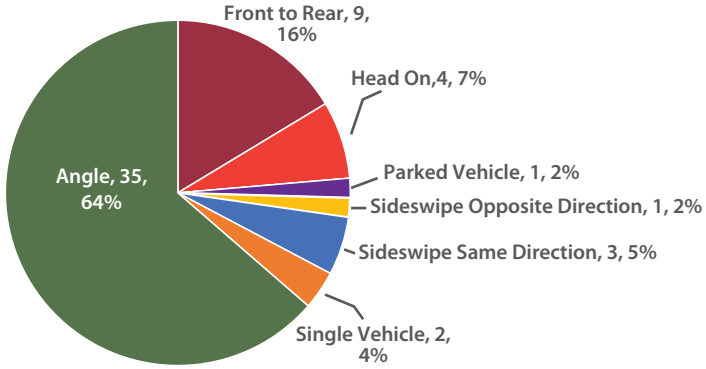
Note: Confidential: This data may be protected under 23 USC 409

11400 South and 1300 East

There were 55 crashes at this intersection between 2016 and 2018. Figure 3-24 shows crashes by crash type. Angle crashes are the predominant crash type, with 64 percent of the total. Steep grades on the east and west approaches may contribute to sight distance issues here. Nearby Alta high school contributes to a high prevalence of teenage driver crashes with 38 percent. There was one bicycle, one pedestrian crash, and one motorcycle crash, all involving a teenage driver. There were two serious injury crashes.

It is recommended that this intersection be considered for an additional safety study.

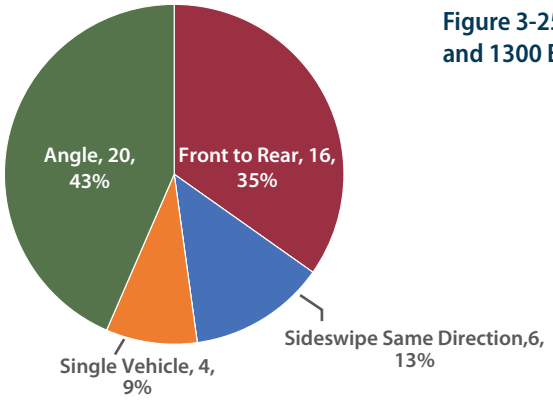
Figure 3-24: 11400 South and 1300 East



8600 South and 1300 East

There were 48 crashes at this intersection between 2016 and 2018. Figure 3-25 shows crashes by crash type. Angle crashes are the predominant crash type, with 51 percent of the total. A contributing circumstance to this is likely land use and access. Gas stations are located on two corners and restaurant/retail on the other two, these all create a situation with many busy access points. Here again, there was a high prevalence of teenage and older driver crashes, with 38 and 18 percent respectively. There was one bicycle and one pedestrian crash, as well as two serious injury crashes.

Figure 3-25: 8600 South and 1300 East



Note: Confidential: This data may be protected under 23 USC 409

Safe Route to School

Safe Routes to School (SRTS) is a program defined by the US Department of Transportation (US DOT) as "an approach that promotes walking and bicycling to school through infrastructure improvements, enforcement, tools, safety education, and incentives to encourage walking and bicycling to school." This program, which receives federal funding, provides benefits not only to students, but to all people who like to enjoy traveling within the built environment without having to use a car. SRTS create safe and friendly routes between neighborhoods and schools. Depending on a school's proximity to other destinations, SRTS may also provide the benefit of making connections along a route to places like parks, libraries, and multi-use trails, all the while allowing for students to use active transportation when traveling to and from school. Information on SRTS, including how to start and run a SRTS program can be found at *https://www.saferoutespartnership.org/safe-routes-school/101*

Not only does creating SRTS promote walking and safe neighborhood connections for pedestrians, it also decreases the number of vehicles on the road during times of peak congestion because it reduces the need for parents to drive their children to school.

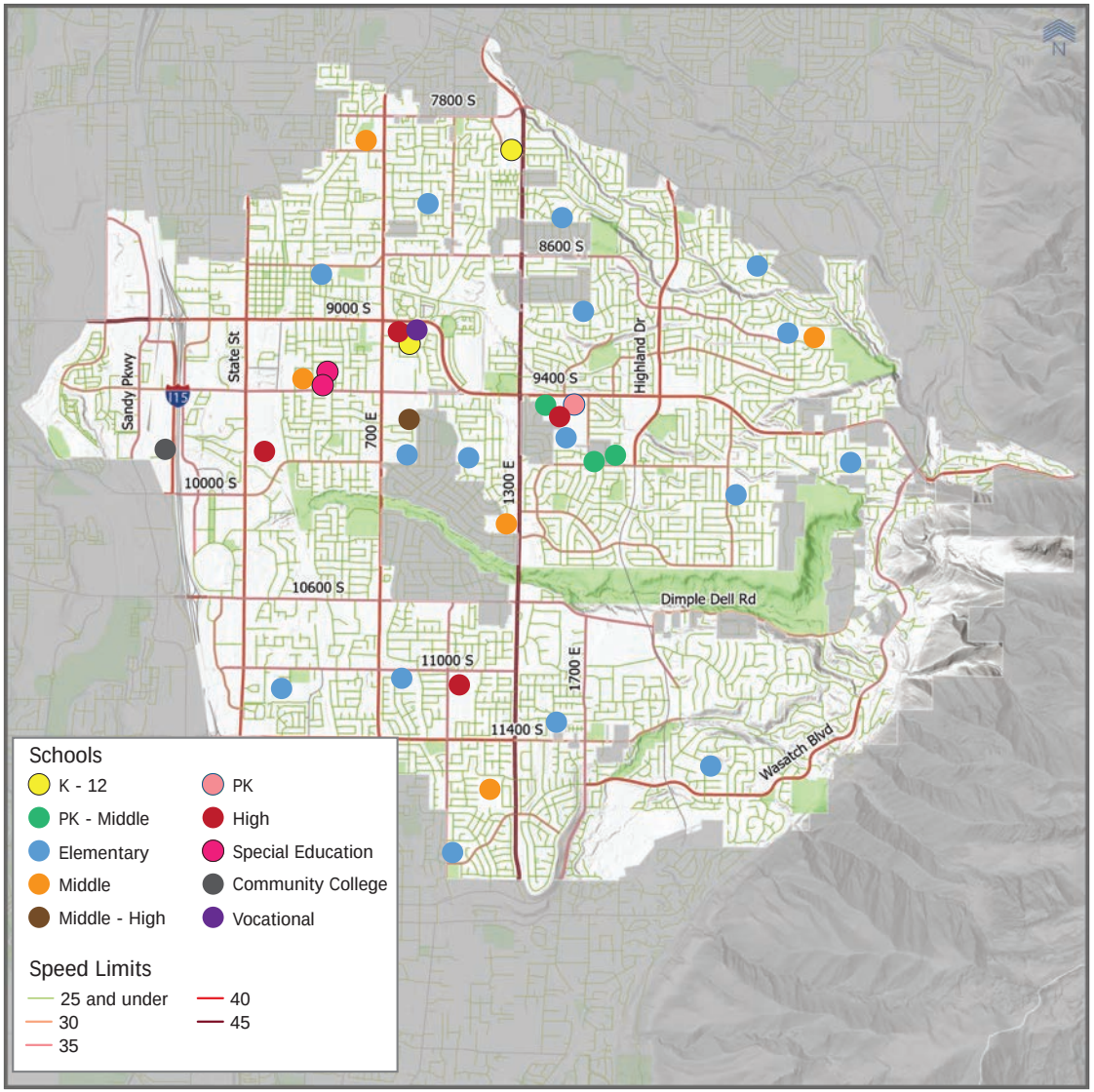
An SRTS online guide, *http://guide.saferoutesinfo.org/*, focuses on the Six E's for successful SRTS planning. They are as follows: evaluation, education, encouragement, engineering, enforcement, and equity. It is understood that successful SRTS programs incorporate all of the Six E's.

The state of Utah has its own website called Safe Routes Utah, *https://saferoutes.utah.gov/*. This website offers valuable resources, including maps of existing SRTS for specific schools, education materials, funding sources, and grant applications. Those who would like to receive further information about SRTS specific to Utah and Sandy should contact UDOT's Active Transportation Safety Program Manager. The name, email, and phone number of the current Active Transportation Safety Program Manager is also found on the website *https://saferoutes.utah.gov/*.

Figure 3-26 shows the locations of schools in Sandy and the speed limits on its roads. A wide road with a high speed limit is an obvious barrier to walking to school. With over 30 schools within the city of Sandy, it is no small task ensuring there are SRTS for each and every school.

However, having so many schools located within the city boundary creates a great opportunity to provide the community with an expansive amount of active transportation options. SRTS programs can fill in gaps throughout the pedestrian network, create new facilities, or launch educational awareness programs that promote alternative and active transportation.

Figure 3-26: Schools and Road Speed Limits



Transit

UTA (Utah Transit Authority) provides TRAX light rail and bus service in Sandy as well as a commuter rail station located just outside the city. Sandy has four rail transit stations that are serviced by the Blue Line; TRAX Historic Station,Sandy Expo Station, Sandy Civic Center, and Crescent View Station.

UTA's bus service has over 160 station stops within Sandy. Some of the busiest bus stops are 9400 South at 2000 East, Historic Sandy Station, Little Cottonwood Road at 3142 East, Sandy Parkway, and Centennial Parkway.

Sandy's updated Transportation Goals and Policies Memorandum includes the transit goal to "increase transportation mode share and convenience of transit service within the city."

Figure 3 -23 shows Sandy's light rail station and bus stops.

Figure 3-26: Existing Transit

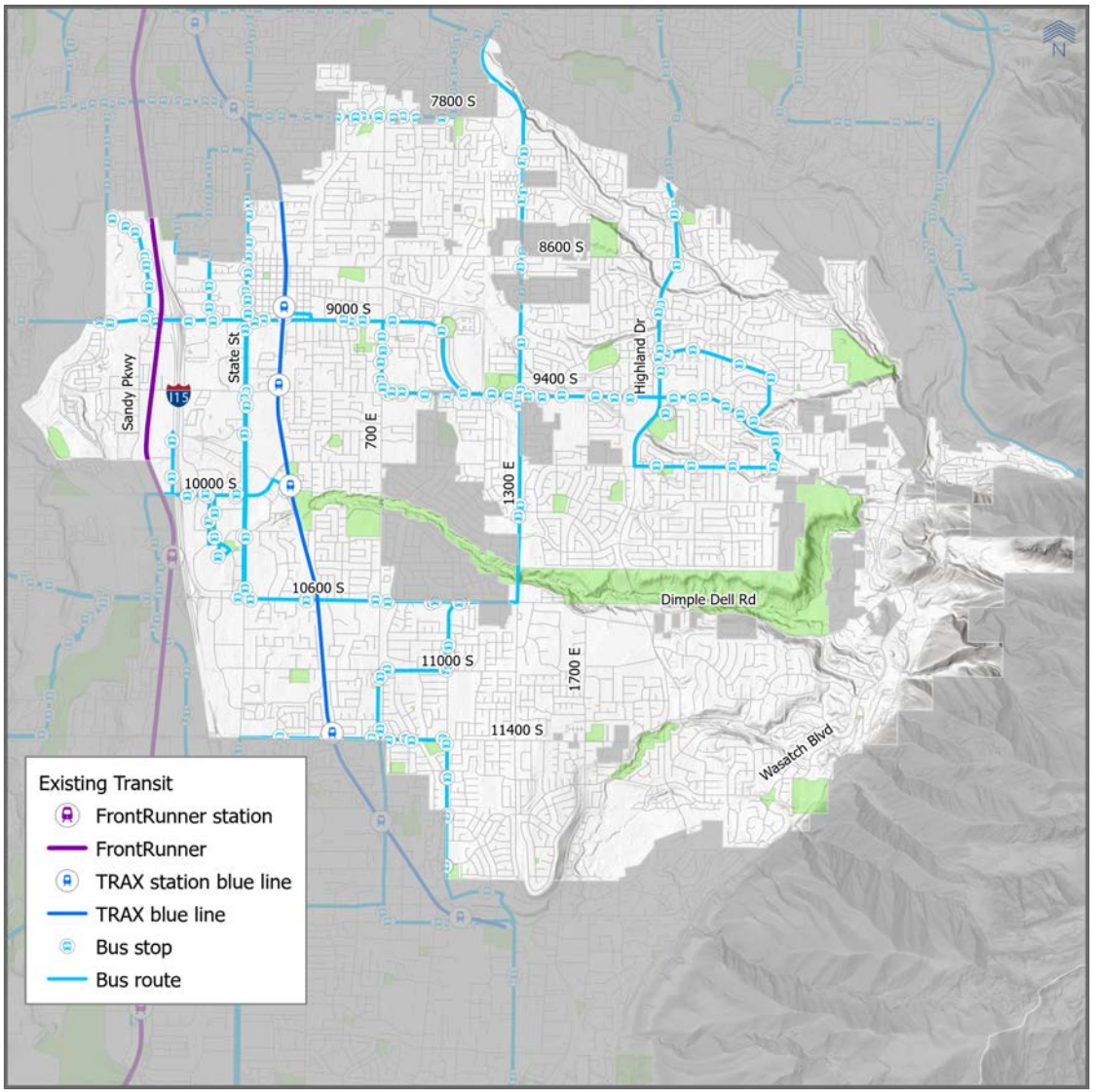


Table 3-12 presents the average weekday transit boardings within Sandy City during 2020. As illustrated below, transit ridership decreased significantly in March due to Covid-19. During January and February there were approximately 2,600 weekday boardings within the City. However, by April weekday boardings were down to approximately 500 per day. Since then the number of boardings has increased with over 800 weekday boardings by November. Even with this increase the number of boardings is below the typical weekday boardings estimated from 2019 route data. Currently, there is uncertainty about when or if ridership levels will return the pre-Covid levels.

The doted line in Table 3-12 represents a "typical year." A typical year refers to one where ridership continues, business as usual, along its regular trend, as apposed to the actual ridership levels of 2020, which were drastically affected by COVID-19. This dotted line was created by averaging ridership data from 2018 and 2019 to obtain an assumed ridership trendline for a hypothetical year 2020 where there was no pandemic. It is impossible to predict when ridership numbers will come back to normal.

Table 3-12: Average 2020 Weekday Transit Boardings

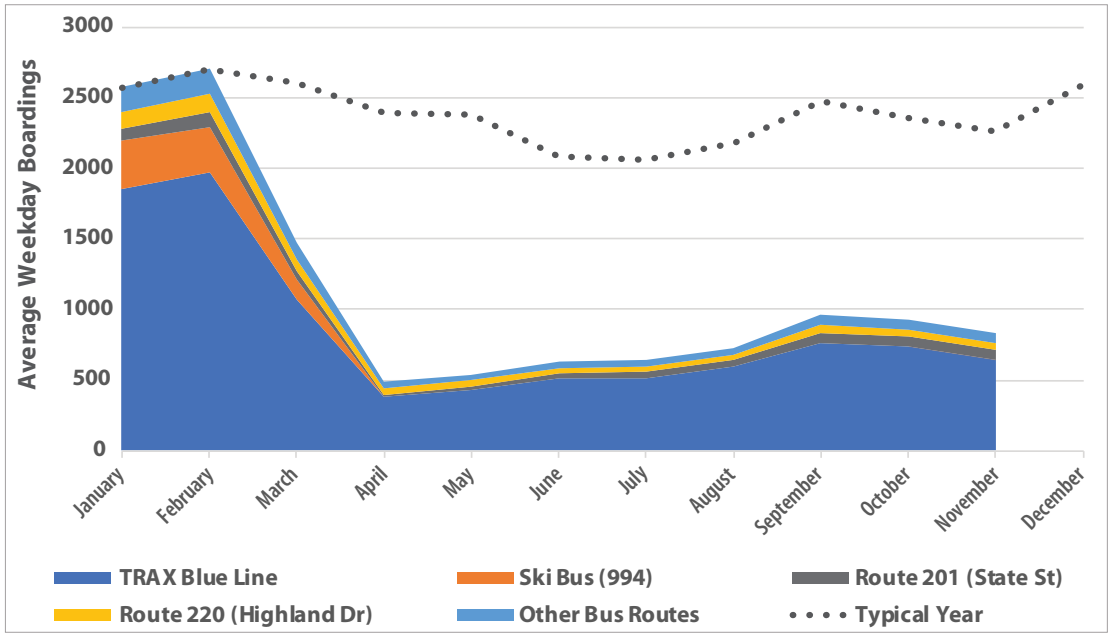
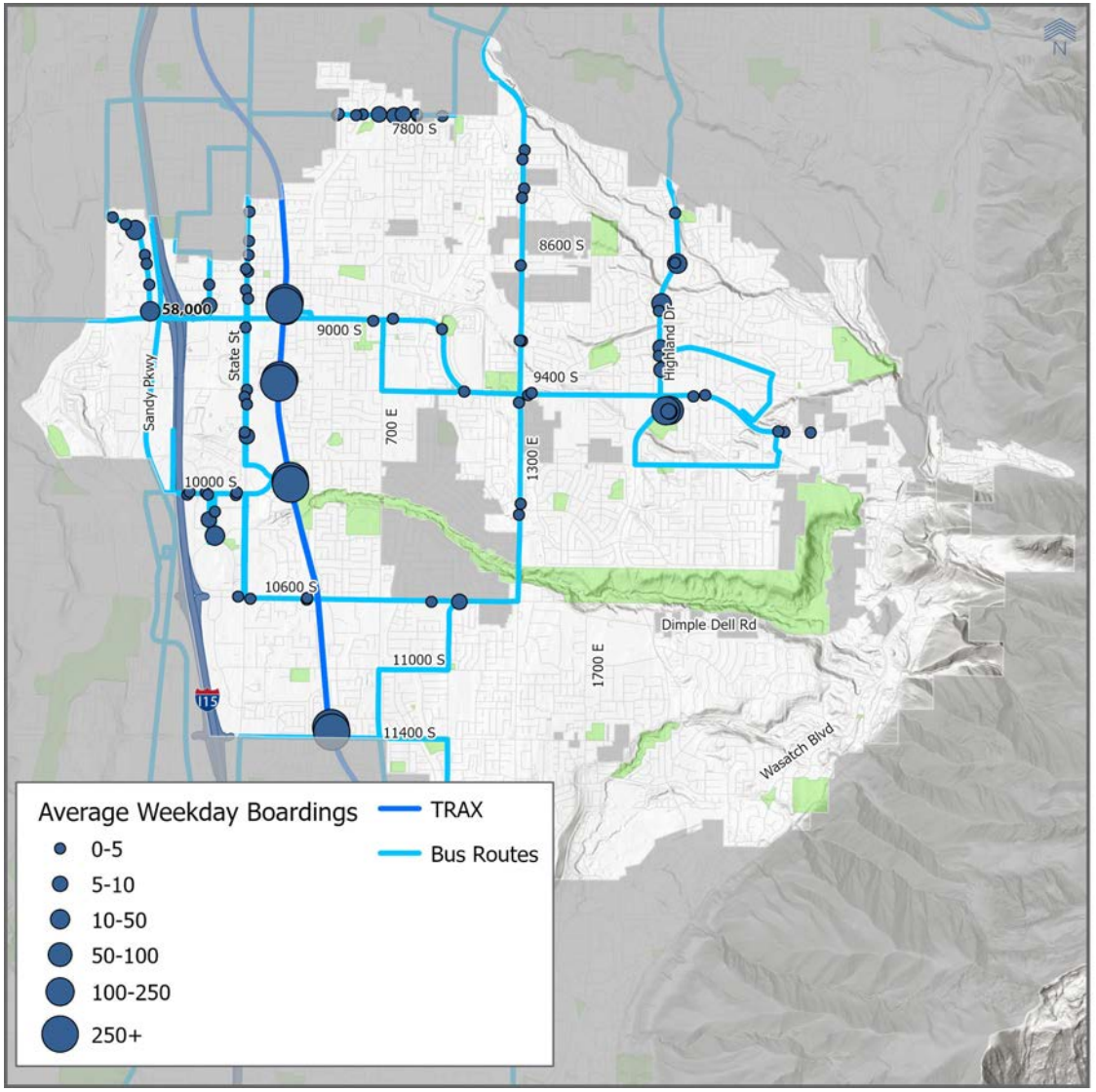


Figure 3-27 shows the most used bus stops and Trax stations in Sandy during January and February 2020. The Historic Sandy TRAX station had the most boardings with over 700 weekday boardings, followed by Sandy Civic Center, Crescent View, and Expo stations. The Highland Drive / 9400 South park and ride bus stop was the most used stop during this period with over 100 weekday boardings. As shown in the map below, bus stops on Highland Drive, Centennial Parkway and Sandy Parkway recorded more than 5 weekday boardings on average.

Figure 3-27: Average Weekly Boardings in 2020

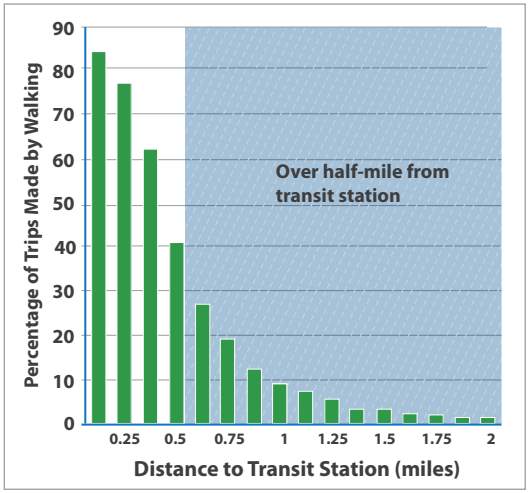


According to the FHWA *(Federal Highway Administration)*: "*most people are willing to walk 1/4 [mile] to 1/2 [mile] to a transit stop....in order to encourage transit usage, safe and convenient pedestrian facilities should be provided within 1/4 to 1/2 mile of transit stops, and greater distances near (heavy) rail stations.*"

The majority of Sandy has access to transit stops within a half-mile distance, if determined by an "as the crow flies" straight line estimate, rather than the distance a person would travel walking along a sidewalk. However, there are areas in Sandy where the housing located on local streets is beyond a half-mile distance from the closest bus stop, including a considerable portion of neighborhoods on the eastern part of the city. UTA is currently exploring other options to reach the blue areas through programs such as VIA micro transit.

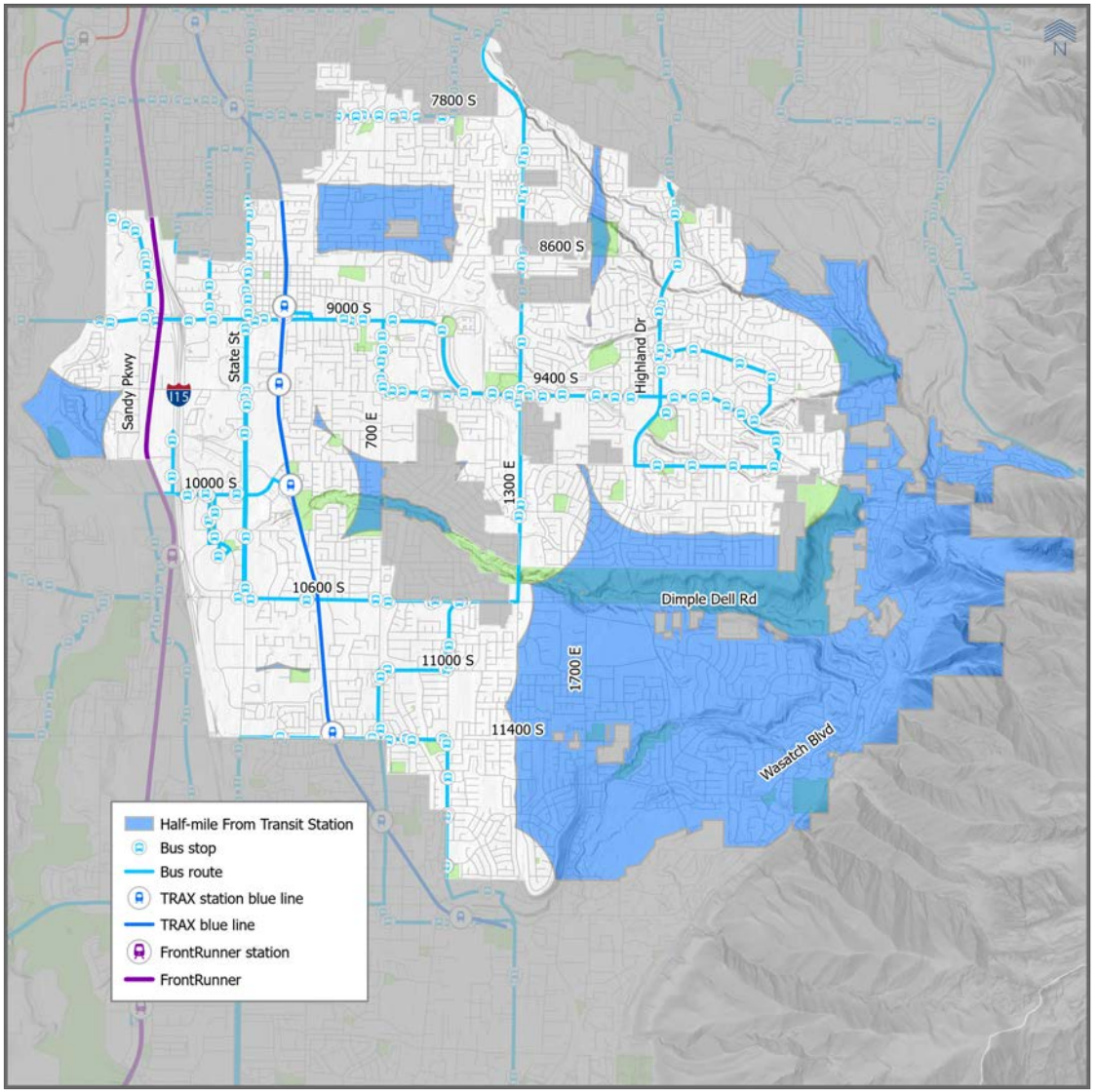
Figure 3 -28 is a map of Sandy's transit stops. The areas colored in blue are beyond a half-mile distance from the closest bus stop. Figure 3-29 is a graph showing the relationship between distance and transit usage.

Figure 3-27: Relationship Between Distance and Number of Trips



Source FHWA: https://safety.fhwa.dot.gov/ped_bike/ped_transit/ped_transguide/ch4.cfm

Figure 3-28: Existing Transit and Half-mile Buffers



Active Transportation

Sandy has recently completed a new AT connection that allows users to cross TRAX through an underground tunnel connecting the west side of TRAX to the east and to Dimple Dell Park and Porter Rockwell Trail. With this new connection a person can now travel from just east of State St to Wasatch boulvard without ever having to cross a street.

An Active Transportation (AT) network is a key component of a transportation system because it provides mobility options for all residents. Making walking and biking safe and convenient is a key goal of any complete transportation plan. The benefits of a practical and accessible active transportation network are broad and include improving physical and mental health, decreasing noise and air pollution, providing a low-cost mode-choice, and increasing the property values along the AT network. When there are more transportation choices, connectivity is improved throughout the community because more access is provided to both specific and regional origins and destinations. While freeways and expressways favor high speed long distance mobility for motor vehicles, a robust active transportation network provides its own accessibility options that can connect people to neighborhoods, downtowns, parks, schools, places of work and worship, shopping centers, etc., without the requirement of a car.

Comfort relates to different types of active transportation infrastructure and design. The comfort an AT user feels is affected by things like whether a protective physical barrier exists, the distance from vehicles, an AT user's sight-line visibility, and motor vehicle speed.

While those are some of the main factors taken into consideration when creating an active transportation network, designs should reflect the needs of the local context.

Much like the traditional roadway functional classification, the multiple active transportation roadway types provide choice, access, and mobility to the user. Just as safety is a key priority with designing roadway networks when considering motorized vehicles, it is a crucial and instrumental factor when determining what type of facility should be designed in specific locations throughout an active transportation network.

Figure 3-30 shows the existing active transportation in Sandy. The City has a variety of striped bike lanes, designated bike routes, wider sidewalks that can double as paved multi-use paths, and roadway separated multi-use trails, such as the Porter Rockwell Trail.

Sandy recently coordinated an Active Transportation Plan with the neighboring city of Draper. This project identified levels of traffic stress for active transportation users, connections among and between the cities, and various active transportation routes that offer choices through neighborhoods, along major corridors, and roadway separated trails. Information about this Multi-Jurisdictional Active Transportation Plan can be found at the project website: *www.activesandydraper.com.*

The existing network offers a good backbone of infrastructure as Sandy continues to expands its active transportation system

Figure 3-30: Existing Active Transportation

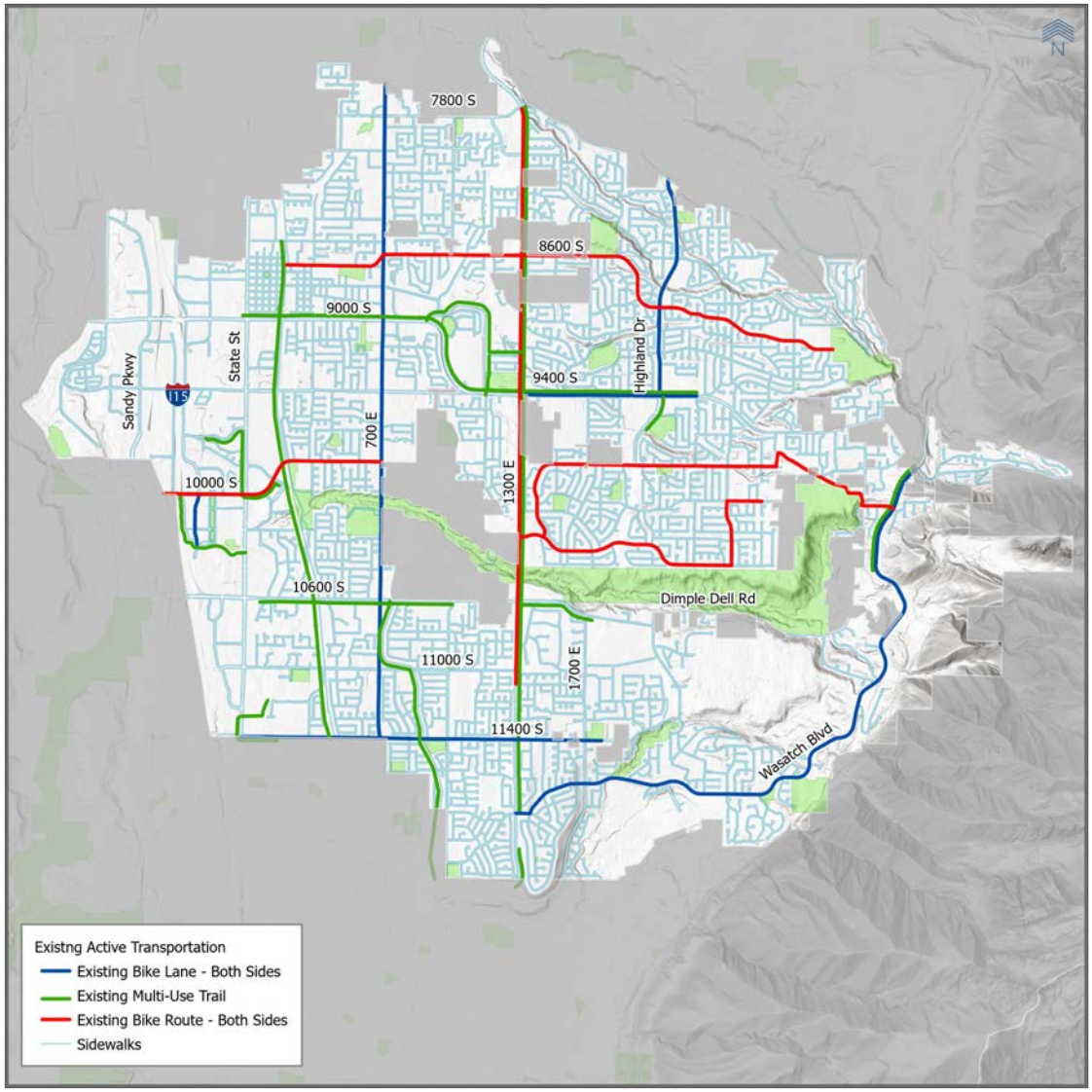
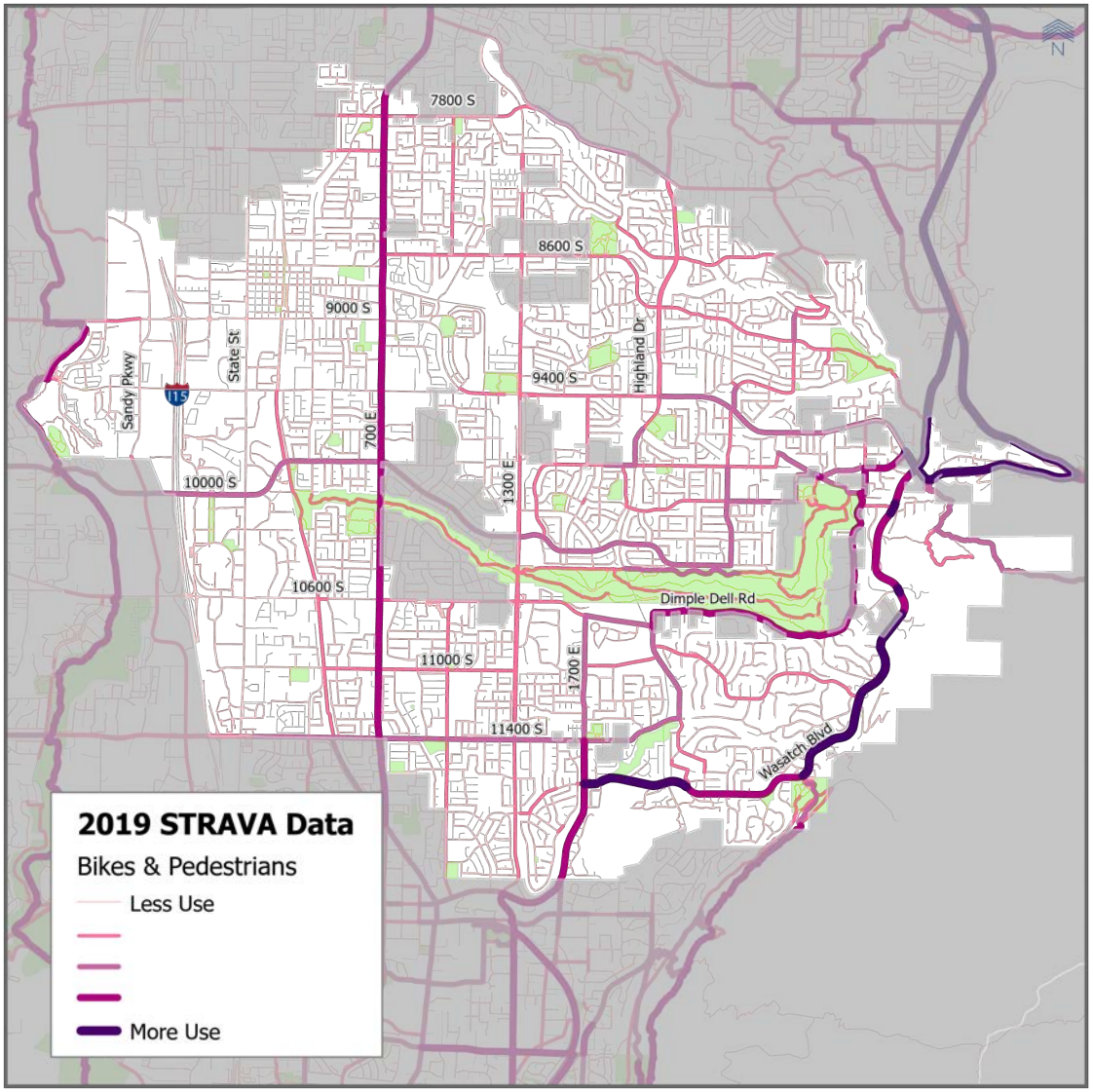


Figure 3-31 shows Strava usage in Sandy. Strava is an app that uses GPS tracking to record a cyclist, runner, jogger, walker's, etc. specific route. The data provides a general idea of where people are participating in active transportation. It is understood that the data is representative of only certain segments and demographics of the population and does not by any means represent all active transportation users. However, it is beneficial to see where these AT trips are occurring along the road network in Sandy. While certain routes, mainly those that run along roads that are classified as arterials and collectors, such as 700 East, receive the highest amount of use, it should be noted that a significant number of local streets have recorded trips on them. When this data is viewed alongside Sandy's existing AT facilities, it may be a helpful tool for identifying where projects receive the highest use, or where there is a latent demand for AT infrastructure.

Figure 3-31: Existing Active Transportation and Strava Usage



4 FUTURE CONDITIONS

This chapter discusses the background and assumptions used to forecast transportation related growth in Sandy. Using travel demand modeling techniques in conjunction with projected socioeconomic, population, and employment trends, future transportation demands were forecast. Transportation system improvements that are committed or planned by agencies such as Utah Department of Transportation (UDOT) and Wasatch Front Regional Council (WFRC) were included in the transportation forecasting prior to identifying additional transportation projects within the city.

Future Growth

The Sandy City General Plan is the official document guiding future development within the City. While the plan provides general goals and policies it does not specify where future development will occur within the city using a future land use map. Instead, current land use decisions are determined by the existing zoning as shown in Existing Conditions Figure 3-1. Additionally, Sandy City has adopted Area Master Plans including the Cairns Master Plan and Stadium Village Master Plan that help guide downtown development over the next 25 years.

The downtown area is planned to have significant growth with over 6,800 residential units and nearly 4 million square feet of office and retail development. These anticipated developments and planned redevelopment areas are shown in Figure 4-1. The number of units and square feet of retail and office space in the downtown area as well as within all of Sandy City is summarized in Table 4-1.

Figure 4-1 and Table 4-1 outline some of the planned growth in and around Sandy, especially in the Downtown. The Stadium Village Plan includes details about the planned growth around Rio Tinto Stadium

Figure 4 -1: Anticipated Developments and Planned Redevelopments in Downtown

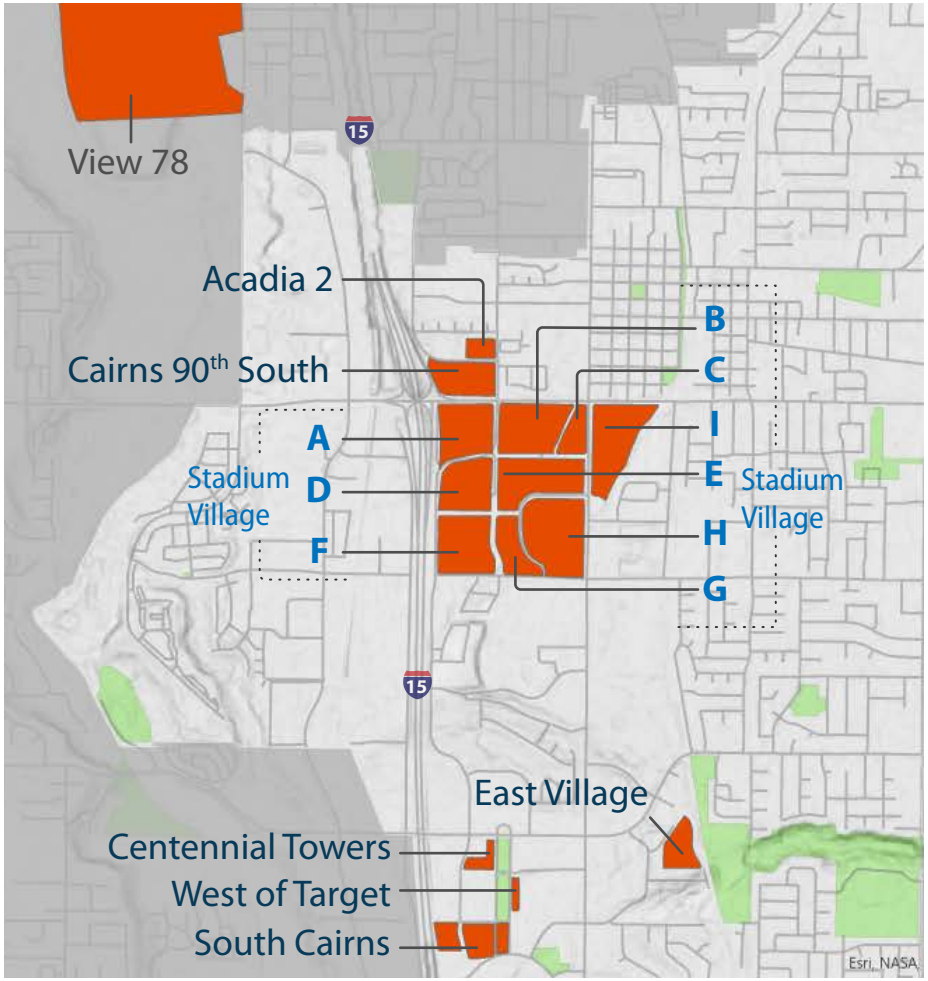


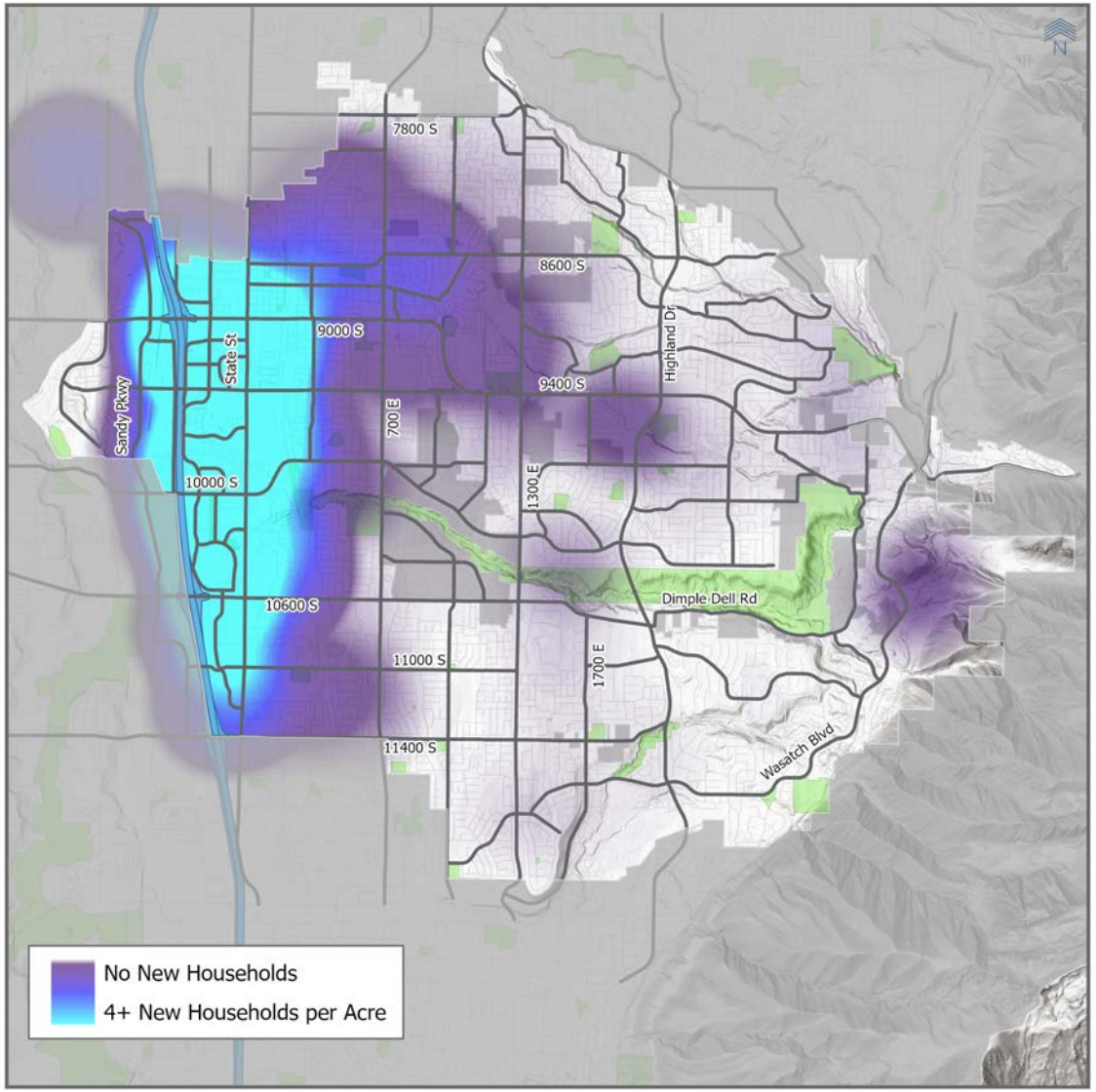
Table 4-1: Anticipated Developments and Planned Redevelopments in Downtown

Development	Residential (units)	Office (sq. ft.)	Retail (sq. ft.)	Hotel (rooms)	Other	Other Description
Downtown Developments						
Stadium Village						
A	666	38,000	82,200	-	-	
B	416	38,000	80,650	-	-	
C	340	-	-	-	-	
I	332	48,000	9,000	-	-	
D	165	583,600	29,200	-	72,300 sf	Entertainment
E	1,182	108,900	106,300	240	128,000 sf	Hotel
F	-	558,600	37,200	240	244,000 sf	Hotel/Storage
G	-	289,500	14,760	-	56,000 sf	Museum
H	336	-	-	-		
Arcadia 2	177	-	-	-		
West of Target	100	-	-	-		
Centennial Towers	100	-	-	-		
Cairns 90th South	-	150,000	11,900	107		
South Cairns	204	414,000	41,400	228		
East Village (Final Phase)	307	-	-	-		
Downtown Totals	**4,325**	**2,228,600**	**412,610**	**815**		
Other Developments						
View 78	2,514	1,300,000				
Farnsworth Farms	100	-	-	-	-	
Wasatch Drive - East	400	-	-	-	-	
Reams	40	-	-	-	450 students	School
Combined Totals	**7,379**	**3,528,600**	**412,610**	**815**	**-**	

Outside these anticipated developments, the future growth in the remainder of the city comes from land use modeling completed by Wasatch Front Regional Council (WFRC). WFRC is the Association of Governments (AOG) for Box Elder, Davis, Morgan, Salt Lake, Tooele, and Weber counties that is responsible for coordinating transportation planning in the region. WFRC recently updated their 2019-2050 Regional Transportation Plan (RTP), which is the blueprint to guide investments in the future transportation system. As part of this process WFRC modeled future land use changes based upon allowed development and transportation system.

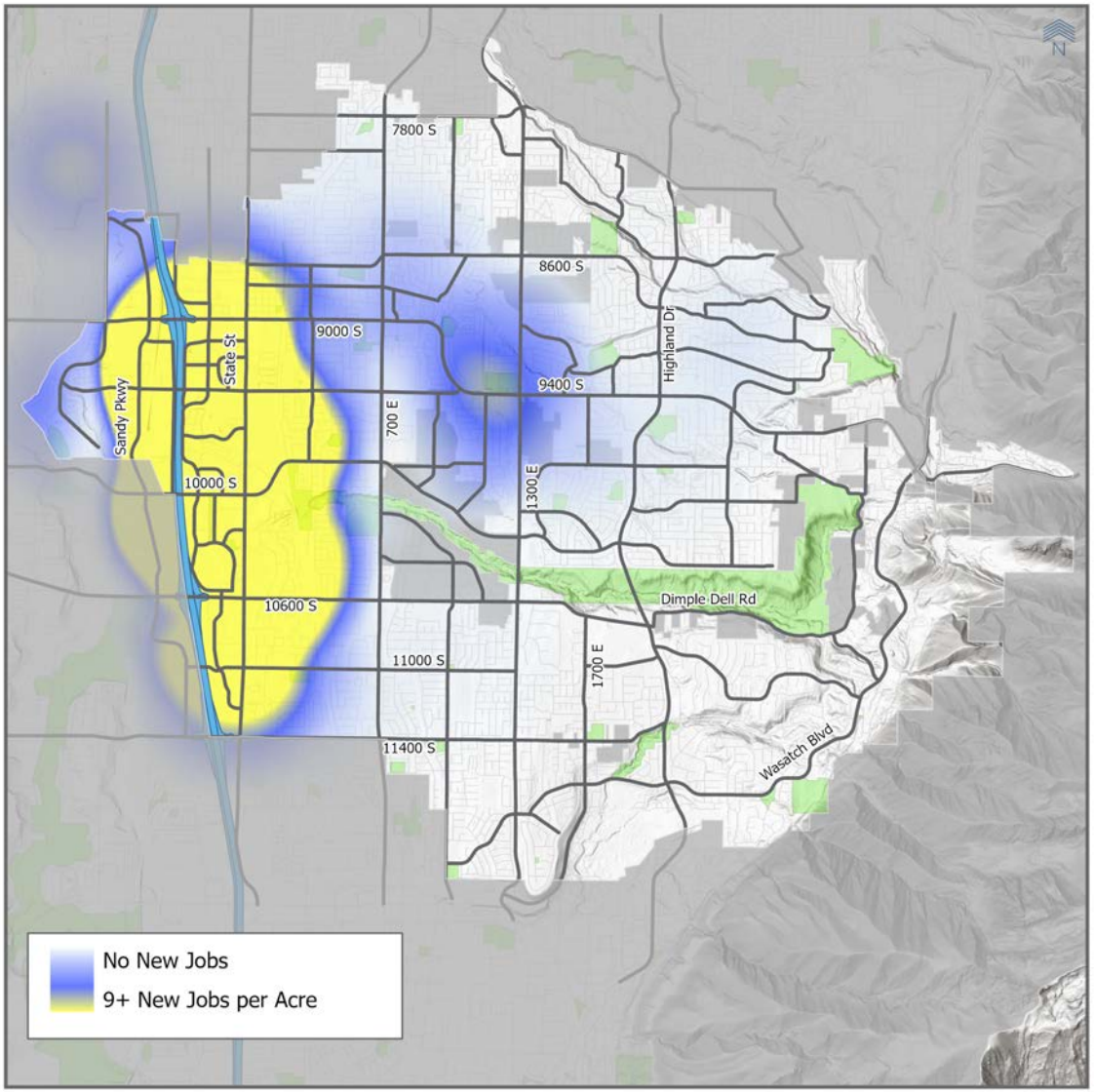
Overall, the majority of known and anticipated development is planned for the downtown or west area of Sandy. Figure 4-2 is a heatmap of future households growth. The vast majority of homes will be located within Sandy's downtown near I-15.

Figure 4-2 Household Growth (2019-2050)



This concentrated development will significantly increase the number of trips to and from the downtown area resulting in increased traffic congestion. Figure 4-3 is a heatmap showing future job growth. Like housing, downtown is where Sandy will experience the majority of its job growth. Promoting a high jobs to housing ratio in the Sandy Downtown area will allow more workers to live close to their employers, providing opportunities for alternative and active transportation behavior on a daily or frequent basis. This may help mitigate congestion and improve quality of life for residents who no longer have to spend large amounts of time commuting in traffic.

Figure 4-3: Employment Growth



Travel Model Development

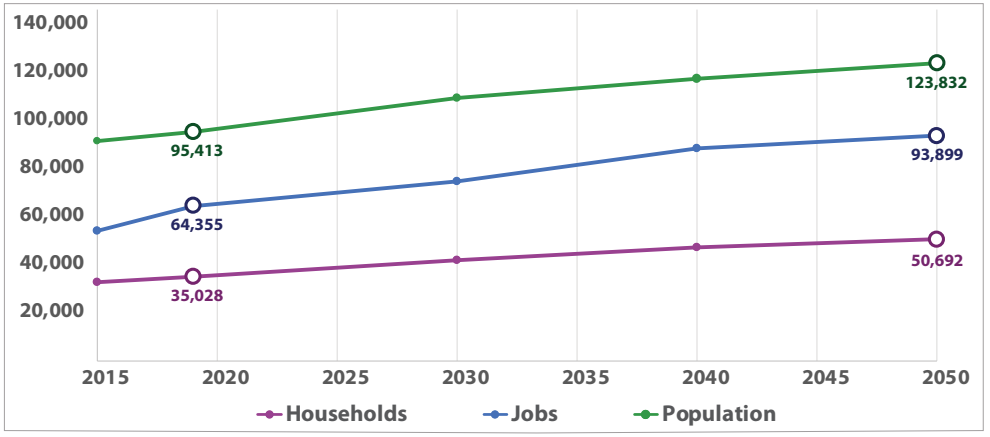
Projecting future travel demand is a function of projected land use and socioeconomic conditions. The WFRC Travel Demand Model (TDM) was used to predict future traffic patterns and travel demand. The travel demand model was modified to reflect better accuracy through the Sandy area by creating smaller Traffic Analysis Zones (TAZ) and a more accurate and extensive roadway network. Existing conditions were simulated in the TDM and compared to the observed traffic count data to get a reasonable base line for future travel demand. Once this effort was completed, future land uses, and socioeconomic data were input into the model to predict the roadway conditions for the horizon year 2050. Year 2050 was selected as the planning year horizon to be consistent with the regional planning process.

Land Use's Effect on Transportation

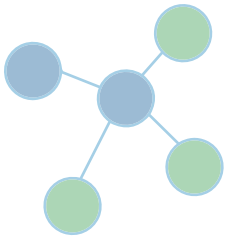
The steady growth that Sandy has experienced is expected to continue in the coming years. Population and employment are projected to increase by at least 35% over the next 30 years, resulting in increased transportation system demands. This increasing demand will require new and improved transportation facilities. Additionally, Sandy is becoming a second regional downtown with a mix of residential, commercial, and industrial land uses in and near downtown. These changes will require transportation options for people to walk, bike or take transit for these shorter distance trips changing how people commute in the future.

The future we are planning for revolves around significant population and employment growth within the City. Figure 4-4 summarizes this anticipated growth over the next 30 years. This chart shows Sandy's population, households, and jobs from the TDM for the years 2019, 2030, 2040, and 2050. The projected 2050 population in Sandy is over 120,000 people with nearly 30,000 new residents. Employment growth is also adding almost 30,000 new jobs over the next 30 years. While population is anticipated to increase by over 35%, employment is forecast to increase by more than 60% with more jobs than people being added within the city.

Figure 4-4: Sandy City Travel Model Projected Growth



Model Years and Results



Projected Traffic Volumes & Conditions

The resulting outputs of the travel demand model consist of traffic volumes on all the classified streets in the city and surrounding area. These forecast traffic volumes were used to identify the need for future roadway improvements to accommodate growth. The following three scenarios were analyzed in detail to assess the travel demand and resulting network performance in the City:

- ***No Build***
- ***Regional Transportation plan***
- ***Recommended Roadway Network***

No-Build Conditions

A no-build scenario is intended to show what the roadway network would be like in the future if no action were taken to improve the roadway network. The travel demand model was again used to predict this condition by applying the future growth and travel demand to the existing roadway network. Interim year growth assumptions were also modeled to understand how congestion grows over time. Figure 4-5 to Figure 4-7 show the 2030, 2040, and 2050 No Build model Levels of Service respectively. These maps show growing congestion on State Street, 700 East, 1300 East, 9000 South, and other corridors as the population and employment increases without improvements to the transportation system. This growing congestion is visible in the expansion of orange and red roadway segments.

As shown in Figure 4-5 if no improvements are made to the transportation system, projected traffic volumes for the planning year 2030 will significantly worsen the LOS of many streets and intersections throughout the city.

Figure 4-4: LOS Intersection (Delay in Seconds)

LOS	Delay in Seconds
A	0< 10
B	10 to 20
C	20 to 35
D	35 to 55
E	55 to 80
F	> 80 seconds

Figure 4-5: 2030 No Build Level of Service

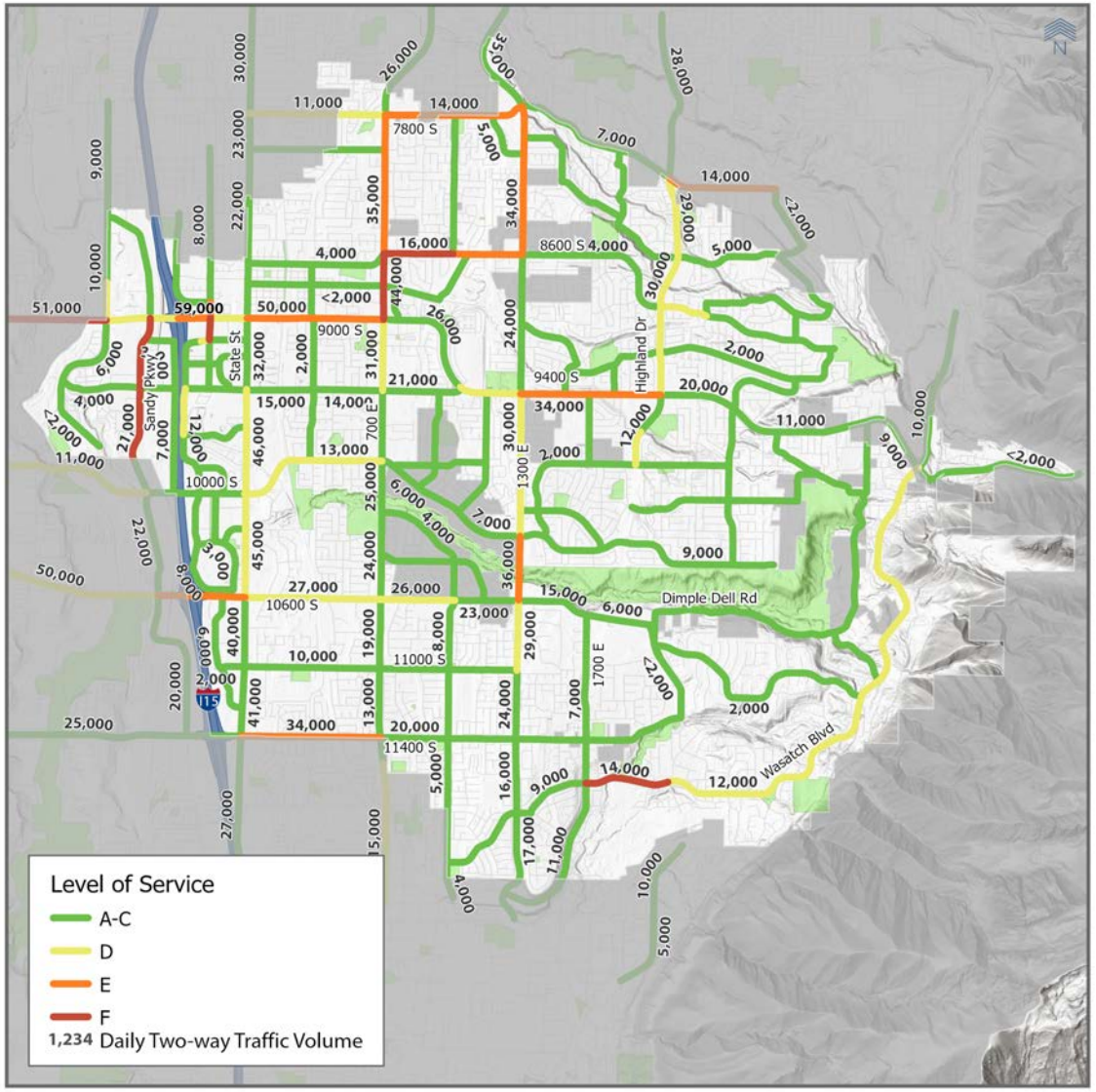


Figure 4-6 is the 2040 Level of Service if no recommended projects are completed. An increasing amount of road segments are functioning at LOS E or below and most segments from the 2030 LOS model are performing more poorly in 2040 due to greater daily traffic volumes.

Figure 4-5: LOS Intersection (Delay in Seconds)

LOS	Delay in Seconds
A	0< 10
B	10 to 20
C	20 to 35
D	35 to 55
E	55 to 80
F	> 80 seconds

Figure 4-6: 2040 No Build Level of Service

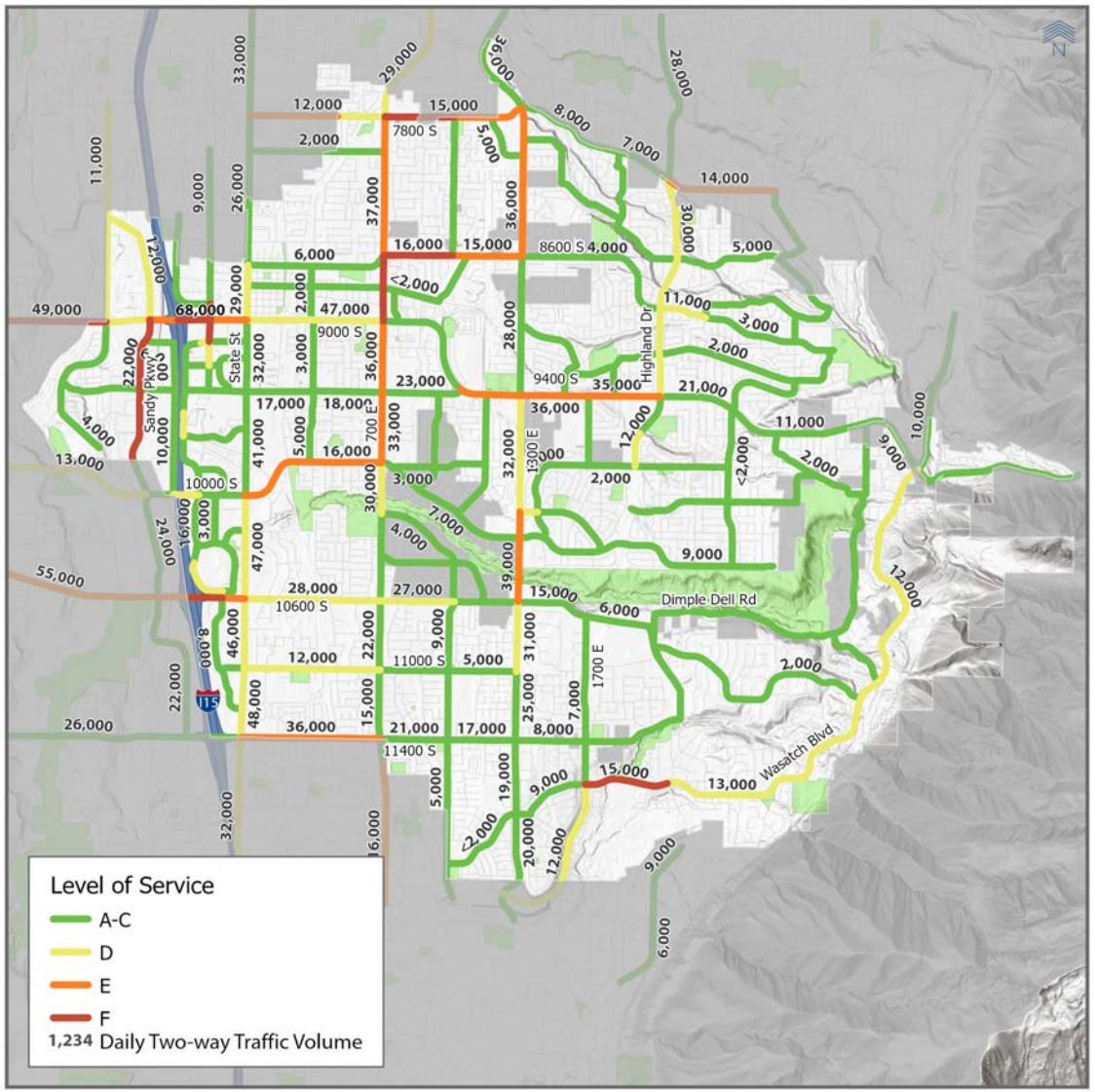


Figure 4-7 is the 2050 Level of Service with no recommended projects completed. This map shows the 32 road segments in Sandy that will function at LOS D or worse. Out of those, 15 will be at level E or worse, which is considered unacceptable. The following list includes the streets expected to perform at LOS D or worse:

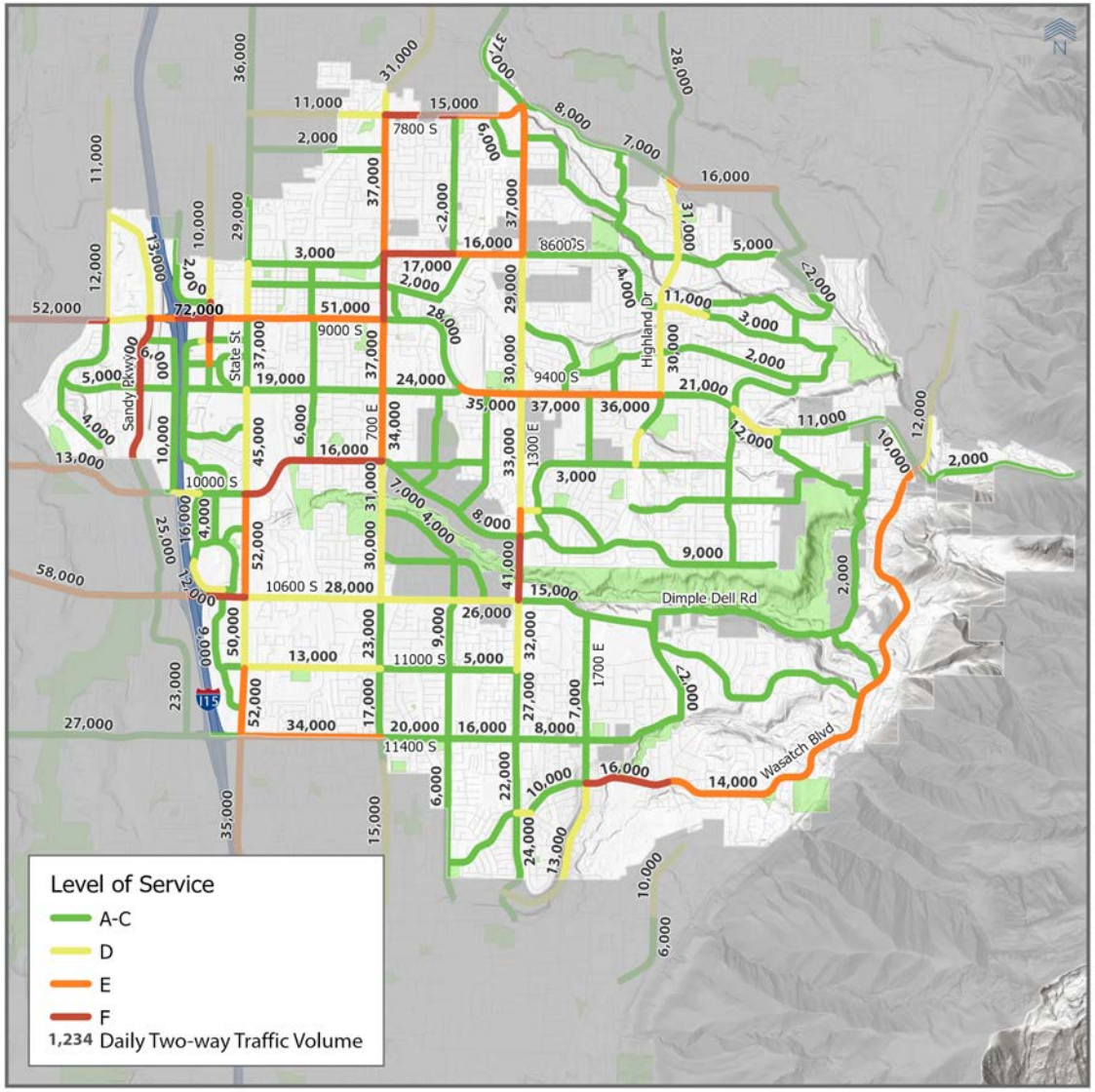
LOS D *(Peak Congestion but Acceptable)*

700 West *(9000 S to North City Limit)*
Sandy Parkway *(9000 S to 700 W)*
Monroe Street *(Harrison St. North City Limit)*
State Street *(11000 S to 10600 S)*
State Street *(10000 S to 9400 S)*
State Street *(9000 S to 8600 S)*
700 East *(10600 S to Sego Lily)*
1300 East *(11000 S to 10600 S)*
1300 East *(10075 S to 8600 S)*
1700 East *(South City Limit to Wasatch Blvd)*
Highland Drive *(9400 S to Creek Rd)*
Wasatch Boulevard *(Little Cottonwood Rd to North City Limit)*
7800 South *(State St to 700 E)*
New Castle Drive *(Highland Dr to 2200 E)*
9400 South *(Quail Hollow Dr to Mt Jordan Rd)*
10600 South *(State St to 1300 E)*
11100 South *(State St to 700 E)*

LOS E or Worse *(Unacceptable)*

Sandy Parkway *(South City Limit to 9000 S)*
Monroe Street *(9270 S to Harrison St)*
State Street *(11400 S to 11000 S)*
State Street *(10600 S to 10000 S)*
700 East *(10000 S to 7800 S)*
1300 East *(10600 S to 10075 S)*
1300 East *(8600 S to 7800 S)*
Wasatch Boulevard
7800 South *(700 E to 1300 E)*
8600 South *(700 E to 1300 E)*
9000 South *(Sandy Pkwy to 700 E)*
9400 South *(9375 S to Highland Dr)*
10000 South/Sego Lily *(State St. to 700 E)*
10600 South *(West City Limit to State St)*
11400 South *(State St to 700 E)*

Figure 4-7: 2050 No Build Level of Service



Recommended 2050 Roadway Network

Transportation system improvements will need to be made to preserve the quality of life and to maintain an acceptable LOS on city streets and at intersections. These improvements will also provide a sound street system that will support the city's economic base. The future analysis can generally be split into two sections. The first are regional projects included in WFRC's RTP. These projects may be funded in part by WFRC and are generally larger improvements such as the State Street widening that benefit multiple communities. After evaluating these projects and the potential need for improvements beyond the WFRC projects, the second section includes additional projects to improve the roadway network and build the transportation system necessary to accommodate future land use plans.

This recommended 2050 roadway network will provide the access and capacity for the growth anticipated in downtown as well as more established neighborhoods. The built environment in downtown Sandy is quickly expanding as seen in the photo above where new development is currently being completed. Without additional improvements to city roadways, congestion will increase reducing the quality of life for Sandy residents.

Regional Transportation Plan

Sandy is not alone in improving the roadway network. WFRC, in cooperation with UDOT, provides financial assistance for projects included in their RTP. If the roadway is included on the RTP and is owned and operated by UDOT, full financial responsibility falls to UDOT. It is important to include these projects in this Plan as well as coordinate with UDOT to ensure these projects are implemented. If the roadway is on the RTP and not owned by UDOT, Sandy may be able to apply for funding through WFRC, in which case, the city will only be responsible to match 6.77% of the total cost of the project. RTP projects within Sandy included on the RTP are shown in Figure 4-8, and are listed below by project phase in Table 4-2. An interactive map can be viewed on WFRC's website *https://wfrc.org/rtp-2019-adopted/*

The RTP projects in Figure 4-8 are color coded by project type. The adopted RTP, includes projects that add capacity, such as widening projects and new construction. These include projects on 9000 South, State Street, and Highland Drive among others. In addition to these projects, there are new roads such as the I-15 CD roads, a Highland Drive connection, and a new I-15 interchange at 9400 South. The RTP projects with Sandy are summarized below.

Phase 1 (2021-2030)

9000 South
Redwood Road to I-15
Widening: 5/7 to 7 lanes

I-15 C-D System (Northbound)
I-215 to Bangerter Highway
New Construction: 0 to 2 lanes

Monroe Street
9000 South to Towne Ridge Parkway
New Construction: 0 to 3 lanes

State Street
8000 South to 9000 South
Widening: 5 to 7 lanes

Highland Drive
9400 South to 9800 South
Widening: 2/5 to 5 lanes

Wasatch Boulevard
Bengal Blvd to Little Cottonwood Rd
Widening: 2/3 to 5 lanes

South Jordan / Sandy Circulator
Sandy Expo TRAX Station to S. Jordan Station
New Transit Circulator

Phase 2 (2031-2040)

Princeton Drive
700 West to 415 West
New Construction: 0 to 3 lanes

9400 South
Monroe Street to State Street
Widening: 3/4 to 5 lanes

900 East/700 East
Fort Union Boulevard to 9400 South
Widening: 5 to 7 lanes

700 East
11400 South to 12300 South
Widening: 3 to 5 lanes

2000 East
Fort Union Boulevard to 9400 South
Widening: 4/5/7 to 7 lanes

Highland Drive
9800 South to Draper City Limit
New Construction: 0 to 5 lanes

10200 South I-15 Crossing
New I-15 Crossing

Phase 3 (2040-2050)

I-15 Interchange
9400 South
New Interchange

11000 South
Jordan Gateway to Auto Mall Drive
New Construction: 0 to 3 lanes

Figure 4-8: 2019-2050 Regional Transportation Plan

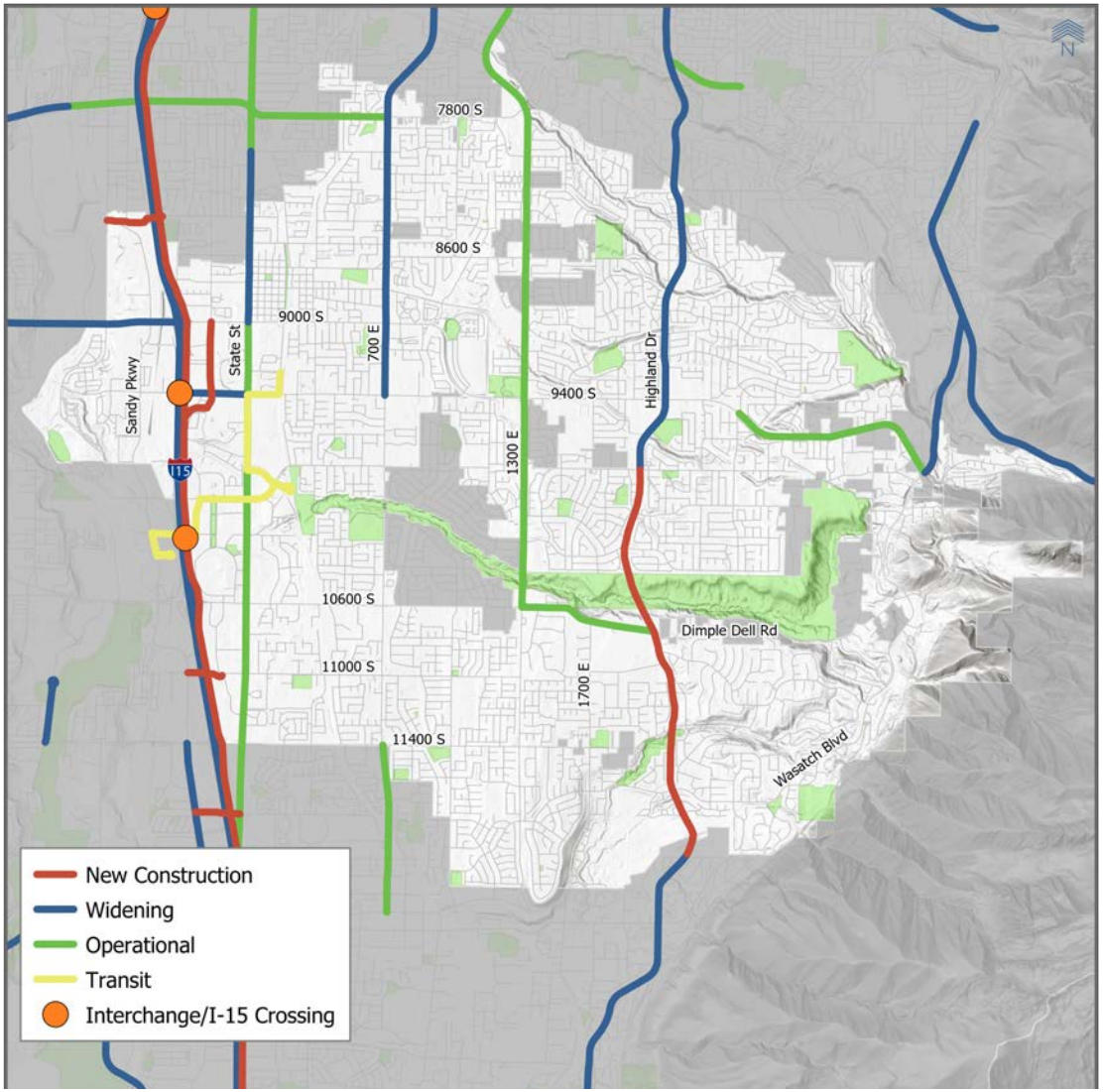
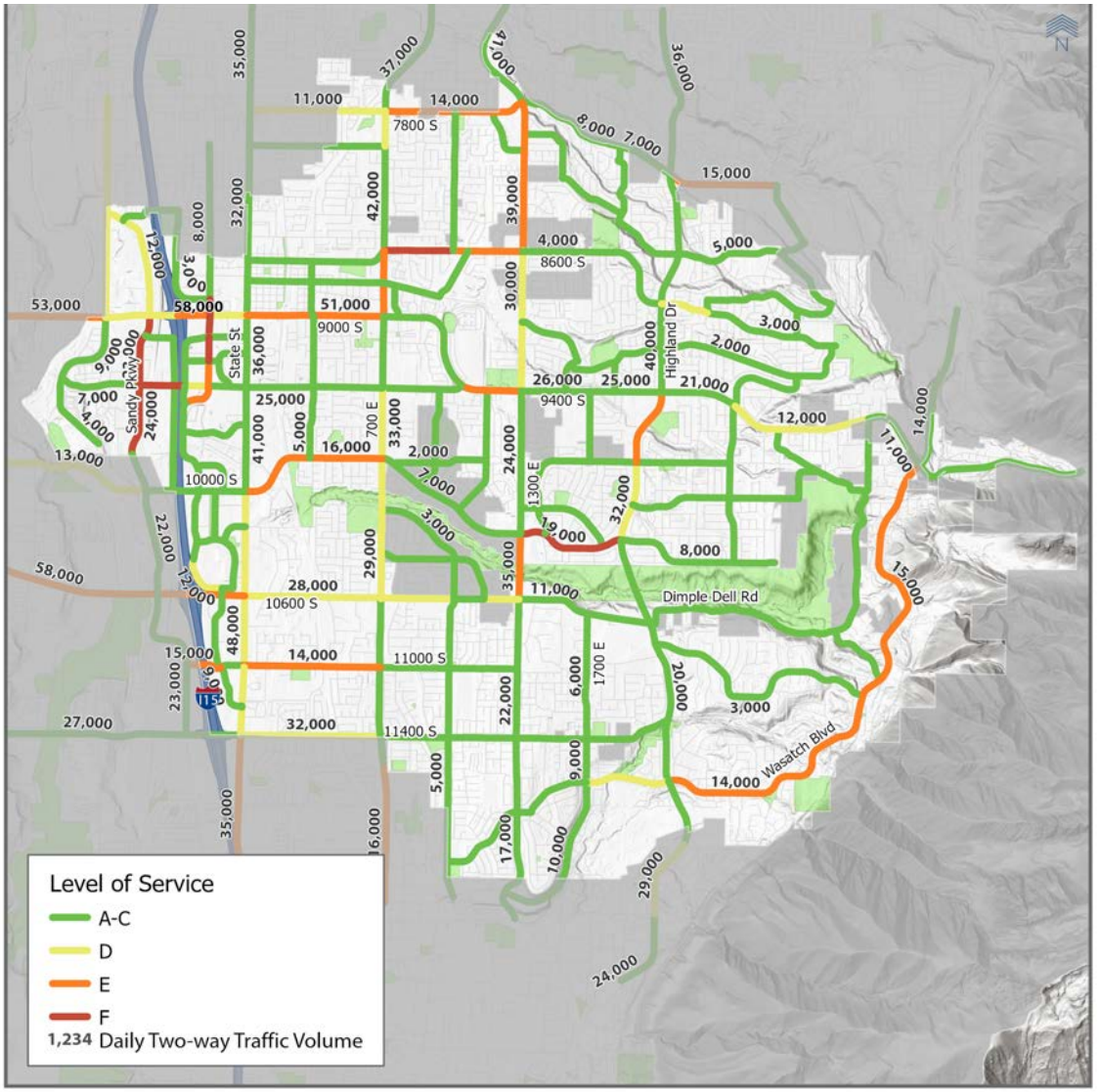


Figure 4-9 summarizes the year 2050 level of service with the RTP projects. These projects reduce daily traffic volumes and improve level of service on many roads throughout the city. However, several roads such as Sandy Parkway and 9400 South from Sandy Parkway to I-15 are still anticipated to be LOS F even with these planned improvements. These segments that are anticipated to experience a poor level of service provide the basis to identify additional roadway projects that will improve mobility and reduce delays for Sandy residents.

Figure 4-9: Level of Service with Regional Transportation Plan



Local Projects

In addition to the RTP project, local input along with travel demand model results were utilized to determine local capacity projects. While many of these are smaller local projects, these projects improve connectivity and transportation options throughout the city. Along with numerous intersection improvement these projects include:

New Construction/Realignment

Green Way *(8800 S to Woodleaf Wy)*
Beetdigger Blvd *(Sage Canal Wy to Midvillage Blvd)*
Cy's Road *(Harvard Park Dr to 1300 E)*
9270 South *(State St to 150 East)*
Riverside Drive *(Extension to 9800 South)*
9200 South (*Monroe Street to State Street)*
Highland Drive *(9800 S to Sego Lily)*
10200 South *(Mall Ring Road to State Street)*
Monroe St *(I-15 Ramp to I0600 S)*

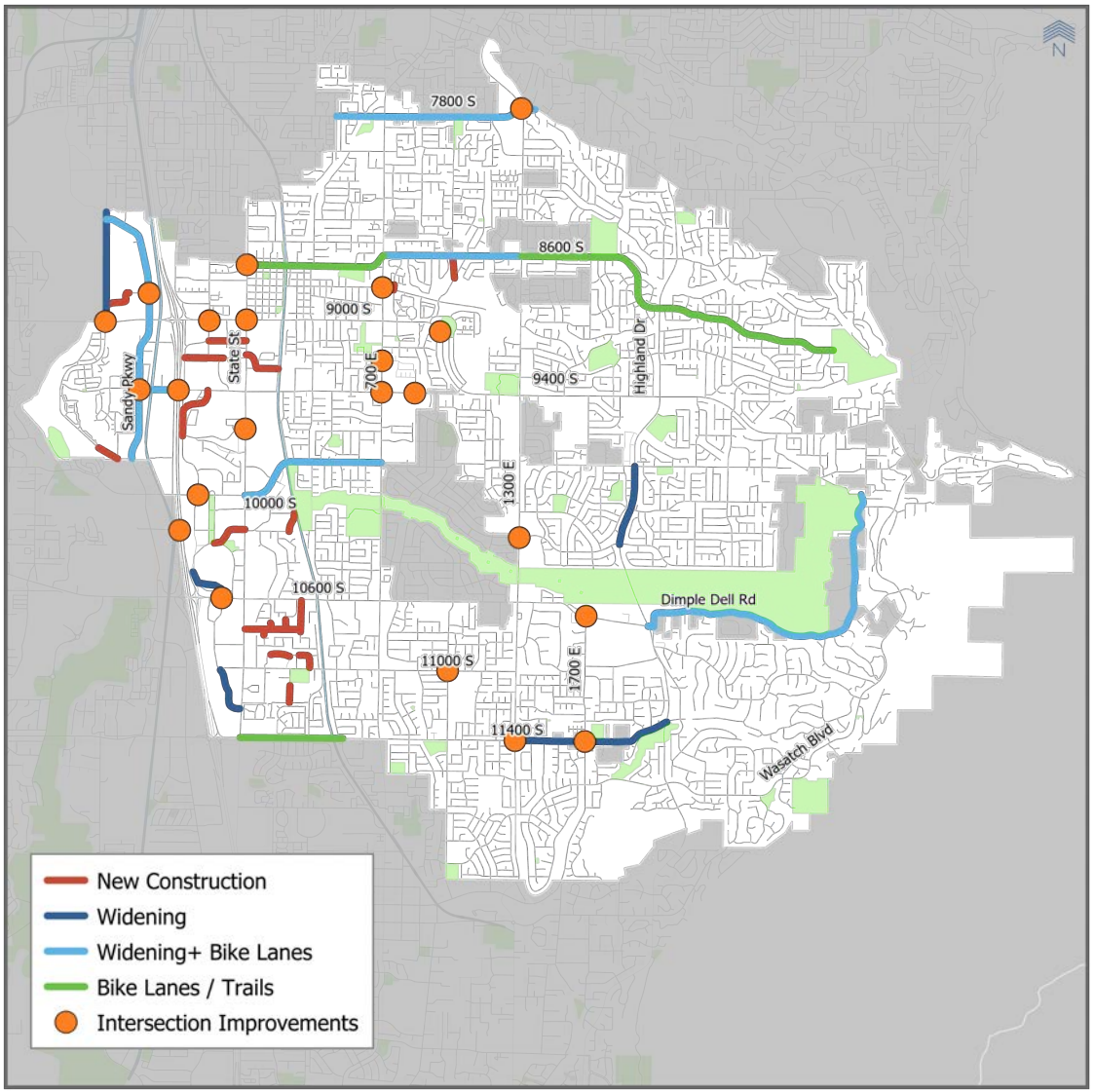
Widening

700 West *(City Border to 9000 S)*
Sandy Parkway *(City border to 700 W)*
9400 South *(Sandy Pkwy to I-15)*
7800 South*(Sego Lily to State St)*
8600 South *(700 E to 1300 E)*
Dimple Dell Road *(1700 E to Mt Jordan Rd)*
11400 South *(1300 E to Highland Dr)*
Auto Mall Drive *(11000 S to State St)*

Active Transportation

7800 South(*450 E to 1300 E)*
8600 South *(State St to Falcon Wy)*
Sego Lily *(Porter Rockwell Trail to 700 E)*
11400 South *(State St to Camden Park Ln)*
Dimple Dell Road *(Highland Dr to Mt Jordan Rd)*

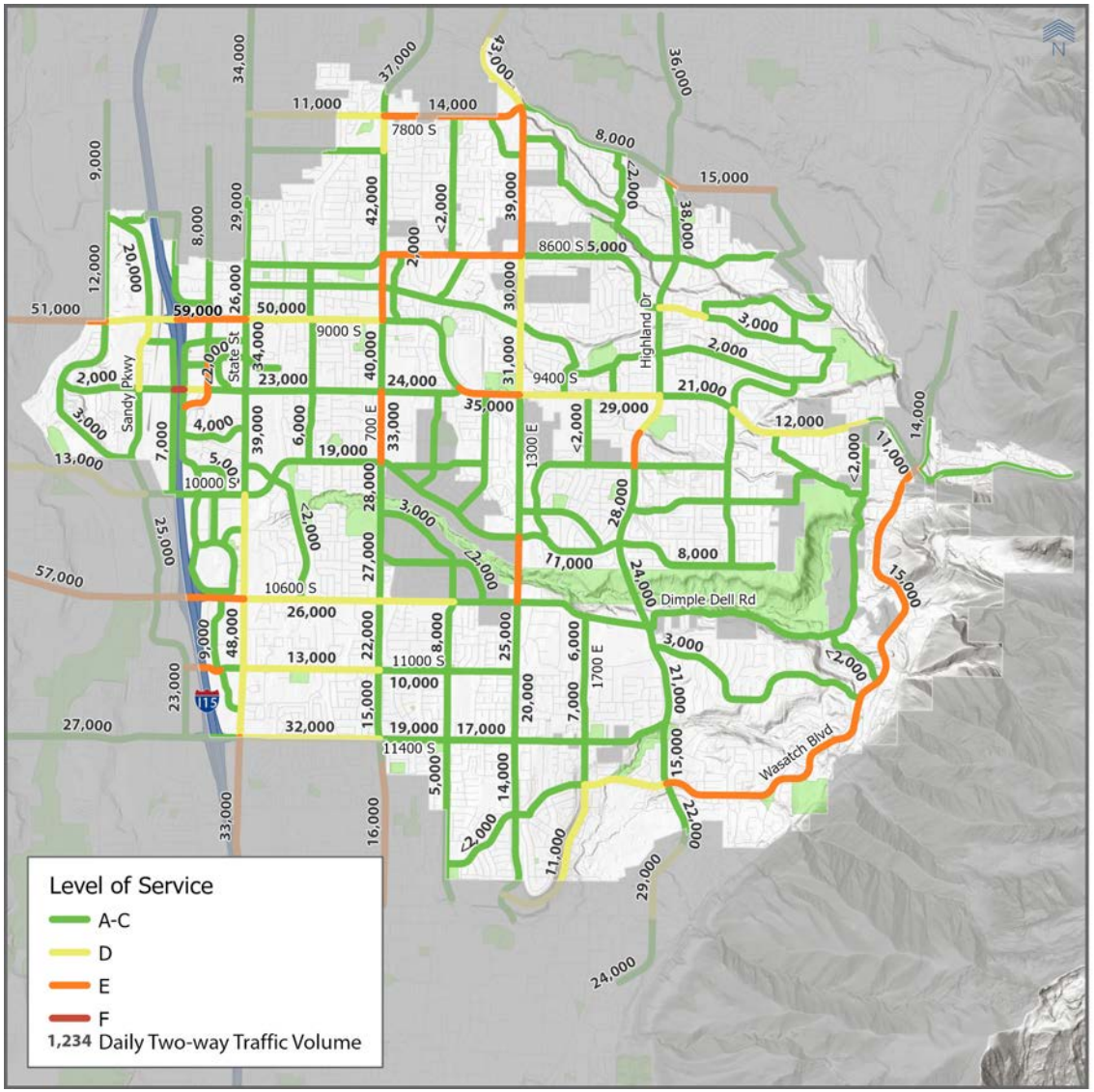
Figure 4-10: Local Roadway Capacity Project



With these local capacity projects included, Figure 4-11 shows the proposed 2050 roadway LOS with all future projects (including WFRC RTP projects). These proposed projects address the larger capacity needs within the city. However, even with these projects some roadway segments are anticipated to be at LOS E. Many of these segments are near the proposed Highland Drive extension with portions of 1300 East, Sego Lily Drive, and Wasatch Boulevard at LOS E. As discussed in the hotspot section, the alignment options for Highland Drive can improve the level of service on these segments. The future level of service on these segments will be addressed further in the Highland Drive environmental study.

Additionally, three-lane collector roads such as Wasatch Boulevard and 11000 South from State Street to 700 East are expected to have peak period congestion. Similarly, 1300 East from 8600 South to 7800 South exceeds the LOS D capacity of a five-lane arterial. The year 2050 daily traffic volumes on these roadways just exceed the LOS D capacity. However, widening these roadways to five and seven lanes, respectively would be impactful and the forecast traffic volumes are well below the LOS D capacity of the larger roadway. As a result, widening these roads would provide a marginal traffic benefit but result in right-of-way impacts. Many of these roadway segments have limited right-of-way so widening these roads would likely require right-of-way acquisition. While widening is not currently identified to address traffic congestions on these roads, traffic congestion should be monitored in case additional capacity is required.

Figure 4-11: Year 2050 Planned Level of Service

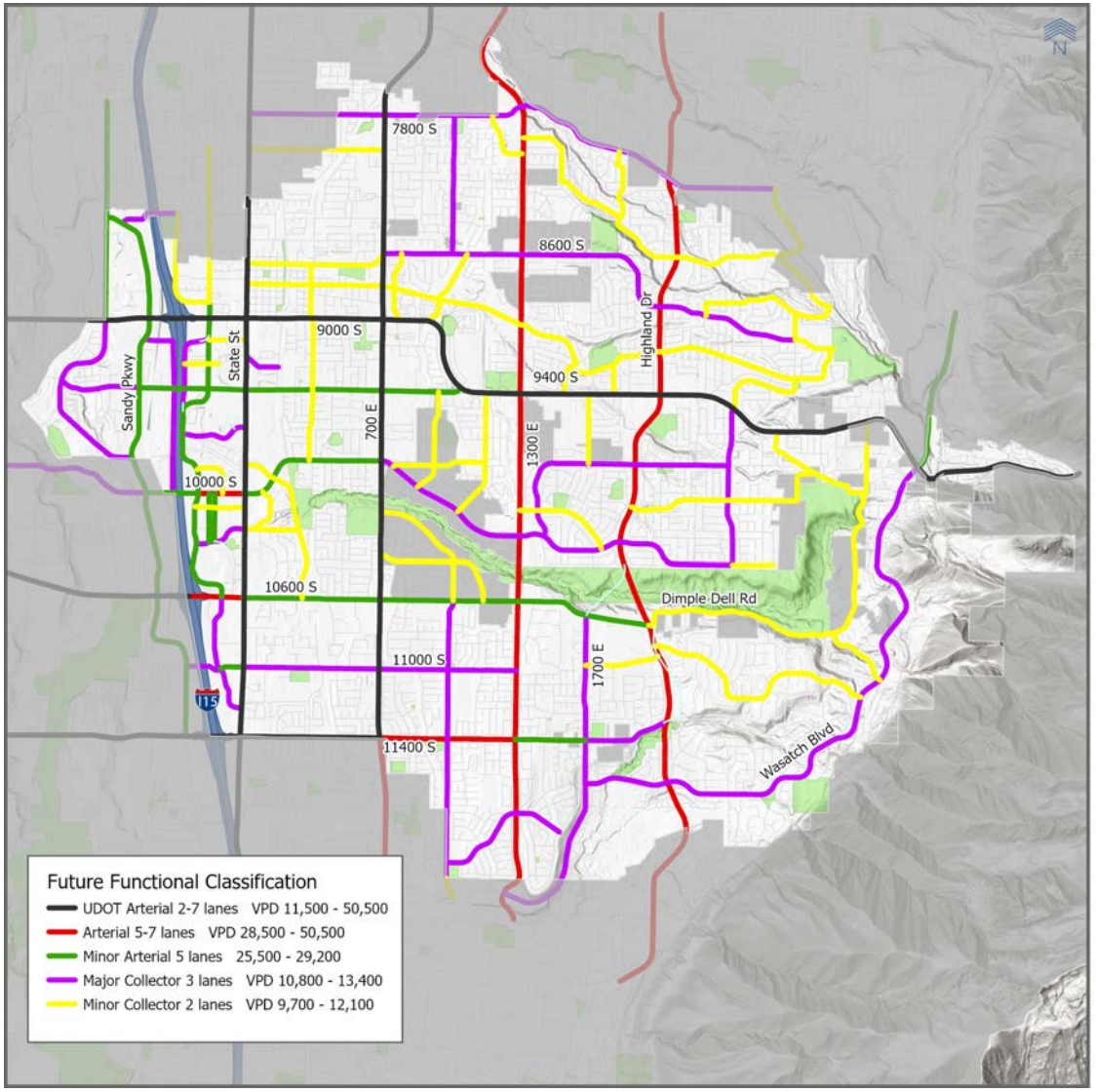


Future Functional Classification

The recommended functionally classified roadway network is illustrated in Figure 4-12. This future functional classification was developed based upon the existing roadway functional classification shown in Figure 3-11 while incorporating other planning efforts such as the Cairns Master Plan. This existing roadway network was refined to serve the updated future land use and traffic forecasts from the travel demand modeling. The recommended network also includes planned projects from WFRC's RTP. These arterial and collector roadways will provide the backbone of the functionally classified transportation network within Sandy. Finally, the recommended functional classification was improved to reflect stakeholder and public comments to create a network that will serve existing and future travel demand.

This future functional classification map is a comprehensive image of the Transportation Master Plan. It shows the existing as well as future roads along with their typical size, so that the community knows what is planned for each road within Sandy.

Figure 4-12: Future Functional Classification



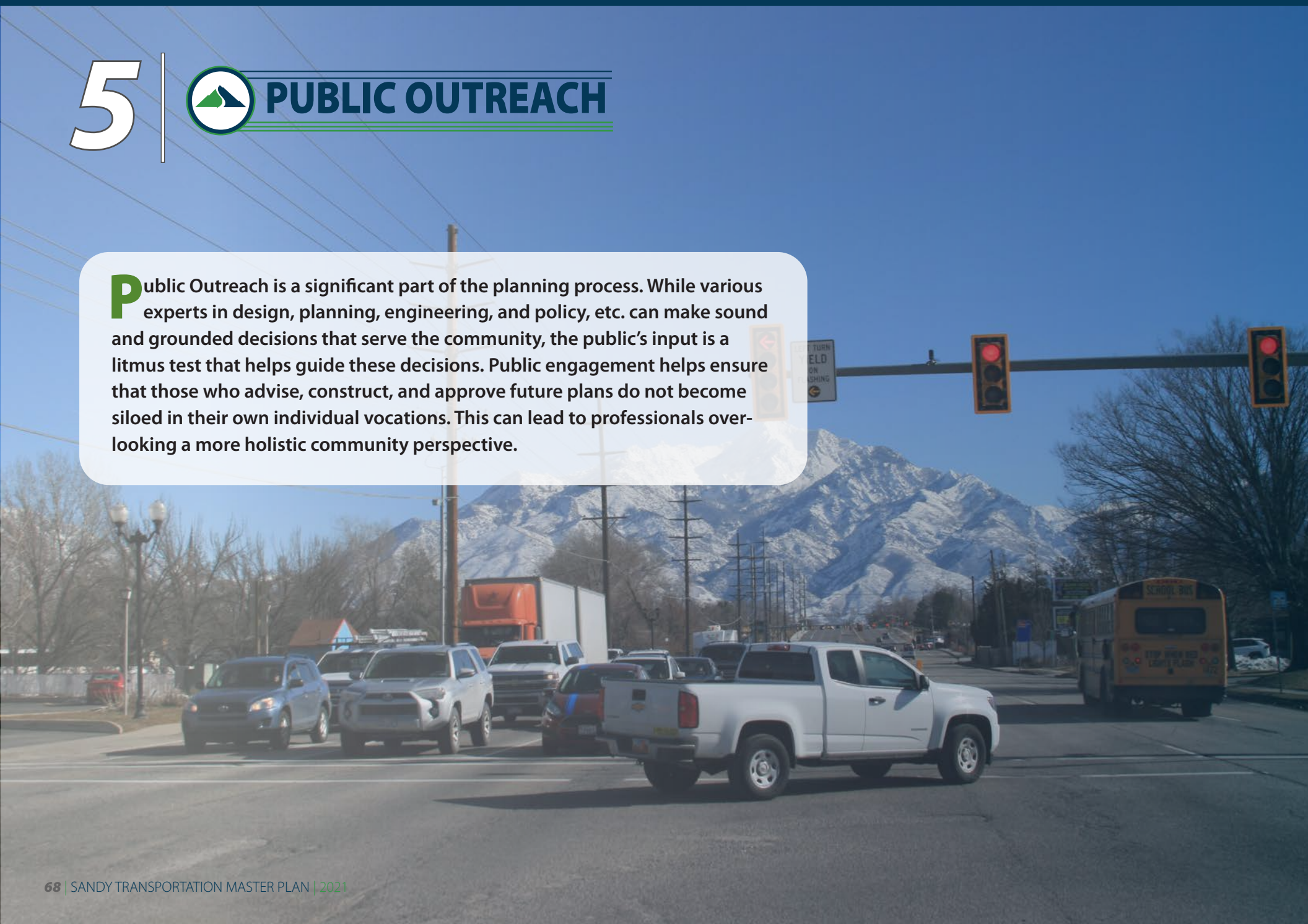
Summary of what the Future Holds

With the planned growth of Sandy and surrounding communities, the transportation system will experience increased demand. Without improvements to the transportation network, traffic congestion and resulting delays will increase significantly on most of the functionally classified roadways. However, Sandy is not alone in planning for future growth and UDOT and WFRC have identified key improvements to the regional roadway network to accommodate future demand. These regional capacity improvements reduce future congestion on the functionally classified roads within the city. Most of the capacity improvements needed to accommodate the future vision for Sandy are planned for with the WFRC's 2019-2050 RTP. To address remaining capacity needs, additional projects were identified that reflect community input and local priorities. With all the projects identified the future roadway system is anticipated to function at an acceptable level of service with minimal delays through the planning year 2050.

Signals will need to be monitored and updated as conditions change. It is recommended that the signalized intersections in the area be regularly monitored, and signal timings adjusted as needed to maintain acceptable operating conditions. Coordination with UDOT will be necessary on all UDOT roads. Additionally, care should be taken to regularly monitor the non-signalized intersections and, where appropriate, studies should be completed to determine the best control for the intersection. The most common mitigations to failing non-signalized intersections are roundabouts and traffic signals. For each intersection, both roundabout and traffic signal solutions should be investigated and studied to determine the best alternative. Funding sources for signals and roundabouts should be explored and may include general funds, impact fees, where appropriate, and/or a special transportation improvement fund.

5 PUBLIC OUTREACH

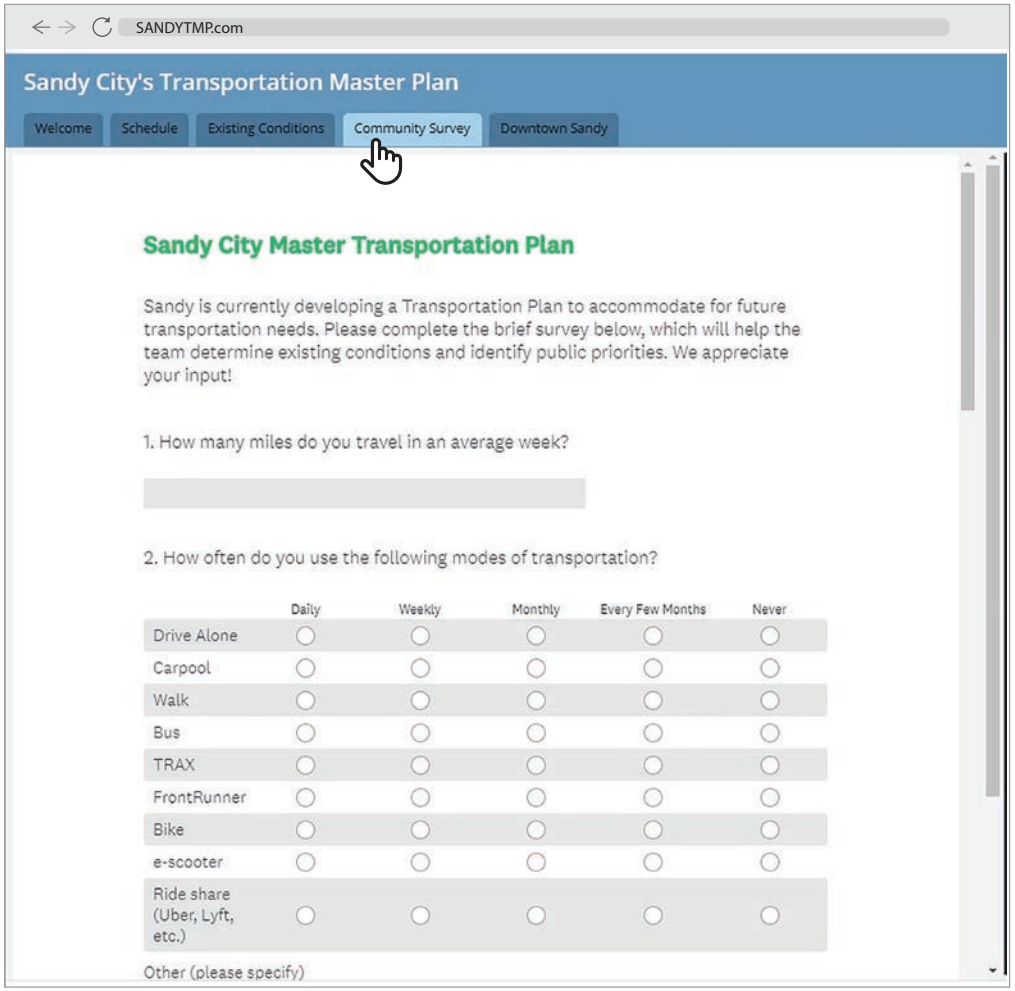
Public Outreach is a significant part of the planning process. While various experts in design, planning, engineering, and policy, etc. can make sound and grounded decisions that serve the community, the public's input is a litmus test that helps guide these decisions. Public engagement helps ensure that those who advise, construct, and approve future plans do not become siloed in their own individual vocations. This can lead to professionals overlooking a more holistic community perspective.



Online Survey

The project website *Sandytmp.com* was the platform used for public outreach. A straight forward 12 question survey was available for the public to take starting July 30 and remaining available until mid August. This survey was curated to get public feedback about resident's relationship to the overall transportation system. This information, combined with the recent Sandy Draper Active Transportation Plan that was also open to the public in 2020 generated over 1,000 responses and produced valuable insight into what Sandy residents want.

The project website is also used to keep current and relevant information about Sandy's Transportation Plan, including a schedule, information about the City's existing transportation network, and an overview of Sandy's Downtown. Public survey results are shown on the subsequent pages.



Like most bedroom communities, the majority of Sandy respondents drive alone as their primary mode of transportation as shown in Figure 5-1. While almost 70% of those surveyed drive alone daily, it is notable that for over 17% of respondents single occupancy trips occur only once per week.

TRAX and FrontRunner are used most frequently *"Every Few Months,"* indicating that rail may be used for events that occur on a semi-frequent basis. The same is indicative for use of ride share, where this mobility service may be used to go to Downtown Sandy or Downtown Salt Lake City, or may be used as a first-mile last-mile option to the airport or a UTA transit stop.

Carpooling is a popular choice of transportation in Sandy, according to survey respondents, 39% of whom stated they use this mode-choice either *"daily" or "weekly."*

Figure 5-2 offers another perspective about mode choice and frequency of use by asking *"how many trips do you make using each mode"(A trip was defined as "beginning in one place and arriving to another").*

While the lack of transit trips taken during the week is evident in Figure 5-2, the amount of trips made either by biking or walking stand out considerably, as well. Over 20% of respondents are biking once or twice per week and almost the same amount is walking between 6 to10 times per week. Like all other modes of travel, active transportation is reliant upon the transportation system's available connections to other land uses within the built environment. Just as single occupancy vehicle trips are conducive to areas where there is plenty of parking, a lack of congestion, and high mobility, active transportation trip levels are reflective of existing available facilities that provide high levels of comfort to the user while creating access between multiple origins and destinations.

Figure 5-1: How often do you use the following modes of transportation?

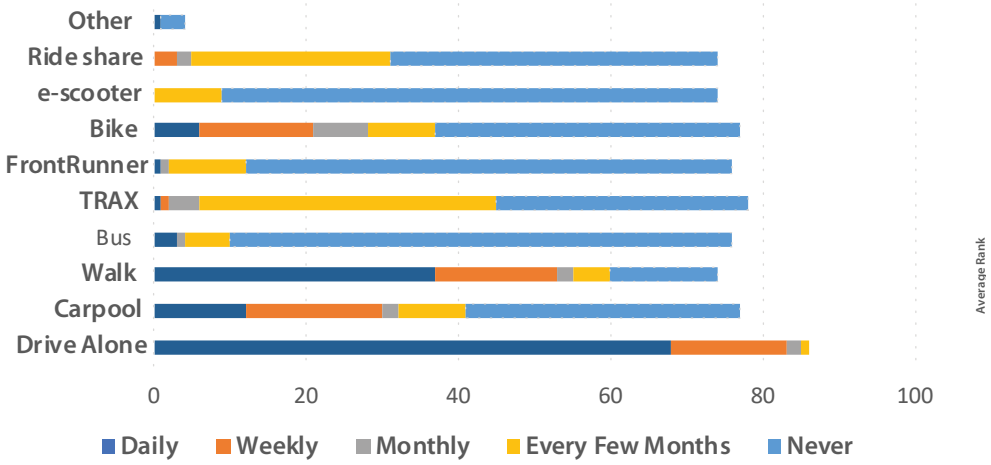


Figure 5-2: In an average week, how many trips do you make using each mode?

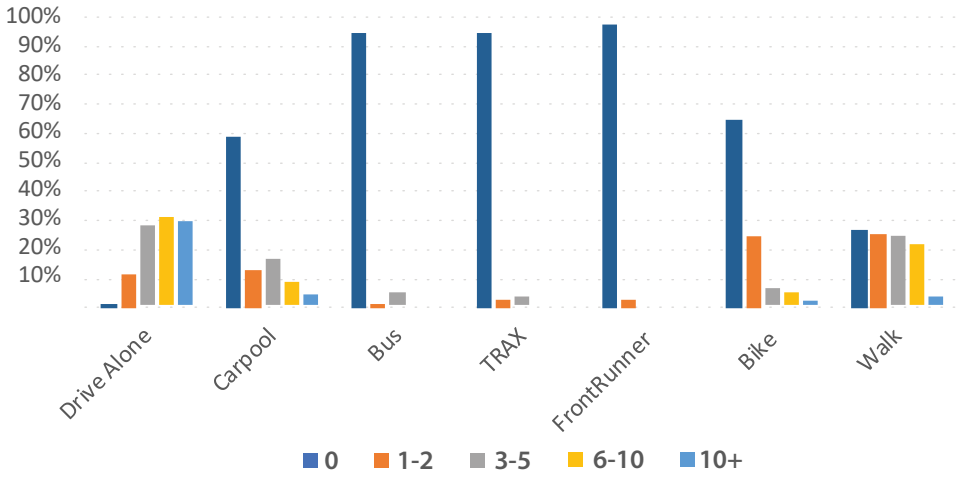
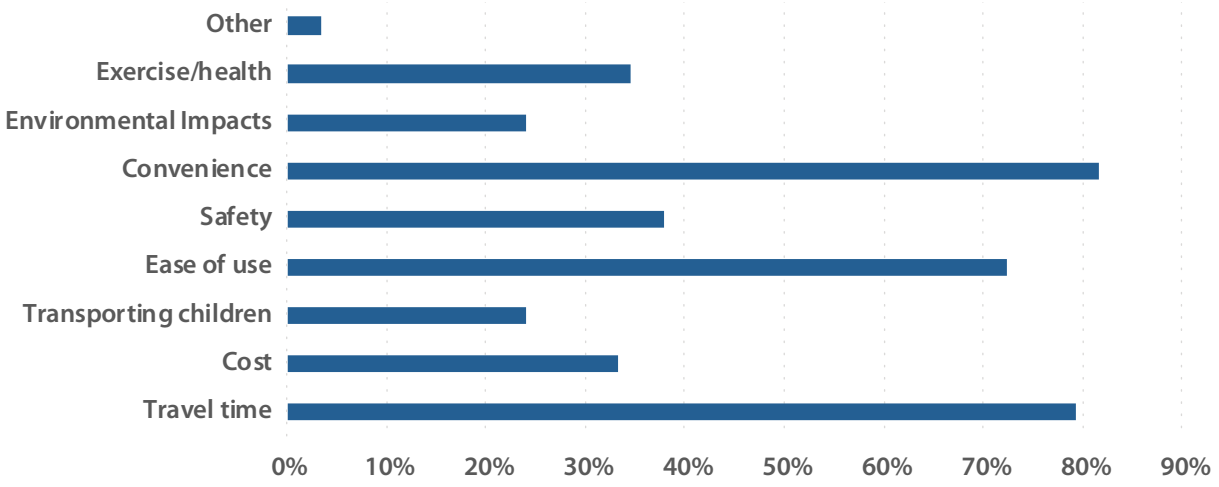


Figure 5-3 shows *"Travel time, ease of use, and convenience"* are by far, the highest ranked factors when determining what is most important when selecting a travel mode for surveyed residents.

"Cost," " exercise & health," and "safety" all placed within the mid-thirty percentage rate for importance. This information, combined with the large number of survey respondents who drive alone on a daily basis indicates that driving alone is not highly cost prohibitive to many residents of Sandy.

"Environmental impacts and transporting children" were the lowest rated factors, both at 24%.

Figure 5-3: What factors are the most important to you when selecting a travel mode ?



As seen in the graph in Figure 5-4, traffic congestion is the main transportation issue concerning Sandy residents who responded to the survey. Active transportation facilities, or *"biking and walking options"* ranked second, closely followed by safety and air quality.

Figure 5-4: What transportation issues are you most concerned with in Sandy City ?

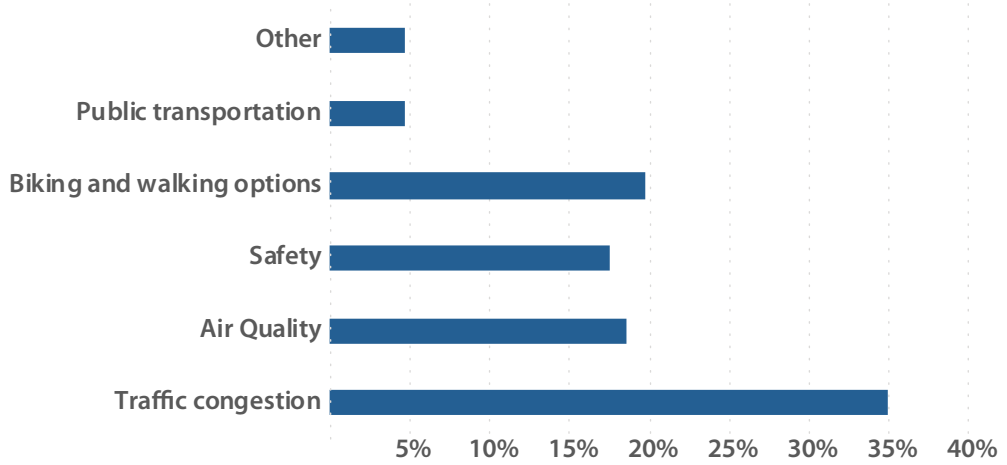
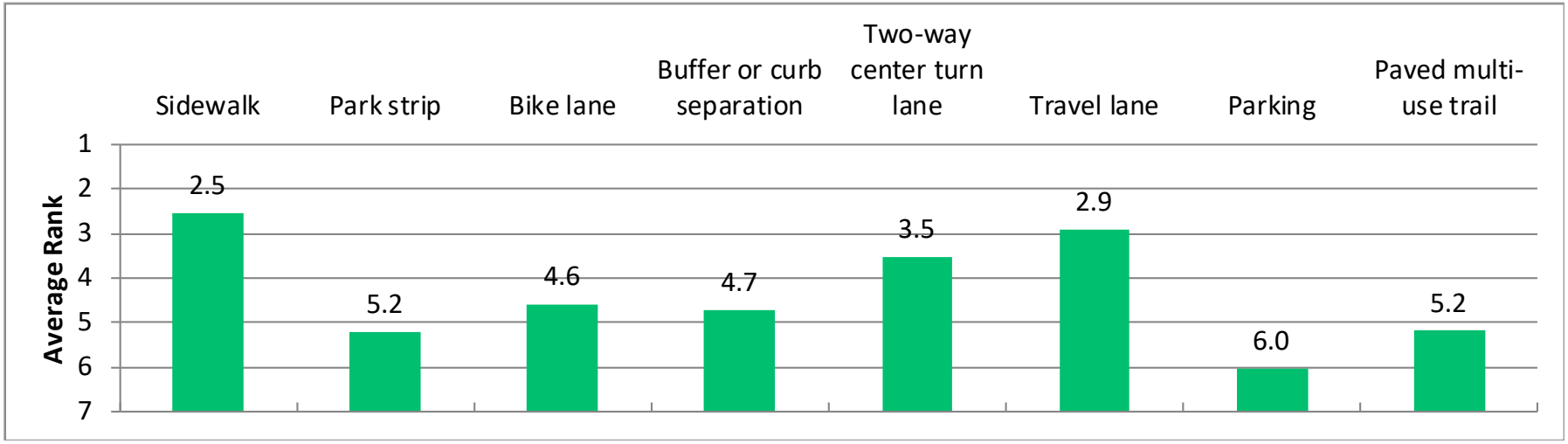
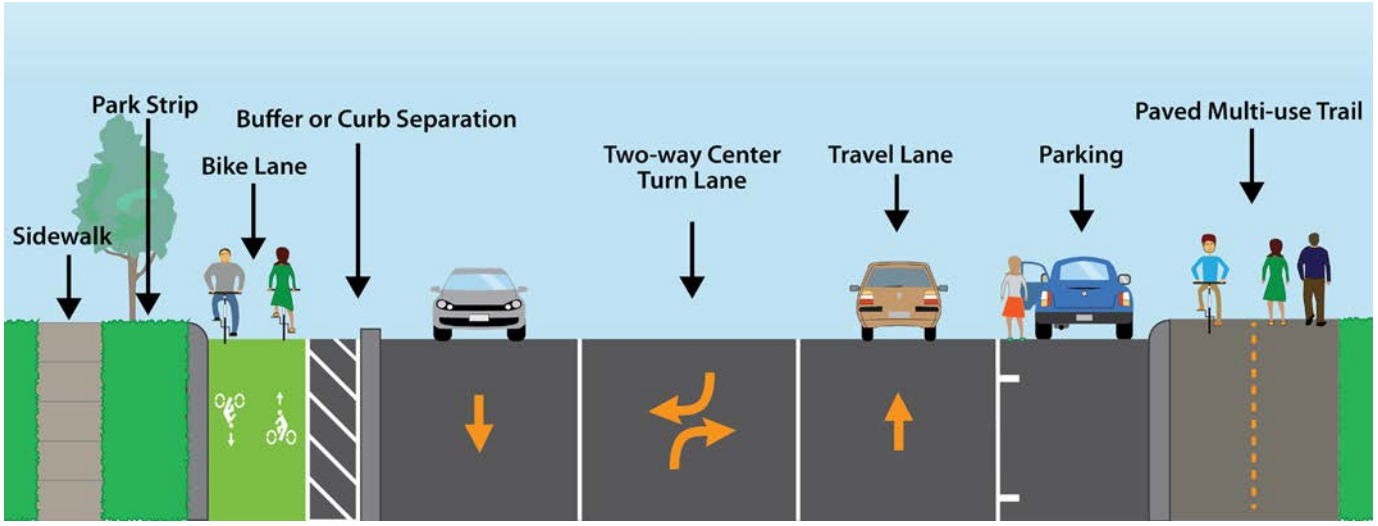


Figure 5-5: If roads weren't able to be widened in Sandy City, and all roadway elements couldn't be included, which elements would be most important to you to keep?





Survey respondents were asked to rank roadway elements by level of importance. *"Sidewalk"* received the highest level of importance, followed by *"Travel lane"*, *"Two-way center turn lane"*, *and "Bike lane."*

Viewing the responses from this Sandy Transportation survey along side the Sandy Draper Active Transportation Plan Survey *(Also Conducted by Avenue Consultants and Parametrix)* reveals a better understanding of how sandy residents value specific roadway elements. The following results are from the Sandy Draper ATP survey:

Sandy survey participants were asked the question *"How important are bicycle and pedestrian facilities to you in the Sandy community?"* Over 67% responded that bicycle and pedestrian facilities were either *"extremely important"* or *"very important."* Approximately 22% valued these facilities as *"somewhat important,"* and under 11% agree that they are *"not so important"* or *"not at all important."* Figure 5-6 shows the survey results.

Figure 5-7 shows the results of the survey question *"Have there been times when you did not walk or bike to a destination in Sandy because comfortable facilities were not available?"* A majority of respondents answered *"Yes."* This response reflects a latent demand in regards to active transportation facilities in Sandy. Latent demand exists when a want or desire is there but the available product to satisfy that want or desire does not exist. The evidence of latent demand for active transportation facilities in Sandy is that almost 60% of respondents agreed there have been times when they have not been able to walk or bike because comfortable facilities were not available.

Figure 5-6: How Important are Bicycle and Pedestrian Facilities to You in the Sandy Community?

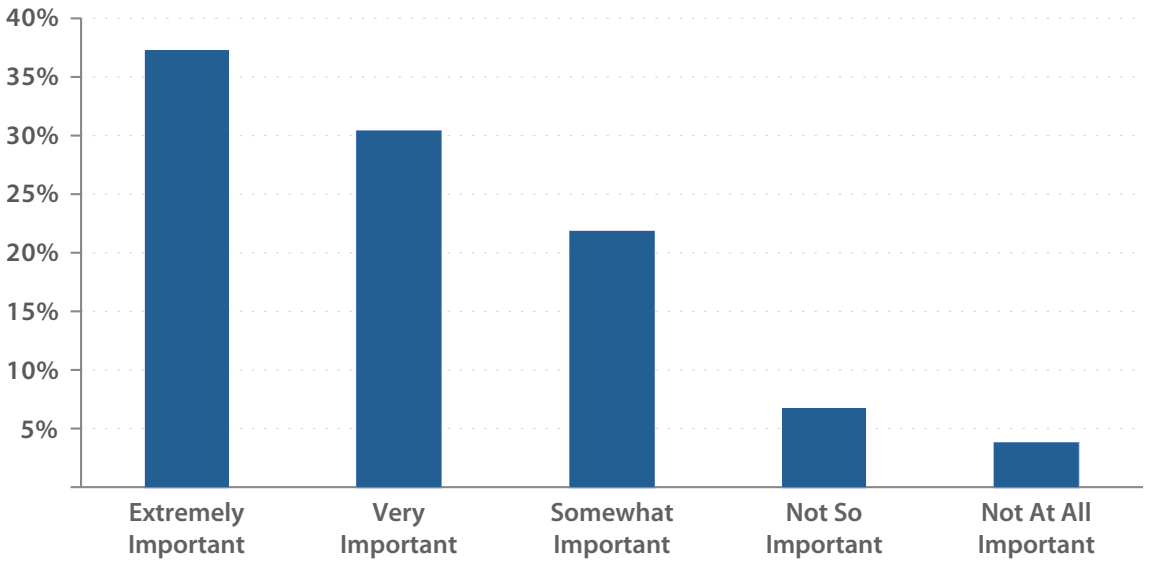


Figure 5-7: Have There Been Times When You Did Not Walk or Bike to a Destination in Sandy Because Comfortable Facilities were Not Available?

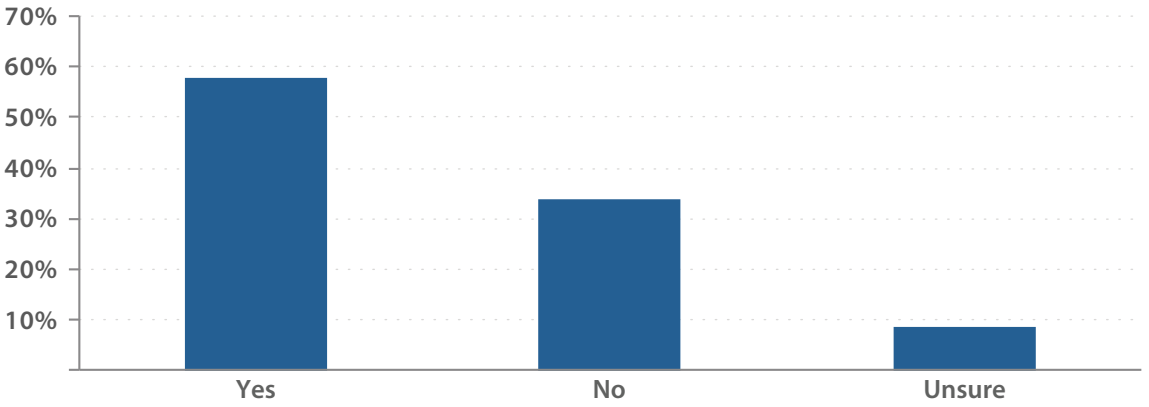


Figure 5-8 shows the results from the question *"If your ideal walking and/or biking facilities were available, how often would you use them?"* While there is a large portion of respondents (20.5%) who replied they would never bike, the majority of respondents replied they would use their ideal facilities either *"daily" or "weekly",* with over 50% selecting biking and over 83% selecting walking.

Figure 5-9, shows responses to the question *"What type of rider should Sandy plan and design bicycle facilities for?"* According to the survey results the *"recreational or casual family rider"* is the majority demographic of active transportation user in Sandy.* This indicates that when incorporating active transportation facilities into plans and designs their needs should be a priority. As Sandy develops, designs, and adopts its future transportation system, the City will have opportunities to create facilities that are inclusive, offer an equitable and holistic vision of ROW utilization, and provide access and mobility options that serve the highest and greatest use. As shown in this chapter, public outreach and engagement will help identify what is required for a transportation plan that meets the current and future needs of the community.

Figure 5-8: IF Your Ideal Walking and/or Biking Facilities were Available, how Often Would you Use Them?

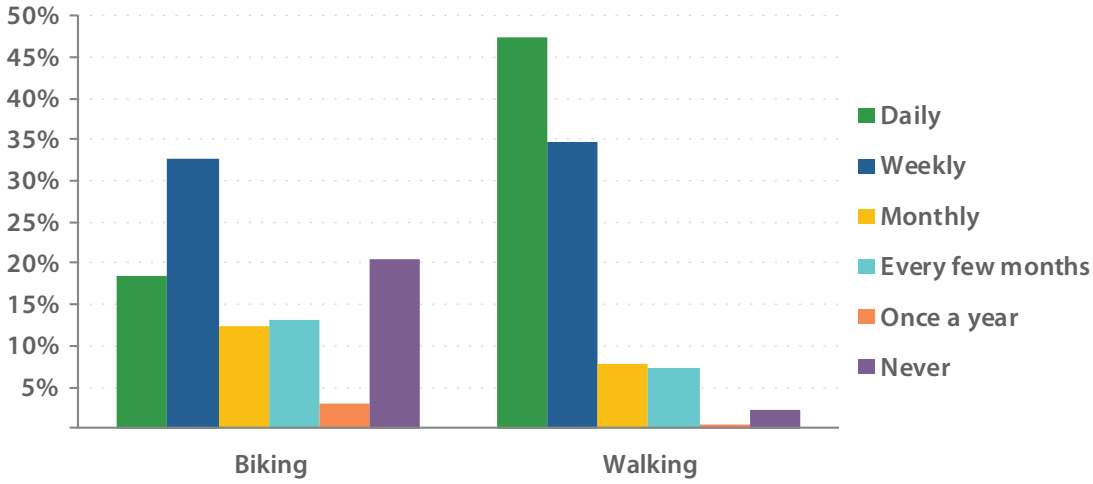
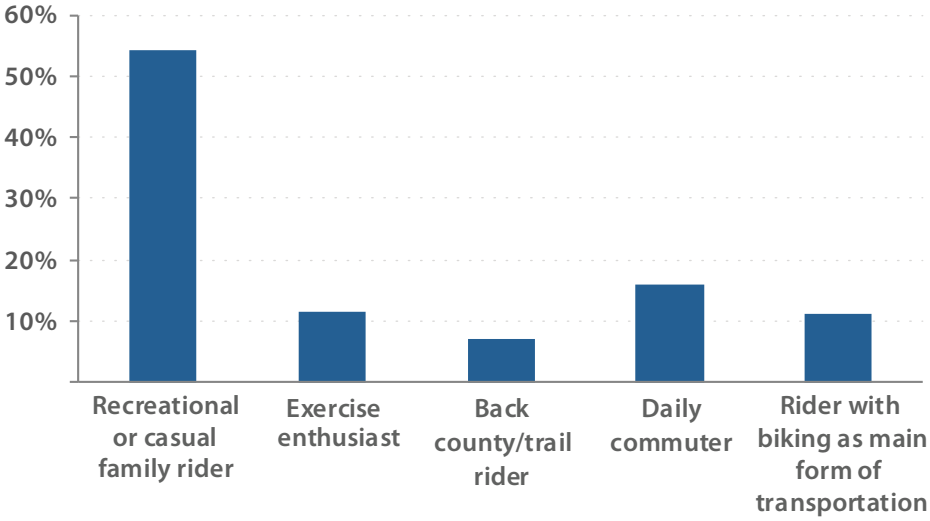


Figure 5-9: What Type of Rider Should Sandy Plan and Design Bicycle Facilities For?



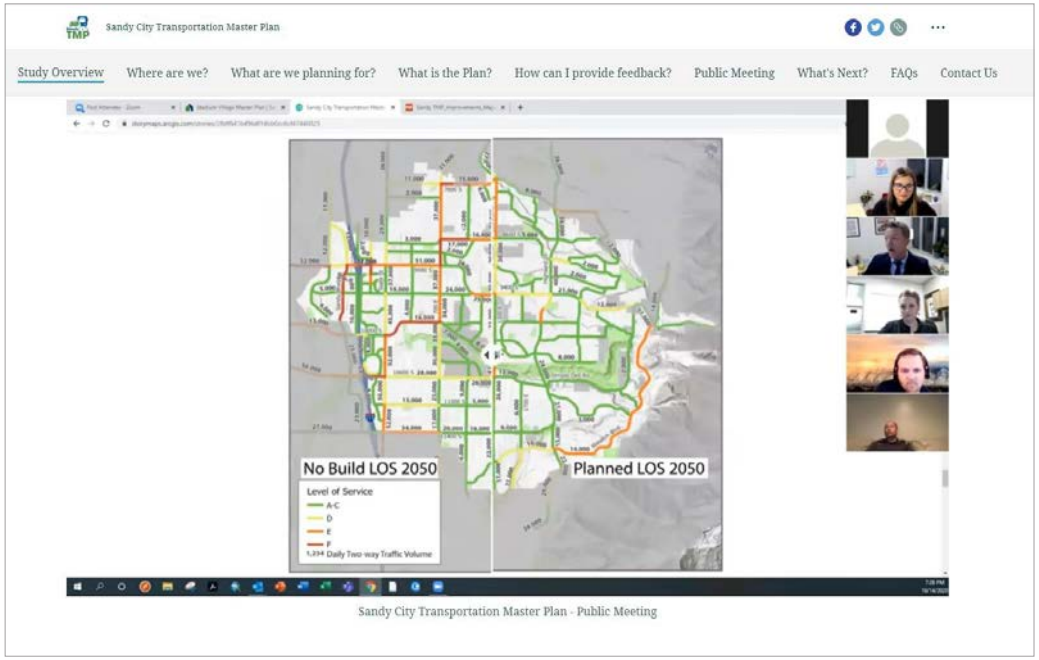
*The "recreational or casual family rider" is also known as the "interested but concerned" group of bicycle riders. This group is one of the four main types of rider famously identified through a study in Portland, Oregon. Portland Bureau of Transportation (PBOT) has information here: https://www.portlandoregon.gov/transportation/article/158497#:~:text=An%20educated%20guess%20would%20be,confident'%20demographic%20of%20Portland%20citizens.&text=A%20much%20larger%20demographic%2C%20representing,residents%20are%20curious%20about%20bicycling.

Public Meeting October 14

On October 14, 2020 a public meeting for the Sandy Transportation Master Plan was held online over Zoom. A presentation was given outlining the process and details of the plan, followed by a Q & A session.

Afterward, until the end of November, comments were collected on the project website, *www.sandytmp.com*. The website provided an interactive map, which allowed individuals to place a pin at any location on the map and attach a comment to it.

Although the meeting was advertised to the public, participation was limited. However, the recording of the meeting is still available on the project website.



6 CAPITAL IMPROVEMENTS PLAN

A capital improvements plan is designed to show the future transportation investment needed in a community. It enhances existing transportation corridors and plans spot intersection improvements to provide future residents of the community with a high quality transportation system.

The phased Capital Improvements Plan (CIP) for future growth up to the year 2050 is provided in this chapter, and is displayed in four parts, broken up by; **Phase I, Phase II, Phase III,** and projects that are specifically linked to future private **development** in Sandy.

Table 6-1 is a project list which includes a brief description with planning level cost for Phase 1; years 2021-2029. These are the projects that are needed in the most short-term, immediate future to provide a quality of life that is expected by Sandy residents. Like Phase II and Phase III, Phase I projects provide a variety of transportation facilities improvements. It is recommended that several bike lane projects, an environmental study for Highland Drive, a roadway realignment, and several intersection improvements be completed by 2029. Figure 6-1 shows the locations of Phase I projects.

Table 6-2 is a project list with planning level cost for Phase II; years 2030-2039. These are the projects that are needed in the mid-term to provide a quality of life that is expected by Sandy residents. Several of these projects will expand north south connections in Sandy, significantly increasing mobility internally and across the city borders.

Collectively, Projects **26, 27,** and **28** will create an arterial from Sandy's north border to its southern border into Draper. This will offer continuity in regards to mobility for Sandy residents living in central and east residential side of the city. They will be able to exit and enter the city without having to enter Sandy's downtown Cairns location.

Like the short-term and mid-term-phasing, Phase III incorporates active transportation facilities into the project list alongside traditional roadway improvements. Integrating these facilities into the transportation network ensures that an array of user groups are accommodated within the community.

Projects **46** and **47** will become the second east to west bike route across Sandy, while Project **48** is a pedestrian bridge that will provide access for AT user across 9000 South, a multi-lane and busy road. Table 6-3 and Figure 6-3 correspond with Phase III.

Table 6-4 lists planned roadway projects that are future development agreements. Development agreements help municipalities manage land use and ensure the impacts from developments are balanced by the benefits they provide to the public. This is done by requiring the construction of facilities such as new or improved roads and sidewalks. While these conditions imposed upon developers may increase their costs, they help provide a certainty to the developer that their investment will fit in with the vision of the city, therefore providing more certainty for a private sector investment. Development agreements help maintain uniformity across transportation, open space, land use, and general plans.

Table 6-1: Phase I Project List

	#	Project	Location	Type	Cost	Funding
2021-2029	1	9000 South	Redwood Road to I-15	Widening: 5/7 to 7 Lanes	$34,000,000	UDOT
	2	State Street	8000 South to 9000 South	Widening: 5 to 7 Lanes	$18,000,000	UDOT
	3	Monroe Street (Phase 3)	10600 South to I-15 Ramp	New Construction: 0 to 5 Lanes	$6,900,000	Development/ Sandy/WFRC
	4	Monroe Street (Phase 6)	9100 South to 9400 South	New Construction: 0 to 3 Lanes	$10,000,000	Sandy/WFRC
	5	9000 South / Monroe Street		Intersection Improvement	$8,000,000	Sandy/UDOT/ WFRC/SLCo
	6	9000 South / State Street		Innovative Intersection	$8,000,000	UDOT
	7	9400 South	Monroe Street to State Street	Widening: 3/4 to 5 Lanes+ Bike Lanes	$3,500,000	Sandy/WFRC
	8	11400 S	State St to Camden Park Ln	Buffered Bike Lanes	$600,000	UDOT
	9	9400 S	9375 S to Raintree Dr	Buffered Bike Lanes	$1,300,000	UDOT
	10	Little Cottonwood Rd	Raintree Dr to Little Cottonwood Canyon	Bike Lanes	$200,000	Development/ Sandy/Draper/ WFRC
	11	Highland Drive	North City Limit to 14600 South (Draper)	Environmental Study	$4,300,000	Sandy/Draper/ WFRC
	12	AutoMall Drive	11000 South to State Street	Widening: 3 to 5 Lanes + Roundabouts + Shoulder Bikeway	$7,000,000	Sandy/WFRC
	13	11000 South / 1000 East		New Roundabout	$1,500,000	Sandy
	14	9000 South / 700 West		Intersection Improvements	$6,000,000	Sandy/UDOT/ WFRC
	15	Sandy Parkway (450 W) / Parkland Drive		New ThrU Turn Intersection	$2,000,000	WFRC/Sandy
	16	7800 South / 1300 East		Intersection Improvements	$2,500,000	WFRC/Sandy
	17	9400 South / 700 East		Intersection Improvements	$3,500,000	WFRC/Sandy
	18	9270 South	State St to 150 East	Roadway Realignment	$7,500,000	Sandy/WFRC
	19	Cy's Road (8800 S) / 700 East		New Traffic Signal	$350,000	UDOT
	20	9200 South / 700 East		New Traffic Signal	$350,000	UDOT
	21	9400 South / 840 East		New HAWK Signal	$250,000	Sandy
	22	9400 South / 500 West		New Traffic Signal	$350,000	Sandy
	23	11400 South 1300 East		Intersection Improvements	$3,500,000	Sandy
	24	1300 East / Sego Lily Dr		Intersection Improvement / Active Transportation	$800,000	Sandy
	25	Towne Ridge Parkway / State Street		Intersection Improvements	$1,300,000	Sandy
				Phase I Total Cost: $131,700,000		

Figure 6-1: Phase I Projects

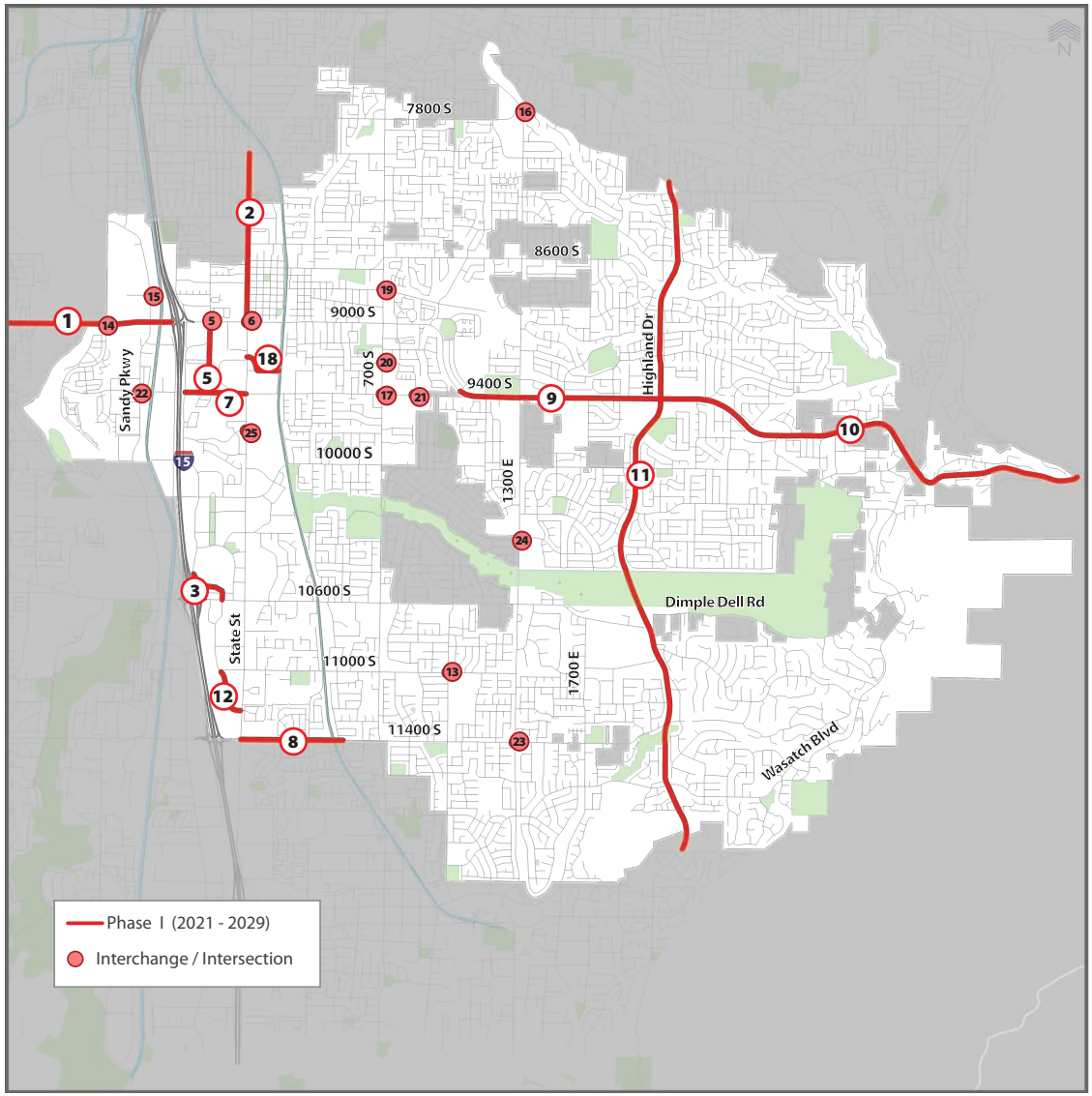


Table 6-2: Phase II Project List

	#	Project	Location	Type	Cost	Funding
2030-2039	26	Highland Drive (2000 East)	Creek Road to 9400 South	Potential Widening Pending EIS: 5 to 7 Lanes	$24,000,000	State/Federal
	27	Highland Drive	9400 South to Sego Lily	Potential Widening/ New Construction Pending EIS: 0-2 to 2-5 Lanes + Trail	$9,000,000	State/Federal
	28	Highland Drive	Sego Lily to Draper City Limit	Potential Widening/ New Construction Pending EIS: 0-2 to 2-5 Lanes + Trail	$81,700,000	State/Federal
	29	10600 South 1700 East		New Roundabout	$1,400,000	Sandy/WFRC
	30	Sego Lily Dr	South Jordan to 700 East & 700 East to Sandy Civic Center TRAX Station	Widen: 5 Lanes from 700 East to TRAX + Bike lanes from South Jordan to 700 East	$5,400,000	Sandy/WFRC
	31	7800 South	Approx. 415 E to Creek Rd	Widening: 3 Lanes + Trail	$12,800,000	Sandy/ Midvale/WFRC (Future RTP)
	32	700 East	7660 South to 9400 South	Widening: 5 to 7 Lanes + Buffered Bike Lanes	$35,600,000	UDOT
	33	700 E	9400 South to Sego Lily Dr	Buffered Bike Lanes	$400,000	UDOT
	34	10000 South / Monroe Street		Intersection Improvements	$2,000,000	Sandy
	35	11400 South	1300 East to 1700 East	Widening: 3 to 5 Lane	$5,100,000	Sandy/WFRC (Future RTP)
	36	10200 South I-15 Crossing		Bike / Pedestrian / Bus / Street Car Crossing	$24,000,000	Sandy/WFRC/ UDOT/UTA
	37	Sandy / South Jordan Circulator	Sandy Expo Station to South Jordan FrontRunner Station	Transit	$4,300,000	Sandy/WFRC/ UTA
	38	Little Cottonwood Rd	Raintree Dr to Little Cottonwood Canyon	Widening: 2 to 3 or 5 Lanes (depending on transit solution) + Bike Lanes	$31,500,000	UDOT
	39	Dimple Dell Road	Highland Drive Corridor to Mt. Jordan Road	Widening to minor collector + Bike Lanes + Multi-use Trail	$16,500,000	Sandy/WFRC (Future RTP)
	40	State Street /8680 South		Intersection Improvement / Move Signal from Main St, add raised median	$350,000	UDOT
	41	9400 South	300 East to 700 East	Widening: 5 Lanes	$4,000,000	Sandy/WFRC
	42	1000 East	7800 South to 8600 South	Widen: 3 Lanes + Bike Lanes + C&G + Sidewalk	$4,800,000	Sandy
	43	Eastdell Drive	9400 South to Glacier View Drive	Traffic Calming Installation + Signed Bike Route	$150,000	Sandy
	44	1700 East	10600 South to Draper	Widening: 5 Lanes - Dependant on Highland Drive Alignment	$20,400,000	Sandy
					Total Cost: $283,400,000	

Figure 6-2: Phase II Projects

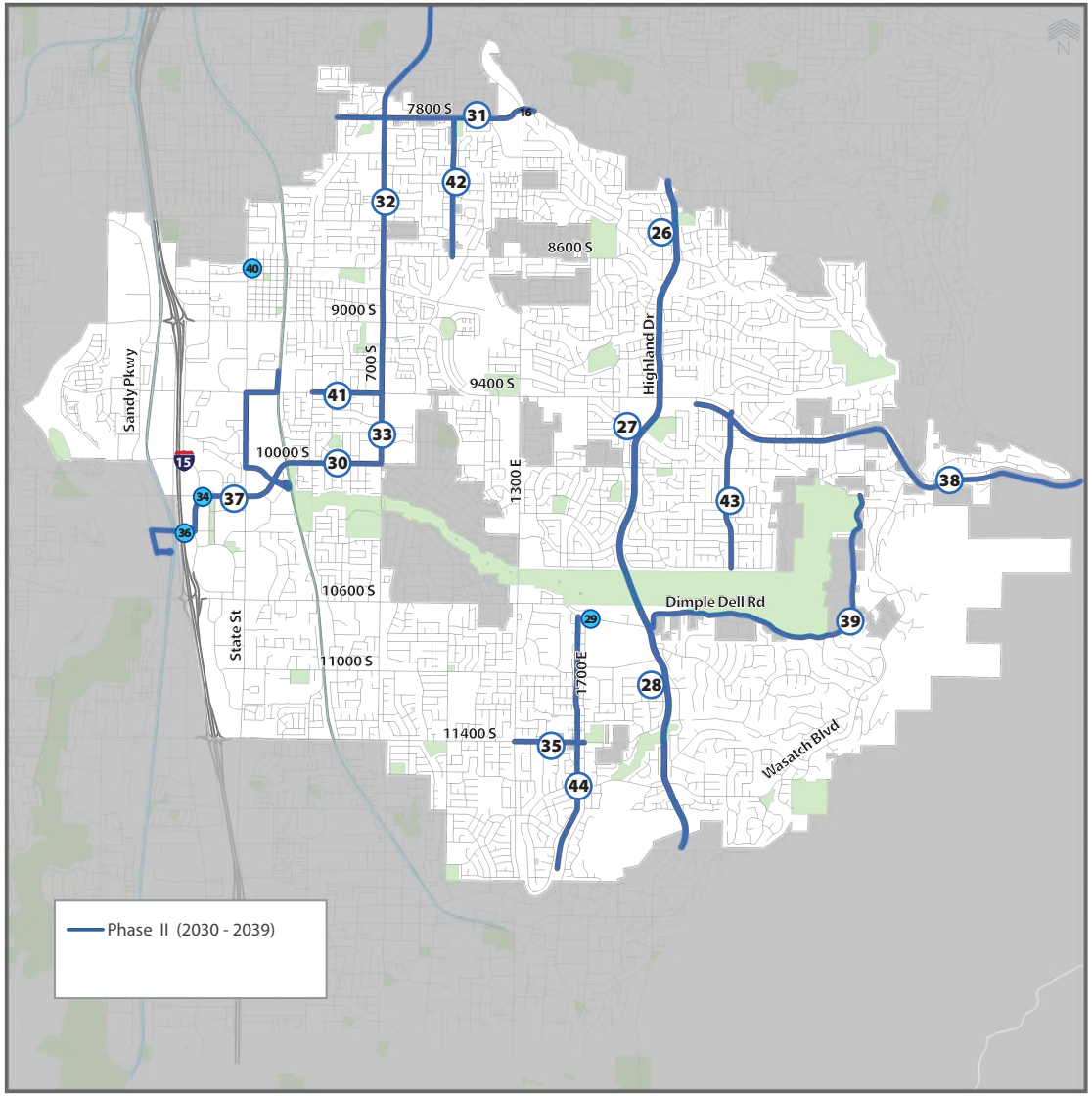


Table 6-3: Phase III Project List

	#	Project	Location	Type	Cost	Funding
2040-2050	45	I-15 Interchange	9400 South	New Construction	$60,000,000	UDOT
	46	9400 South	Sandy Parkway to 300 West	Widening: 3 to 5 Lanes+ Bike Lanes	$3,600,000	Sandy/WFRC (Future RTP)
	47	11000 South	Jordan Gateway to Auto Mall Drive	New Construction: 0 to 3 Lanes	$25,700,000	Sandy/South Jordan/UDOT/ WFRC
	48	Sandy Parkway	9800 South to 700 West	Widening: 5 Lanes + Bike Lanes	$26,600,000	Sandy/WFRC (Future RTP)
	49	8600 South	700 E to 1300 E	Widening: 3 Lanes + Bike Lanes	$10,900,000	Sandy/WFRC (Future RTP)
	50	8600 South	State St to 700 E and 1300 E to Approx. Falcon Way	Bike Lanes + Traffic Calming	$160,000	Sandy
	51	9000 South	Approx. Quarry Bend Drive	New Pedestrian Bridge	$1,700,000	Sandy/WFRC (Future RTP)
	52	700 West	9000 South to North City Boundary	Widening: 2 to 5 Lanes + trail on west side of road	$9,200,000	Development/ Sandy
	53	11400 South	1700 East to Highland Drive Corridor	Widening: 2 to 3 Lanes	$8,000,000	Sandy/WFRC (Future RTP)
	54	Riverside Drive	Extension to 9800 South	New Construction: 0 to 3 Lanes	$6,100,000	Sandy/Draper/ WFRC (Future RTP)
	55	11400 South / 1700 East		New Roundabout	$1,500,000	Sandy
	56	10600 South / Auto Mall Drive		Intersection Improvements	$3,000,000	Sandy/South Jordan/UDOT/ WFRC
	57	1700 East	10600 South to Draper	Corridor Improvements + Bike Lanes	$9,700,000	Sandy
	58	Dimple Dell Road	1700 East to Highland Drive Corridor	Widening: 2 to 5 Lanes + Trail	$6,000,000	Sandy
					Total Cost: $172,160,000	

Figure 6-3: Phase III Projects

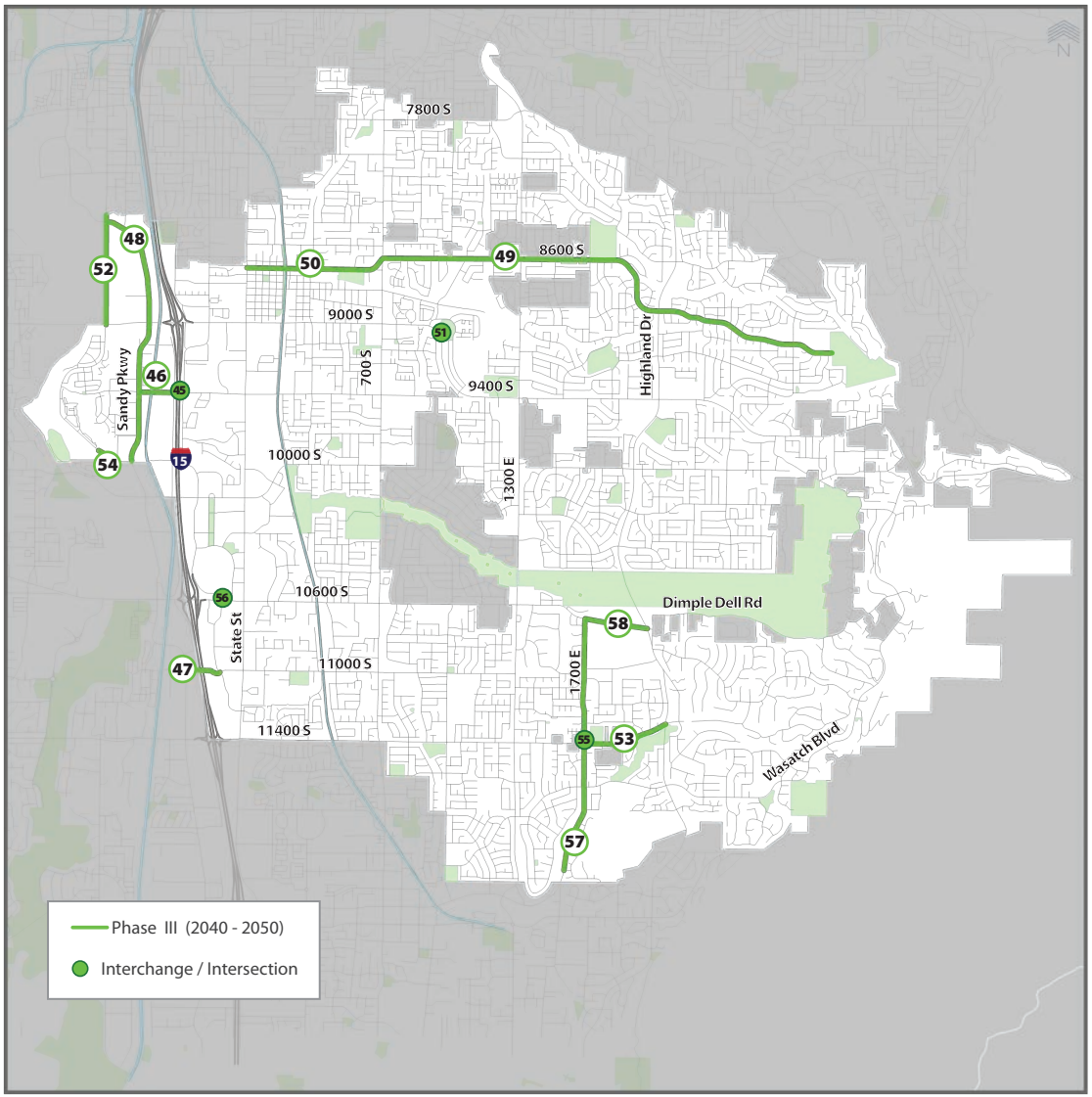


Table 6-4: Development Related Project List

	#	Project	Location	Type	Cost	Funding
Development Related	59	Green Way	Connection of Green Way, north of Cys Rd	New Construction: 0 to 3 Lanes	TBD	Development
	60	Beetdigger Blvd	Dry Creek Ridge to 10200 South	New Construction: 0 to 3 Lanes	TBD	Development
	61	Cy's Road	Harvard Park Road to 1300 East	New Construction: 0 to 2 Lanes	TBD	Development
	62	9270 South	Monroe Street to State Street	New Construction: 0 to 2 Lanes	TBD	Development
	63	9120 South	Monroe Street to State Street	New Construction: 0 to 2 Lanes	TBD	Development
	64	10200 South	Mall Ring Road to State Street	New Construction: 0 to 3 Lanes	TBD	Development
	65	Harvard Park Dr.	Approx. 8730 Harvard Park Dr. to 1000 East	New Construction: 0 to 2 Lanes	TBD	Development
	66	Parkland Drive Extension	700 W (8800 S)	New Construction: 0 to 2 Lanes	TBD	Development
	67	Monroe Street (Phase 5)	9400 South to Towne Ridge Parkway	New Construction: 0 to 3 Lanes	TBD	Development
	68	Neighborhood Projects	East Jordan Canal & 10600 S	New Construction: 0 to 3 Lanes	TBD	Development
	69	Neighborhood Projects	Crescent View Area	New Construction: 0 to 3 Lanes	TBD	Development

Figure 6-4: Development Related Projects

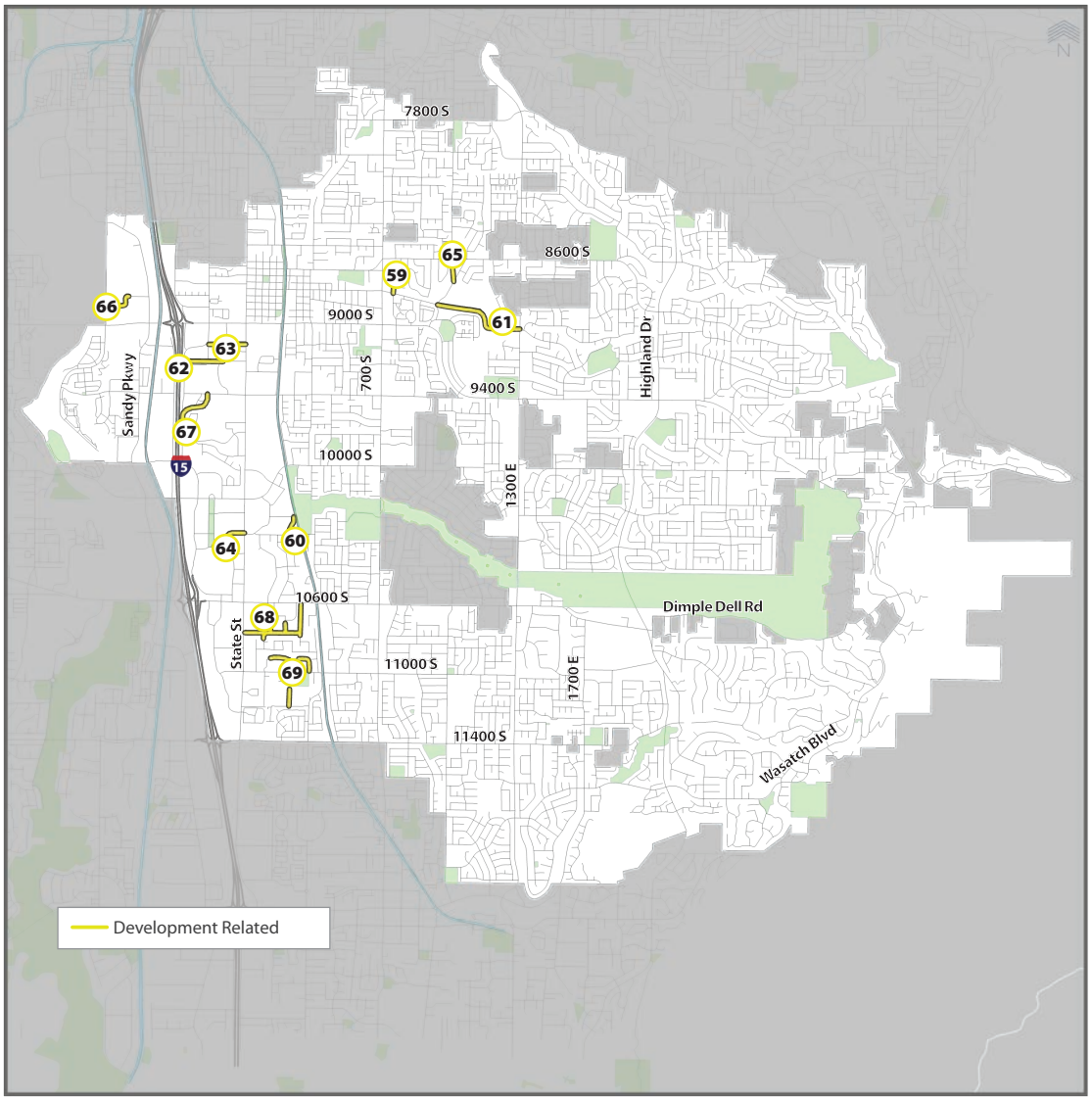
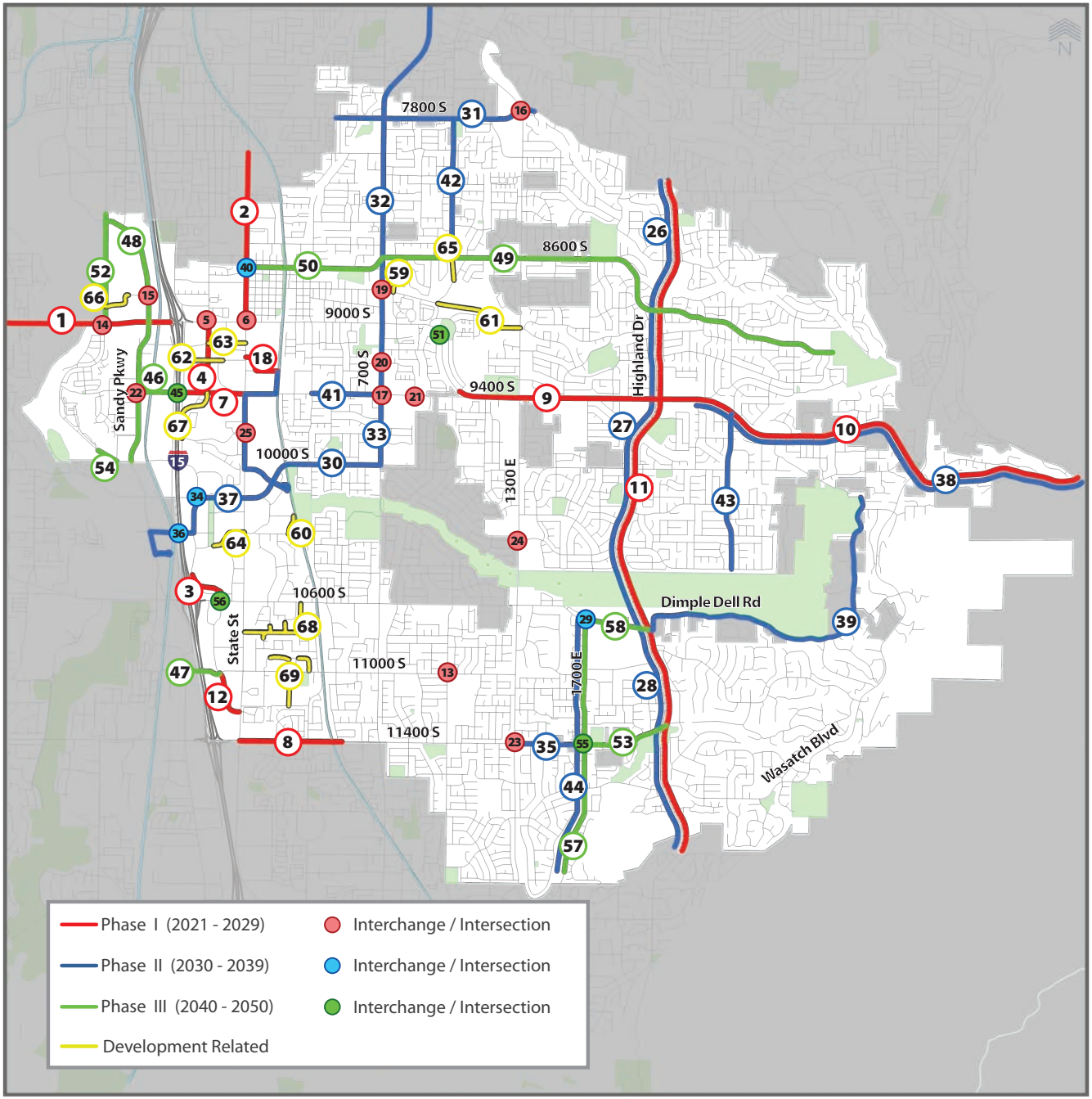


Figure 6-5: Complete Project List Map

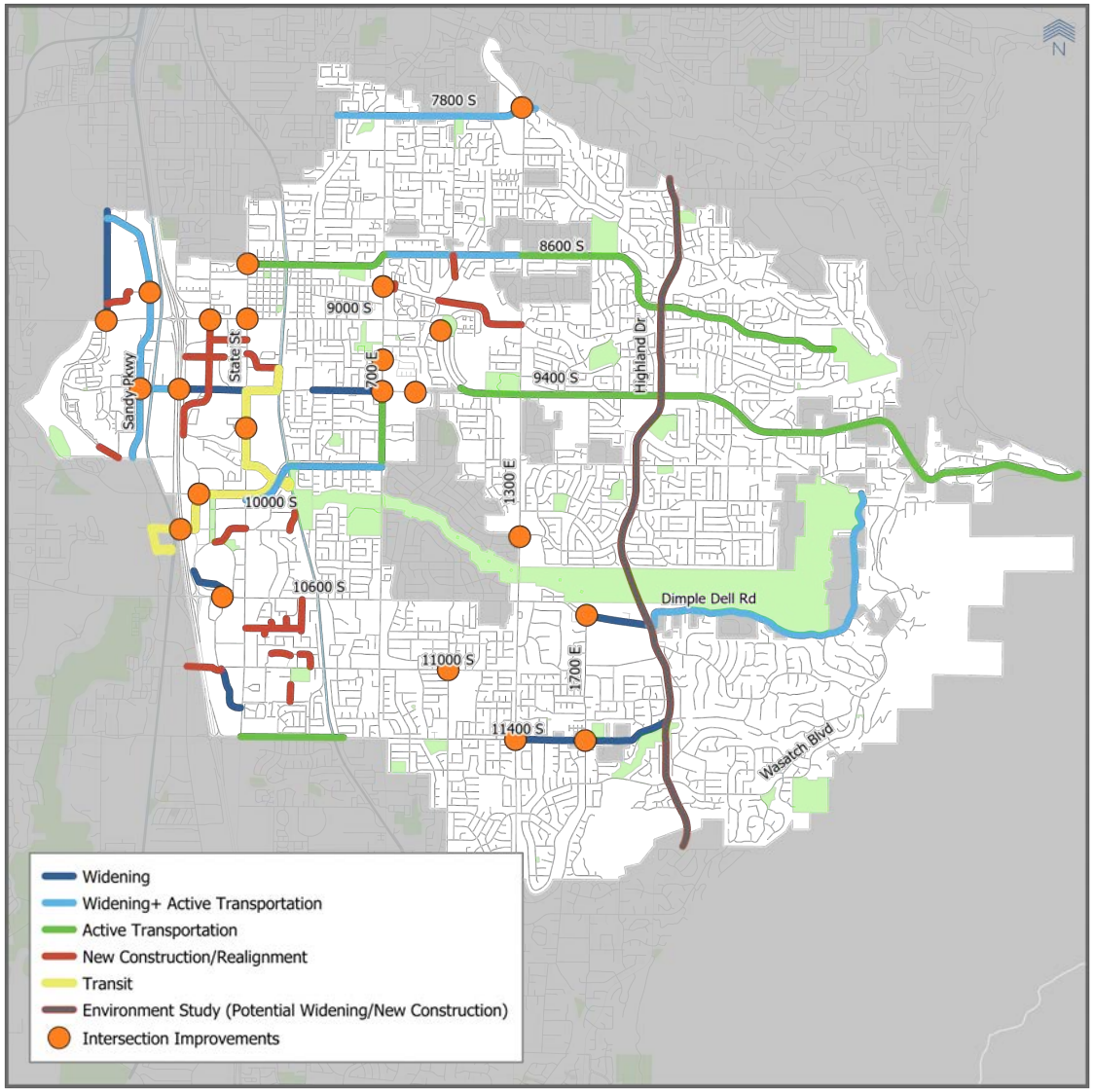
The complete project list for the Sandy Transportation Master Plan includes widening projects, new roads, intersection improvements, transit, and active transportation facilities. This list is extensive with 69 projects and ensures that Sandy residents will have a future transportation network that is well functioning and stable.

The projects on this list help support a variety of modes of transportation, increase community connections, assist economic growth, and encouraging active transportation and transit use.



While project phasing is central to a capital Improvements plan, Sandy's mix of widening projects, new roads, intersection improvements, transit, and active transportation facilities contains many project types. To understand how these projects fit together, Figure 6-6 summarizes all projects by type providing a large-scale view of the planned transportation improvements within the City. This provides for an easy understanding of what transportation improvements are expected.

Figure 6-6: Projects by Type



Funding

All possible revenue sources have been considered as a means of financing transportation capital improvements needed as a result of new growth. This section discusses these potential revenue sources.

Transportation routes often span multiple jurisdictions and provide regional significance to the transportation network. As a result, other government jurisdictions or agencies often help pay for such regional benefits. Those jurisdictions and agencies could include the Federal Government, the State (UDOT), the county, and the local metropolitan planning organization (WFRC). The City will need to continue to partner with these other jurisdictions to ensure adequate funds are available for the identified transportation solutions. The City will also need to partner with adjacent communities to ensure corridor continuity across jurisdictional boundaries (i.e., arterials connect with arterials; collectors connect with collectors, etc.).

Funding sources for transportation are essential if the Sandy City recommended improvements are to be built. The following paragraphs further describe the various transportation funding sources available to the City.

Federal Funding

Federal monies are available to cities and counties through the federal-aid program administered by UDOT. In order to be eligible, a project must be listed on the five-year Statewide Transportation Improvement Program (STIP). The Surface Transportation Program (STP) funds projects for any roadway with a functional classification of a collector street or higher as established on the Statewide Functional Classification Map. STP funds can be used for both rehabilitation and new construction. The Joint Highway Committee programs a portion of the STP funds for projects around the state in urban areas. Transportation enhancements include twelve categories ranging from historic preservation, bicycle and pedestrian facilities, and water runoff mitigation.

WRFC accepts applications for federal funds from local and regional government jurisdictions. The WFRC Technical Advisory and Regional Planning committees select projects for funding every year. These selected projects form the Transportation Improvement Program (TIP). In order to receive funding, projects should include one or more of the following aspects: Congestion Relief, Mode Choice, Air Quality, and Safety.

State/County Funding

The distribution of State Class B and C Program monies is established by State Legislation and is administered by UDOT. Revenues for the program are derived from State fuel taxes, registration fees, driver license fees, inspection fees, and transportation permits. Some of these funds are kept by UDOT for their construction and maintenance programs. The rest is made available to counties and cities. As many of the roads in Sandy fall under UDOT jurisdiction, it is in the interest of the City that a few staff are aware of the procedures used by UDOT to allocate those funds and to be active in requesting the funds be made available for UDOT owned roadways in the City.

Class B and C funds are allocated to each city and county by a formula based on population, centerline miles, and land area. Class B funds are given to counties, and Class C funds are given to cities and towns. Class B and C funds can be used for maintenance and construction projects. Most of the funding should be used for maintenance and construction but some of these funds can be used for matching federal funds or to pay the principal, interest, premiums, and reserves for issued bonds.

In 2005 the State Senate passed a bill providing for the advance acquisition of right-of-way for highways of regional significance. This bill enables cities and counties to better plan for future transportation needs by acquiring property to be used as future right-of-way before it is fully developed and becomes extremely difficult to acquire. Corridor Preservation purchases are an effective way to reduce the cost of future projects by proactively planning. In order to qualify for preservation funds, the City must comply with the Corridor Preservation Process, found at the following link *www.udot.utah.gov/public/ucon.*

City Funding

Certain areas might have different needs or require different methods of funding than traditional revenue sources. A Special Assessment Area (SAA) can be created for infrastructure needs that benefit or encompass specific areas of the City. Creation of the SAA may be initiated by the municipality by a resolution declaring public health, convenience, and necessity to require the creation of a SAA. The boundaries and services provided by the district must be specified and a public hearing must be held prior to creation of the SAA. Once the SAA is created, funding can be obtained from tax levies, bonds, and fees when approved by the majority of the qualified electors of the SAA. These funding mechanisms allow the costs to be spread out over time. Through the SAA, tax levies and bonding can apply to specific areas in the City needing to benefit from the improvements.

General fund revenues are typically reserved for operation and maintenance purposes as they relate to transportation. However, general funds could be used if available to fund the expansion or introduction of specific services. Providing a line item in the City budgeted general funds to address roadway improvements, which are not impact fee eligible, is a recommended practice to fund transportation projects, should other funding options fall short of the needed amount.

Developers

Developers construct the local streets within subdivisions and often dedicate rights-of-way and participate in the construction of collector/arterial streets adjacent to their developments.

Implementation

The specific roadway improvements required to accommodate future growth throughout Sandy were identified in Tables 6-1 through 6-4. Projects costs for the CIP are in Tables 6-1 through 6-3. The total costs for the phase 1 CIP projects is $149,600,000. Many of the identified projects are for UDOT roads or roads which would be eligible for WFRC funding assistance. Where a planned project occurs on a UDOT road, it is assumed that the City would not participate in funding that project. In the case of WFRC eligible roadways, the City would be responsible for a 6.77% match of the total project cost. Also included in Tables 6-2 and 6-3 are the other projects needed in phase 2 and phase 3. Although this transportation plan should be regularly updated, all roadway improvements were identified to accommodate forecast traffic volumes.

Overall Sandy is in a good position to improve their transportation system to accommodate new growth. The Capital Improvements Plan reflects a multi-modal approach at growing and developing a resilient and accommodating transportation network which will benefit the community for years to come.

APPENDIX

SANDY CITY HIGHLAND DRIVE ANALYSIS

Introduction:

Sandy City's Transportation Master Plan is being updated with completion expected by winter 2021. A main priority of the update is to identify key corridors for capital improvements which identify the type of project, and timing of when the improvements are needed. One of the corridors identified during this update is Highland Drive.

Highland Drive is a regionally significant north-south corridor that currently extends from Sugar House (approximately 2100 South) to 9800 South. From Creek Road (beginning at Sandy City limits) to 9600 South, Highland Drive is a five-lane arterial (two NB lanes, two SB lanes, and one center turn-lane) with full shoulders and bike lanes. From 9600 South to 9800 South, Highland Drive is a two-lane road (one NB lane and one SB lane) with anticipated widening to 5 lanes in the next 10 years. Since the 1960's right of way has been preserved for the future possibility of improving the corridor.

The following is a summary of the transportation analysis that demonstrates the impact of an east side, north-south corridor improvements as related to the Highland Drive corridor.

Existing Conditions:

City/Area Growth:

Population growth in Sandy city has increased an average of seven percent over the last ten years. As shown in Table 1 continual growth is expected over the next 30 years in the categories of population, households, and jobs. However, the largest increase in these categories is projected to occur within the next 10 years.

Table 1: 30 Year Population Growth

10 year Time Frame	Percent Growth Category		
	Population	Households	Jobs
2020-2030	19.4%	20.5%	16.4%
2030-2040	7.5%	12.3%	18.1%
2040-2050	5.4%	7.0%	6.1%
30 year Total	29.8%	44.7%	45.9%

Population, households, and jobs have a strong correlation with the overall number of vehicles using the roadway network. For the last 10 years traffic volumes in Sandy have increased by 17 percent and are further projected to increase by 19 percent every 10 years for the next 30 years based on traffic model projections. This projected growth is anticipated to result in an overall delay of 139 percent throughout the city's roadway network if no improvements are provided.

Long Range Plan:

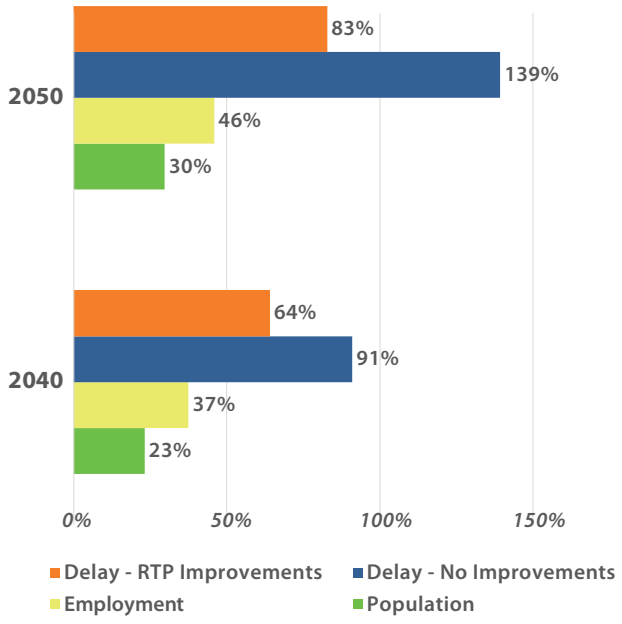
Table 2 is a summary of the current Wasatch Front Regional Council 2019-2050 Regional Transportation Plan (WFRC 2019-2050 RTP) showing Sandy City's planned projects to accommodate projected growth Implementation of the RTP projects will reduce delay as shown in Figure 1, RTP vs. No Build Delay, 2040 & 2050.

As shown in table 2, Highland Drive (9800 South Draper City Limit) is included in Phase 2 (2031-2040) of the RTP.

Table 2: Sandy RTP Projects

Phase	#	Project	Location	Description
Phase 1 2019-2030	1	9000 South	Redwood Road t o I-15	Widening: 5/7 to 7 lanes
	2	I-15 C-D System (Northbound)	I-215 to Bangerter Highway	New Construction: 0 to 2 lanes
	3	Monroe Street	9000 S to Towne Ridge Prkwy	New Construction: 0 to 3 lanes
	4	State Street	8000 S to 9000 South	Widening: 5 to 7 lanes
	5	Highland Drive	9400 South to 9800 South	Widening: 2/5 to 5 lanes
	6	Wasatch Boulevard	Bengal Blvd to Little Cottonwood Rd	Widening: 2/3 to 5 lanes
Phase 2 2031-2040	7	Princeton Drive	700 West to 415 West	New Construction: 0 to 3 lanes
	8	9400 South	Monroe Street to State Street	Widening: 3/4 to 5 lanes
	9	900 East/700 East	Fort Union Boulevard to 9400 South	Widening: 5 to 7 lanes
	10	700 East	11400 South to12300 South	Widening: 3 to 5 lanes
	11	2000 East	Fort Union Boulevard to 9400 South	Widening: 4/5/7 to 7 lanes
	12	Highland Drive	9800 South to Draper City Limit	New Construction: 0 to 5 lanes
Phase 3 2041-2050	13	I-15 Interchange(half int.)	9400 South	New Construction
	14	11000 South	Jordan Gateway to Auto Mall Drive	New Construction: 0 to 3 lanes

Figure 1: RTP vs No Build Delay, 2040 & 2050



Influence of Highland Drive Extension:

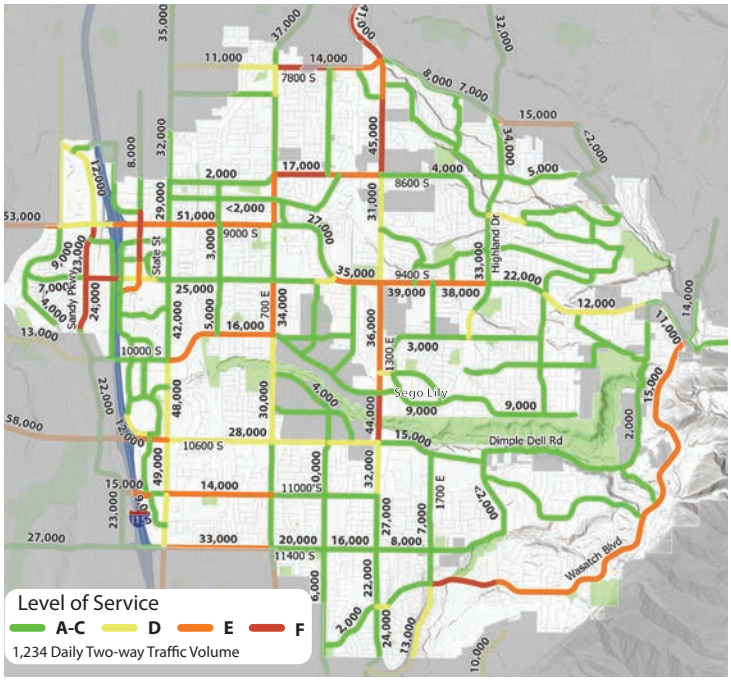
Sandy City has six north-south corridors that run the entire length of the city: Sandy Parkway, I-15, State Street, 700 East, 1300 East and Wasatch Boulevard (which terminates at 11600 South). Approximately half of the city (east side) only has one corridor (Wasatch Boulevard) east of 1300 East.

Comparing Figures 2 and 3, it shows that the extension of Highland Drive (approximately 2000 East) as a 5 lane corridor (from 9800 South to 11625 South) through the east side of the city would have a positive, city-wide affect by redistributing traffic resulting in a seven percent reduction in delay throughout the city. Parallel north-south routes of 700 East, State Street, 1700 East, and Wasatch Boulevard reduce volumes by 1,000 vehicles per day. The greatest impact is seen on the 1300 East (9400 South-10600 South) and 9400 South (1300 East - Highland Drive) with reductions of 12,000 and 13,000 vehicles per day, respectively. However, Sego Lily (between 1300 East and Highland Drive) increases from 9,000 to 19,000 vehicle per day, resulting in a level of service LOS F. To provide an acceptable LOS (D or better) would require a capacity improvement project on Sego Lily.

The influence (positive or negative) of the Highland Drive extension extends to several corridors throughout the city and can change the location and type of future projects that could be included in the transportation master plan.

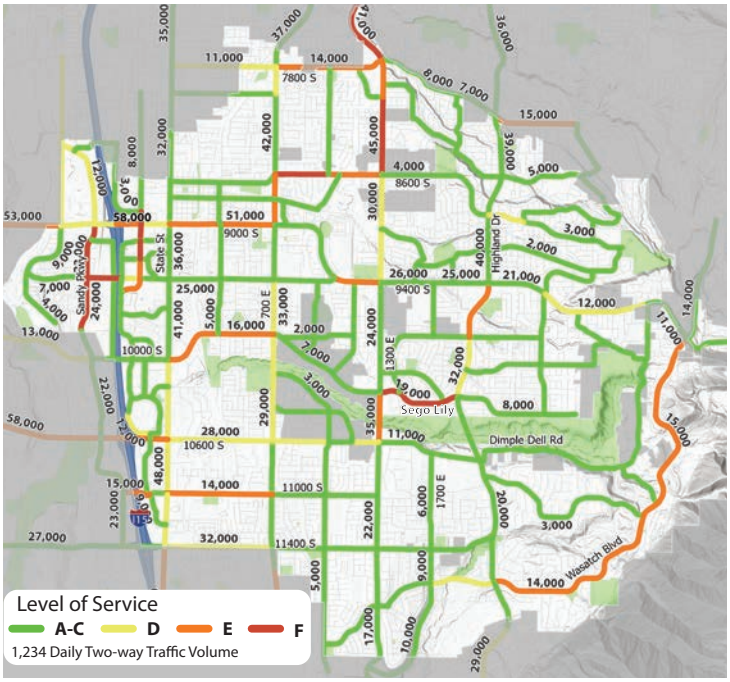
As a result, an environmental study should be completed to determine the future projects for the area.

*Figure 2: 2050 **without** Highland Drive.*



For example, 1300 East capacity improvement projects depend on the timing of the Highland Drive extension. On 1300 East, Phase I (2030) modeling shows 1300 East from Buttercup to 10600 South has LOS E. If Highland Drive is not extended until later phases then capacity improvements on 1300 East would be warranted. If Highland Drive (2000 East) alignment is implemented, then improvements to 1300 East (Sego Lily to 10600 South) and Sego Lily (1300 East to Highland) would be needed. Also, as shown in Figure 2, Wasatch Boulevard from 1700 East to 2025 East experiences LOS F. As shown in Figure 3, this section of Wasatch is improved to LOS D with the extension of Highland Drive.

*Figure 3: 2050 RTP **with** Highland Drive.*



1700 East option

While a ROW corridor has been preserved for Highland Drive from 9800 South to 11625 South, an optional alignment on 1700 East was also considered to provide an east side, north-south connection. The alignment option would transition south west at Dimple Dell Park and connected to the existing 1700 East corridor. On the south side of Dimple Dell, 1700 East is an existing three lane major collector which continues south to the Sandy and Draper city boundary and ties into Draper Parkway (approximately 12300 South and 1300 East). Preliminary traffic analysis shows that this alignment (as a 5 lane corridor) attracts as much as 18,000 more vehicles per day than the Highland Drive extension along 2000 East.

Influence of Highland Drive Extension:

Sandy City has six north-south corridors that run the entire length of the city: Sandy Parkway, I-15, State Street, 700 East, 1300 East and Wasatch Boulevard (which terminates at 11600 South). Approximately half of the city (east side) only has one corridor (Wasatch Boulevard) east of 1300 East.

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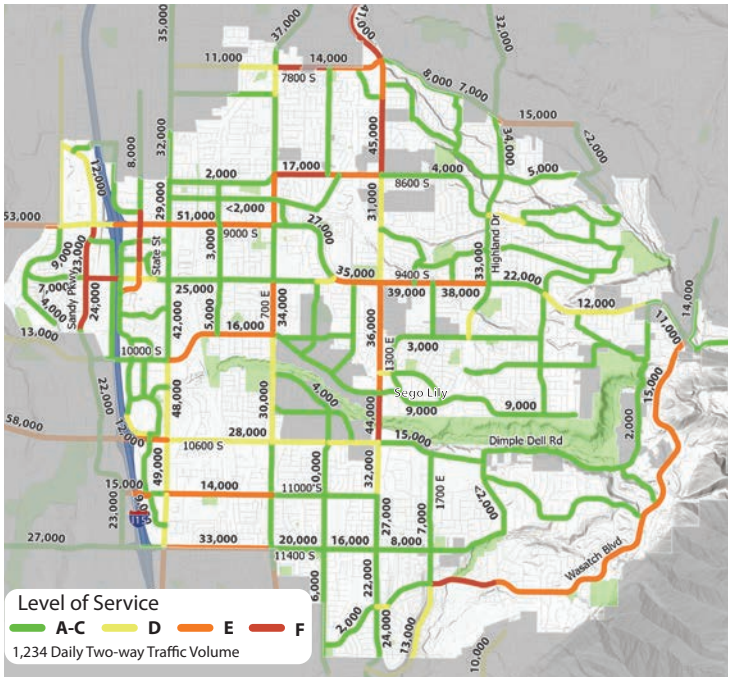

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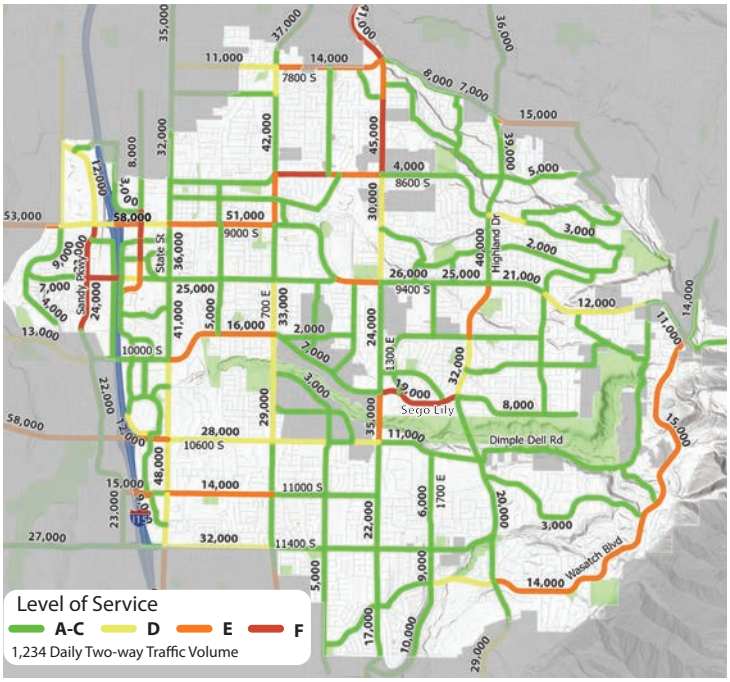

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While a ROW corridor has been preserved for Highland Drive from 9800 South to 11625 South, an optional alignment on 1700 East was also considered to provide an east side, north-south connection. The alignment option would transition south west at Dimple Dell Park and connected to the existing 1700 East corridor. On the south side of Dimple Dell, 1700 East is an existing three lane major collector which continues south to the Sandy and Draper city boundary and ties into Draper Parkway (approximately 12300 South and 1300 East). Preliminary traffic analysis shows that this alignment (as a 5 lane corridor) attracts as much as 18,000 more vehicles per day than the Highland Drive extension along 2000 East.

Influence of Highland Drive Extension:

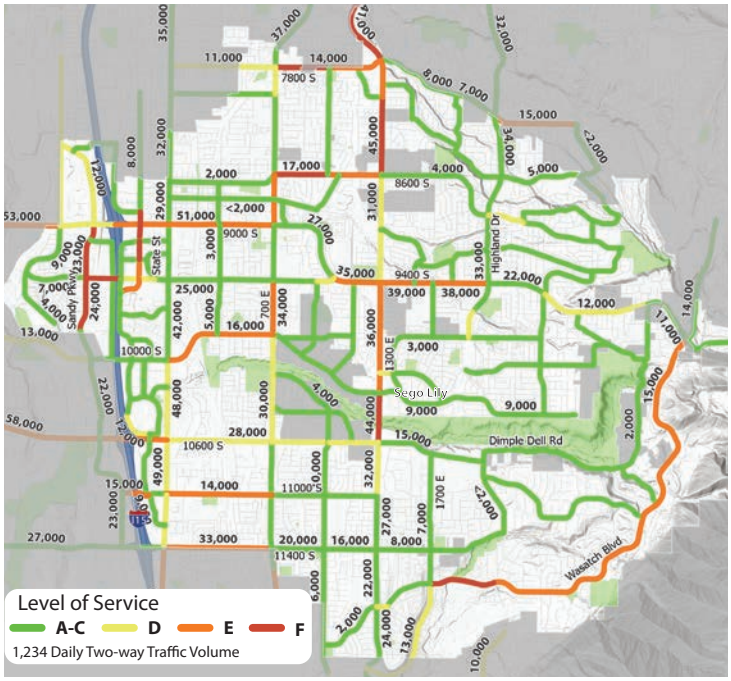
Sandy City has six north-south corridors that run the entire length of the city: Sandy Parkway, I-15, State Street, 700 East, 1300 East and Wasatch Boulevard (which terminates at 11600 South). Approximately half of the city (east side) only has one corridor (Wasatch Boulevard) east of 1300 East.

Comparing Figures 2 and 3, it shows that the extension of Highland Drive (approximately 2000 East) as a 5 lane corridor (from 9800 South to 11625 South) through the east side of the city would have a positive, city-wide affect by redistributing traffic resulting in a seven percent reduction in delay throughout the city. Parallel north-south routes of 700 East, State Street, 1700 East, and Wasatch Boulevard reduce volumes by 1,000 vehicles per day. The greatest impact is seen on the 1300 East (9400 South-10600 South) and 9400 South (1300 East - Highland Drive) with reductions of 12,000 and 13,000 vehicles per day, respectively. However, Sego Lily (between 1300 East and Highland Drive) increases from 9,000 to 19,000 vehicle per day, resulting in a level of service LOS F. To provide an acceptable LOS (D or better) would require a capacity improvement project on Sego Lily.

The influence (positive or negative) of the Highland Drive extension extends to several corridors throughout the city and can change the location and type of future projects that could be included in the transportation master plan.

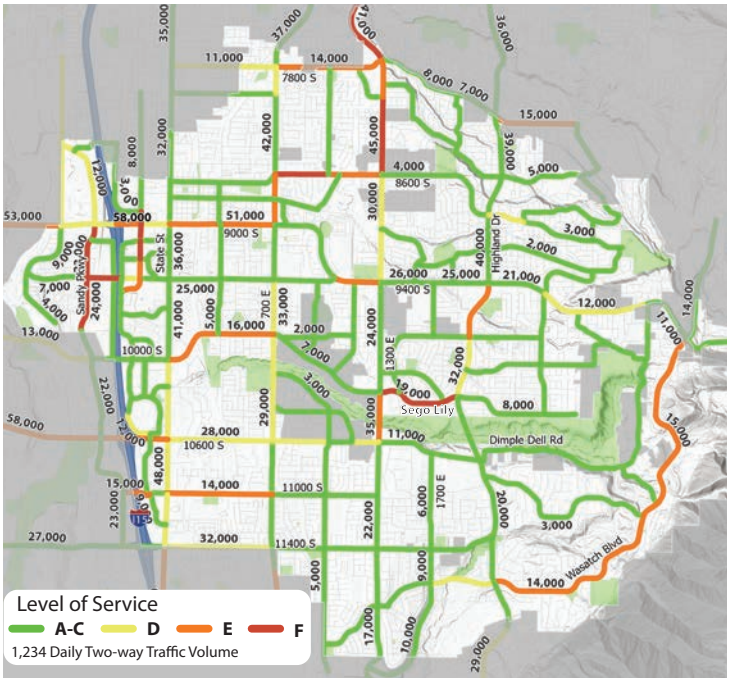
As a result, an environmental study should be completed to determine the future projects for the area.

*Figure 2: 2050 **without** Highland Drive.*



For example, 1300 East capacity improvement projects depend on the timing of the Highland Drive extension. On 1300 East, Phase I (2030) modeling shows 1300 East from Buttercup to 10600 South has LOS E. If Highland Drive is not extended until later phases then capacity improvements on 1300 East would be warranted. If Highland Drive (2000 East) alignment is implemented, then improvements to 1300 East (Sego Lily to 10600 South) and Sego Lily (1300 East to Highland) would be needed. Also, as shown in Figure 2, Wasatch Boulevard from 1700 East to 2025 East experiences LOS F. As shown in Figure 3, this section of Wasatch is improved to LOS D with the extension of Highland Drive.

*Figure 3: 2050 RTP **with** Highland Drive.*



1700 East option

While a ROW corridor has been preserved for Highland Drive from 9800 South to 11625 South, an optional alignment on 1700 East was also considered to provide an east side, north-south connection. The alignment option would transition south west at Dimple Dell Park and connected to the existing 1700 East corridor. On the south side of Dimple Dell, 1700 East is an existing three lane major collector which continues south to the Sandy and Draper city boundary and ties into Draper Parkway (approximately 12300 South and 1300 East). Preliminary traffic analysis shows that this alignment (as a 5 lane corridor) attracts as much as 18,000 more vehicles per day than the Highland Drive extension along 2000 East.

SANDY CITY 9400 SOUTH & I-15 INTERCHANGE

Introduction:

Sandy City's Transportation Master Plan is being updated with completion expected in winter 2021. A priority of the update is to identify key areas for capital improvements, along with the improvement type and timing of when improvements are needed.

One area identified during the update is Sandy City's Downtown, roughly delineated by 9000 South to 10600 South, and I-15 to TRAX line. New development and growth in this area are anticipated and will place large demands on the existing transportation system.

The following is a summary of the transportation analysis that demonstrates the City's need for advancing the planned interchange (whole or partial) at I-15 and 9400 South, as shown on the Wasatch Front Regional Council 2019-2050 Regional Transportation Plan (WFRC RTP).

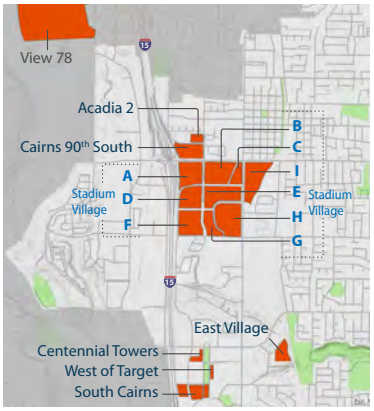
City/Area Growth:

Population growth in Sandy City has increased an average of seven percent over the last ten years. As shown in Table 1, continual growth is expected over the next 30 years in the categories of population, households, and jobs. However, the largest increase in these categories are projected to occur within the next 10 years.

Table 1: 30 Year Population Growth

10 year Time Frame	Percent Growth Category		
	Population	Households	Jobs
2020-2030	19.4%	20.5%	16.4%
2030-2040	7.5%	12.3%	18.1%
2040-2050	5.4%	7.0%	6.1%
30 year Total	29.8%	44.7%	45.9%

Figure 1: Downtown Growth



Population, households, and jobs have a strong correlation with the overall number of vehicles using the roadway network. For the last 10 years traffic volumes in Sandy have increased by 17 percent and based on traffic modeling are further projected to increase by 19 percent every 10 years for the next 30 years. Additionally, the projected growth is anticipated to result in an overall delay of 139 percent throughout the city's roadway network if no improvements are provided.

New large-scale developments expected to contribute to specific Downtown growth include Cairns at 90 South, Arcadia 2, and multiple phases of Stadium Village (see Figure 1). These anticipated developments are estimated to provide 6,839 residential units, 815 new hotel rooms, 3,528,600 square feet of office space, and 912,910 square feet of retail and other space. Altogether, this is an estimated total of 4.4 million square feet of new development. The general focal point of future population and job growth is centered near the 9000 and 9400 South area; and between Sandy Parkway and State Street.

WFRC 2019-2050 RTP Phase III (2041 - 2050)

Influence of 9400 South Half Interchange

The I-15, 9000 South and 10600 South interchanges are the main accesses to and from I-15 for the Sandy City Downtown area. Both the east-west corridors of 9000 South and 10600 South currently operate at Level of Service (LOS) D. However, it is projected that these corridors would operate at failing conditions (LOS E or worse) within the next 10 years (See Figure 3). Currently the only planned projects are to realign Monroe and provide dual left turn lanes in all directions at the intersection of 9000 South and Monroe.

Figure 2: 2030 LOS for Downtown Full Build

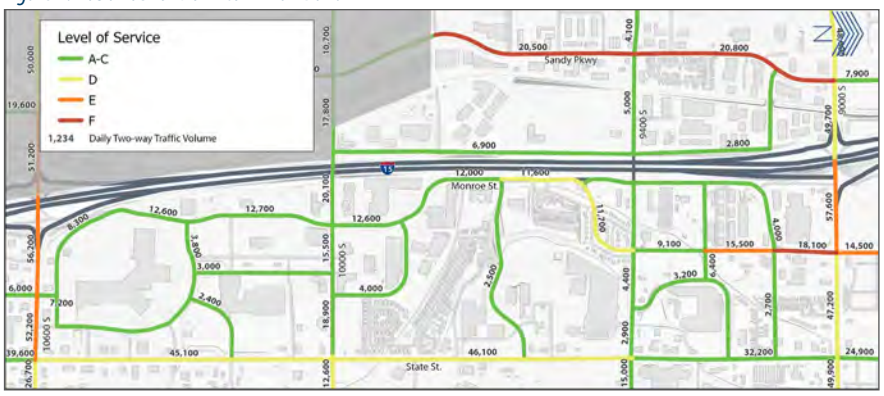
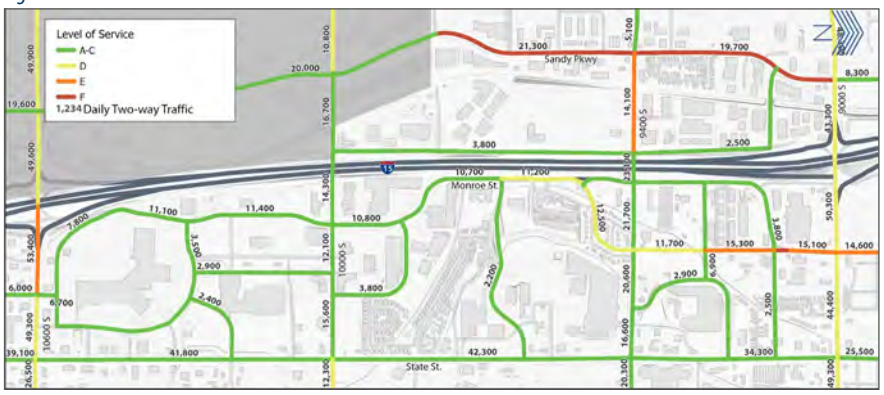


Figure 3: 2030 LOS for Downtown Partial 9400 South Build



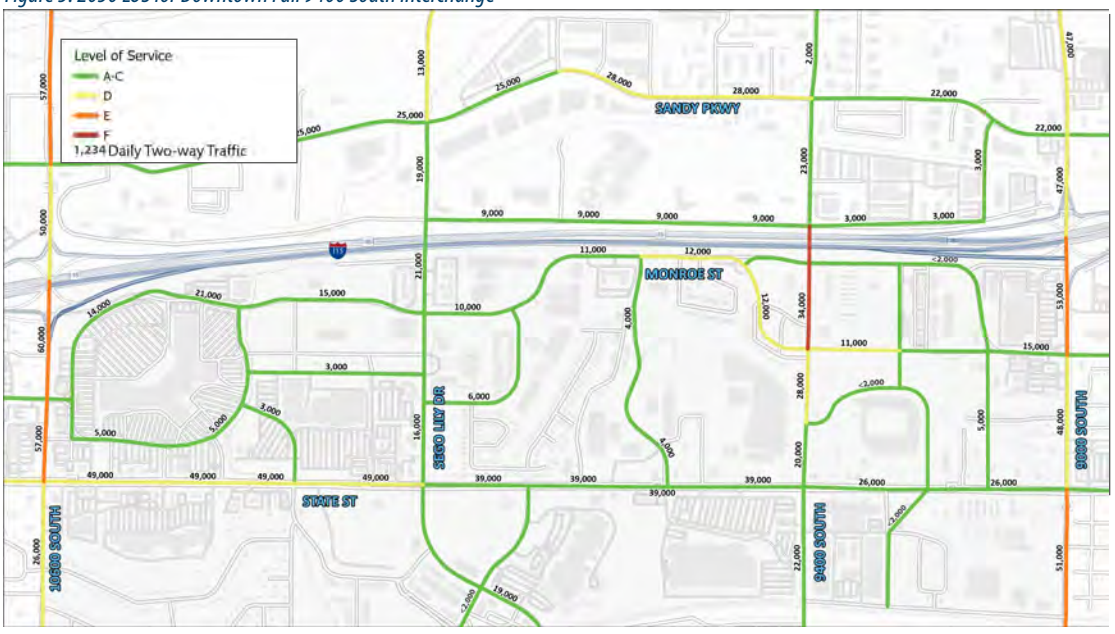
In anticipation of heavy congestion in the Downtown area, a new half interchange at I-15 and 9400 South is planned for Phase III (2041-2050) in the WFRC RTP. As shown in Figure 3 the effect of the half interchange alleviates demand on 9000 South and provides and acceptable LOS D in 2030. Based on projections of this analysis, the half interchange at I-15 and 9400 South would be beneficial if included during Phase I (2019-2030). Although 9000 South and 10600 South are benefited, 9400 South (west of I-15) experiences LOS E because it is modeled as a 3 lane facility. However, if 9400 South were widened to 5 lanes from Sandy Parkway to Monroe Street (similar to the planned 9400 South project listed on WFRC RTP Phase II - Widen 9400 South to 5 lanes from Monroe to State Street) then this section of 9400 South improves to LOS C.

Influence of 9400 South Full Interchange:

As shown in Figure 4, providing a full interchange at I-15 and 9400 South improves operations on 9000 South to LOS C or better in 2030 and provides LOS D or better through 2050 as shown in Figure 5. Additionally, a full interchange has citywide impact by reducing citywide delay by approximately 8 percent (663 hours).

Figure 4: 2030 LOS for Downtown Full 9400 South Interchange

Figure 5: 2050 LOS for Downtown Full 9400 South Interchange



Recommendations:

The new half interchange at I-15 and 9400 South should be advanced to Phase I (2019-2030) of the WFRC RTP to maintain acceptable LOS on 9000 South. Additionally, a full interchange at I-15 and 9400 South should be considered instead of the planned half interchange due to long term benefit to 9000 South and 10600 South. If both projects (9400 South interchange and Highland Drive extension) are completed then the overall delay would be decreased by about 19% city wide.

Sandy Downtown

Transportation Master Plan

2021

Parametrix

avenue

CONSULTANTS

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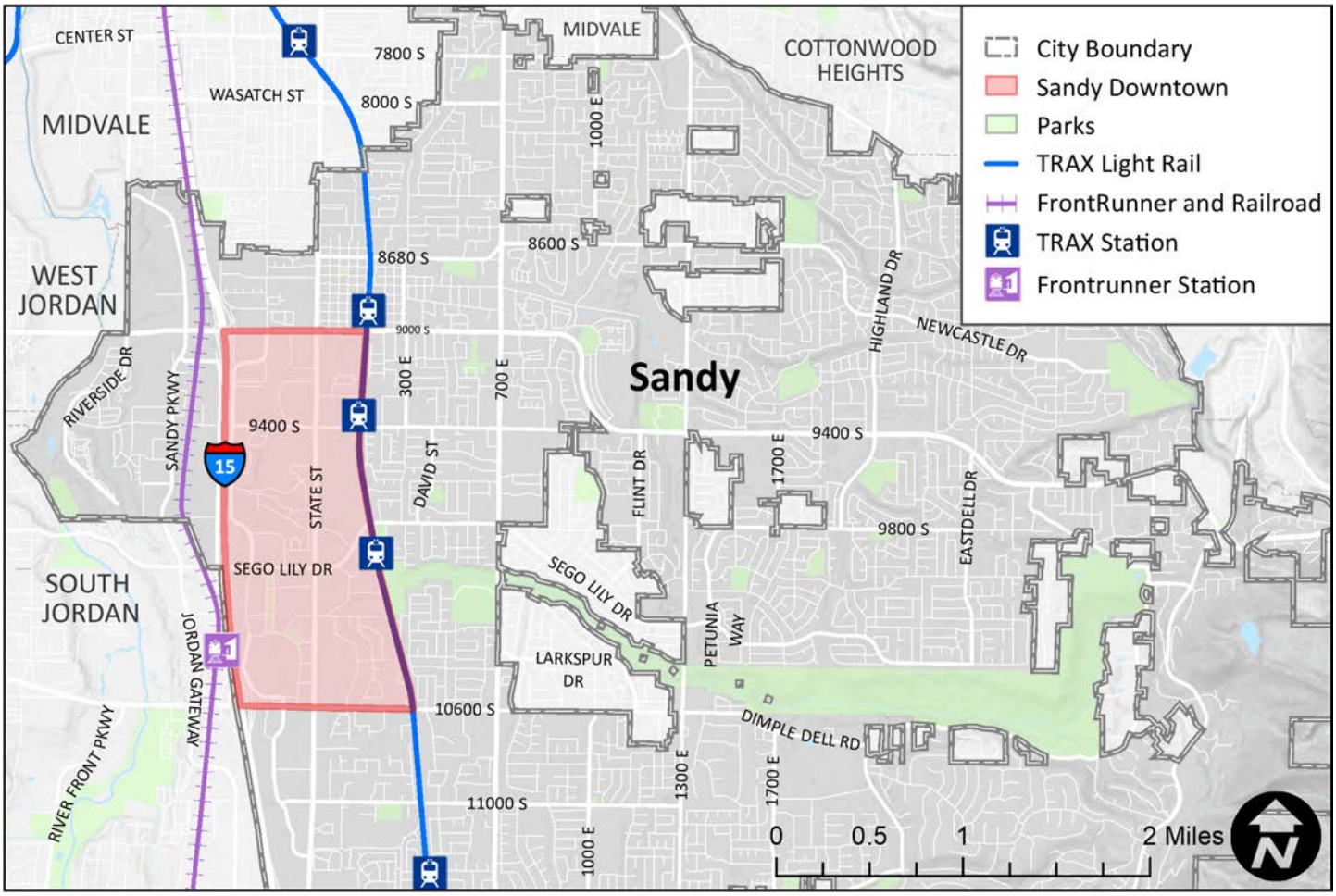
1 INTRODUCTION

Sandy City has a flourishing downtown with dozens of successful businesses, offices, and entertainment venues that have a large regional draw. Downtown areas make up the backbone of any community, and their large concentrations of destinations present unique transportation challenges and opportunities. Healthy downtowns provide a variety of transportation options, with infrastructure design that allows for all systems to work in concert with each other. The purpose of this study is to examine the transportation systems currently in place in Sandy downtown, and to offer insight and recommendations for future improvements that will allow the area to continue as a healthy, vibrant, and safe downtown for generations to come.

Figure 1–1 shows what is referred to in this study as "Sandy downtown." The roughly 1,000-acre area is bordered on the north by 9000 South, the east by the TRAX Blue line, the south at 10600 South, and the west by Interstate 15.

Figure 1–1 Sandy Downtown Study Area



2 GOALS AND POLICIES

The goals and policies outlined in this section are designed to promote transportation choices that provide real options in how we choose to get around and increase the number of easily reached destinations. While these goals and policies are citywide, they also apply for the Sandy downtown area.

The goals and policies from the 2009 Transportation Master Plan (TMP) were used as a starting point to develop this section of the report. These current (or new) goals and policies have been reviewed and approved by the city's Transportation Master Plan Steering Committee.

Streets

Goal: Design, maintain, and operate streets that provide safe and effective movement of people and goods.

Policies:

1. Multi-Modal Streets – Design roadways to maximize use for all modes of transportation including: personal vehicles, trucks, transit, bicycles, and pedestrians. Encourage a practical balance between multiple modes while realizing that private passenger vehicles will continue to be an important means of transportation.
2. Intelligent Transportation Systems (ITS) – Consider solutions that will increase capacity without necessarily increasing the number of roadways or travel lanes. Improve the efficiency of the transportation system by optimizing traffic signal timing and using ITS technologies.
3. Street Improvements – Minimize the negative impacts of traffic through the on-going monitoring and improvement of the overall transportation system.
4. Coordination – Coordinate the development and improvement of streets with adjacent jurisdictions, County, Wasatch Front Regional Council (WFRC) the Metropolitan Planning Organization, Utah Transit Authority (UTA), and Utah Department of Transportation (UDOT).
5. Access Management – Implement access management practices that will promote safety and improve mobility on major roadways while providing an overall system that will support adjacent land uses. Discourage local street access directly onto arterials.
6. Design Standards – Require all roads and roadway features to meet minimum design standards established by the American Association of State Highway and Transportation Officials (AASHTO); require all signs, pavement markings, and traffic control signals to meet standards established by the Manual of Uniform Traffic Control Devices (MUTCD), and related roadway standards established by State, Federal, or local law. Exceptions to applicable standards may be granted by the CIty Transportation Engineer on a case-by-case basis and shall demonstrate innovative superiority or other advantages over existing standards.
7. Maintenance – Consider maintenance aspects in the planning and design of the street system. Minimize life cycle costs through preventative maintenance.

Safety

Goal: Build and maintain a safe transportation system.

Policies:

1. Safety Improvements – Improve safety through the use of signals, signs, street markings, and street lighting.
2. Intersection Conflicts – Decrease intersection conflicts to reduce the frequency and severity of transportation-related collisions.
3. Traffic Calming – Implement traffic calming practices to achieve appropriate vehicular speeds and pedestrian safety for residential, mixed-use, and multi-modal areas.

4. Pedestrians – Provide a safe pedestrian system. Enhance safety by reducing vehicle-pedestrian conflicts.

5. Bicycles – Provide a safe bicycle system. Enhance safety by reducing vehicle-bicycle conflicts.

6. Railroad Crossings – Work with State and railroad officials to identify ways to alleviate existing railroad crossing safety hazards. Consider flashing lights, automatic gates, and/or grade separation at railroad crossings to reduce auto-train conflicts.

Transit

Goal: Increase transportation mode share and convenience of transit service within city.

Policies:

1. Coordination – Increase coordination and collaboration with UTA by reviewing both land use plans and infrastructure improvement plans as they as they go through adoption and approval phases. Future transit services should expand in step with growth in the city.

2. Transit Options – Work with UTA to plan expansion options that are harmonious with the increased demand connected to future land use development.

3. Transit Frequency – Work with UTA to increase frequency of service so it is synchronized with the needs associated with future land use development.

4. Downtown – Encourage regional transit access into Sandys' downtown, along with local transit service within downtown, and connecting to the regional system.

5. Transit Stops – Provide good auto, bus, bicycle, and pedestrian access to existing and future transit stations and facilities. Encourage UTA to provide shelters and other amenities that improve the safety and comfort of transit passengers.

6. Special Events – Encourage use of transit for special events to relieve vehicular traffic and parking demand.

7. Transit Oriented Development – Encourage Transit Oriented Development (TOD). Require commercial development to consider integrating transit and alternative modes into site plans by accommodating/building transit stops and pedestrian connections.

Bicycles and Pedestrians

Goal: Make walking and bicycling a viable, convenient, and safe mode of transportation.

Policies:

1. Parks, Recreation, and Trails – Support the goals and recommendations of the Parks, Recreation, and Trails Element of the Sandy City General Plan. Coordinate street improvement projects with construction of trails (bicycle, walking, equestrian, and multipurpose).

2. Connectivity – Improve the connectivity of sidewalks, trails, and paths. Provide and maintain a continuous and direct network of trails and on-street bicycle lanes and paths. Require new development and redevelopment plans to provide pedestrian connections to adjacent uses, transit facilities, and roadways.

3. Expand Network – Increase transportation choices by expanding the bike & pedestrian network with new trails and bike lanes as laid out in the Active Transportation Plan.

4. Regional Facilities – Coordinate with neighboring jurisdictions, UDOT, and the MPO to develop future bicycle facilities. Coordinate street improvements projects with construction of bicycle improvements.

5. Maintenance – Consider maintenance and aesthetic aspects in the planning and design of sidewalks, trails, and recreational facilities.

Parking

Goal: Review parking facilities to see that they meet the needs and functional requirements of surrounding land uses and streets.

Policies:

1. School Areas – Work with schools to improve circulation at pick-up/drop-off areas and resolve parking issues as well as pick-up/drop-off issues.

2. Downtown – Encourage drivers to "park once" and get around using other modes (walking, transit, etc.) in downtown and other activity centers where multiple trip purposes can be accomplished with a single automobile trip.

3. Special Events – Develop a special event parking and circulation plan that considers available off-street and on-street parking and will minimize congestion during event peak traffic times.

Travel Demand Management

Goal: Relieve congestion by reducing vehicle miles traveled per capita.

Policies:

1. Expand Transportation Choice – Work creatively to provide viable options for how people get around like walking, biking, transit, scooters, rideshare, carpool, etc.

2. Land Use Planning – Integrate transportation and land use planning to reduce the length and frequency of vehicle trips and ensure that existing and planned transportation facilities meet the travel demands generated by surrounding land uses.

3. Mode Choice Awareness – Increase awareness of transportation mode choices and their consequences. Support UTAs' ride share and carpool efforts. Support UDOTs' park-and-ride lot program and the Travel Wise initiative.

4. Alternatives to Travel – Support infrastructure and technology improvements that better enable telecommuting, remote shopping, and other alternatives to travel.

Goals and Policies Summary

The goals and policies described above should be used by city planners, engineers and community leaders on a regular basis as they evaluate transportation needs and alternatives. Additionally, this section along with the rest of the TMP should be updated as development and transportation alternatives change in the city.

While many citywide policies are applicable to the Sandy downtown, only two polices were specifically labeled as downtown. They include the following under the topics of transit and parking.

1. Downtown – Encourage regional transit access into Sandys' downtown, along with local transit service within downtown, and connecting to the regional system.
2. Downtown – Encourage drivers to "park once" and get around using other modes (walking, transit, etc.) in downtown and other activity centers where multiple trip purposes can be accomplished with a single automobile trip.

3 SAFETY ANALYSIS

The purpose of this section is to document the safety analysis conducted for the Sandy downtown area. Using the most recent three years of crash data (2016-2018) from the Utah Department of Transportation (UDOT) Traffic & Safety Division, Parametrix analyzed historic crash patterns and conditions within the study area to develop project and policy recommendations. This memorandum presents data and methodology documenting this process. Further, the information in the memorandum may be protected under 23 USC 409.

Study Area (All Crashes)

Parametrix identified all crashes within downtown Sandy for 2016-2018.[1] In total there were 1,983 reported crashes within the study area.

When examining the distribution of all vehicle crashes in the area, it is helpful to look at a couple metrics. First, the crash rate per million vehicle miles travelled (MVMT) shows if there are any street segments with disproportionately high crash rates. **Figure 3–1** shows the crash rates per MVMT on all UDOT streets in the study area. The streets with the highest crash rates per MVMT include 9000 South, 9400 South, Mall Ring Road, and a portion of State Street.

Second, it is helpful to look at the concentrations of all crashes based on point density. This is accomplished with a heat map, which can help identify problematic areas (such as intersections) that have high concentrations of crashes relative to the total number of crashes reported.

Figure 3–2 is a heat map of crash locations illustrating the highest concentrations of crashes within the city. The most predominant crash concentrations occurred at the I-15 interchange at 9000 South, the intersections of 9000 South at Monroe Street and the intersection of 9000 South and State Street. Hotspots also occurred at the I-15 interchange at 10600 South and the intersection of 10600 South and State Street. A minor hotspot also occurred at the intersection of 10600 South and Auto Mall Drive.

[1] While 2019 crash records are available, they have been found to be incomplete and would misrepresent conditions if used in this analysis. Crash analyses in urban areas typically involve a three year analysis window.t

Figure 3–1 Sandy Downtown Crash Rate per Million Vehicle Miles Travelled

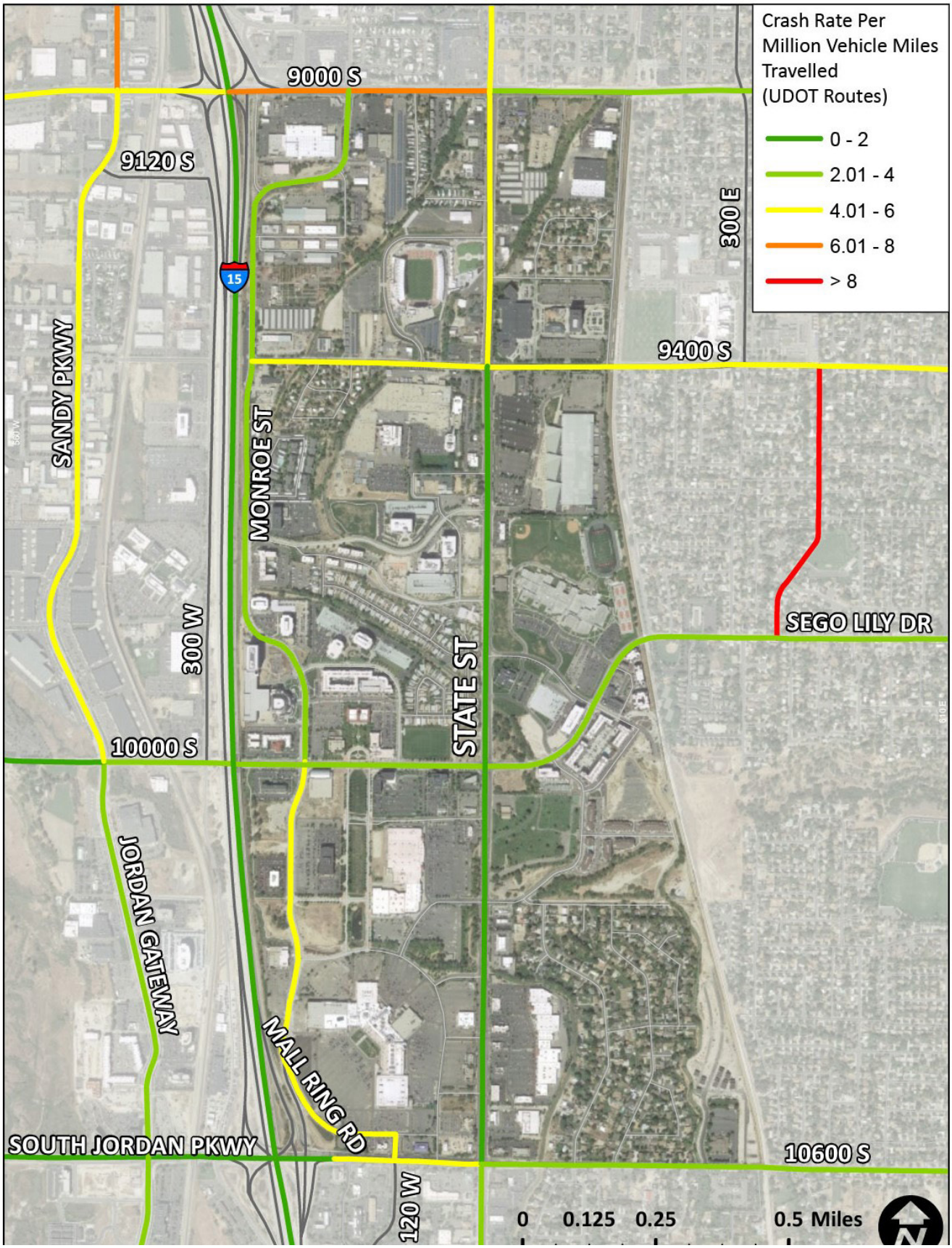
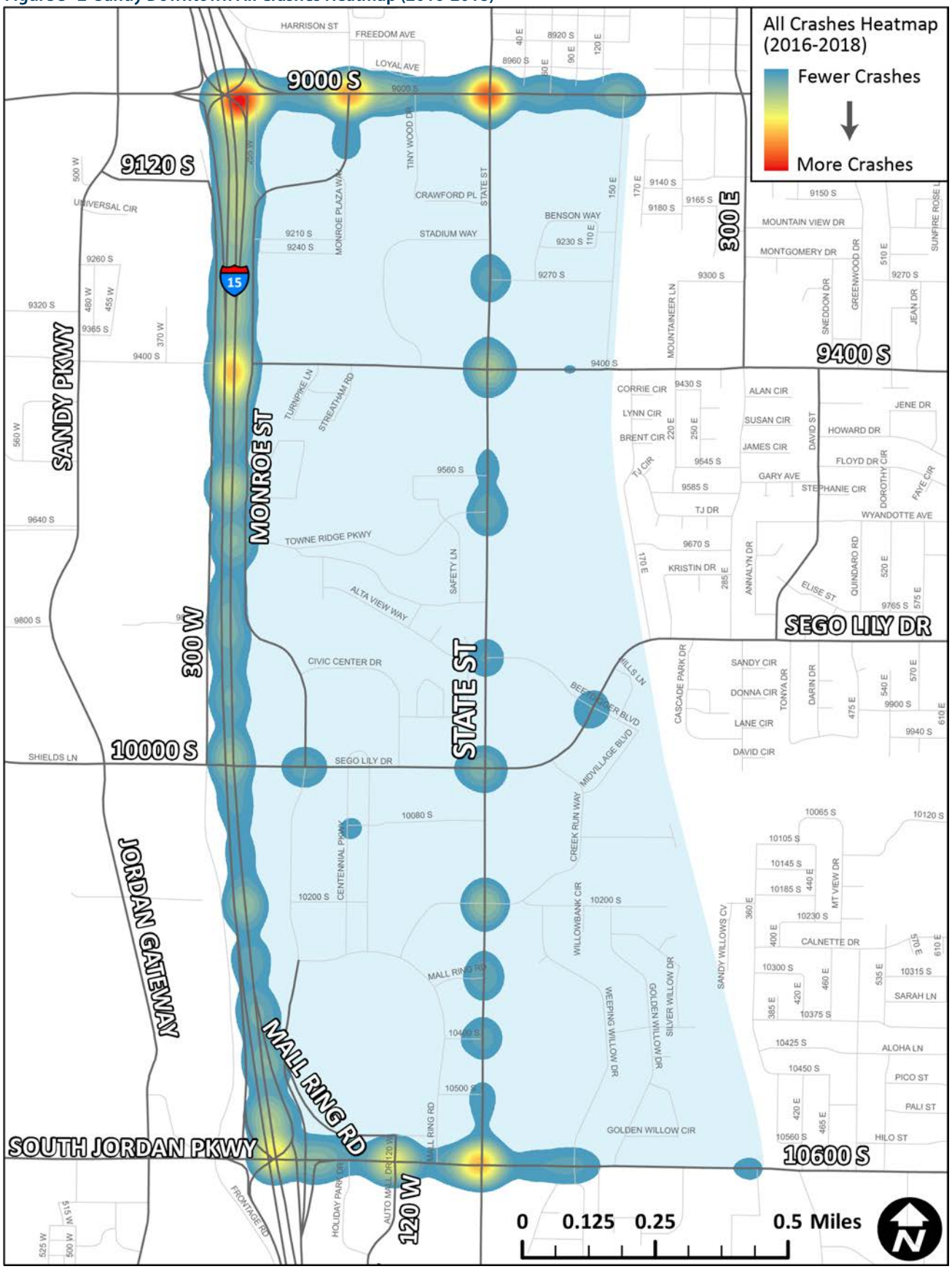


Figure 3–2 Sandy Downtown All Crashes Heatmap (2016-2018)



Fatal and Serious Injury Crashes

Crash severity is reported according to a five-category scale ranging from no injury to fatality. There is considerable emphasis in Utah among safety agencies, transportation planners and engineers to eliminate fatal crashes. However, the low frequency of fatal crashes can result in an insufficient sample size to identify meaningful patterns. As a result, the next level of crash severity, serious injury crashes, is often included in a crash severity analysis.

Figure 3–3 illustrates the fatal and serious injury crashes in downtown Sandy. For the analysis period, there were four crashes with a fatality and 23 serious injury crashes. The number of fatal and serious injury crashes in Sandy City as a percentage of total crashes is 1.4 percent.

Figure 3–3 Sandy Downtown Fatal and Serious Injury Crashes (2016-2018)

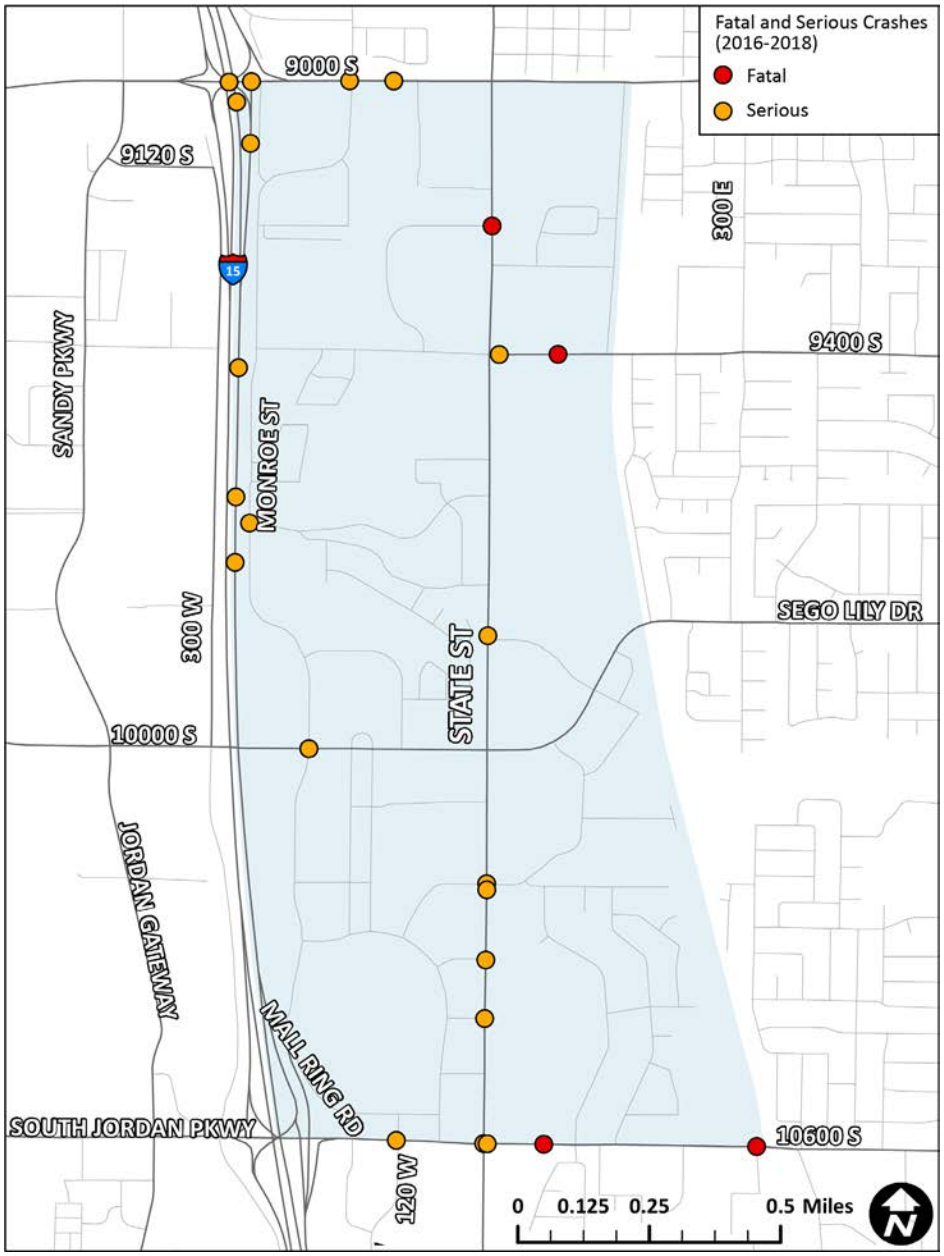


Table 3–1 documents a few of the key characteristics of each fatal crash. All four crashes were located along major streets. Considering there were four fatal crashes total, a significant proportion of fatal crashes also involved vulnerable roadway users – three crashes involved pedestrians and one crash involved a motorcycle. Driver condition plays an important role in several fatal crashes. Two crashes involved a distracted driver. Finally, lighting conditions also played a factor. All four fatal crashes occurred at night, and two of the four were in unlighted areas. This suggests the need that lighting conditions are particularly important to pedestrian safety.

Table 3–1 Fatal Crash Characteristics (2016-2018)

Year	Key Crash Characteristics
2016	Pedestrian Involved, Road Geometry Related, Dark (not lighted)
2017	Pedestrian Involved, Distracted Driving, Work Zone Related, Intersection Related, Dark (not lighted)
2017	Pedestrian Involved, Distracted Driving, Teenage Driver Involved, Dark (lighted)
2018	Motorcycle Involved, Intersection Related, Dark (lighted)

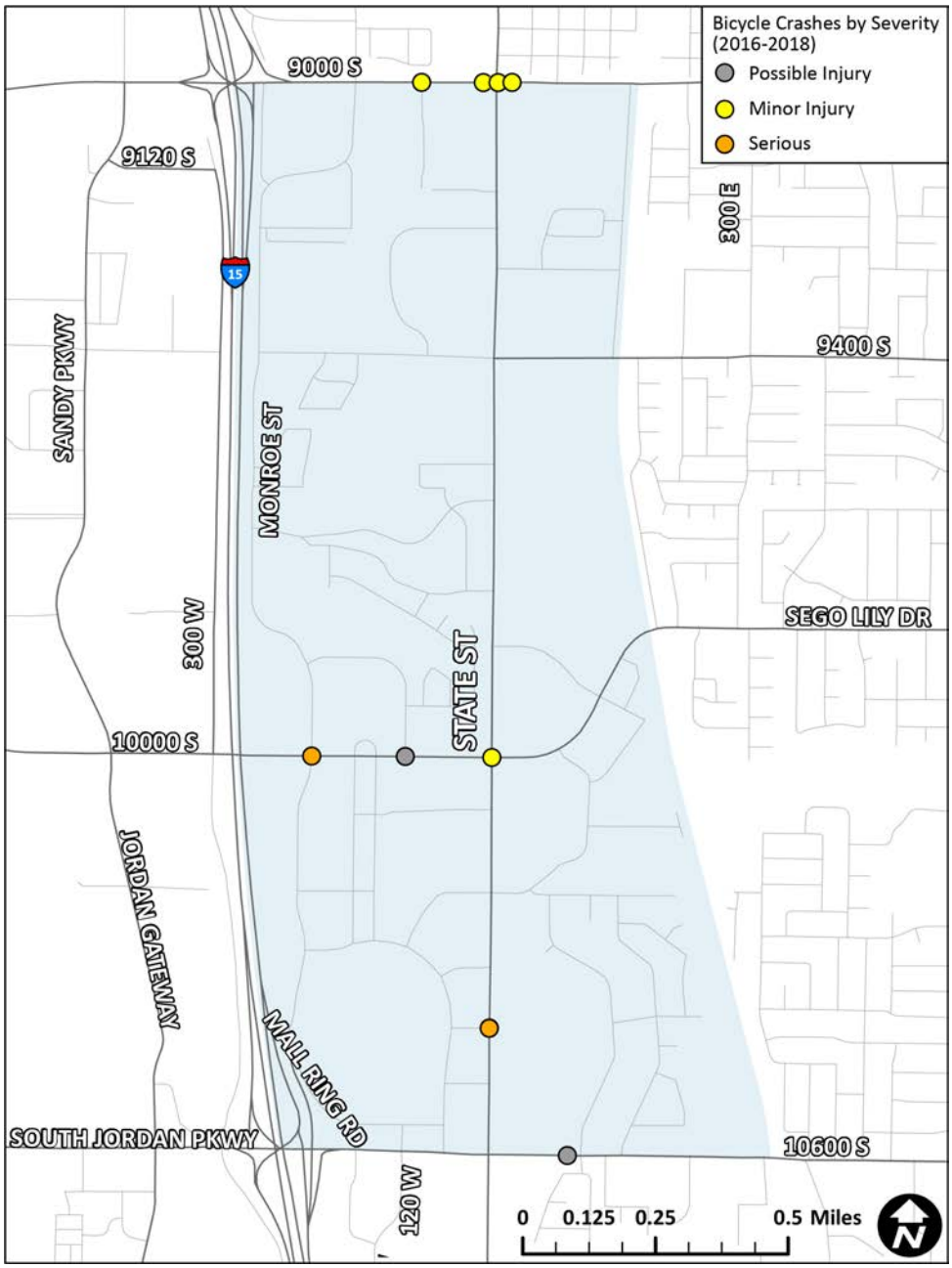
Note: Confidential: This data may be protected under 23 USC 409

Bicycle-Involved Crashes

For 2016-2018, 10 vehicle crashes involving a bicyclist occurred in the Sandy downtown area. **Figure 3–4** symbolizes the locations of these crashes by crash severity. There were no recorded bicyclist fatalities during the study period, but there were two serious injury incidents and several minor injury incidents—all of which occurred along major roads (collectors and arterials).

Most bicyclist incidents occurred during the day with clear, dry weather conditions. Only two occurred at night in lighted areas. Also, most incidents occurred at street intersections. This suggests that the designed speed of roadways and the design of intersections (and accommodations for bicyclists) could be a contributing factor.

Figure 3–4 Sandy Downtown Bicycle Crashes (2016-2018)

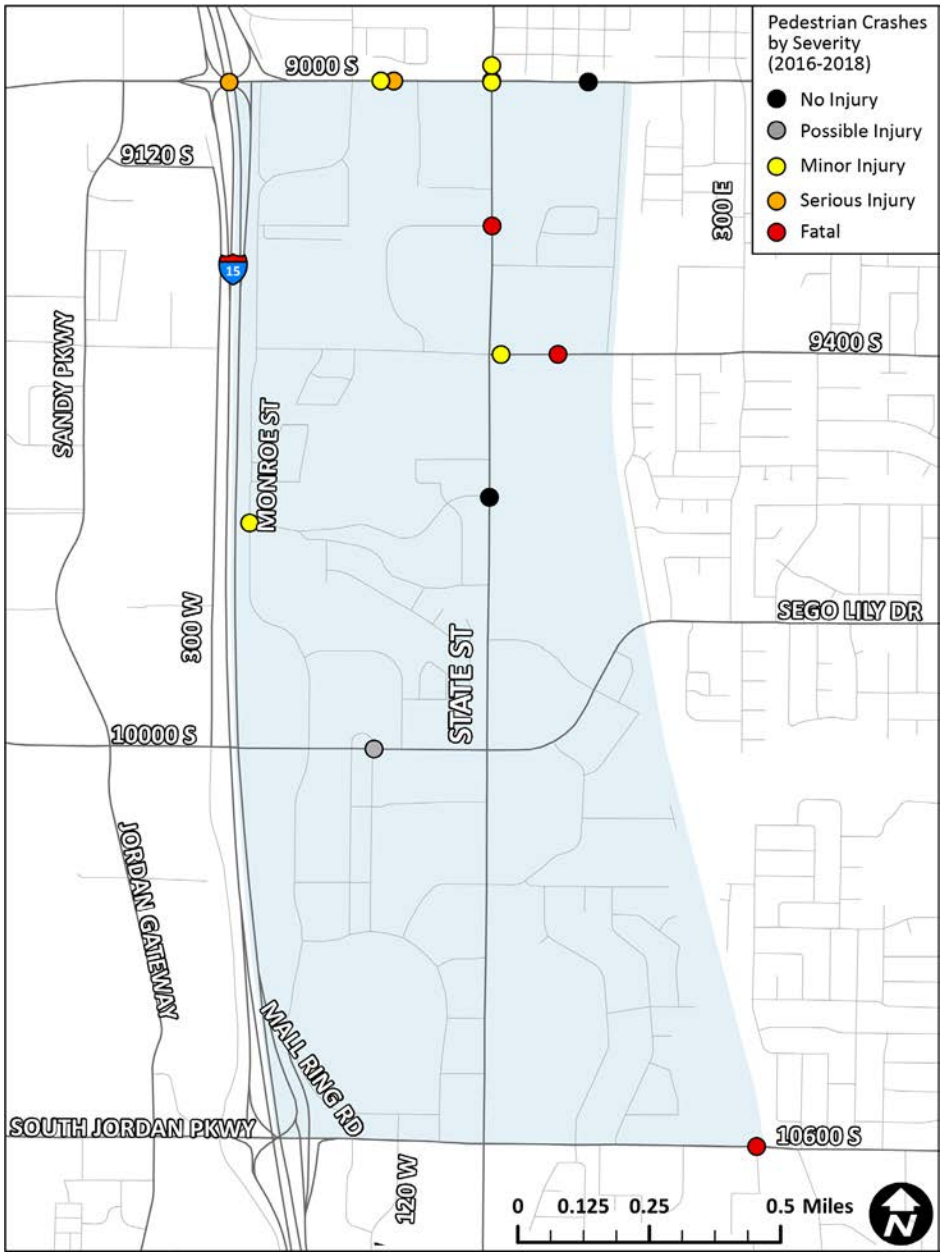


Pedestrian-Involved Crashes

For 2016-2018, 15 vehicle crashes involving a pedestrian occurred in Sandy downtown area. **Figure 3–5** symbolizes the locations of these crashes by location. Clusters are hard to define because of the relatively small sample size, but there were a large portion of crashes located along 9000 South. There are several crashes located at intersections, with eight of the 15 (53 percent) of the incidents being labeled as "Intersection-related". The largest clusters of pedestrian crashes occurred at the 9000 South and State Street intersection, and just east of the intersection of 9000 South and Monroe Street.

Furthermore, all pedestrian crashes occurred along large roads, such as major collectors and arterials. 9000 South in particular had the highest number of pedestrian-related incidents. Traffic speed and volume along these larger streets are likely contributing factors.

Figure 3–5 Sandy Downtown Pedestrian Crashes (2016-2018)



Increased pedestrian activity could also be a factor contributing to higher numbers of pedestrian-involved crashes. **Figure 4–4** shows that there were a high number of pedestrian crosswalk signal actuations in 2019 on 9000 South.

Pedestrian-related crashes also had a higher mortality rate than bicycle-related incidents, with a total of three pedestrian fatalities during the study period (compared to zero bicyclist fatalities). This is significant because the city as a whole only had six fatal pedestrian crashes during this time period. This means 50 percent of all pedestrian fatalities occurred in Sandy's downtown area. Also, significantly more pedestrian incidents occurred at night (53 percent) compared to bicyclist incidents (20 percent). This suggests that lighting conditions play a more critical role when it comes to pedestrian safety.

All Non-State Route Crashes

From 2016-2018 there were a total of 1,983 crashes in Sandy downtown, most of which occurred along state routes where Sandy City has limited influence to correct potential design deficiencies leading to high crash rates. Only 62 crashes (or 3 percent) of the 1,983 occurred along non-state routes. Still, it is helpful to look at these non-state routes to isolate potential hotspots where the city can influence change. **Figure 3–6** shows a heat map of non-state route crashes within the Sandy downtown area.

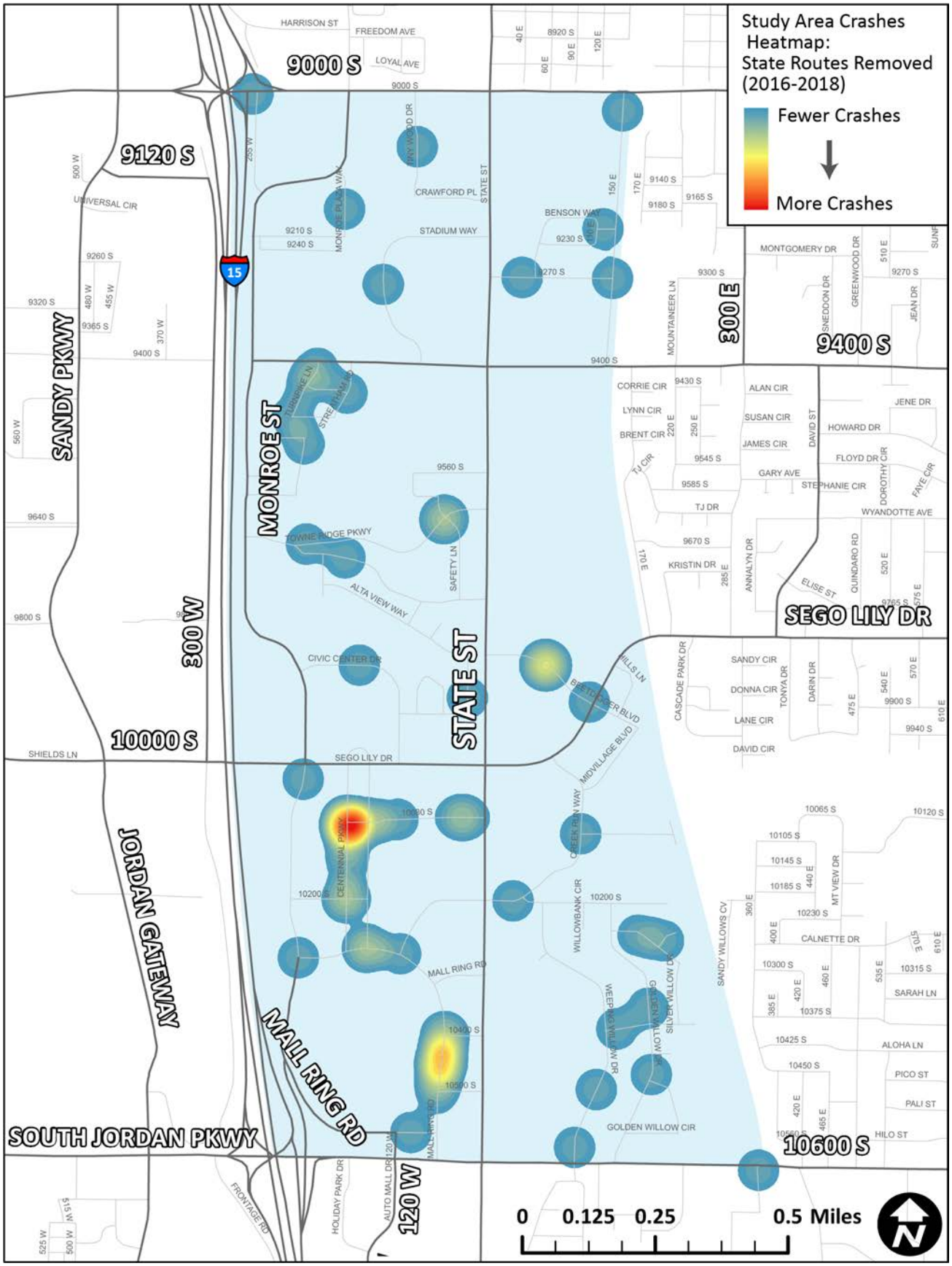
Non-state corridors that stand out are Centennial Parkway, Mall Ring Road, and Beetdigger Boulevard. **Table 3–2** shows intersection hotspots within the city that do not involve a state road. Most hotspot intersections occur near large retail establishments and employment centers. This suggests areas with land uses that draw heavy traffic will experience more traffic incidents.

Table 3–2 Non-State Route Hotspot Locations (2016-2018)

Location	Total Crashes
Centennial Parkway / 10080 South	9
Mall Ring Road / 10450 South	5
Beetdigger Boulevard	3

Note: Confidential: This data may be protected under 23 USC 409.

Figure 3–6 Sandy Downtown Non-State Route Crashes Heatmap (2016-2018)



Hotspot Analysis: Non-State Routes

Centennial Parkway and 10080 South

This intersection represents the largest non-State Route hotspot in the study area. There were nine crashes (or 15 percent of non-state route crashes) at this intersection, with the vast majority being non-injury crashes (there was one minor injury crash). This suggests the crashes at this intersection occurred at low rates of speed. Six of the nine crashes were angle crashes, also suggesting possible conflict points for merging traffic. Most crashes occurred during daylight, so lighting conditions do not appear to have been a factor. Stop controlled intersection and predominantly angle crashes indicate likely conflict between those turning left onto Centennial not looking for Southbound traffic on their right. **Figure 3–7** shows the breakdown of all crashes at this intersection by crash type and **Figure 3–8** shows the locations of each crash around the intersection.

Figure 3–7 Centennial Parkway and 10080 South Crashes by Crash Type (2016-2018)

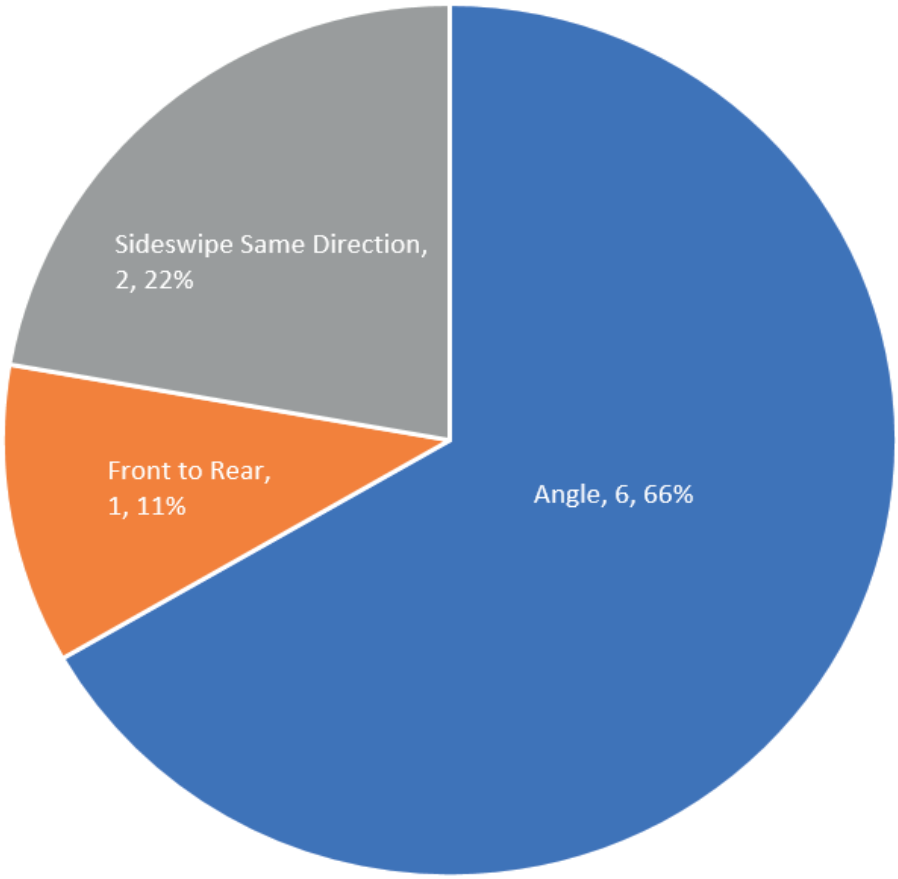
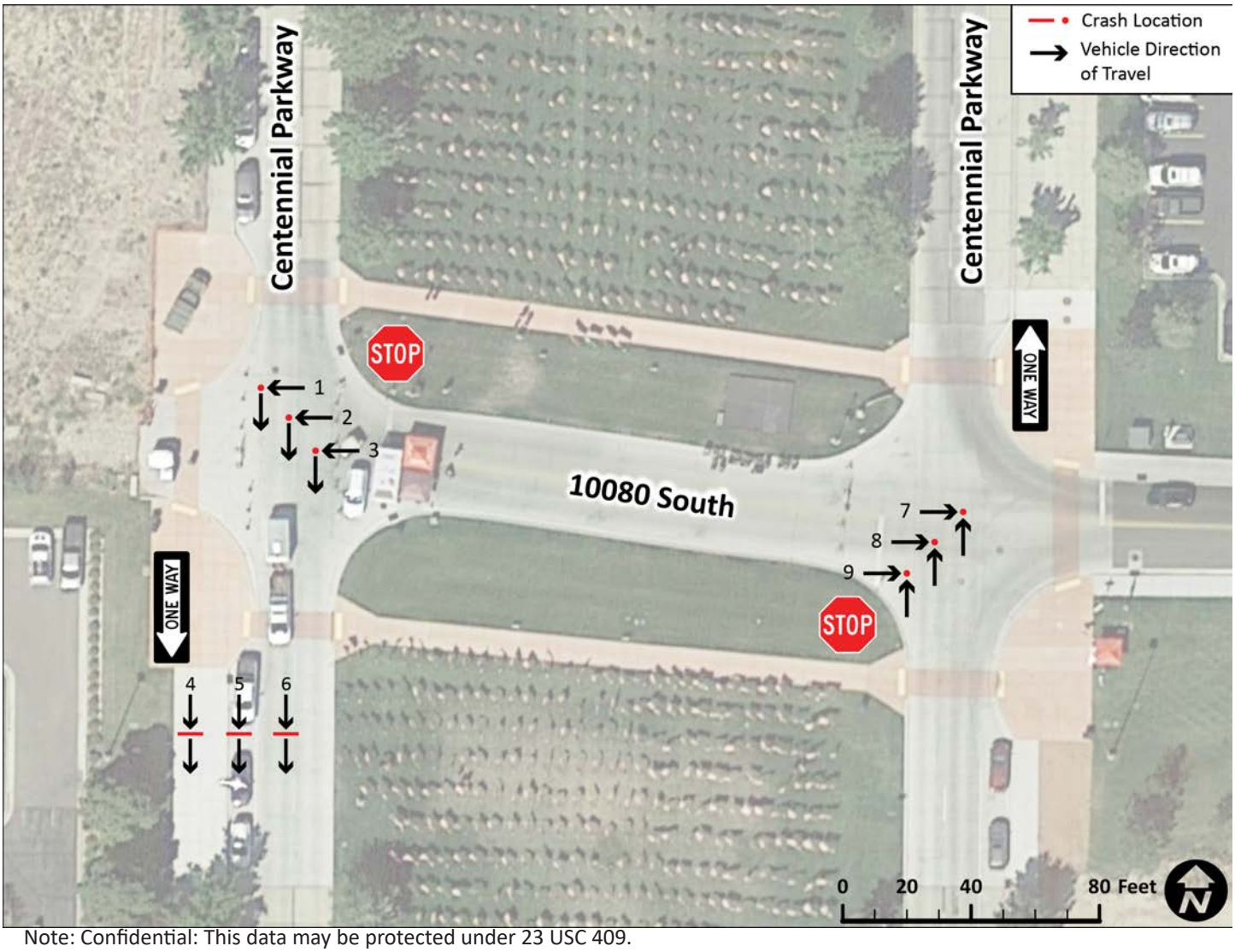


Figure 3–8 Centennial Parkway and 10080 South Crash Locations (2016-2018)



Note: Confidential: This data may be protected under 23 USC 409.

Mall Ring Road/Centennial Parkway Between 10400 South and 10500 South

This intersection is the second largest hotspot for non-state routes in the study area. There was a total of eight crashes, all of which resulted in no injuries. Mall Ring Road provides access to The Shops at South Town, so most vehicles are likely travelling at lower rates of speed. Five of the eight crashes were angle crashes, and six of the eight were in daylight, suggesting most accidents occurred due to drivers failing to yield when merging with traffic. Access management to parking to the west is likely a contributing factor (many access points create many conflict points). **Figure 3–9** shows the breakdown of all crashes at this intersection by crash type and **Figure 3–10** shows the locations of each crash around the intersection.

Note: Confidential: This data may be protected under 23 USC 409.

Figure 3–9 Mall Ring Road/Centennial Parkway Crashes by Crash Type (2016-2018)

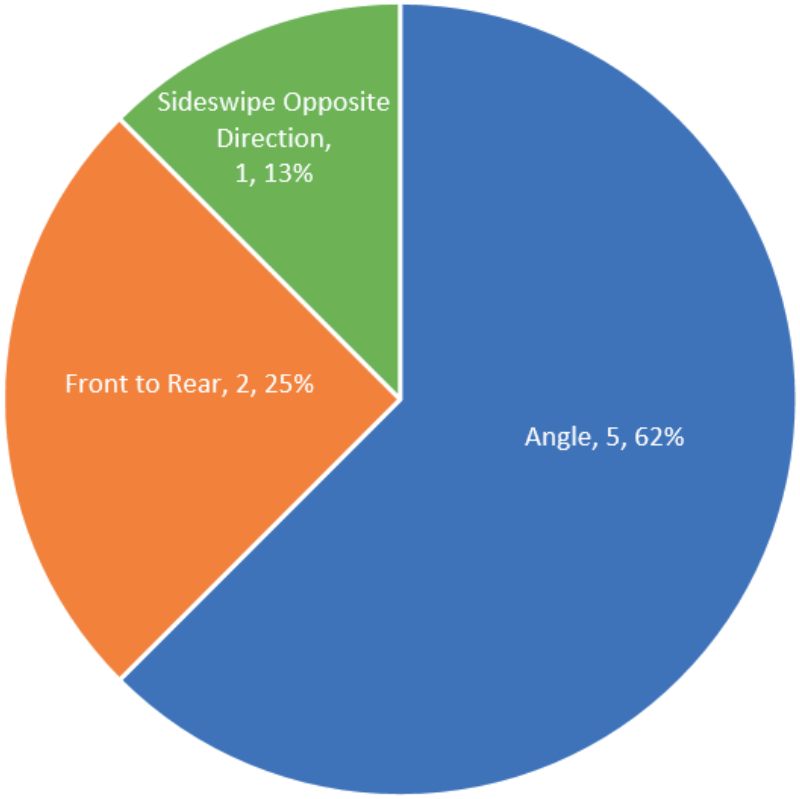


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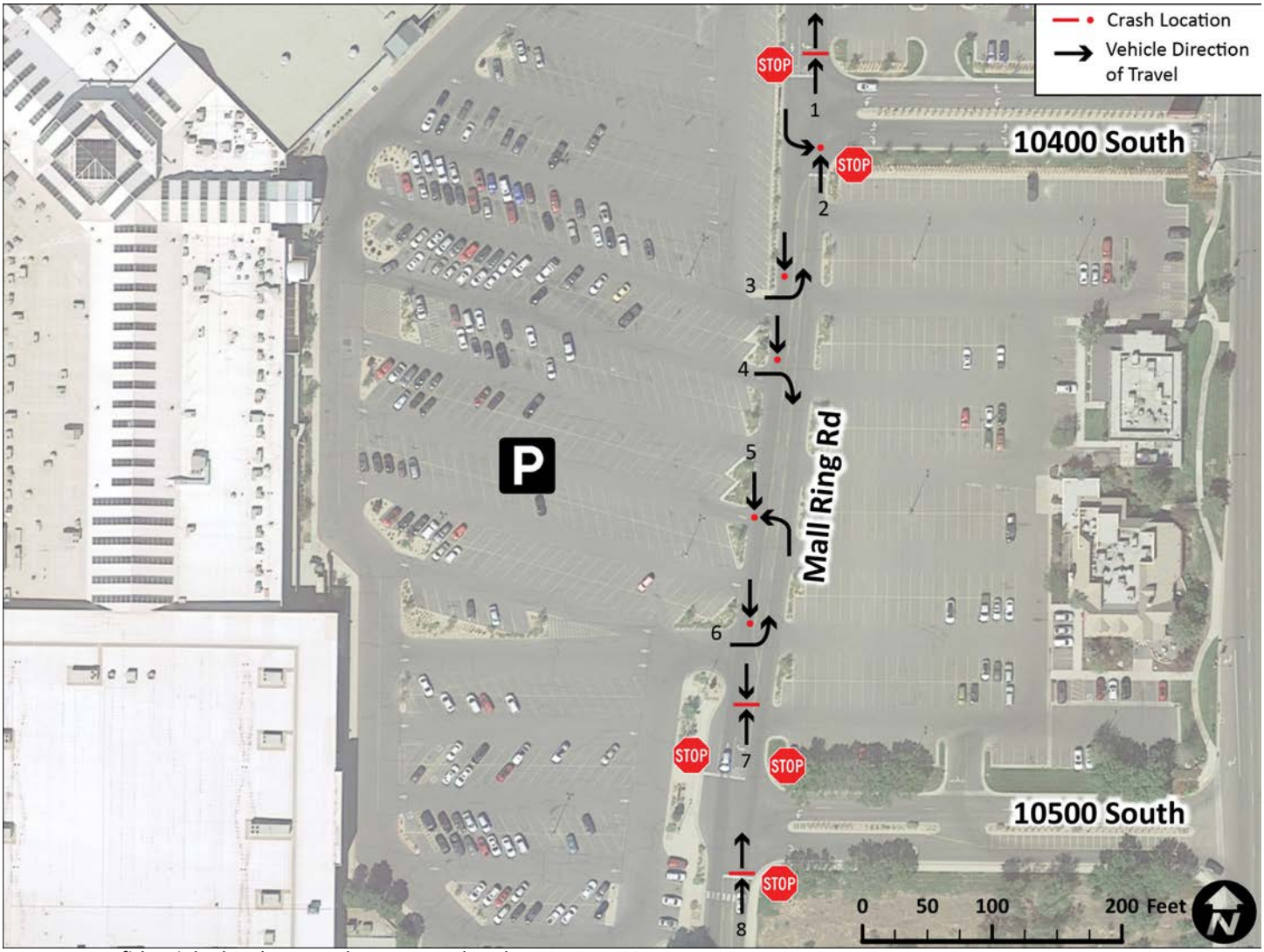
Figure 3–10 Mall Ring Road/Centennial Parkway Crash Locations (2016-2018)



Note: Confidential: This data may be protected under 23 USC 409.

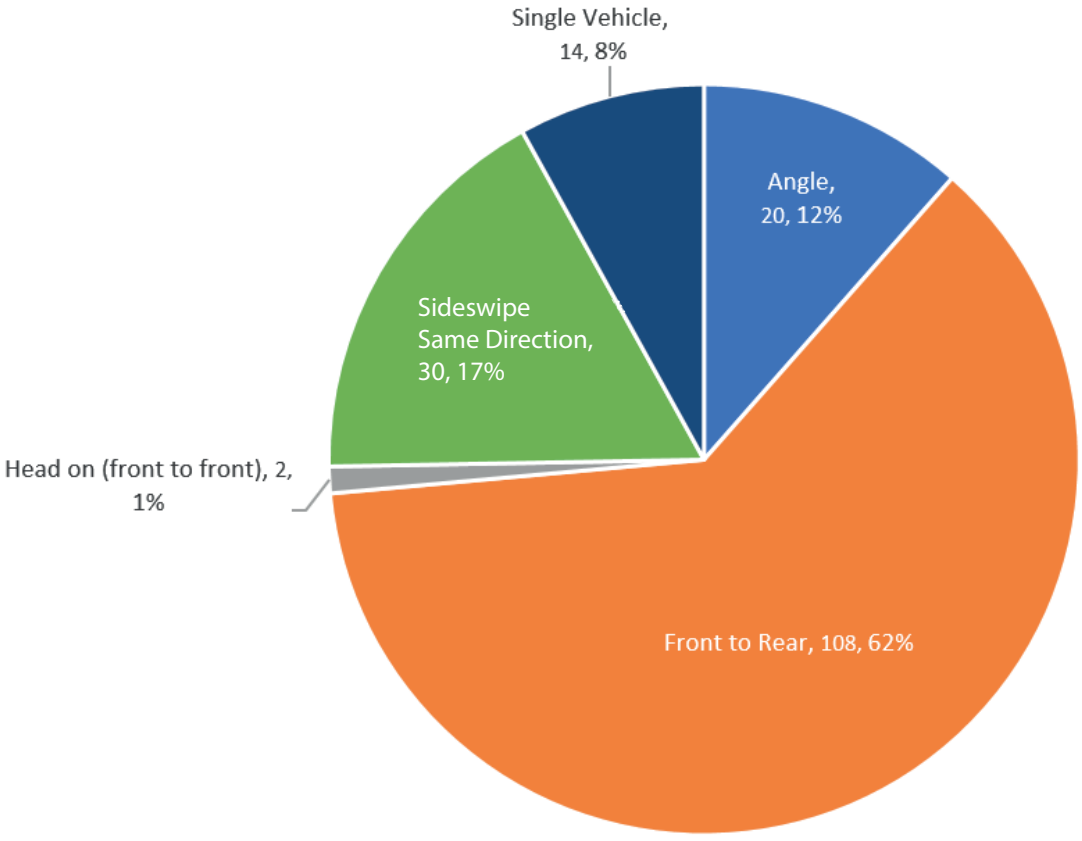
Hotspot Analysis: State Routes

9000 South and I-15 Interchange

This intersection represents the largest crash hotspot with 174 crashes between 2016 and 2018, a moderately high crash rate**. Figure 3–11** shows the breakdown of all crashes at this intersection by crash type. The most predominate crash type was front to rear with 108 crashes, 62 percent of the total. Weather conditions are not a contributing factor with a majority of crashes occurring while clear, dry, and in daylight. Road geometry was flagged as a contributing factor for a large portion of these crashes. There were four serious injury crashes at this location.

Note: Confidential: This data may be protected under 23 USC 409.

Figure 3–11 9000 South and I-15 Interchange Crashes by Crash Type (2016-2018)

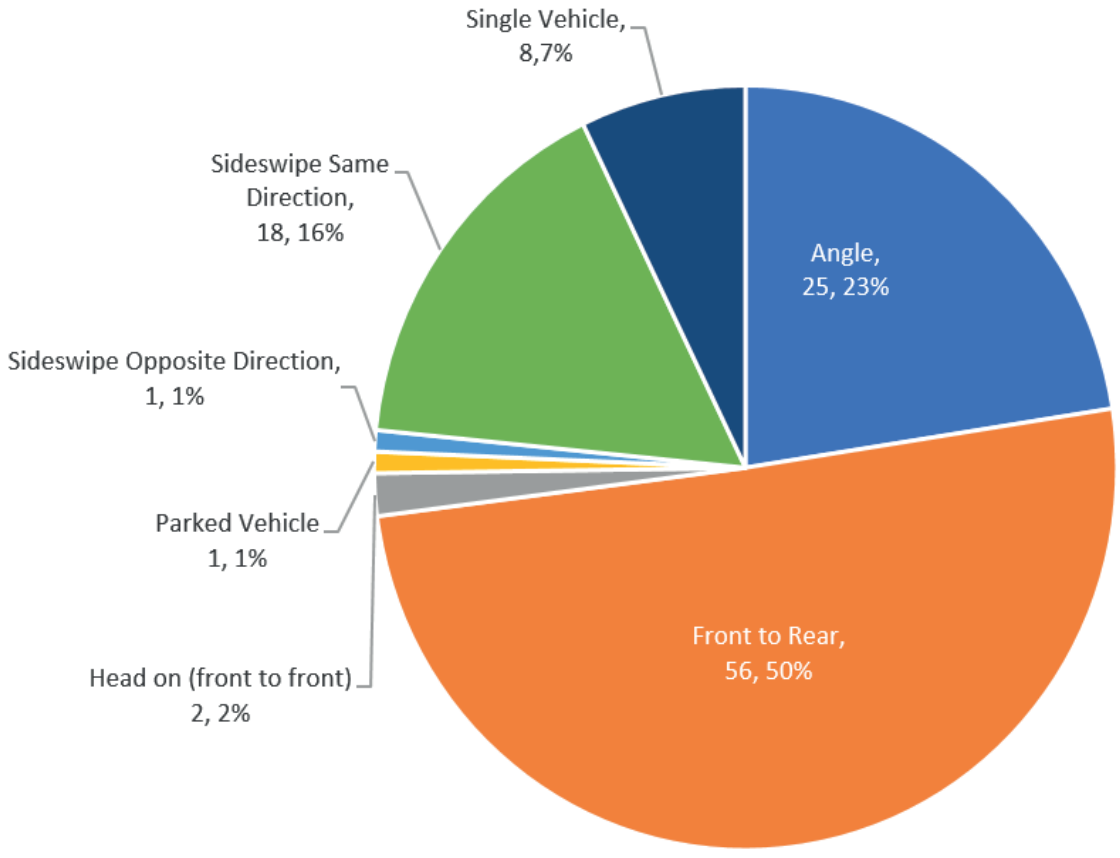


9000 South and State Street

There were 111 crashes at this intersection between 2016 and 2018. **Figure 3–12** shows the breakdown of all crashes at this intersection by crash type. The most predominate crash type at this intersection was front to rear, accounting for 50 percent of all crashes. There were no serious injury or fatal crashes.

Note: Confidential: This data may be protected under 23 USC 409.

Figure 3–12 9000 South and State Street Crashes by Crash Type (2016-2018)

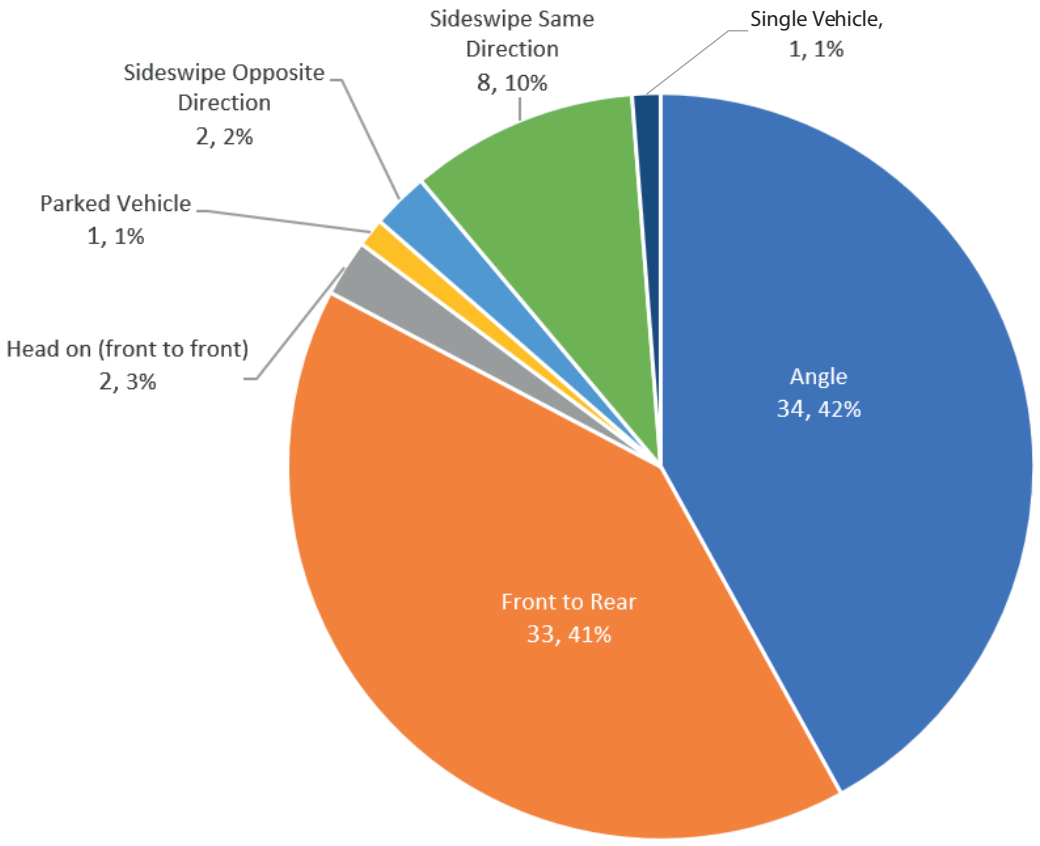


9000 South and Monroe Street

There were 81 crashes at this intersection between 2016 and 2018. **Figure 3–13** shows the breakdown of all crashes at this intersection by crash type. Here angle crashes were the predominant crash type, with 42 percent of all crashes, closely followed by front to rear crashes at 41 percent. There was one serious injury crash and no fatal crashes at this location.

Note: Confidential: This data may be protected under 23 USC 409.

Figure 3–13 9000 South and Monroe Street Crashes by Crash Type (2016-2018)

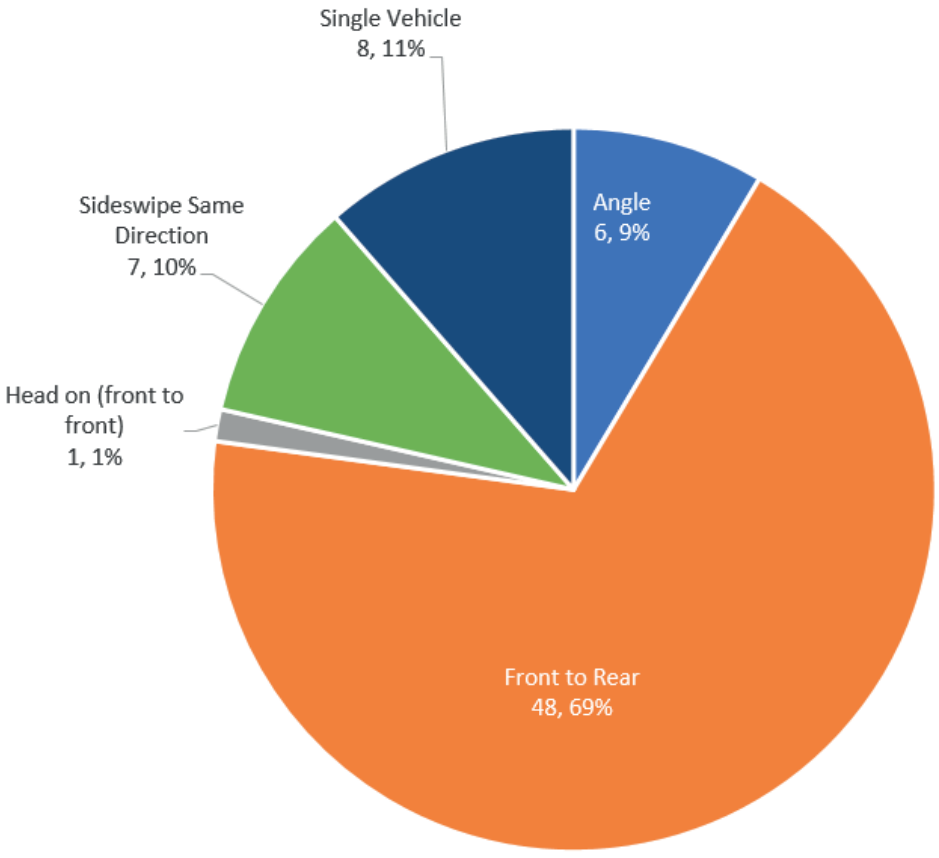


10600 South and I-15 Interchange

There were 55 crashes at this intersection between 2016 and 2018. **Figure 3–14** shows the breakdown of all crashes at this intersection by crash type. Front to rear crashes are the predominant crash type, with 69 percent of the total. There were no serious injury or fatal crashes.

Note: Confidential: This data may be protected under 23 USC 409.

Figure 3–14 10600 South and I-15 Interchange Crashes by Crash Type (2016-2018)

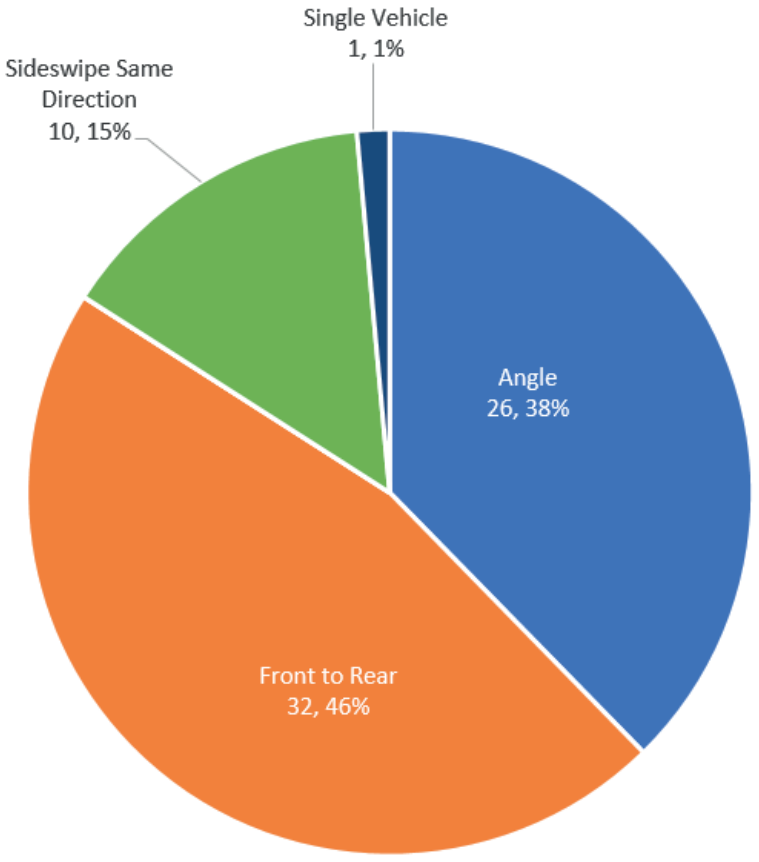


10600 South and Auto Mall Drive

There were 69 crashes at this intersection between 2016 and 2018. **Figure 3–15** shows the breakdown of all crashes at this intersection by crash type. The most predominate crash type at this intersection was front to rear, accounting for 46 percent of all crashes. This is a heavily congested area and is less than a quarter mile from the I-15 interchange to the west, all contributing to a condition where front to rear crashes are expected. There was one serious injury crash and no fatal crashes.

Note: Confidential: This data may be protected under 23 USC 409.

Figure 3–15 10600 South and Auto Mall Drive Crashes by Crash Type (2016-2018)

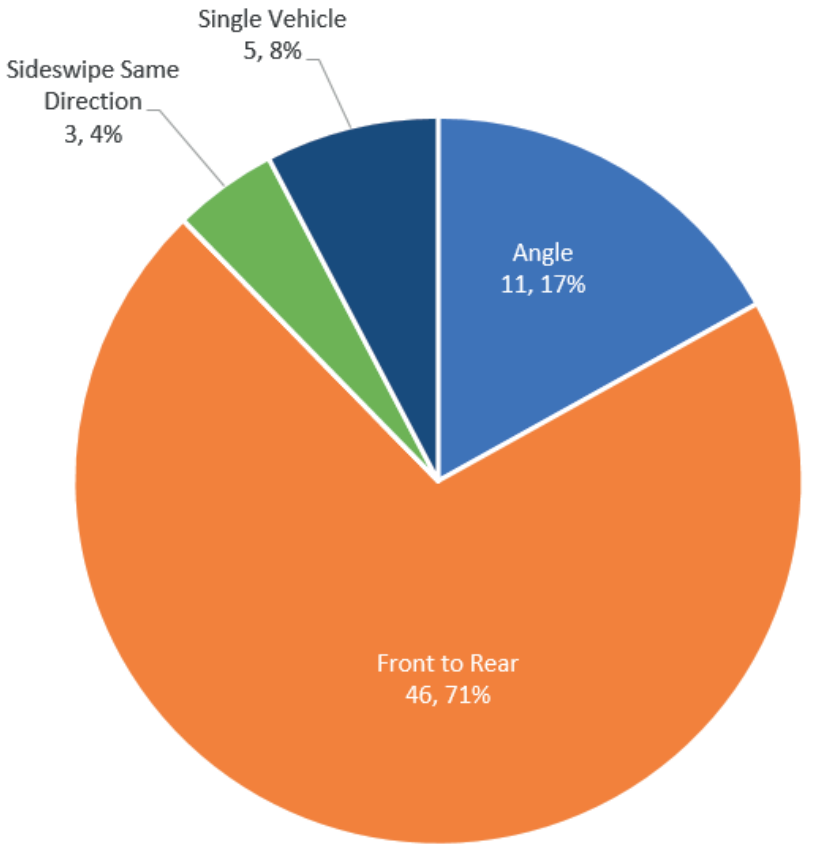


10600 South and State Street

There were 65 crashes at this intersection between 2016 and 2018. **Figure 3–16** shows the breakdown of all crashes at this intersection by crash type. Front to rear crashes are the predominant crash type, with 71 percent of the total. There were two serious injury crashes and no fatal crashes at this location.

Note: Confidential: This data may be protected under 23 USC 409.

Figure 3–16 10600 South and State Street Crashes by Crash Type (2016-2018)



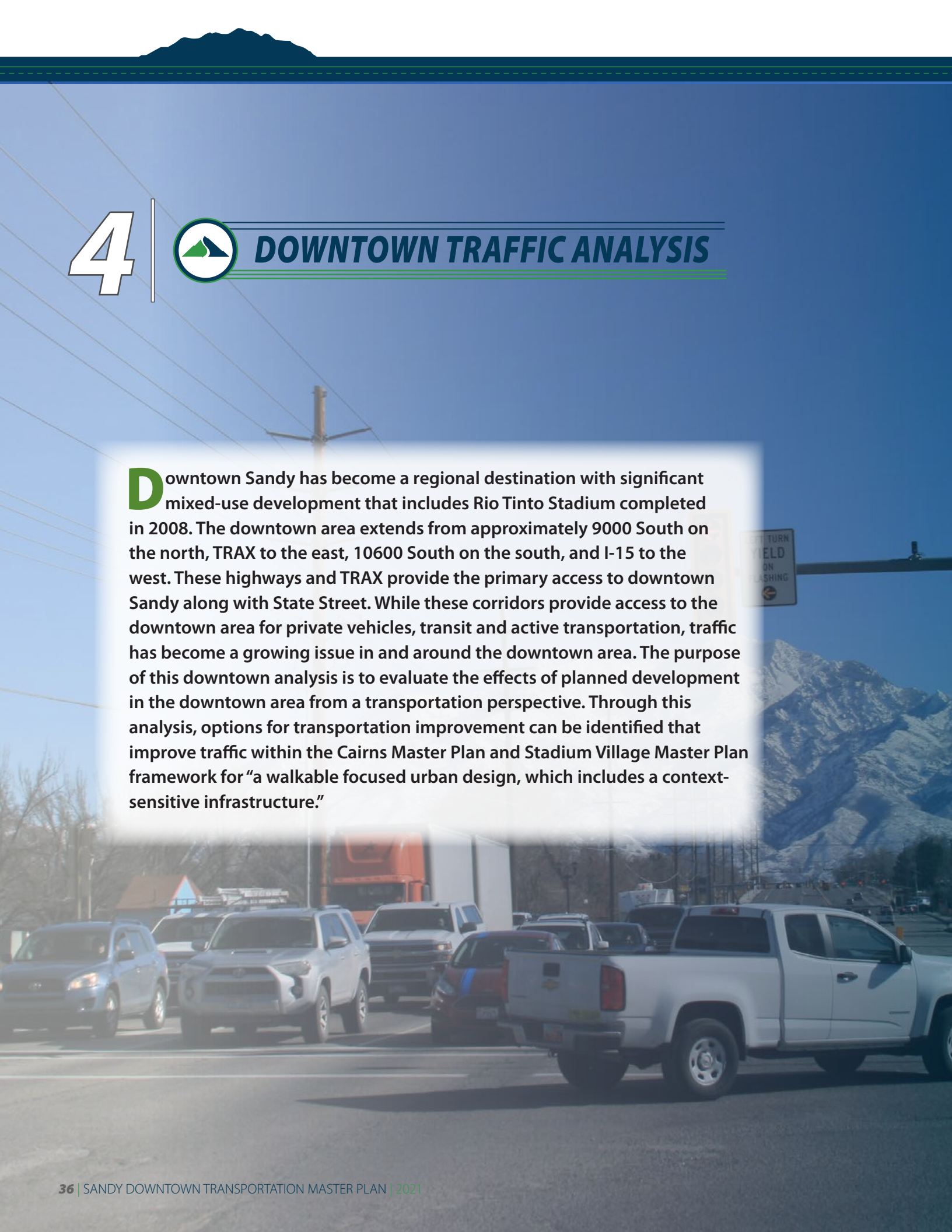
Summary

Understanding and reducing vehicle crashes is always of concern to any community. Looking at all crashes within the city, the I-15 corridor and other state facilities have large traffic volumes and larger concentrations of crashes. The 9000 South Interchange stands out as the dominant crash hotspot in the study area. The largest concentration of hotspots along city facilities occurs at the intersection of Centennial Parkway and 10080 South.

When it comes to bicyclist safety, most crashes occur at major street intersections. Dedicated and striped bike lanes, signs to alert drivers of cyclists, and bulb-outs are but a few interventions that can help improve the safety of intersections. The only corridors in the Sandy downtown area with bicycle crashes were 9000 South, 10000 South, 10600 South, and State Street. Dedicated bike facilities that run parallel to 9000 South would greatly improve bicyclist safety.

Crashes that involved pedestrians also primarily occurred along major streets and intersections. This analysis found that 50 percent of all pedestrian-involved crashes for the city occurred in the Sandy downtown area. Lighting conditions played a significant factor in pedestrian safety. Increasing outdoor lighting coverage, especially along major streets, will improve the visibility and overall safety for drivers and pedestrians alike. An analysis of existing streetlight infrastructure could easily identify where infrastructure improvements could improve pedestrian safety. Requirements for new developments to added sufficient lighting could be examined, especially on wide roadways with commercial or other retail development.

4 DOWNTOWN TRAFFIC ANALYSIS



Downtown Sandy has become a regional destination with significant mixed-use development that includes Rio Tinto Stadium completed in 2008. The downtown area extends from approximately 9000 South on the north, TRAX to the east, 10600 South on the south, and I-15 to the west. These highways and TRAX provide the primary access to downtown Sandy along with State Street. While these corridors provide access to the downtown area for private vehicles, transit and active transportation, traffic has become a growing issue in and around the downtown area. The purpose of this downtown analysis is to evaluate the effects of planned development in the downtown area from a transportation perspective. Through this analysis, options for transportation improvement can be identified that improve traffic within the Cairns Master Plan and Stadium Village Master Plan framework for "a walkable focused urban design, which includes a context-sensitive infrastructure."

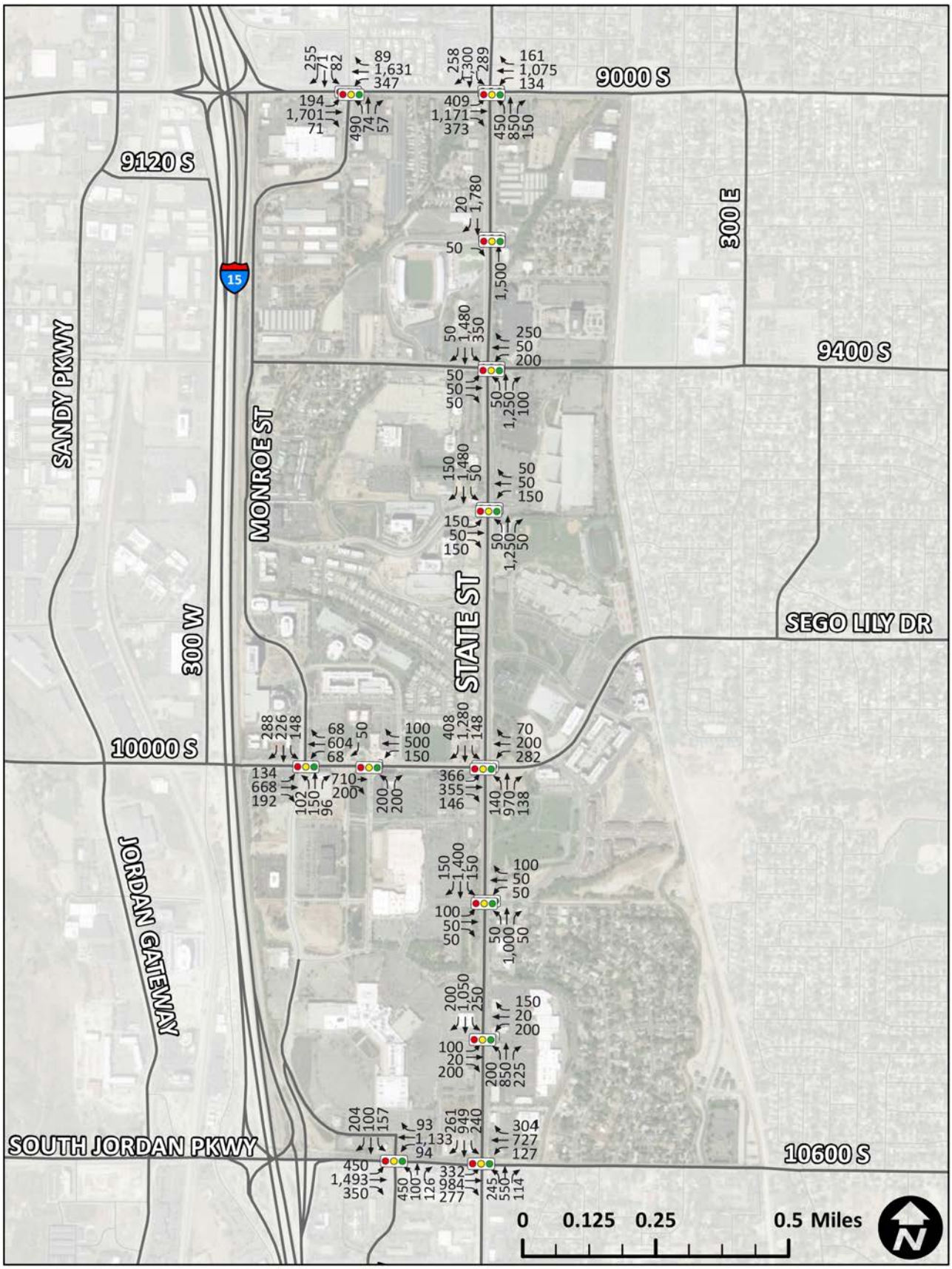
Existing Conditions

While the downtown Sandy has many elements that support the overall vision of the Cairns Master Plan area, several transportation elements present mobility challenges to achieve this vision for downtown Sandy. Below are the findings from a detailed review of the existing transportation conditions in the downtown core.

Traffic Volumes

Existing intersection turning movement volumes are based upon data collected as part of the 2019 Sandy City Signal Synchronization project. These 2019 traffic volumes are from Automated Traffic Signal Performance Measures (ATSPMs). The ATSPMs are a summary of data gathered by the traffic signal controller during signal operations. The data is summarized in a variety of methods to show how the signal is performing. Some of the operation data includes signal phase time served, pedestrian activations, phase split failures, and vehicle data. The metrics available at each signal varies based on the level of detection and number of detector channels. For this project ATSPMs were used to evaluate existing conditions and to provide data for the Synchro models. ATSPM also includes turning movement counts and approach volume which were used to create Synchro models to evaluate existing traffic conditions. **Figure 4–1** summarizes the existing PM peak hour traffic volumes at major intersections within or surrounding the downtown area.

Figure 4–1 Existing (2019) PM Peak Hour Traffic Volumes



Intersection Level of Service

The analysis of peak hour intersection traffic operations is a primary indicator of roadway system performance. Average vehicle delay was determined utilizing the methodology found in the Highway Capacity Manual (HCM) 6th Edition. Level of service (LOS) is used to describe the operating performance of an intersection and is measured quantitatively based on average vehicle delay and reported on a scale from A to F, with A representing the best performance and F the worst. LOS D or better is generally considered acceptable for urbanized areas. For unsignalized intersections, LOS is based on the approach with the highest delay. **Table 4–1** provides a brief explanation for each LOS and the associated delay per vehicle.

Avenue used the Synchro traffic analysis software to evaluate the operations of the study intersections. The existing conditions level of service results are summarized in **Figure 4–2**. Overall, only the intersection of State Street / 9000 South is currently operating at LOS F with multiple movements at LOS E/F due to existing capacity constraints. All other intersections have an overall LOS of D or better.

Although all intersections have an overall LOS of D or better, some individual movements are currently at LOS E or F. These movements with higher delay are generally on cross-street roadways that intersect higher volume road such as 9000 South or State Street. These movements with higher delay can explain the feeling of increased traffic congestion within the downtown area.

Table 4–1 Intersection Level of Service

Level of Service	Traffic Conditions	Unsignalized	Signalized
		Average Delay (seconds/vehicle)	Average Delay (seconds/vehicle)
A	Free Flow Operations / Insignificant Delay	0 ≤ 10.0	0 ≤ 10.0
B	Smooth Operations / Short Delays	>10.0 and ≤ 15.0	>10.0 and ≤ 20.0
C	Stable Operations / Acceptable Delays	>15.0 and ≤ 25.0	>20.0 and ≤ 35.0
D	Approaching Unstable Operations / Tolerable Delays	>25.0 and ≤ 35.0	>35.0 and ≤ 55.0
E	Unstable Operations / Significant Delays Begin	>35.0 and ≤ 50.0	>55.0 and ≤ 80.0
F	Very Poor Operations / Excessive Delays Occur	> 50.0	> 80.0

Source: Highway Capacity Manual (HCM) 6th Edition, Transportation Research Board National Research Council, Washington D.C.

Figure 4–2 Existing PM Peak Hour Level of Service

Pedestrian Traffic

The overall transportation network is more than just streets and vehicle traffic. It includes sidewalks, trails, and crosswalks that accommodate pedestrians and other users. The pedestrian network is especially important in the downtown area for local business. These hotels, restaurants, and shops attract numerous people every day. As illustrated in **Figure 4–3** there is a developed pedestrian network with 29 miles of sidewalks, 2.7 miles of trail, and 112 crosswalks to facilitate pedestrian mobility in the downtown area.

To better understand pedestrian demand in the area, ATSPM pedestrian actuation data were collected as part of this study. These pedestrian signal actuations were evaluated for 16 existing traffic signals within the downtown area. These pedestrian actuations summarize the number of times the crosswalk button has been pushed and the crosswalk signal was called to allow for pedestrians to cross the intersection. The pedestrian actuations represent the number of times pedestrians could cross the street at the signal and not the total number of pedestrians, since each actuation can allow for one or more pedestrians to cross. The pedestrian actuation data is available from UDOT's ATSPM website http://udottraffic.utah.gov/atspm and was used to calculate the average weekly pedestrian actuations.

Figure 4–4 shows the number of weekly pedestrian actuations at each of these intersections. The most actuations were at the intersection of 9000 South / State Street with over 2,600 pedestrian actuations per week. The intersections of 9000 South / Monroe Street and 10600 South / Auto Mall Drive had the second and third most pedestrian actuations with 982 and 922 actuations, respectively. Most pedestrians were crossing the side streets going east or west.

Figure 4–3 Existing Pedestrian Network

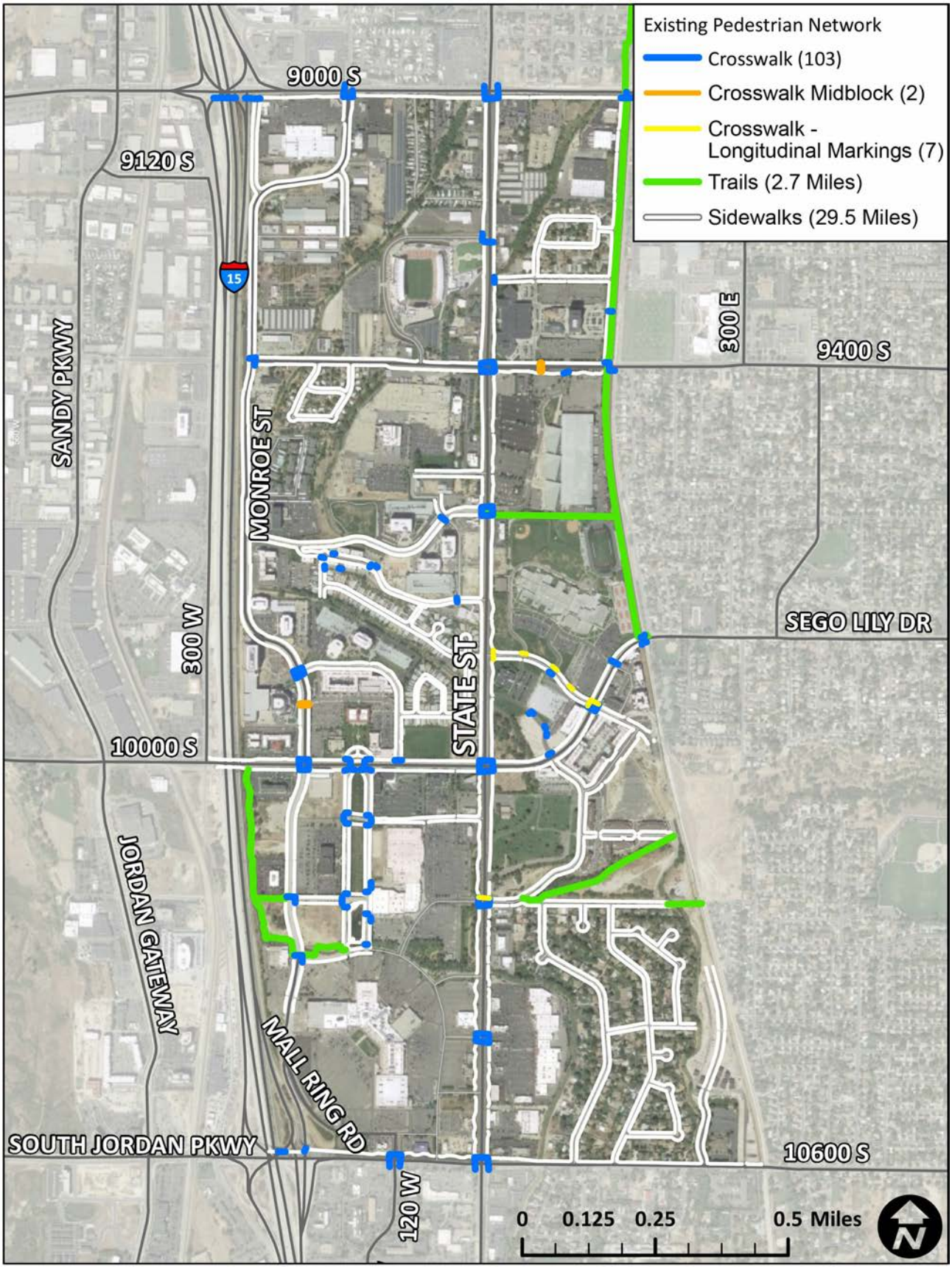
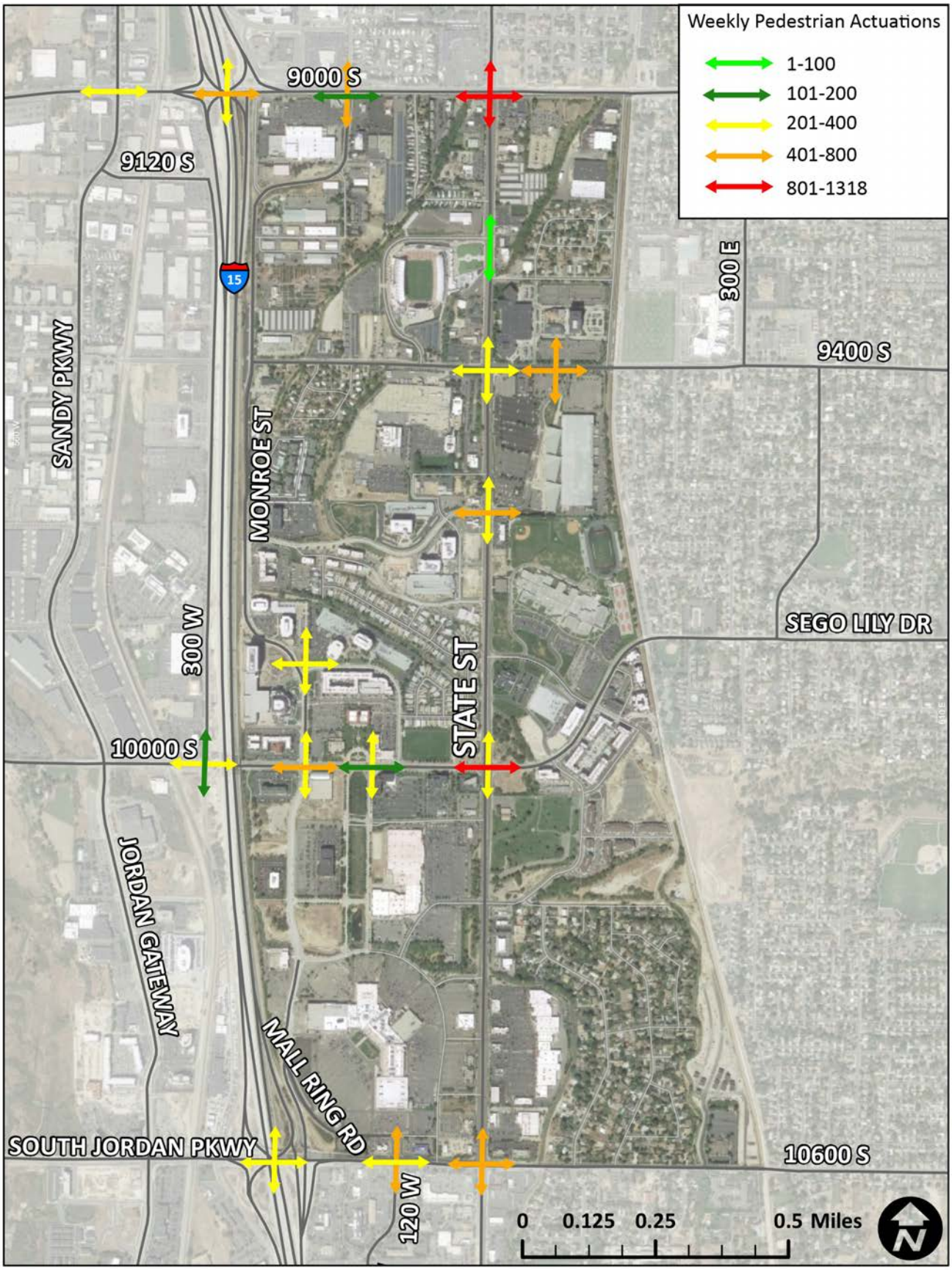


Figure 4–4 Weekly Pedestrian Actuations (2019)

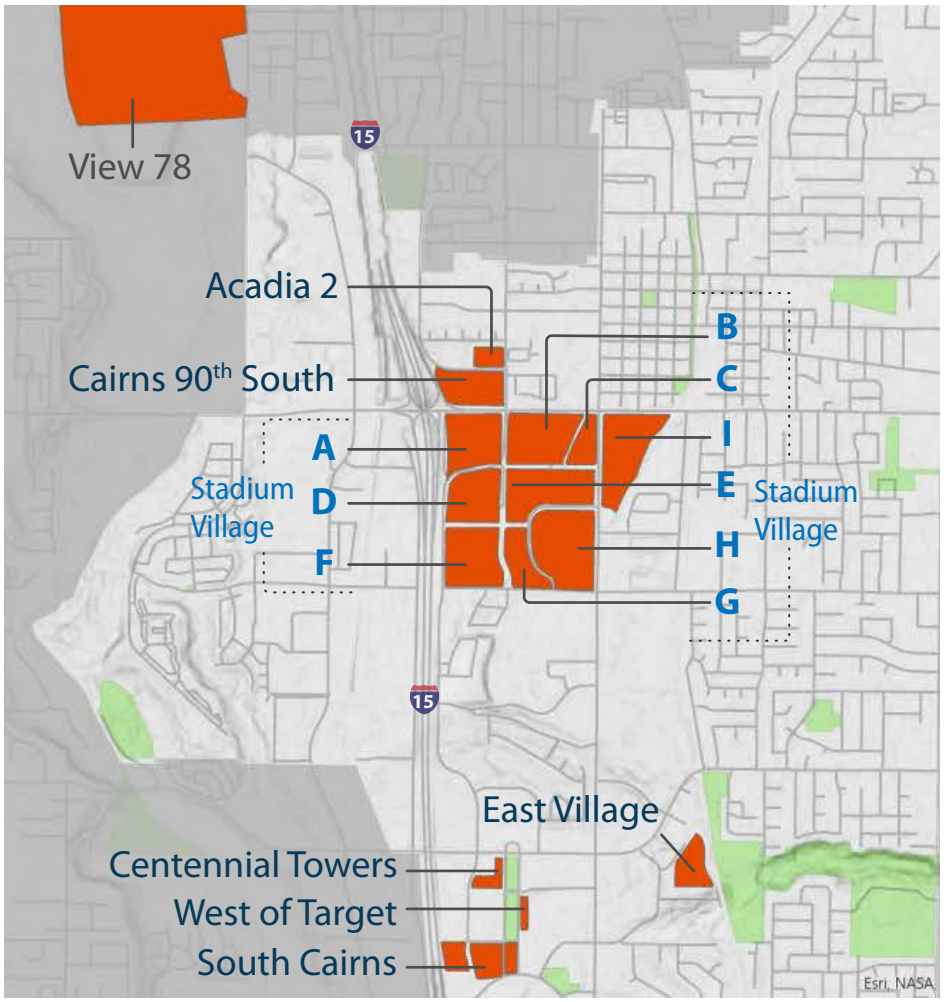


Future Conditions with Anticipated Development

The downtown area is planned to have significant growth with over 6,800 residential units and nearly four million square feet of office and retail development. These anticipated developments and planned redevelopment areas are shown in **Figure 4–5**.

The amount of anticipated development in the downtown area as well as within all of Sandy City is summarized in **Table 4–2**. Overall, the majority of known and anticipated development is planned for the downtown area. All office and retail space are proposed within the downtown area while 92 percent of the residential units are also expected to be constructed in or near downtown Sandy. This development will significantly increase the number of trips to and from the downtown area resulting in increased traffic congestion.

Figure 4–5 Anticipated Development – Downtown Area



Trip Generation

Trip generation for the anticipated development was derived from the Institute of Transportation Engineer's (ITE) publication, Trip Generation, 10th Edition. This report provides standards and recommendations for the probable vehicle trip generation for various land uses based upon nationwide studies of existing developments in comparable settings. The selected land use types, which most accurately reflects the proposed developments, are listed in **Table 4–2**. The details included in **Table 4-2** come directly from the Cairns Master Plan and other development site plans.

There are other developments listed at the bottom of Table 4-2 that represent new growth outside of downtown.

The daily and PM peak hour trip generation for the anticipated developments near downtown are summarized in **Table 4–3**. The proposed developments will add over 100,000 vehicles a day to the street network in downtown Sandy. The total calculated number of PM peak hour vehicle trips is more than 10,500. However, due to the mixed-use nature of the proposed downtown development, internal capture rates were assumed to be 10 to 17 percent depending on land use. Internal trip capture is the portion of trips generated by a mixed-use development that both begin and end within the development. The importance of internal trip capture is that those trips satisfy a portion of the total development's trip generation and they do so without using the external road system. These net trips are also summarized in the table below and were used to evaluate future traffic conditions.

Table 4–2 Anticipated Development Summary

Development	Residential (units)	Office (sq. ft.)	Retail (sq. ft.)	Hotel (rooms)	Other	Other Description
Downtown Developments						
Stadium Village						
A	666	38,000	82,200	-	-	
B	416	38,000	80,650	-	-	
C	340	-	-	-	-	
I	332	48,000	9,000	-	-	
D	165	583,600	29,200	-	72,300 sf	Entertainment
E	1,182	108,900	106,300	240	128,000 sf	Hotel
F	-	558,600	37,200	240	244,000 sf	Hotel/Storage
G	-	289,500	14,760	-	56,000 sf	Museum
H	336	-	-	-		
Arcadia 2	177	-	-	-		
West of Target	100	-	-	-		
Centennial Towers	100	-	-	-		
Cairns 90th South	-	150,000	11,900	107		
South Cairns	204	414,000	41,400	228		
East Village (Final Phase)	307	-	-	-		
Downtown Totals	**4,325**	**2,228,600**	**412,610**	**815**		
Other Developments						
View 78	2,514	1,300,000				
Farnsworth Farms	100	-	-	-	-	
Wasatch Drive - East	400	-	-	-	-	
Reams	40	-	-	-	450 students	School
Combined Totals	**7,379**	**3,528,600**	**412,610**	**815**	**-**	

Table 4–3 Downtown Trip Generation

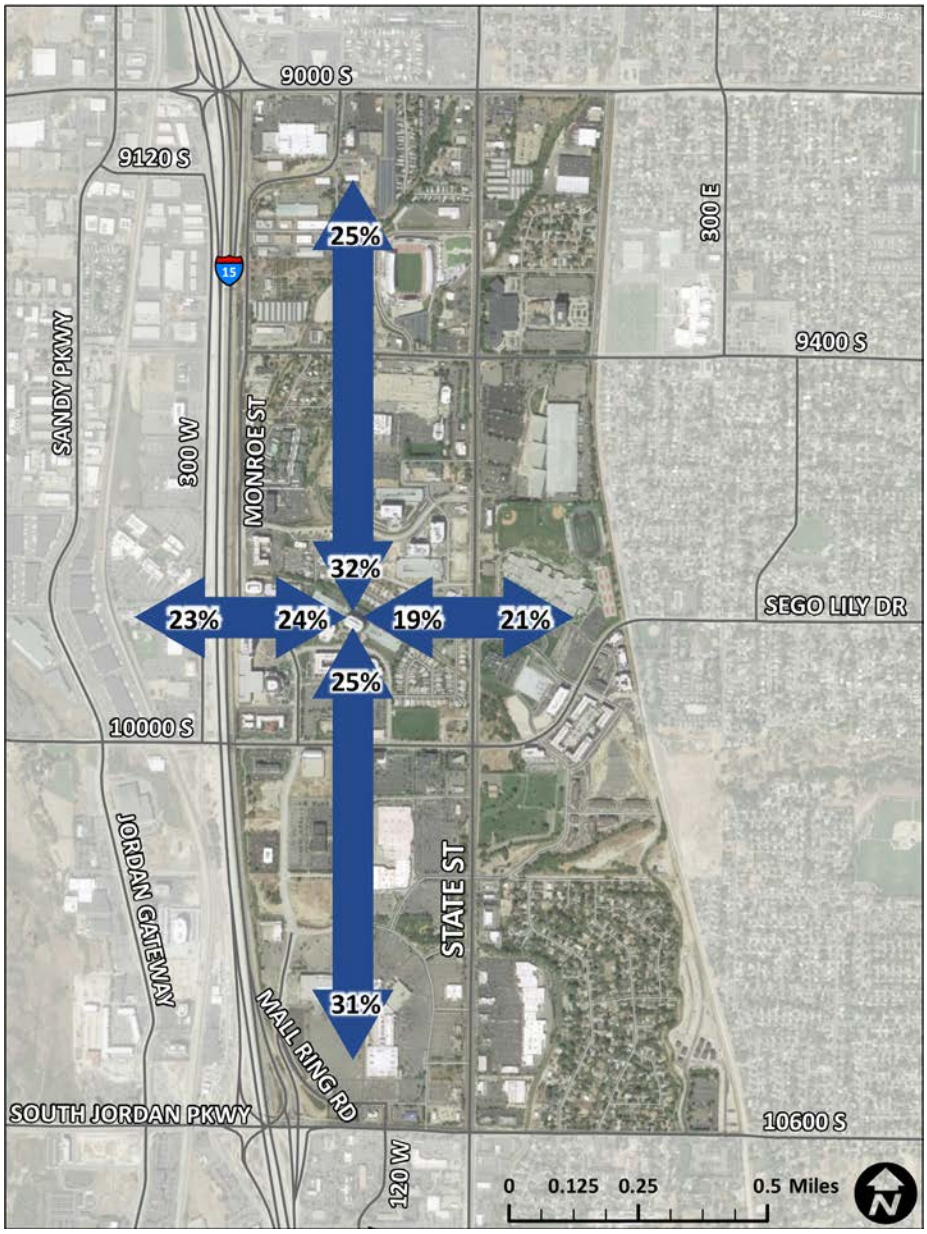
	Daily Total Trips			PM Peak Total Trips			PM Peak Net Trips		
Development	Total	In	Out	Total	In	Out	Total	In	Out
Stadium Village - A	9,300	4,650	4,650	810	410	400	700	350	350
Stadium Village - B	7,850	3,950	3,950	690	340	350	600	290	310
Stadium Village - C	1,850	950	950	150	90	60	120	80	40
Stadium Village - D	3,500	1,750	1,750	290	140	150	250	120	130
Stadium Village - E	10,650	5,450	5,250	1,320	480	840	1,210	450	760
Stadium Village - F	16,250	8,150	8,100	1,380	690	690	1,210	610	600
Stadium Village - G	11,150	5,600	5,550	1,090	330	760	990	300	690
Stadium Village - H	4,650	2,350	2,300	470	120	350	430	110	320
Stadium Village - I	1,850	900	900	150	90	60	120	70	50
Arcadia 2	950	500	500	80	50	30	60	40	20
West of Target	550	250	250	40	30	10	40	20	20
Centennial Towers	550	250	250	40	30	10	40	20	20
Cairns 90th South	3,900	1,950	1,950	350	110	240	320	110	210
South Cairns	10,750	5,400	5,400	990	340	650	900	310	590
East Village	1,650	850	850	140	80	60	110	70	40
View 78	26,450	13,250	13,250	2,600	910	1,690	2,260	780	1,480
Downtown Total	111,850	56,200	55,850	10,590	4,240	6,350	9,360	3,730	5,630

Trip Distribution

The distribution of the anticipated trips was based on the traffic patterns in the study area. **Figure 4–6** shows the trip distribution that was used for this analysis. This distribution assumes the northbound left-turn at the intersection of 9000 South / Monroe Street is capacity constrained to 1,000 vehicles per hour. Based upon the existing traffic patterns total demand for this movement exceeds 1,500 vehicles per hour. The additional 500 vehicles were assumed in the future to use other access points for egress from the downtown area. This is shown in the percent changes in the in-bound and out-bound trips in Figure 4-6.

There are a couple of on-going projects downtown, like a new intersection at 9000 and Monroe, and we have assumed these projects in place in the modeling and analysis

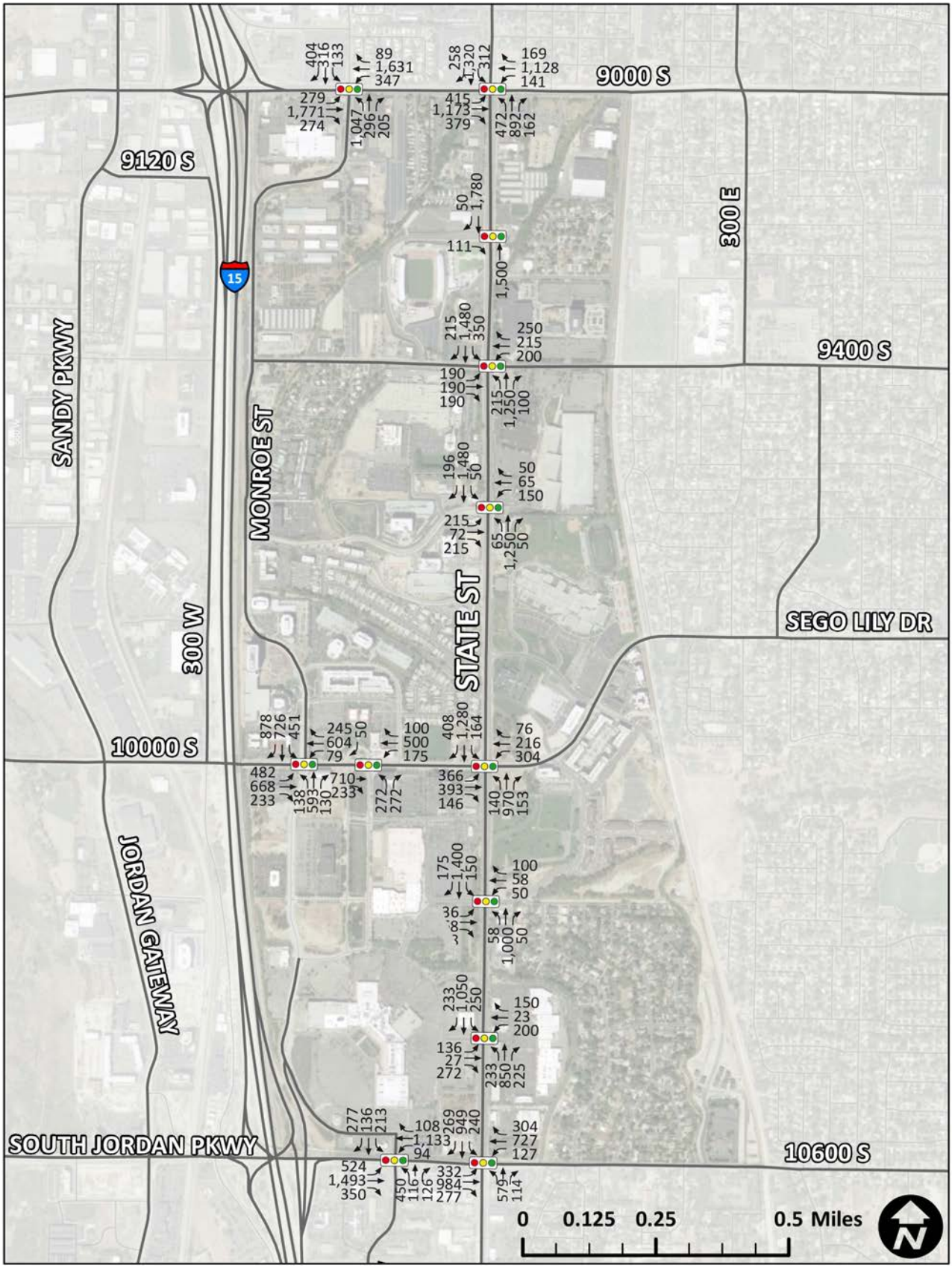
Figure 4–6 Assumed Trip Distribution



Existing Traffic Plus Anticipated Development

The existing traffic volumes were added to the projected traffic for the downtown area to develop the total traffic that was used in the traffic operations analysis. These total volumes are shown in **Figure 4–7**. As discussed previously, the northbound left at 9000 South / Monroe Street is limited to 1,000 vehicles. The additional vehicles were reassigned to other intersections. While traffic volumes increase at all intersections with the anticipated developments, the intersections on 9000 South have the highest traffic volumes out of all the intersections included in the analysis.

Figure 4–7 Existing Plus Planned Traffic Volumes – PM Peak Hour



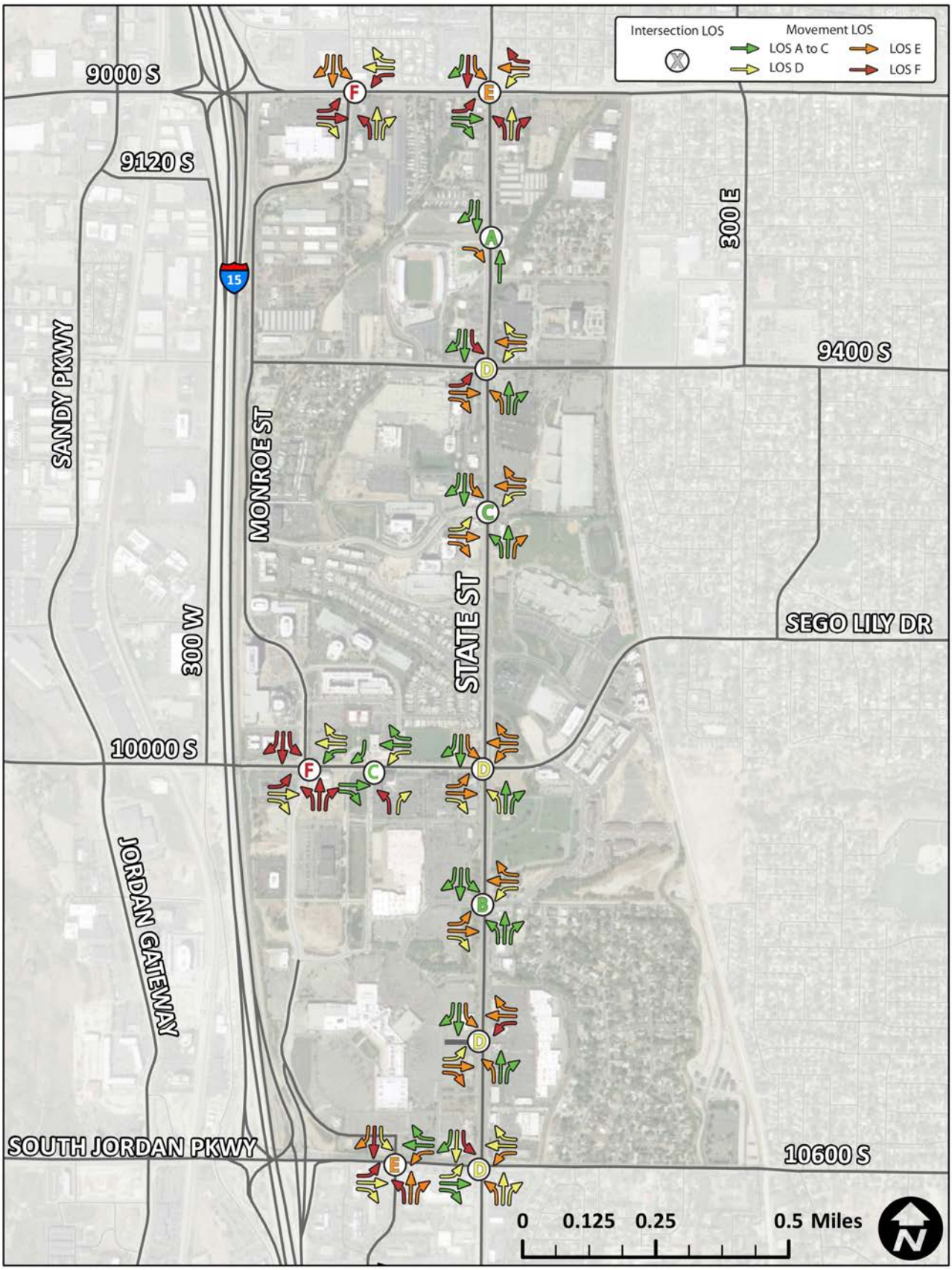
Existing Plus Planned Development Intersection Level of Service

Figure 4–8 summarized the PM peak hour LOS with the planned downtown developments. These results assumed the completion of all active projects including the I-15 northbound reconstruction and other improvements like the Monroe Street realignment.

At 9000 South /Monroe Street the northbound left-turn lanes were assumed to be widened to triple-lefts to accommodate the forecasted 1,000 vehicles/hour with the downtown development. Even with these capacity improvements, the anticipated developments will result in the intersections of 9000 South / Monroe Street and 10000 South / Monroe Street operating at LOS F during the PM peak hour.

Additionally, the intersections of 9000 South / State Street and 10600 South / Auto Mall Drive will be at LOS E.

Figure 4–8 Existing Plus Planned Development Level of Service



Potential Intersection Options

Based upon the operation analysis, four intersections are expected to experience significant delays with the anticipated downtown developments. These intersections include:

- 9000 South / Monroe Street
- 9000 South / State Street
- 10000 South / Monroe Street
- 10600 South / Auto Mall Drive

To address these operational issues, two options were identified to improve each intersection. These improvements were developed to reduce delay to meet LOS D or better at each intersection if possible.

9000 South / Monroe Street

ThrU-Turn Intersection with Additional Improvements

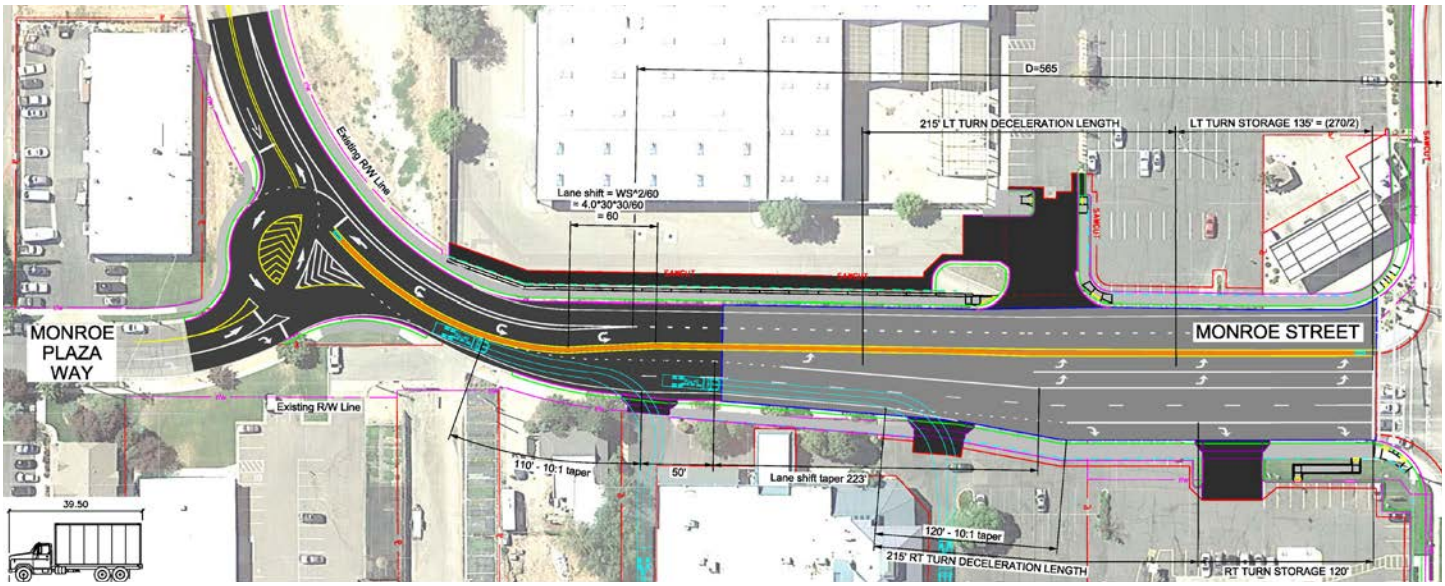
Conceptual design for a ThrU-Turn intersection, also known as median U-turn or Michigan left-turn intersection has been completed for the intersection of 9000 South and Monroe Street as illustrated in **Figure 4–9**.

Building on this design we considered an option that includes triple north-bound lefts and removes the eastbound and westbound left-turns on 9000 South improving intersection operations. Drivers wanting to make a left turn will now turn right onto Monroe Street where they can make a U-turn at the turnaround at Monroe Plaza Way and continue through the 9000 South intersection.

This intersection option also requires additional lanes to accommodate traffic with the downtown developments. These include:

- an additional northbound left-turn lane at 9000 South (triple lefts),
- two northbound thru lanes at the turnaround, and
- two southbound thru lanes at the turnaround

Figure 4–9 Monroe Street and 9000 South Intersection Interim Improvement Conceptual Design



I-15 / 9000 South

Northbound Access to CD System

A substantial proportion of the traffic from Monroe Street is going to northbound I-15. Based upon travel demand model results, over half of the vehicles making a northbound left-turn at Monroe Street / 9000 South are going to northbound I-15. To accommodate this movement, a northbound access at 9400 South to the Collector/Distributor (CD) system was evaluated. This connection would provide improved connectivity from downtown to I-15 reducing northbound left-turn volumes at Monroe Street / 9000 South. However, even with this connection reducing the northbound left-turn volume by 50%, additional intersection improvements at 9000 South and Monroe will be required. These include:

- triple northbound left-turn lanes, and
- westbound right-turn lane

9000 South / State Street

North/South Continuous Flow Intersection

Two continuous flow intersection (CFI) options were considered at this location due to the high left-turn volumes. The first option is a north/south CFI that displaces the northbound and southbound left-turns to crossovers.

East/West Continuous Flow Intersection

The second option considered was an east/west CFI that displaces the eastbound and westbound left-turns.

These CFI options could also be modified to a full CFI with crossovers on all approaches, but only a partial CFI is needed in order to meet LOS D standard.

10000 South / Monroe Street

Dual Eastbound Lefts Plus Dual Southbound Rights

The additional traffic from the planned downtown development can be addressed with conventional improvements of additional turn lanes at the 10000 South / Monroe Street intersection. Due to high eastbound left-turn volumes with the developments, dual eastbound left-turn lanes will be required. The north intersection leg will also require additional turn lanes. One option is to add dual southbound right-turn lanes to serve the high southbound right-turn volume.

Dual Eastbound Lefts Plus Dual Southbound Lefts

The second option also requires dual eastbound left-turn lanes. However, instead of adding a southbound right-turn lane, this option adds dual southbound left-turn lanes. Both options improve the intersection to LOS D.

10600 South / Auto Mall Drive

Single Southbound Left-Turn Lane Thru-lane

Monroe Street is planned to be extended from the current terminus at the northbound I-15 off-ramp to 10600 South as phase 3 of the extension project. This extension of Monroe Street presents an opportunity to revise the lane configuration on the north intersection leg with 10600 South. Currently, the southbound approach has two left-turn lanes, a thru/right lane, and a right turn lane. Due to the short distance between 10600 South and Mall Ring Road, these dual left-turn lanes provide additional storage. However, they are not required for the existing traffic volume.

One option is to revise the southbound lane geometry as part of the extension project and could include:

- one left-turn lane,
- one thru-lane, and
- two right-turn lanes

These changes keep the same number of lanes on this leg of the intersection and accommodate more of the southbound right turns, which is the heaviest movement.

Eastbound / Westbound Right-turn Lanes

The additional improvement would be to install eastbound and westbound right-turn lanes on 10600 South. This would separate the thru and right turn movements allowing the thrus to go straight unimpeded, improving the overall intersection LOS.

Intersection Options Level of Service

Table 4–4 summarizes the overall intersection delay and level of service for the baseline conditions as well as the intersection options with the traffic from the anticipated developments. These options result in reduced delay at the four intersections that are expected to function at LOS E/F. Generally, each option provides a similar delay reduction. However, the east/west CFI at 9000 South / State Street offers a larger delay reduction than a north/south CFI at that location.

Table 4–4 Intersection Options Level of Service

Intersection	Option	Delay (sec)	Level of Service
9000 South / Monroe Street	*Baseline**	90.4	F
	*ThrU + Additional Improvements**	53.2	D
	*I-15 NB On-ramp Connection**	53.6	D
9000 South / State Street	*Baseline*	64.6	E
	North/South CFI	55.3	E
	East/West CFI	41.0	D
10000 South / Monroe Street	*Baseline*	247.7	F
	SB Dual Right-Turn Lanes	52	D
	SB Dual Left-Turn Lanes	51.6	D
10600 South / Auto Mall Drive	*Baseline*	55.7	E
	SB Single Left / Dual Right Lanes	48.9	D
	East/West Right-Turn Lanes	53.2	D
	Combination SB Dual Right Lanes & East / West Right - Turn Lanes	41.3	D

* Includes northbound triple left-turn lanes to accommodate anticipated demand with planned development.

Roadway Level of Service

In addition to the intersection operation analysis, the travel demand model was utilized to understand how many travel lanes will be required on key streets within the downtown area. A future interchange with I-15 is planned at 9400 South. However, with the ongoing construction of the northbound I-15 CD system there is some uncertainty to the feasibility of constructing a full interchange at this location. To account for this uncertainty, future roadway capacity was evaluated for three scenarios:

- No Interchange I-15/9400 South
- Partial Interchange I-15/9400 South
- Full Interchange I-15/9400 South

All these scenarios assumed the realignment of Monroe Street, widening of 9400 South from I-15 to State Street, and the downtown grid street network as proposed in the Stadium Village Master Plan. These forecasts represent year 2050 conditions with full buildout of the planned developments detailed above.

No Interchange I-15/9400 South

Figure 4–10 summarizes the anticipated year 2050 roadway LOS without an interchange at 9400 South. With this scenario most downtown roadways are LOS D or better. The only exceptions are 9000 South, State Street and 10600 South, which makes sense considering there is no 9400 South / I-15 access to reduce congestion at the existing interchanges. This no-interchange option keeps a good LOS on collectors within downtown, but it is difficult for drivers to access downtown from I-15. Without improved interchange capacity, development could be artificially capped at a lower level due to the limited accessibility.

Partial Interchange I-15/9400 South

The roadway LOS results for a partial interchange at 9400 South are summarized in **Figure 4–11**. This scenario assumes a northbound on and off-ramps to the I-15 CD system. With this option, Monroe street would likely need two-lanes in each direction from 9400 South to 9000 South along with intersection improvements at 9000 South / Monroe Street. Although this option provides some traffic reduction on 9000 South and 106000 South, it also increases traffic volume significantly on 9400 South creating a potential barrier for walking and biking in the downtown area.

Full Interchange I-15/9400 South

Figure 4–12 illustrates the expected roadway LOS with a full interchange at 9400 South. While this interchange option reduces traffic volumes the most on 9000 South and 10600 near I-15, it also has significantly higher traffic volumes on 9400 South. Five lanes will likely be required on 9400 South from Monroe Street realignment to I-15, and five lanes are needed from Sandy Parkway to I-15 to achieve LOS D. However, these high traffic volumes and wide roadways through the center of downtown create barriers to walking/biking across 9400 South. A grade separated pedestrian facility should be considered in this scenario. A pedestrian tunnel along the Salt Lake Canal is a viable solution.

The full interchange option reduces overall congestion and delay for Sandy residents accessing I-15 because it alleviates pressure at the 9000 South and 10600 interchanges. Basically, it spreads I-15 access to three points instead of only two. However, it adds the most traffic to downtown, increasing volumes and delay on 9400 South.

Option Comparison

Table 4–5 provides a qualitative comparison of the intersection options as well as the 9400 South interchange. Overall, these options reduce delay compared to no build conditions. The options with additional connectivity to I-15 via a new slip ramp from 255 West or new interchange at 9400 South would have the most right-of-way impacts and costs. The options that only include minor turn lane improvements have lower right-of-way requirements and costs. These higher capacity options that significantly increase traffic volume through downtown such as the 9400 South interchange or a CFI on 9000 South are less walkable and bikeable than the turn lane improvements. These alternatives that reduce the walkability and bikeability of downtown are also not consistent with the completed masterplans that provides "a walkable focused urban design, which includes a context-sensitive infrastructure." These options can help guide the implementation of context sensitive transportation solutions that improve mobility as the area continues to transform to a second regional downtown.

Table 4–5 Potential Improvement Comparison

Intersection	Option	Reduces Delay	Right-of-way	Cost	Walkable/ Bikeable	Consistent with Cairns Master Plan Urban Design
9000 South / Monroe Street	*ThrU + Additional Improvements*	✓✓✓	✓✓	✓✓	✓✓	✓
	I-15 NB On-ramp Connection	✓✓✓	✓✓✓	✓✓✓	✓✓	✓✓
9000 South / State Street	*North/South CFI*	✓✓	✓✓	✓✓	✓	✓✓
	East/West CFI	✓✓✓	✓✓	✓✓	✓	✓✓
10000 South / Monroe Street	*SB Dual Rights*	✓✓✓	✓	✓	✓✓	✓✓✓
	SB Dual Lefts	✓✓✓	✓	✓	✓✓	✓✓✓
10600 South / Auto Mall Drive	*SB Single Left / Dual Rights*	✓✓	✓	✓✓	✓✓	✓✓✓
	East/West Right-Turns	✓✓	✓✓	✓✓	✓✓	✓✓✓
9400 South / I-15 Interchange	*No Interchange*	✓	✓	✓	✓✓✓	✓✓✓
	Partial Interchange	✓✓✓	✓✓✓	✓✓✓	✓	✓
	Full Interchange	✓✓✓	✓✓✓	✓✓✓	✓	✓

✓ Low
✓✓ Medium
✓✓✓ High

Figure 4–10 Year 2050 No Interchange 9400 South

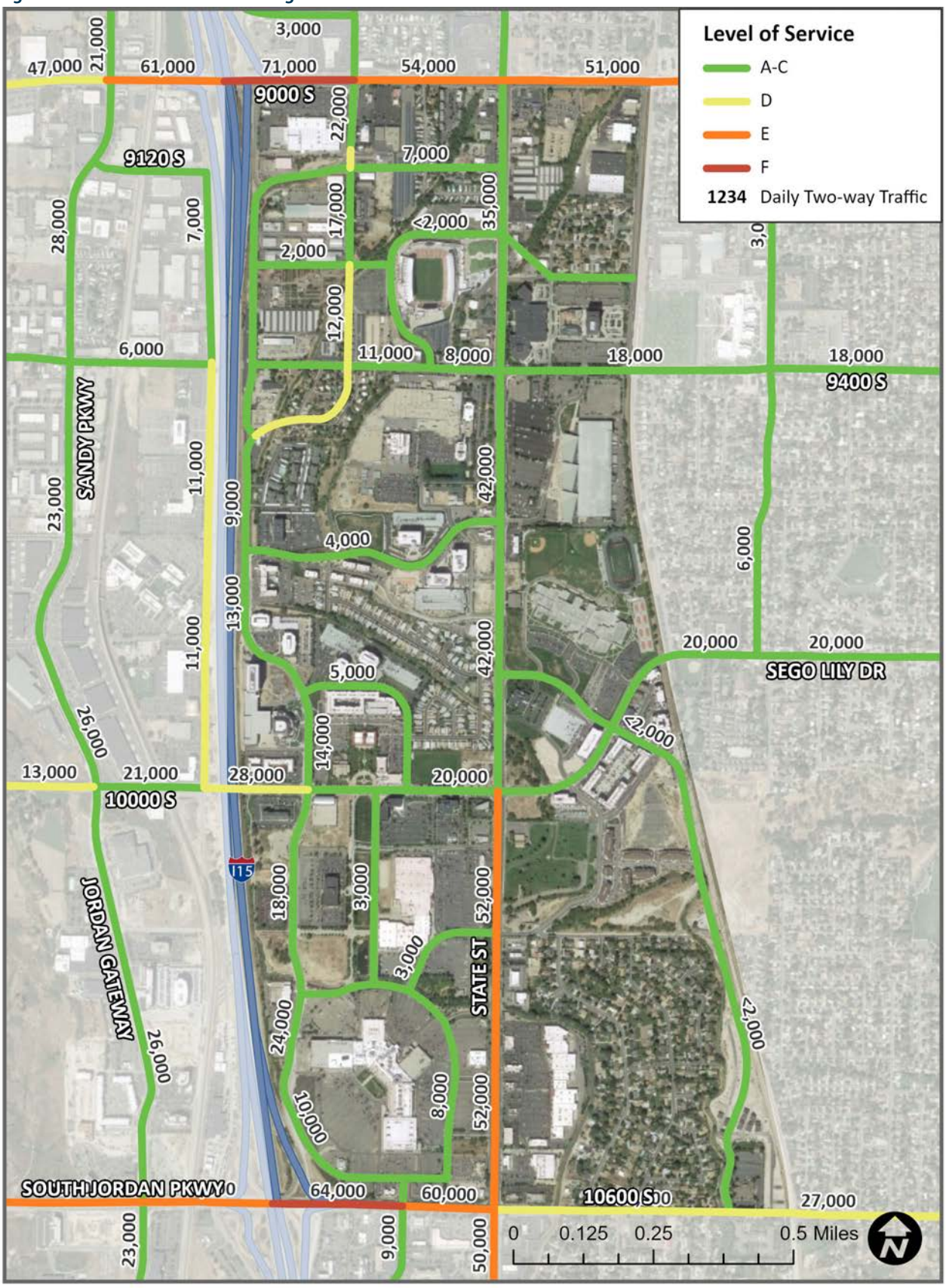


Figure 4–11 Year 2050 Partial Interchange 9400 South – Access to/from Northbound I-15

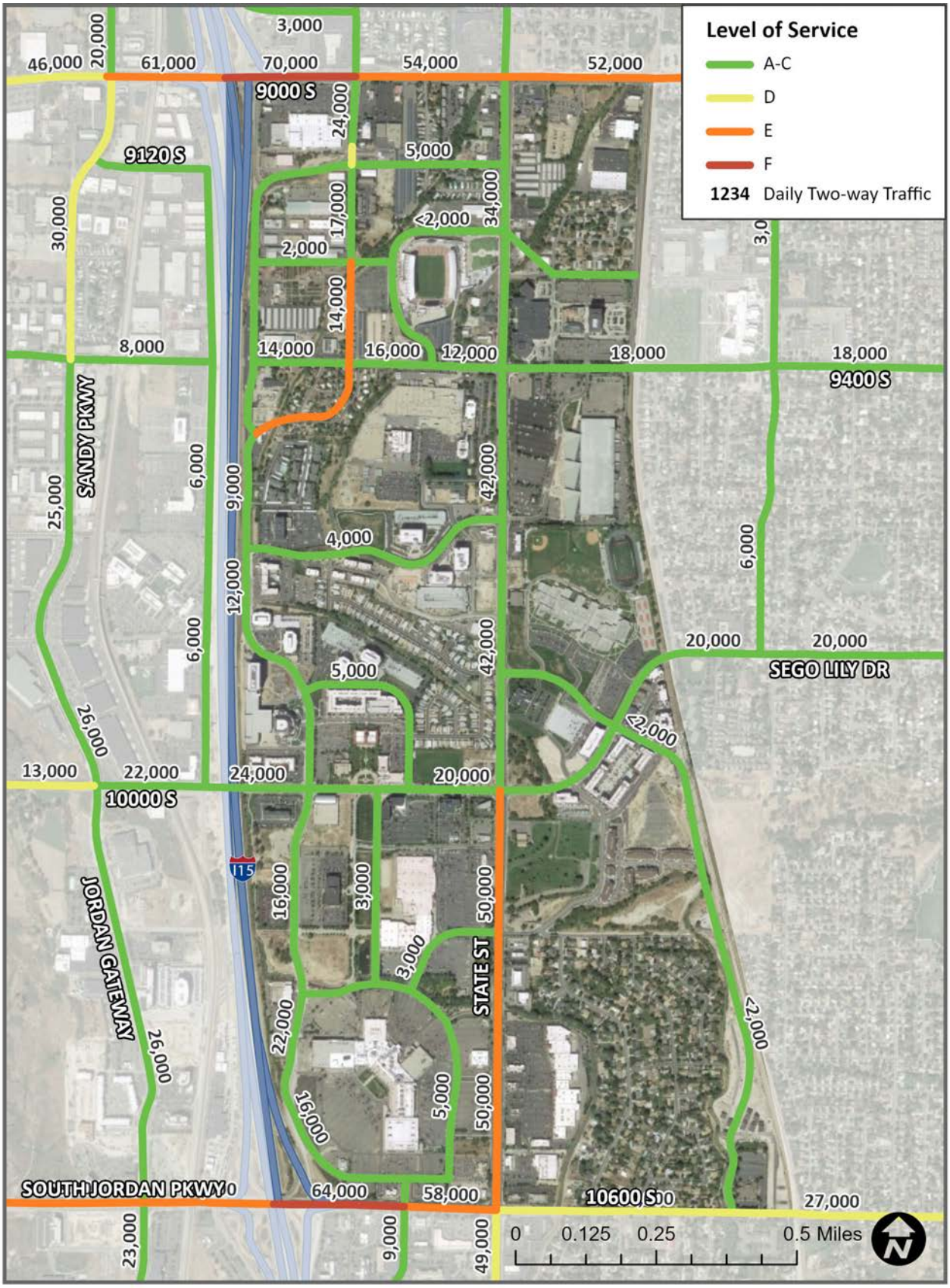


Figure 4–12 Year 2050 Full Interchange 9400 South

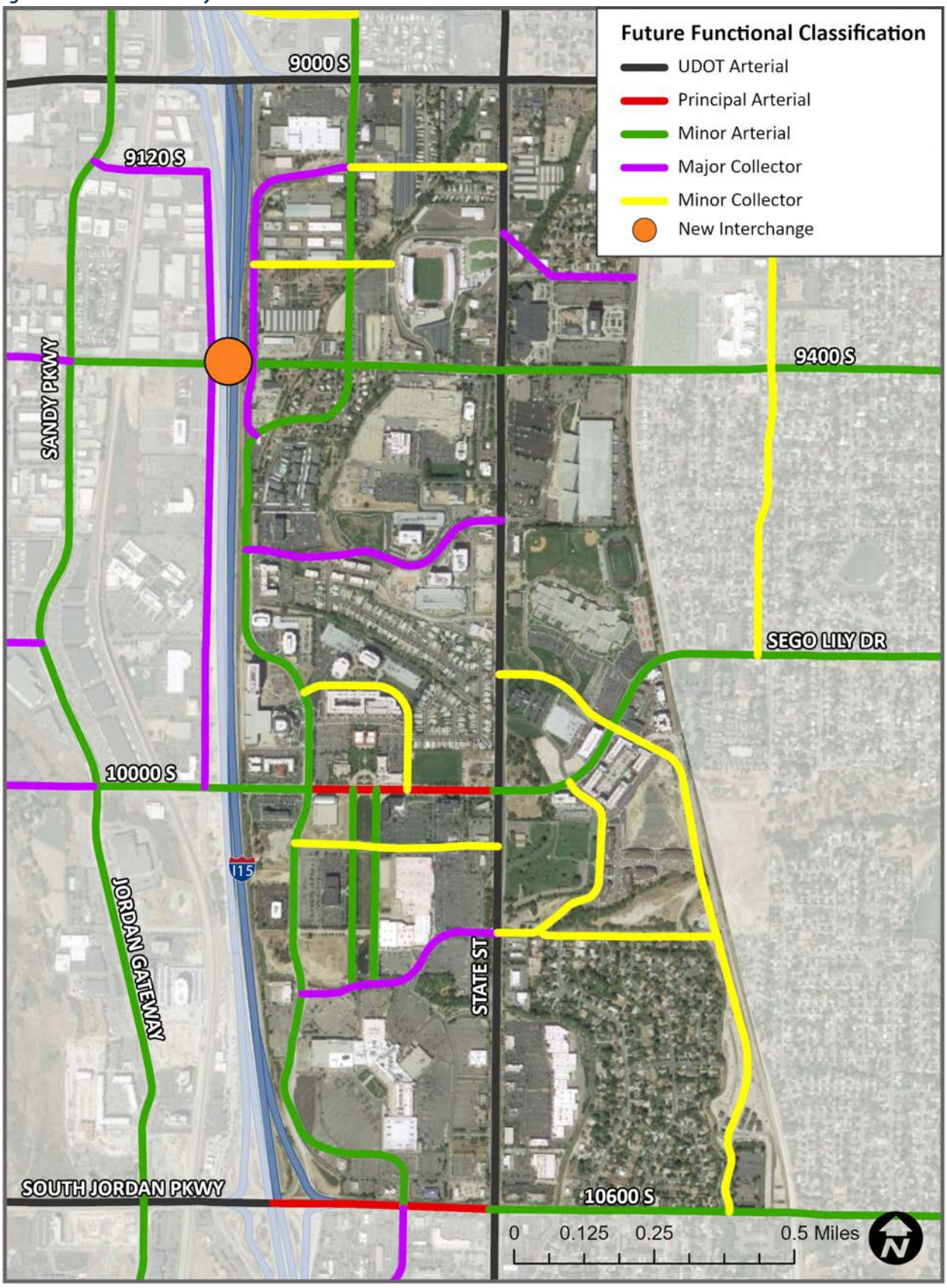
Functional Classification

The numerous roadways within the Sandy Downtown are categorized by their functional classification. A streets' functional classification takes into consideration its design, speed, capacity, and relationship to existing and future land use development. Determining a streets' functional classification is important for determining routes eligible to receive Federal aid, and for prioritizing transportation improvement projects. The functional classification categories relevant to the study area include the following:

- **Principal Arterials** that have a high degree of mobility (can handle lots of traffic movement), but lower accessibility overall (with relatively few driveways or on-ramps present).
- **Minor Arterials** that provide service for trips of moderate length, serve smaller geographic areas, and offer connectivity to the higher arterial system.
- **Major Collectors** that gather traffic from local roads and funnels it to the arterial system. These have higher degrees of accessibility (connecting areas such as neighborhoods, business parks, or recreational destinations to larger arterials).
- **Minor Collectors** that are similar to their Major Collector counterparts, but have slightly lower speeds, volumes, and serve smaller geographic areas.

Figure 4–13 incorporates the travel demand model results and assigns functional classifications to all roadways within the study area. The future Principal Arterials of note include State Street, 9000 South, and 10600 South. The future minor arterials are 9400 South, Sego Lily Drive /10000 South, Centennial Parkway, and a portion of Monroe Street.

Figure 4–13 2050 Roadway Functional Classification



5 ACTIVE TRANSPORTATION

Active transportation (AT) is a critical component to a vibrant and healthy downtown area. Currently there are very few dedicated on and off-street bicycle facilities within the downtown area. There is however, an existing sidewalk network with good coverage throughout the area. Activity data suggests that most cyclists are going through and not traveling within the downtown area. On the other hand, micro-mobility (Lime) users are mostly restricted within the downtown, with most trip-ends occurring at a few specific locations. The following section explores the existing condition of AT within the downtown, and details existing plans for improvements.

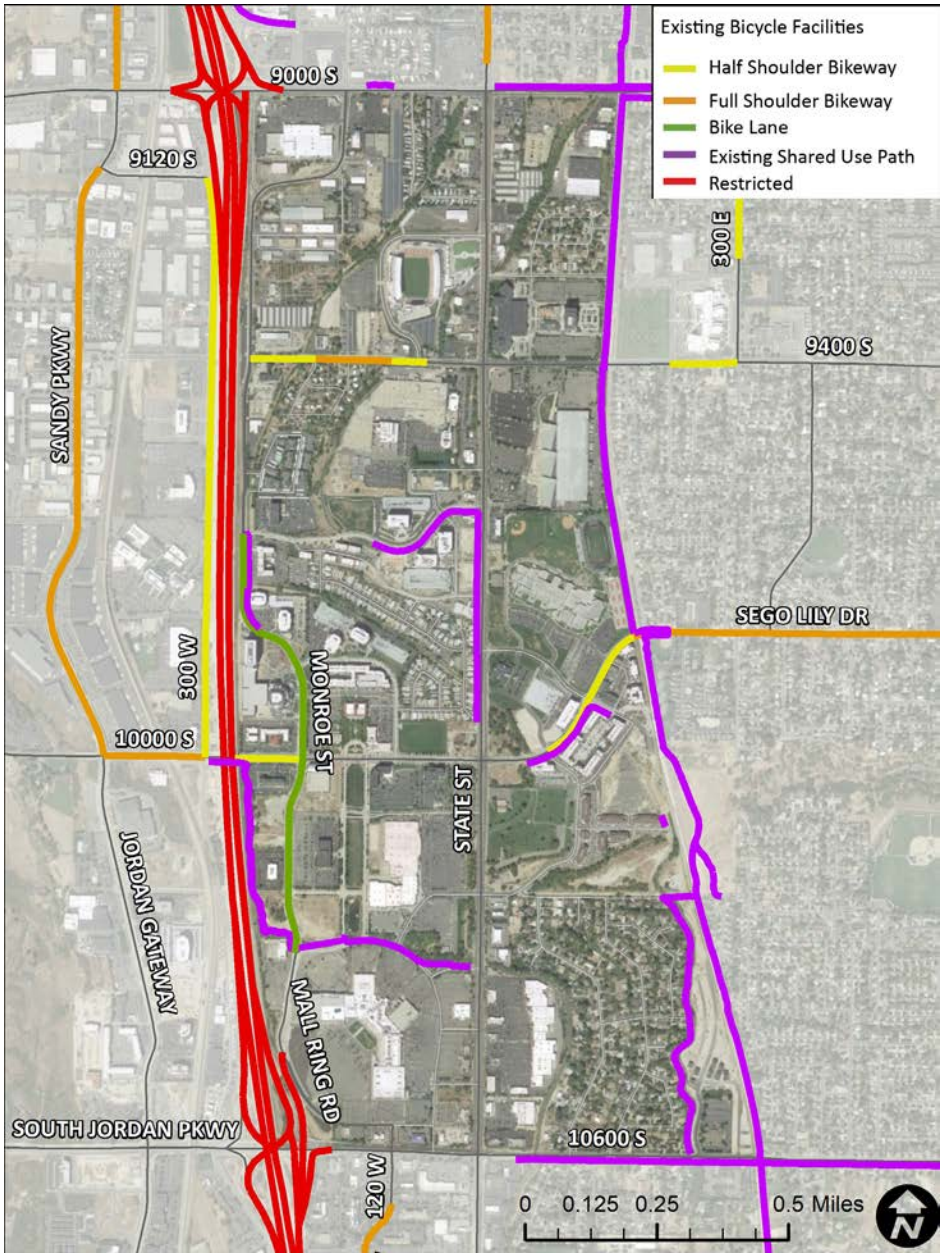
Bicycle Network

Existing Bicycle Network

While there is data showing cyclist activity in the study area, the amount of dedicated physical bicycle infrastructure is quite sparse. There are a few full-shoulder bikeways (shoulders on both sides of the road wide enough to safely accommodate cyclists). These bikeways are found on portions of 9000 South and 9400 South (see **Figure 5–1**). Segments of half shoulder bikeways (shoulder on one side of road that can safely accommodate cyclists), are found on 9400 South, Monroe Street, Sego Lily Drive, 10000 South, and 10600 South.

There is a notable shortage of dedicated bicycle lanes within the downtown area, and the existing shoulder bikeways are very segmented. As roadways projects are planned, it is highly encouraged that bicycle facilities are incorporated into their design.

Figure 5–1 Sandy Downtown Existing Bicycle Network



Bicycle Facility Types

While different bicycle facility types within the downtown area will appeal to different types of riders, all will contribute to expanding transportation options for residents and visitors.

Conventional Bike Lanes

A conventional bike lane is one that is separated from the main roadway by a painted line. They are typically adjacent to the vehicle travel lane and are four to five feet wide. Bike lanes are often accompanied by bike lane signs and painted bike symbols at strategic intervals.

Bike Route

A bike route is where bike riders use the shoulder of the road as their riding space. It is not marked by bicycle paint in the road, but by signs. It is similar to a conventional bike lane but is not specifically marked to be a bike lane. The bike route shoulder space can be shared with on-street parking or other typical roadway shoulder uses.

Neighborhood Byways

Neighborhood byways are usually not marked by signs or paint but are mapped. They provide connections through neighborhoods and between other bikeways. They function like shared roadways but without markings.

Shared Roadways

Shared roadways are roadways shared by both bicycles and motor vehicles. In a shared roadway, the cyclist may use the entire travel lane. Shared roadways may only be used on roads with low traffic volumes and where the posted speed limit is 35 mph or less. The street is typically painted with a shared lane marking to show it's designation and to inform users that cyclists and vehicles may share the same space.

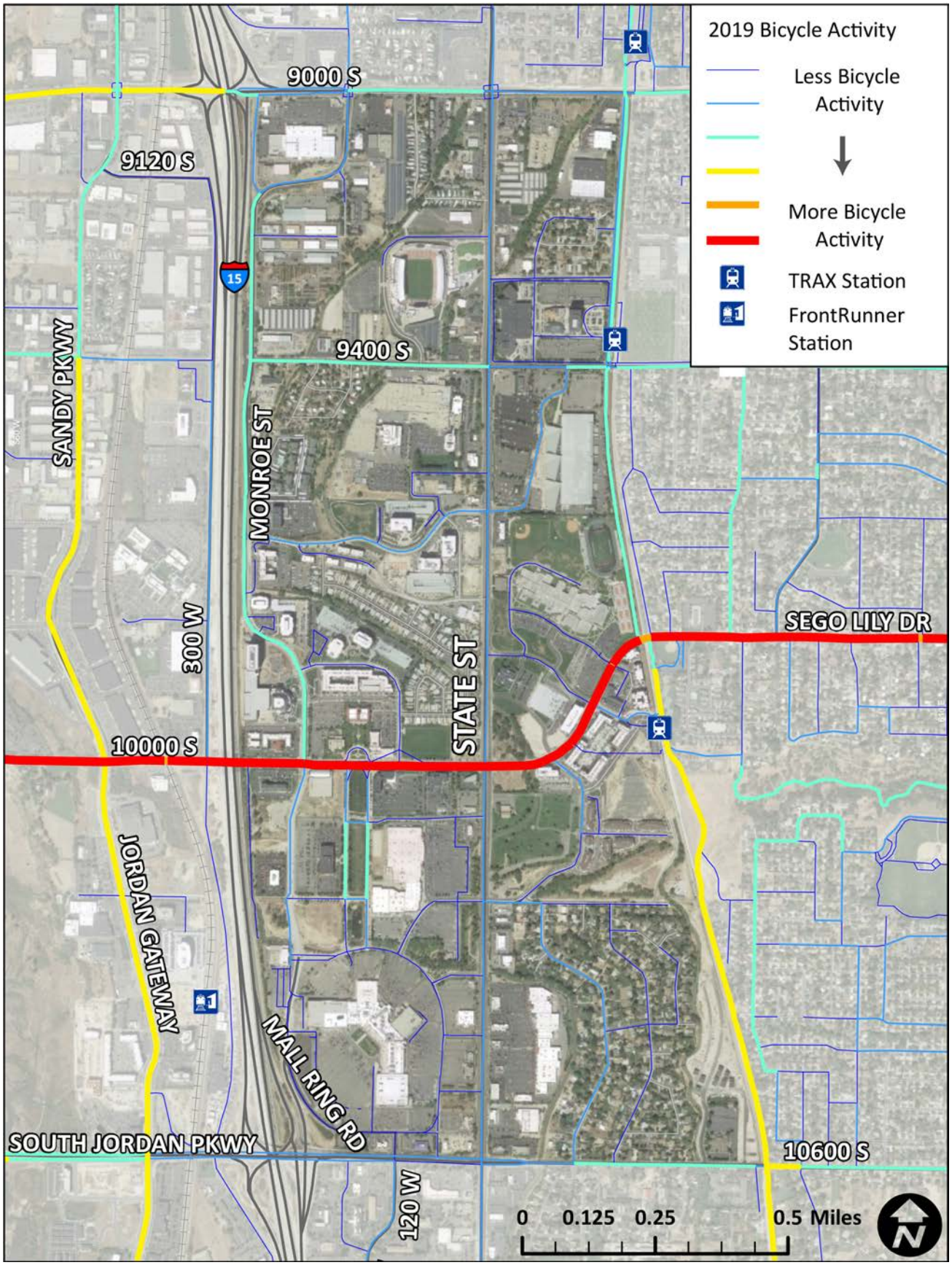
Shared Use/Parallel Bike Paths

Shared use paths provide the highest level of comfort to bicyclists and pedestrians alike. They are often independent of adjacent roadways but can also be configured as broad paved routes significantly wider than conventional sidewalks. When shared use paths intersect other roads, these routes provide users with enhanced crosswalk configurations as well as wayfinding signage.

Bicycle Activity

Activity data indicates a predominant through route on Sego Lilly Drive, without much infiltration into the land uses of the downtown area (see **Figure 5–2**). Shorter, destination-based trips are less likely to be captured in this data given that the source—a fitness-tracking smartphone application popular among competitive cyclists—is more representative of recreational and training trips. However, the lack of low-stress infrastructure and an auto-oriented development pattern does likely result in the low activity levels indicated in the bicycle activity data. In the future, a series of planned bicycle infrastructure projects, including a number of low-stress shared use pathways, should do well to provide good options for people to access desired destinations within the downtown without the use of a personal vehicle.

Figure 5–2 Sandy Downtown Bicycle Activity



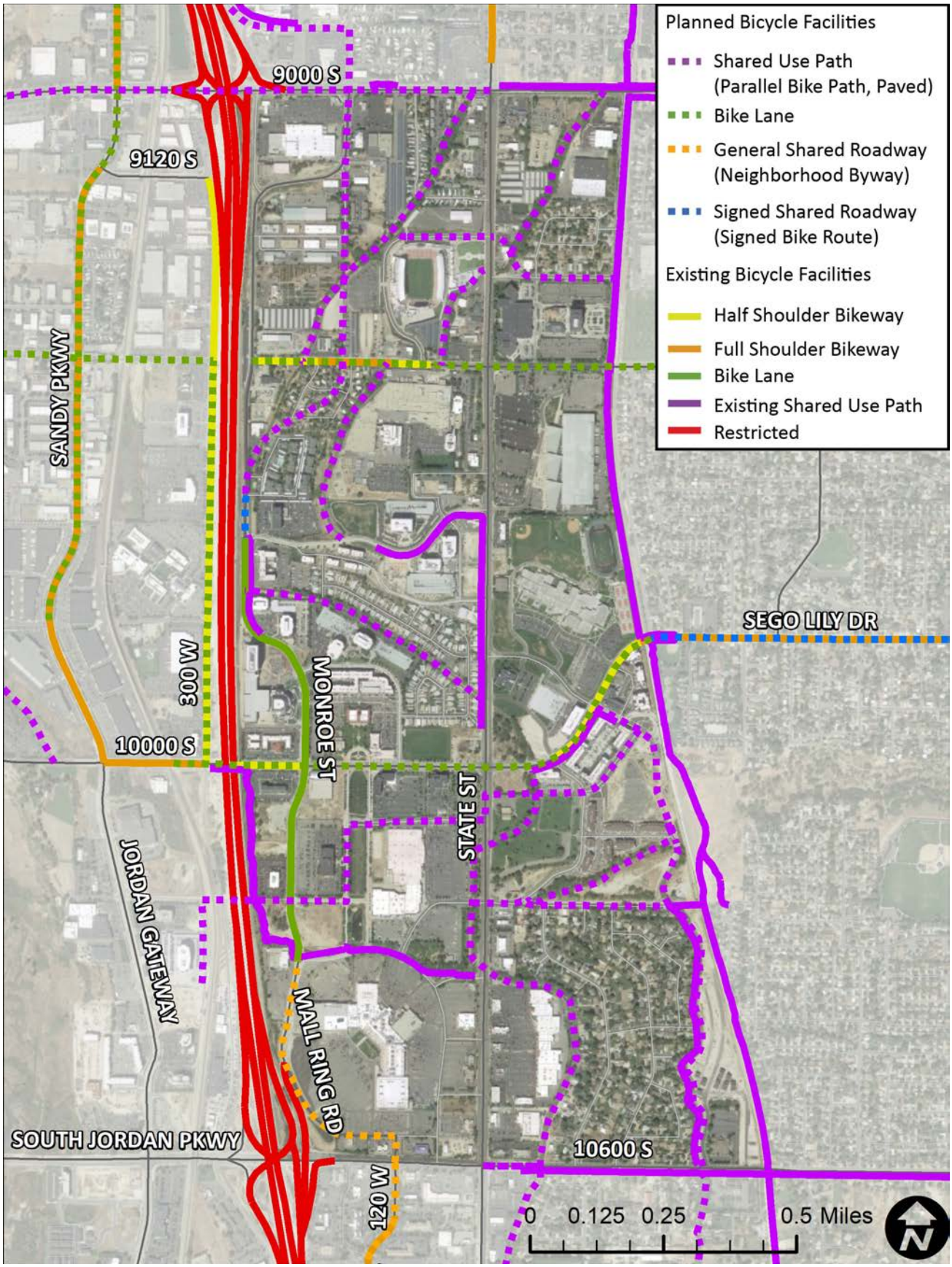
Planned Bicycle Network and Connectivity Improvements

Sandy City's planned bicycle network appears as dotted lines on **Figure 5–3** with existing bicycle infrastructure visible with solid lines. The planned bicycle network includes projects detailed in the Sandy Trails Master Plan, Sandy Active Transportation Plan, and the Cairns Master Plan. The implementation of these plans will link together the existing segments of shared use paths into a cohesive network of bicycle facilities that are accessible to a large number of people. The planned bike lane on 10000 South/Sego Lily Drive will accommodate the significant bicycle activity currently utilizing this route. This project is pending road widening construction to the east of the State Street and Sego Lily Drive intersection. A shared use path will directly link the Sandy Civic Center TRAX Station to the South Jordan FrontRunner Station via a proposed bridge over I-15 at 10200 South.

There is an opportunity for an additional north-south bicycle corridor that interconnects the whole downtown area. This route could parallel State Street, the west side of the TRAX Blue Line, or run along Monroe Street. Currently, bike lanes are present on Monroe Street from Mall Ring Road to Towne Ridge Parkway. Planned bike lanes and shared use pathways along Monroe Street will extend the current facilities to connect the Shops at South Town and the Rio Tinto Stadium (two popular destinations) and provide better north-south connectivity.

Accessing the downtown area from the neighborhoods to the east of the TRAX Blue Line requires detouring to a crossing opportunity. These opportunities are limited between 9000 South and Sego Lily Drive as well as 10200 South and 10600 South. Coordination with adjacent municipalities will ensure greater regional access to Sandy downtown.

Figure 5–3 Sandy Downtown Existing and Planned Bicycle Network

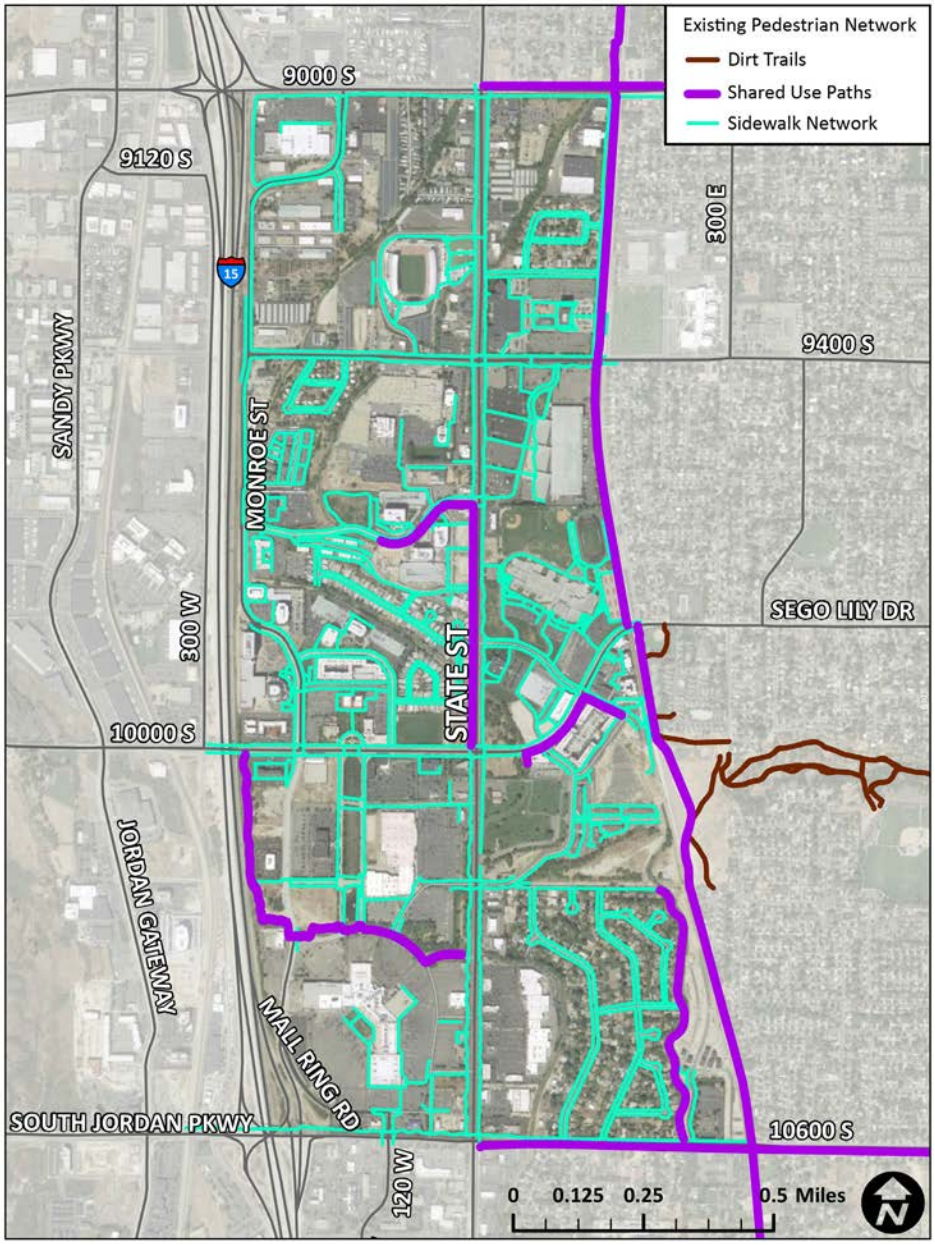


Pedestrian Network

Existing Pedestrian Network

A well-connected sidewalk network is a key part of a vibrant, walkable downtown. The sidewalk network in Sandy downtown is extensive, but the overall grid is large, which can result in unnecessarily long trips for those walking. Most public streets have pedestrian facilities on one or both sides of the road, but there are relatively few connections from those sidewalks to the neighborhoods they serve. Most major destinations have sidewalk access, but fewer access points overall. For example, to access the Shops at Southtown from the north, pedestrians must cross the parking lot or a lengthy detour to the southeast to access the only contiguous sidewalks that connect to 10600 South or State Street (see **Figure 5–4**). This commercial hub lacks easy pedestrian connectivity to the rest of downtown. One regional multi-use pathway parallels the TRAX Blue Line. This serves as a north-south pedestrian corridor. Due to its location on the east side of the tracks, the

Figure 5–4 Sandy Downtown Existing Pedestrian Network



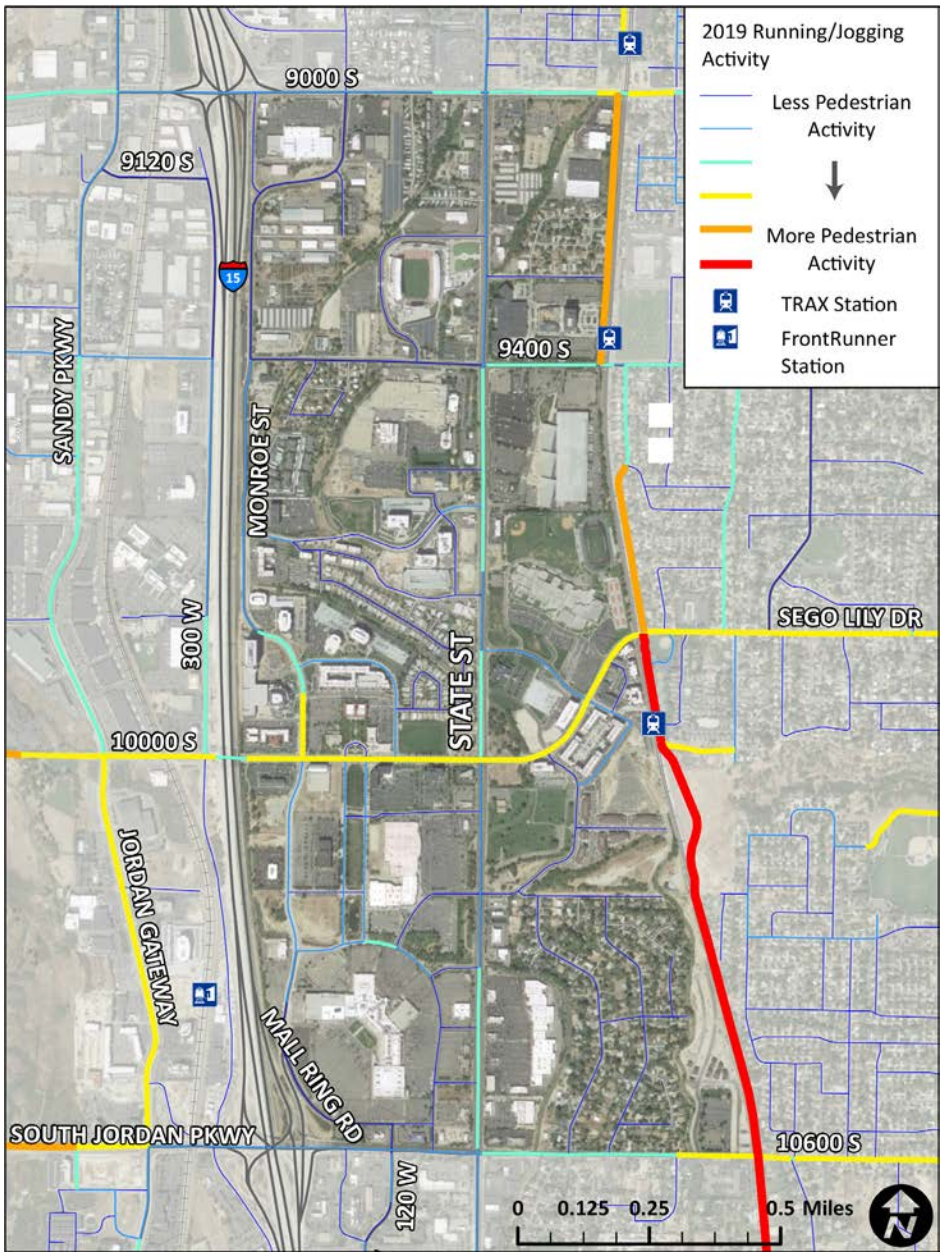
only connections to the to the downtown area to the west are located at major streets with railroad crossings, a tunnel at 10200 South, and a connection at 9270 South pending construction. Segments of a multi-use path network currently exist. They run parallel to portions of Towne Ridge Parkway, State Street, Sego Lily Drive, I-15, Mall Ring Road, and the East Jordan Canal.

The area northwest of the Rio Tinto Stadium is unserved when it comes to pedestrian facilities. There is a clear opportunity to connect Stadium Way to Monroe Plaza Way with sidewalks, thus making much of the northwest area accessible from the stadium.

Existing Pedestrian Activity

Figure 5–5 shows the 2019 pedestrian activity recorded using a GPS-based smartphone app. Although this fitness tracking application mostly captures running/jogging activity, it does show some of the more popular pedestrian routes. The primary north-south route favored by app users is the multi-use trail along the TRAX line. The most heavily used east-west route is along Sego Lily Drive (see **Figure 5–5**). There is some activity on State Street, 10600 South, 9400 South, and Monroe Street as well. There is very little activity around the stadium or in the residential neighborhoods within

Figure 5–5 Sandy Downtown Pedestrian Activity

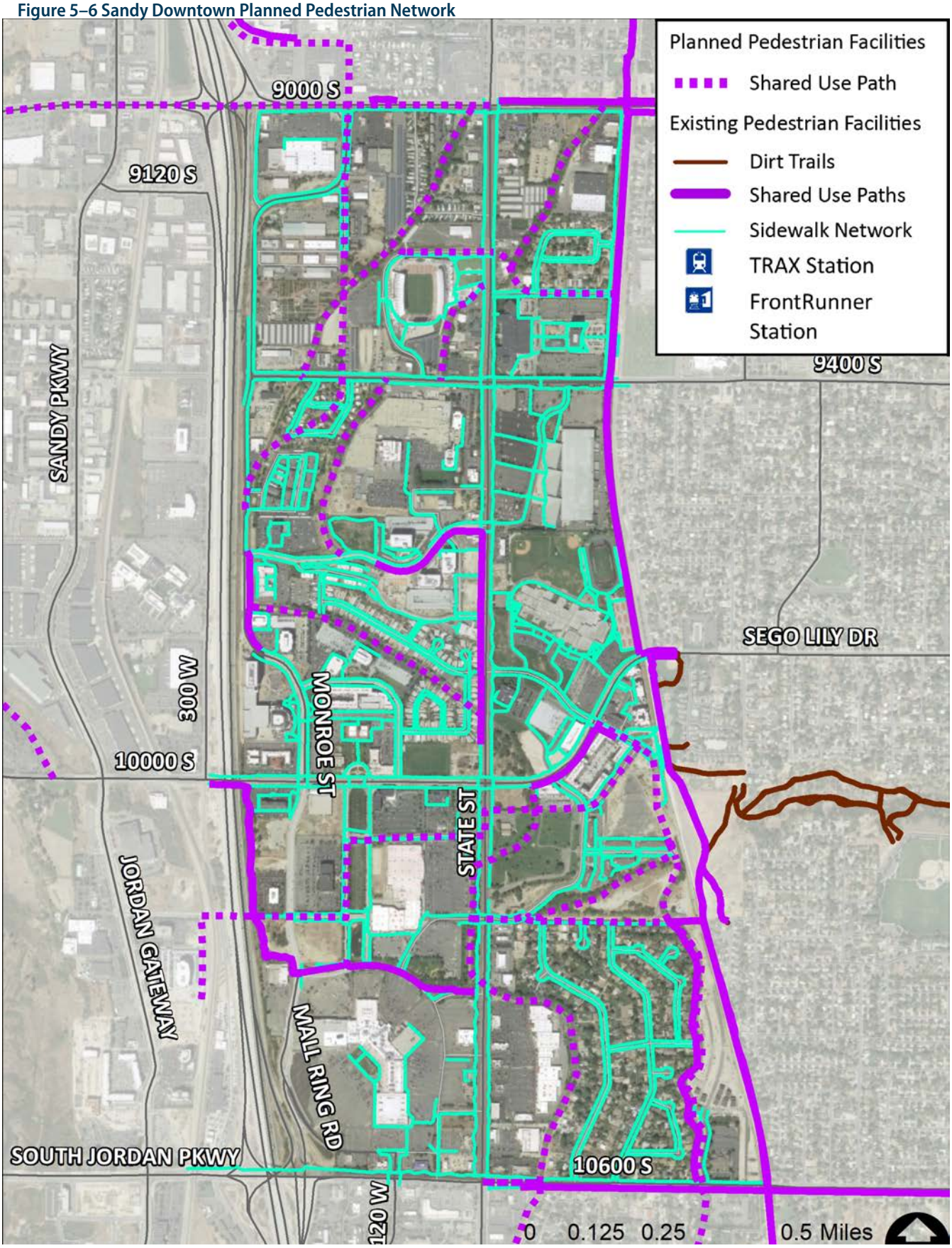


the study area. Despite there being sidewalks on 10600 South across I-15, the app's users greatly preferred to cross I-15 at the underpass on 10000 South.

Planned Pedestrian Network and Connectivity

Sandy City has a few planned shared use paths, which would serve both pedestrians and cyclists. These paths (dotted lines on **Figure 5–6**) will help fill in the gaps in the overall pedestrian network. It is important that when these facilities are built, that they connect to the existing network at every opportunity possible. One noticeable gap in the planned pedestrian network includes the area around the mall (see **Figure 5–6**). Since the mall is a large regional destination, a stronger sidewalk network would be beneficial. Currently the mall is surrounded by a large parking lot, with little shade or sidewalks present. There is also an opportunity to connect the mall with the overall network to the north via Monroe Drive and Centennial Parkway.

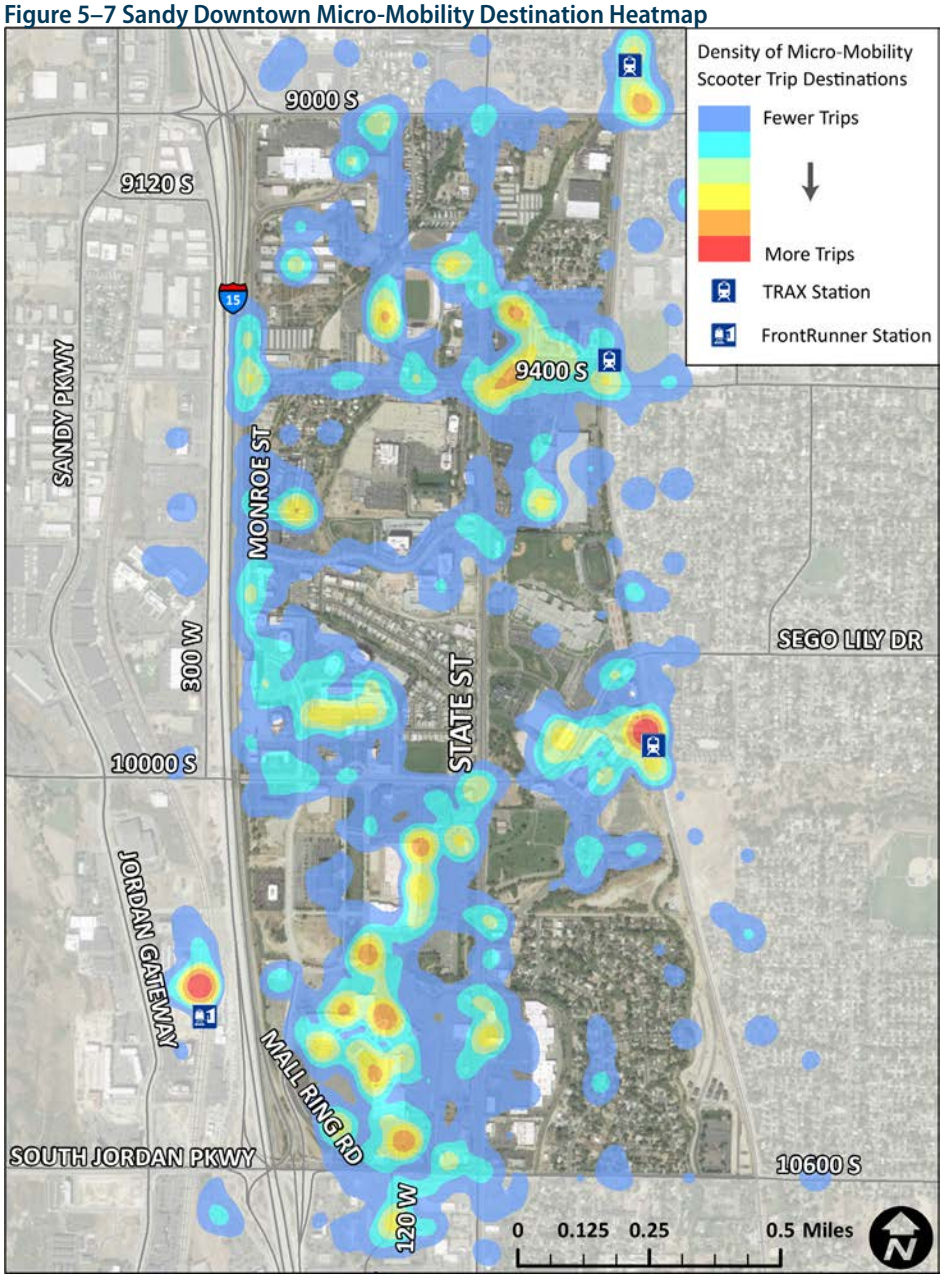
Figure 5–6 Sandy Downtown Planned Pedestrian Network



Micro-Mobility

The Lime scooter micro-mobility service launched in Sandy in June of 2019, in a service boundary area which roughly matches the Sandy downtown geography, extending to 700 East. **Figure 5–7** shows the trip end density of Lime scooter trips within the Sandy downtown for the first year of operation. The biggest hot spot within the downtown is the Sandy Civic Center TRAX Station. Less prominent hot spots also cluster around the Shops at South Town, Target, the Jordan Commons, and the Rio Tinto Stadium. Just outside downtown is a large hot spot at the South Jordan FrontRunner Station and a smaller one at the Historic Sandy TRAX Station.

Figure 5–7 Sandy Downtown Micro-Mobility Destination Heatmap



Summary

In Sandy Downtown there is a lot of opportunity for improvement for on and off-street bicycle facilities. Fortunately, there are plans in place for a number of improvements throughout the area including a robust network of shared use pathways. This may help shift the existing activity pattern of people mainly passing through, to more penetration of bicycle activity into and throughout the downtown. This same planned pathway network will also help to bolster the existing sidewalk infrastructure and helps provide connectivity from popular destinations to existing trail networks (Porter Rockwell) and transit stations. Improved connectivity in a low stress network also supports emerging micro mobility services in the area, and helps create the needed backbone for a vibrant and dynamic downtown area.

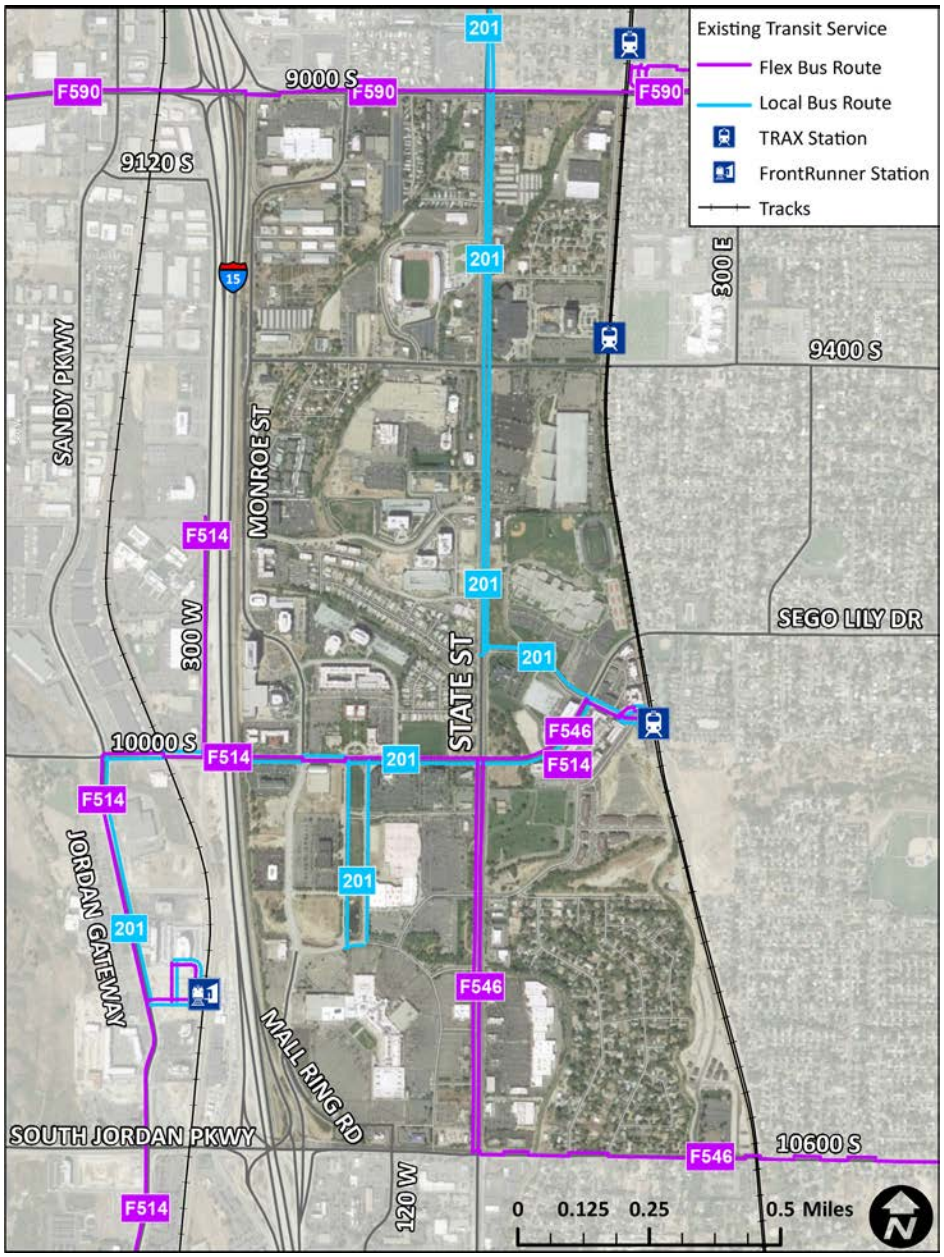
6 TRANSIT

Transit in Sandy downtown area is an integral component of future plans for the area. At present the area has access to bus, light rail, and commuter rail service. More thoroughly integrating these services and expanding regional access to the downtown area is a central component of planned transit projects.

Existing Transit Service

The Sandy downtown area is defined by transportation infrastructure, displayed in **Figure 6–1**. The TRAX Blue Line forms the eastern border of the study area and I-15 constitutes the western border. Three light rail stations—Historic Sandy, Expo Center, and Civic Center—are located within or directly adjacent to the downtown study area. The FrontRunner commuter rail runs just to the west of I-15. FrontRunner commuter rail is accessed using the South Jordan Station. Despite being in a neighboring municipality, this station provides important regional access to the Sandy downtown area.

Figure 6–1 Existing Transit Service in Sandy Downtown



Bus Service

The local, express, and flexible bus routes—displayed in **Figure 6–1**—provide service within the Sandy downtown area and connections to neighboring communities. Additionally, they extend the access to TRAX and FrontRunner stations. At present, no bus routes serve the Sandy Expo Center Station. A suspended express route connected 10600 South to the University of Utah, however being express service, it had a limited number of trips in a day. Currently, the express route has been suspended. Among the remaining bus service routes, four have stops within Sandy downtown.

West Jordan FLEX Route (F590) primarily provides east-west connectivity along the 9000 South corridor from the Historic Sandy Station to West Jordan and the TRAX Red Line Jordan Valley Station. Since flexible routes can deviate from the main route by .75 of a mile, large portions of the northern study area can be accessed by this route that runs along the northern periphery of the study area.

Draper FLEX Route (F546) is another flexible route that connects the Sandy Civic Center Station to the Draper Town Center and Crescent View Stations. It runs along Sego Lily Drive, State Street, and east along 10600 South. Given this route's ability to deviate as well, most areas east of I-15 and south of Sego Lily Drive can be accessed by this route.

State Street South Route (201) is one of two routes that connect the Sandy Civic Center Station to the South Jordan Frontrunner Station. Route 201 runs primarily along State Street from Murray Central Station to the Sandy Civic Center Station. From there it travels west along 10000 South, loops around the Centennial Parkway, continues west to Jordan Gateway before terminating at the South Jordan FrontRunner Station. This route has relatively frequent service throughout the day. It is the only route that provides north-south mobility between 9000 South and 10000 South.

300 West FLEX Route (F514) is the second route that provides service between Sandy Civic Center and the South Jordan Station. The routing follows the route 201 west of Sandy Civic Center Station on 10000 South and continues south to the Draper FrontRunner Station. It too has flexible routing that covers much of the southern portions of the downtown area.

Future Transit Plans

Future transit projects in the Sandy downtown area are detailed in several plans. However, if they will require non-local resources, they must first be included in the Wasatch Front Regional Council's Regional Transportation Plan (RTP). Other plans--such as the Cairns Master Plan, Stadium Village Plan, and the Sandy South Jordan Circulator Study among others--contain additional transit concepts worthy of consideration in future updates. Numerous concepts and ideas designed to further develop transit service exist within the Sandy downtown area. **Figure 6–2** outlines potential alignments for transit projects from these various plans.

Wasatch Choice 2050 RTP Transit Projects

Transit projects within or adjacent to Sandy downtown are currently detailed in two phases of the Wasatch Choice 2050 RTP and are visible in **Figure 6–2**. Phase 1 projects are slated for construction and implementation in 2019-2030. Phase 3 projects are planned for implementation in 2040-2050. Projects can be advanced to a nearer phase if their implementation is needed more immediately. Other plans may utilize different project phasing schema that will need to be translated into the RTP's phasing.

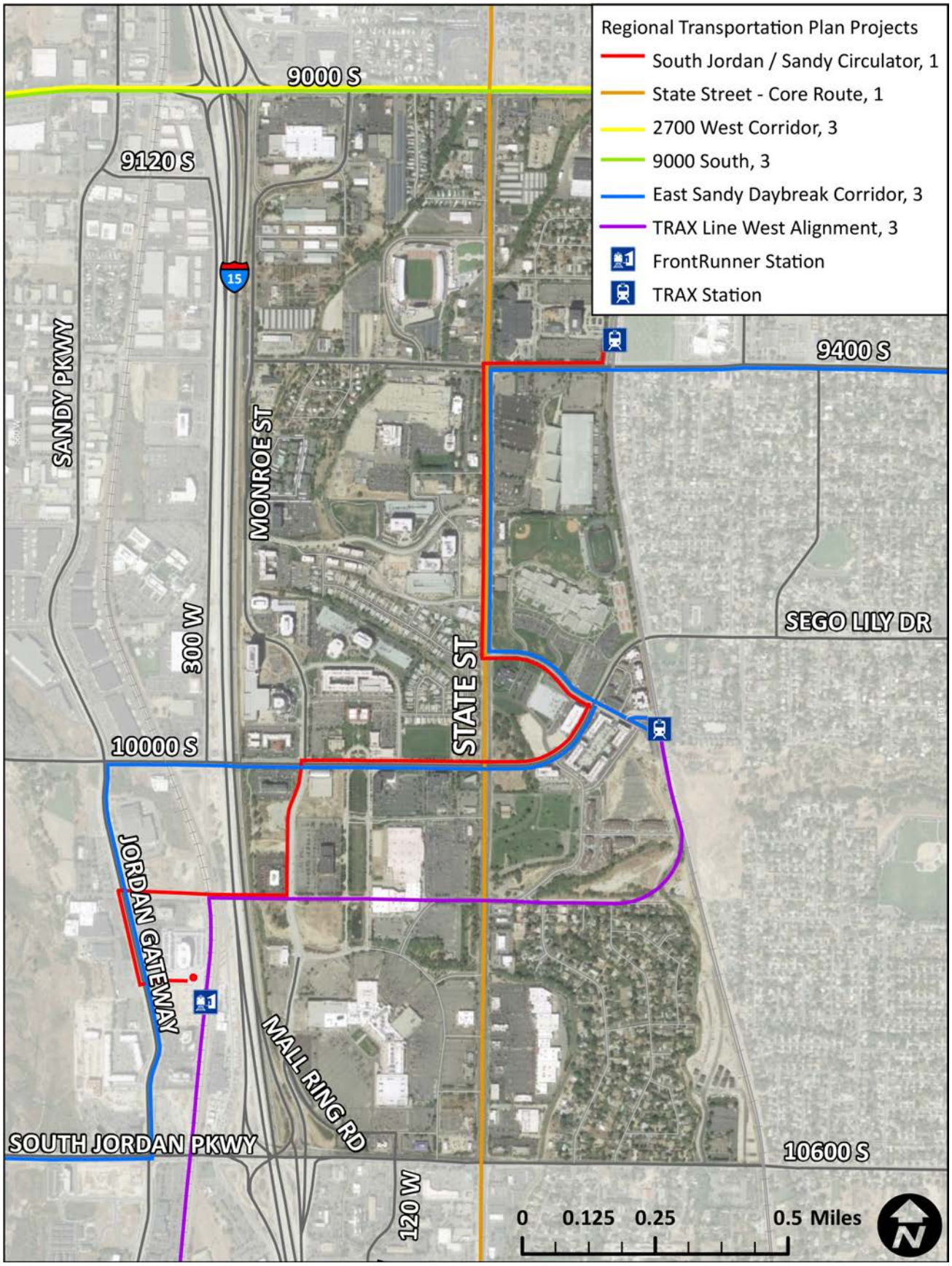
State Street - Core Service 5 (Phase 1) is planned to run the entire length of Sandy downtown. This bus service would feature 5-minute headways between busses, dramatically improving the ease of north-south mobility within downtown. It will also provide access to the rest of the State Street corridor and the Draper FrontRunner Station.

South Jordan/Sandy Circulator (Phase 1) is a Core Service route with 15-minute headways between busses. It is planned to connect the Expo Center and Civic Center Stations to the South Jordan Station. Connecting transit service between the Civic Center and South Jordan Stations is a concept that appears in various configurations and alignments in different forms that will be further expanded upon in subsequent sections.

The South Jordan/Sandy Circulator Study, is the most detailed analysis of this important transit link. The study analyzed two alternatives, one of which was selected as "preferred" while the other was not eliminated from consideration. Each alternative was analyzed with different routing options to maximize potential ridership.

The preferred alternative appears in **Figure 6–3**. This alternative envisions a bus or streetcar route that begins at the Expo Center Station, continues to the Civic Center Station via State Street or the existing TRAX right of way (ROW). From there, the route dips south to travel west more or less along 10080 South to Monroe Street. This alternative, like most plans and studies that involve the connector, rely on the construction of planned 10200 South I-15 overpass. This analysis further extends the circulator to the south along Jordan Gateway and west along South Jordan Parkway. The non-selected, but not eliminated alternative, appears in **Figure 6–4**. This alternative envisions a bus or trolley bus that primarily connects the Expo Center Station to the South Jordan Station with portions of routing on State Street. One option includes a stop at the Civic Center Station while the other winds a more circuitous and westerly route through the downtown area. Although this alternative may not be utilized, the underlying ridership data of the routing could be incorporated into another downtown circulator bus.

Figure 6–2 Regional Transportation Plan Projects



2700 West Corridor (Phase 3) is planned to be a high frequency bus route with 15-minute headways. It is the first of two projects that originates at the Historic Sandy Station and travels along the 9000 South corridor. Although this roadway is at the periphery of the downtown area, it will extend regional access to other Salt Lake County communities. This project extends west to 2700 West. Eventually the route terminates at the North Temple FrontRunner Station.

9000 South Corridor (Phase 3) is the second high-frequency bus route with 15-minute headways. This project extends from the Historic Sandy Station to 5600 West: providing high frequency transit service to much of the 9000 South corridor.

East Sandy Daybreak Corridor (Phase 3) is planned to be a high frequency bus route with 15-minute headways. This project would extend access to Sandy downtown from the west and east. To the west the route is planned to access the Daybreak area via the South Jordan Parkway. To the east, the route is planned to travel along 9400 South to Little Cottonwood Canyon. The route is planned to enter the downtown area on 10000 South, stop at the Civic Center Station, and continue north on State Street to 9400 South before proceeding east.

TRAX Blue Line West Alignment (Phase 3) this extension of the TRAX Blue Line is intended to extend into northern Utah County. This project is currently being refined and analyzed in the Point of the Mountain Transit study. At present, the RTP concept visible in **Figure 6–2** branches off of the TRAX Blue Line at the Civic Center Station, follows the existing ROW before continuing west along 10000 South, over the proposed viaduct, and following the FrontRunner corridor south to the Utah County line. Within the Point of the Mountain Transit Study, three of the alternatives involve routing a bus, bus rapid transit, or light rail through Sandy downtown. Draft versions of some routing concepts appear in **Figure 6–3**. However, other alternatives do not involve routes through Sandy, so the alignment of this project may shift away from the downtown area in subsequent RTP updates.

Other Transit Concepts

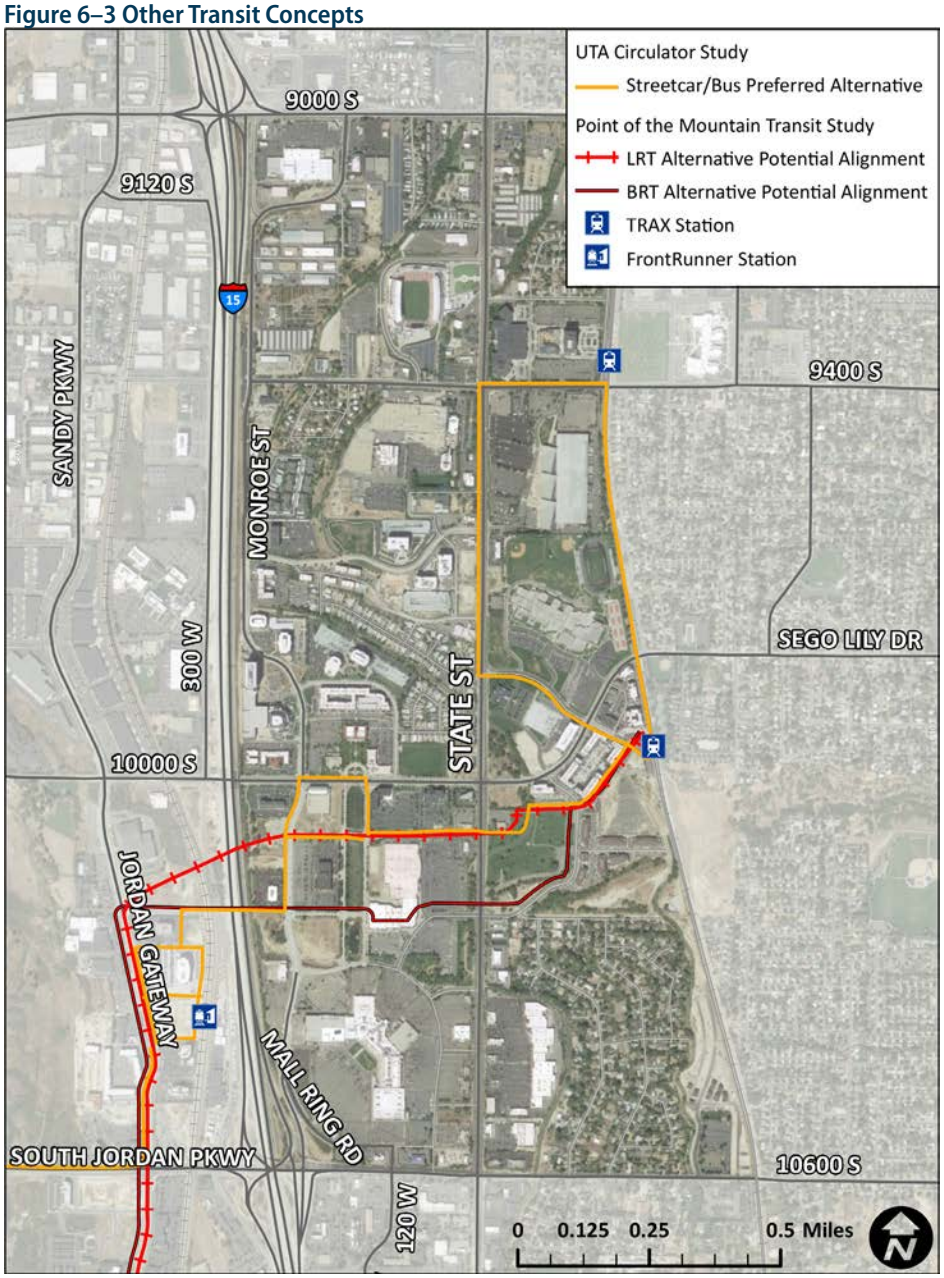
TRAX to South Jordan Frontrunner Station Transit Connector

Transit service linking TRAX and FrontRunner appears in some form in the following plans:

- UTA Sandy-South Jordan Circulator Study
- Point of the Mountain Transit Study
- Cairns Master Plan
- WFRC RTP 2050

The specificity of the routing varies depending on the focus of the plan. All transit connector concepts increase regional access to Sandy downtown. Another common element that they share, is that their routes are only feasible with some sort bridge over I-15, most often around 10200 South. Among these plans, potential modes to make this connection include light rail, BRT, a rubber wheeled trolley, or conventional bus service. All these potential connections will be reconciled as more studies are completed and amended.

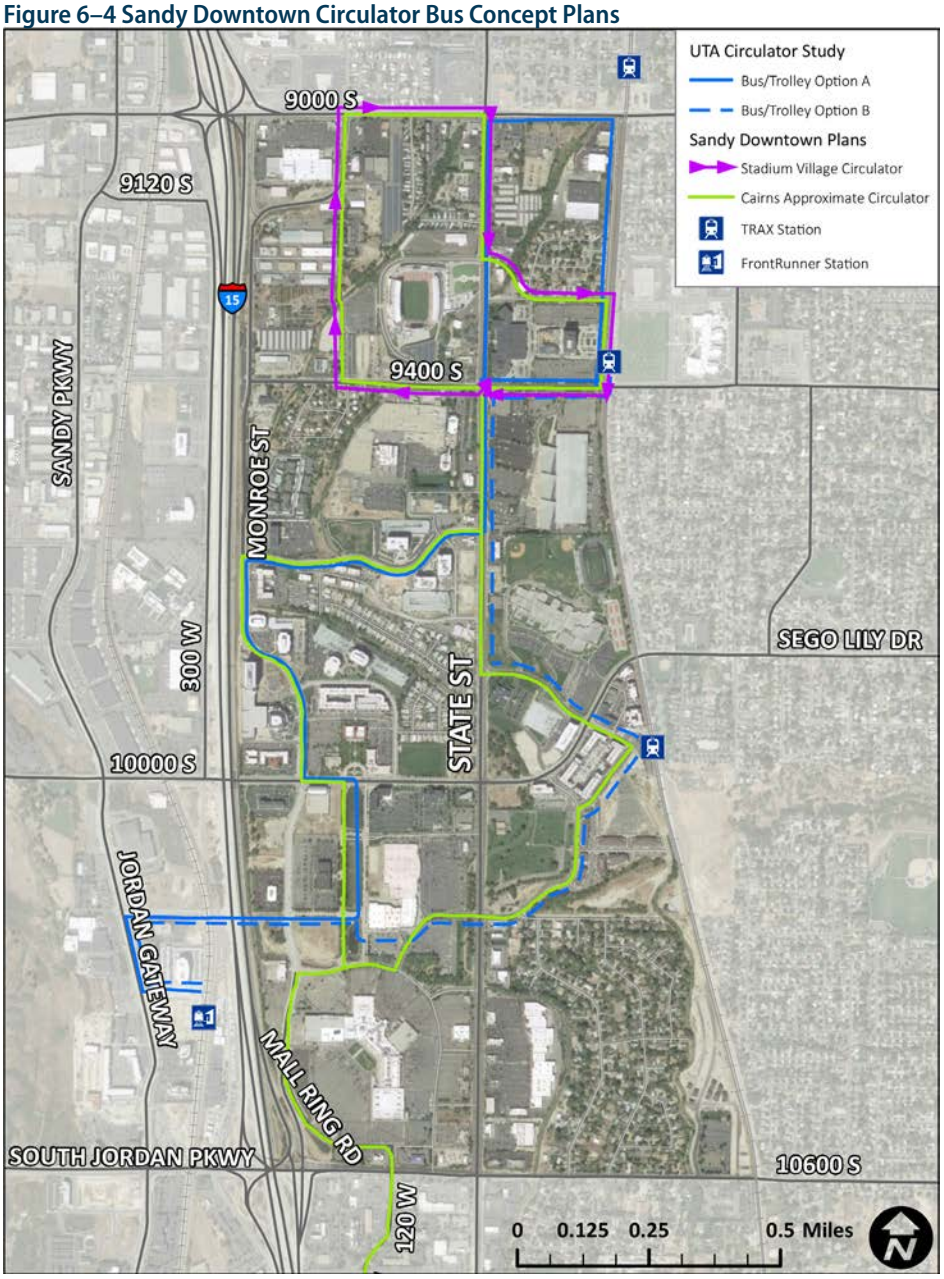
Figure 6–3 Other Transit Concepts



Two potential alignments in the Point of the Mountain Transit Study link Sandy Civic Center TRAX Station to the South Jordan FrontRunner Station via, Midvillage Boulevard, 10090 South or 10200 South, and an I-15 overpass. It is also possible that an alignment outside of Sandy downtown will be identified as the preferred alignment.

The UTA Sandy-South Jordan Circulator Study was intended to explore the service connection between these two transit hubs. The study analyzed routing and ridership performance among two alternatives that will be selected based on the ability to provide the best land use and transportation options. The preferred alternative—visible in **Figure 6–3**—analyzed potential routes a bus or streetcar could take through Sandy downtown. Two routing options explored different routes to connect the Sandy Expo TRAX Station, Sandy CIvic Center TRAX station, Centennial Parkway, and the South Jordan FrontRunner Station. A second alternative—appearing in **Figure 6–4**—was not selected but also not eliminated. The bus or rubber-wheeled trolley in this alternative had different routing from the first. The second alternative also has routing options. Option A links the Historic Sandy

Figure 6–4 Sandy Downtown Circulator Bus Concept Plans



and Sandy Expo TRAX Stations to the Frontrunner station via State Street, Towne Ridge Parkway, Monroe Street, Centennial Parkway, and a future 10200 South bridge over I-15 bridge. Meanwhile, Option B connects Sandy Expo and Sandy Civic Center TRAX Stations to the FrontRunner station via State Street, Beetdigger Boulevard, Midvillage Boulevard, and the same 10200 South overpass. While the second alternative may not be implemented, some of the analyzed routes could be incorporated into a circulator transit service within Sandy downtown.

Downtown Circulator Bus

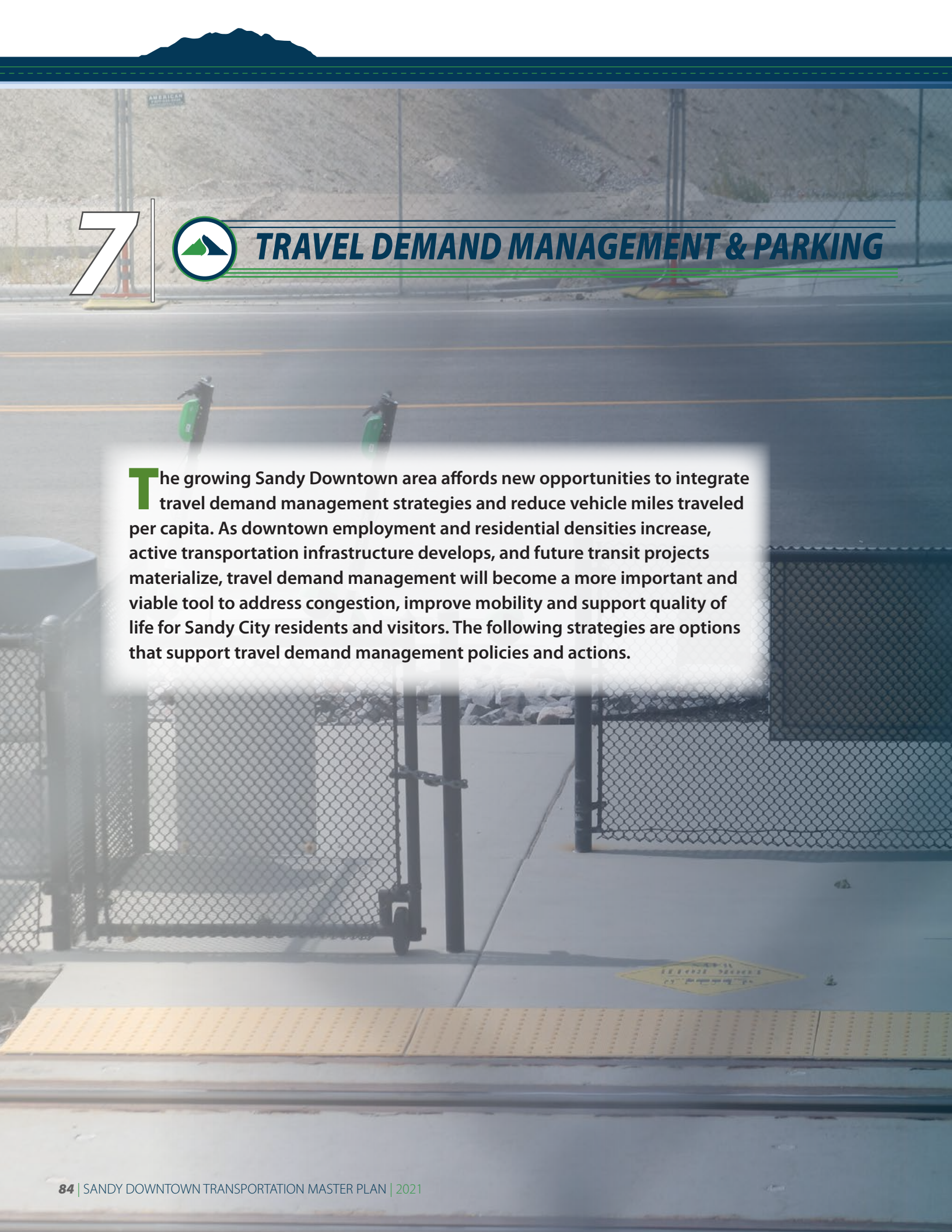
The Cairns and Stadium Village Master Plans both detail some sort of downtown circulator shuttle bus. This circulator is designed to link together the various sub-areas of downtown. **Figure 6–4** displays current circulator bus route concepts as they appear in the plans. There is potential to leverage some of the routing in the second, not selected alternative that appears in the UTA Sandy-South Jordan Transit Circulator Study. More in depth analysis will help to further refine the operation of this service. Given that the Sandy downtown area will be developed or redeveloped over time, a phased approach may be required to both provide service to desirable destinations and maximize ridership.

Summary

Transit is an essential component of any downtown area. At present, Sandy Downtown features a robust suite of transit options that will be further enhanced as planned transit projects are implemented. TRAX light rail and FrontRunner commuter rail provides regional access to communities within the larger Wasatch Front. Bus service increases access to the transit rail stations, provides connections elsewhere in Sandy city, other Salt Lake County communities, and access to the rich recreational opportunities in the Cottonwood canyons. Four bus routes provide service throughout the day. Three routes connect to Sandy Civic Center TRAX Station and provide the most overlap along and to the south of 10000 South. Three flexible routes--which can deviate from the primary route by 3/4 of a mile--expand transit reach to a larger area within Sandy Downtown, however, limited rider familiarity with this service may act as a barrier to wider utilization. Route 201 travels along State Street and provides the only transit connection between the northern and southern areas of Sandy Downtown. This route as well as Route F514 connect the Sandy Civic Center TRAX Station to the South Jordan FrontRunner Station. Linking these two important transit hubs has been the subject of several studies and plans.

Transit service improvements in Sandy Downtown are detailed in WFRC's RTP. These projects are planned for implementation in Phase 1 (2019-2030) and Phase 3 (2040-2050). Phase 1 projects will provide high-frequency transit service along the State Street corridor and between TRAX and FrontRunner stations. The latter connection appears in several studies and plans, the different transit modes and routes will need to be reconciled before implementation. A proposed I-15 bridge at 10200 South is an essential component of many future transit service improvements. Phase 3 projects envision high frequency transit service along the 9000 South corridor and more frequent service to Little Cottonwood Canyon. A proposed western alignment of TRAX in this phase, connects Sandy Civic Center and South Jordan stations before continuing on to the Utah County Line. This inter-county transit connection is currently being developed in a study and may be located further to the south. A proposed circulator shuttle bus that connects all villages within Sandy Downtown appears in local plans and will require further refinement. These improvements will further enhance the access to transit and provide mobility alternatives to Sandy Downtown visitors and residents.

7 TRAVEL DEMAND MANAGEMENT & PARKING



The growing Sandy Downtown area affords new opportunities to integrate travel demand management strategies and reduce vehicle miles traveled per capita. As downtown employment and residential densities increase, active transportation infrastructure develops, and future transit projects materialize, travel demand management will become a more important and viable tool to address congestion, improve mobility and support quality of life for Sandy City residents and visitors. The following strategies are options that support travel demand management policies and actions.

The **first** strategy is to link the downtown interior to high-capacity transit facilities. The Sandy downtown area is served by Frontrunner on the west and the TRAX Blue Line on the east. However, major roadways (I-15 and State Street) separate many of the downtown core destinations from the high-capacity transit stations. Implementing the active transportation and transit linkages identified in this plan that connect transit stations to core destination is critical to making non-automobile trips a viable option for users.

Second, careful management of parking supply and policies within the downtown area will provide an important incentive for non-automobile travel. Crafting and implementing parking policies that balance the need for day-to-day parking and special event parking while maximizing comfort and access for alternative modes can help to reduce overall parking demand. Parking maximums for new developments, shared parking opportunities for complimentary land uses, and preferred parking for carpool vehicles are all strategies to consider. It should be noted that parking strategies cannot be implemented in a silo but must be conducted in tandem with improved infrastructure and services for alternative travel modes.

Third, the ongoing evolution of technology and travel modes continually offers new opportunities to shift travel behavior. Micro-mobility and ride-share programs can be adopted for downtown areas to overcome first-mile/last-mile barriers for transit trips. Additionally, Mobility as a Service (MaaS) is a progressive concept that eliminates many of the barriers and complications of a multi-modal trip by centralizing the payment system, scheduling, and route choices of multiple transportation service providers.

Finally, as downtown areas mature, forming a Travel Management Agency (TMA) offers powerful tools to establish incentives and disincentives for travel choices. Through a TMA, travel demand management policies can be implemented at a more consistent and comprehensive level. Likewise, a TMA gives employers the opportunity to combine resources and provide travel services, such as carpool programs or shuttle systems, that would otherwise be cost-prohibitive if implemented alone.

8 CONCLUSION

In conclusion, Sandy downtown is well poised to capitalize on recent development in the area, and to continue to develop into an even more vibrant destination with a very large regional draw. As the area continues to evolve, all transportation modes should be considered so each system can work in accord with each other. This report provides insights on current and planned transportation systems, including roadways, active transportation, and transit. A safety analysis is also provided to highlight where safety improvements could be made. The two intersections within the City's jurisdiction specifically called out include the intersection of Centennial Parkway and 10080 South, and the intersection of Mall Ring Road and 10400/10500 South.

A few potential roadway improvements are also explored, including several design options for 9000 South and Monroe Street. Other potential roadway projects are listed in **Table 7–1**.

Sandy downtown is also well-served with transit, with both TRAX and FrontRunner in fairly close proximity. There is an opportunity to connect these two lines together within the downtown area, which would greatly improve access for transit riders to visit the area. Potential transit projects are listed in **Table 7–2**.

The overall active transportation network is also fairly robust, with the largest amount of bicycle and pedestrian activity occurring along 10000 South/Sego Lily Drive. There is potential for increased north-south connectivity from the South Town Mall to the Rio Tinto Stadium. A micro-mobility analysis also showed lots of activity around these destinations, as well as around nearby TRAX and FrontRunner Stations. Several other smaller active transportation projects that could improve the overall network are listed in **Table 7–3**.

With consideration of the findings presented in this report, Sandy City staff will be able to plan and prioritize future projects that will improve the safety, connectivity, and attractiveness of the downtown area, ensuring it will remain a healthy, attractive, and economically thriving area well into the future.

The growth and density planned for downtown in the Stadium Village Plan and the Downtown Cairns Plan will impact the transportation system. Congestion will increase and some road segments and intersection will experience LOS E and F, (most notably on 9000 South and Monroe Street). Transportation options detailed in this plan can help reduce the future congestion in Downtown Sandy, but often require impactful solutions like:

- a new I-15 interchange at 9400 South
- widened intersection with triple NB lefts at 9000 South and Monroe St
- a partial CFI at 9000 South and State Street

These concepts may detract from walkability and urban form desired in Downtown Sandy. Therefore the City may want to prioritize preserving the nature of the area over reducing congestion.

Conversely, unless capacity from I-15 to the area is improved future development will be limited.

The following tables, Figures 7-1, 7-2, and 7-3, which list all potential downtown projects are separated according by roadway, transit, and active transportation projects. The numbering system for both transit and active transportation projects use a "**T**" for *transit* or an "**A**" for *Active transportation*, respectively. However, letters are not used for transit project #37 or active transportation projects #7 or #30 because these three projects have been included in the Capital Improvements Plan for Sandy City's 2021 Transportation Master Plan and have already been numbered without the associated letters "**T**" or "**A**".

Roadways

Table 7–1 Potential Roadway Projects

#	Project	Location	Type	Funding
3	Monroe Street (Phase 3)	10600 South to I-15 Ramp	New Construction: 0 to 5 Lanes	Development/ Sandy/ WFRC
4	Monroe Street (Phase 6)	9100 South to 9400 South	New Construction: 0 to 3 Lanes	Sandy/WFRC
5	9000 South / Monroe Street		Intersection Improvement	Sandy/UDOT/ WFRC/SLCo
6	9000 South / State Street		Innovative Intersection	UDOT
7	9400 South	Monroe Street to State Street	Widening: 3/4 to 5 Lanes+ Bike Lanes	Sandy/WFRC
18	9270 South	State St to 150 East	Roadway Realignment	Sandy/WFRC
25	Towne Ridge Parkway / State Street		Intersection Improvement	Sandy
30	Sego Lily Dr	State St to 700 East	Widen: 3 to 5 Lanes + Bike Route from TRAX to 700 East	Sandy/WFRC
34	10000 South / Monroe Street		Intersection Improvements	Sandy
36	10200 South I-15 Crossing		Bike / Pedestrian / Bus / Street Car Crossing	Sandy/WFRC/ UDOT/UTA
37	Sandy / South Jordan Circulator	Sandy Expo Station to South Jordan FrontRunner Station	Transit	Sandy/WFRC/ UTA
56	10600 South / Auto Mall Drive		Intersection Improvements	Sandy/WFRC/ UTA
60	Beetdigger Blvd	Dry Creek Ridge to 10200	New Construction: 0 to 3 Lanes	Development
62	9270 South	Monroe Street to State Street	New Construction: 0 to 2 Lanes	Development
63	9120 South	Monroe Street to State Street	New Construction: 0 to 2 Lanes	Development
64	10200 South	Mall Ring Road to State Street	New Construction: 0 to 3 Lanes	Development
67	Monroe Street (Phase 5)	9400 South to Towne Ridge	New Construction: 0 to 3 Lanes	Development

Transit

Table 7–2 Potential Transit Projects

#	Project	Type
37	Sandy / South Jordan Circulator	Bus Route
T1	State Street - Core Service 5 (Phase 1)	Bus Route
T2	2700 West Corridor (Phase 3)	Bus Route (High Frequency)
T3	9000 South Corridor (Phase 3)	Bus Route (High Frequency)
T4	East Sandy Daybreak Corridor (Phase 3)	Bus Route (High Frequency)
T5	TRAX Blue Line West Alignment (Phase 3)	TRAX Blue Line ExtensionTRAX
T6	TRAX to South Jordan Frontrunner Station Transit Connector	New LRT or BRT Connection

Bike/Pedestrian/Trails

Table 7–3 Potential Active Transportation Projects

#	Project	Type
7	9400 South: Monroe Street to State Street	Widening: 3/4 to 5 Lanes+ Bike Lanes
30	Sego Lily Dr: State St to 700 East	Widen: 3 to 5 Lanes + Bike Route from TRAX to 700 East
A2	9400 South: Riverside Dive to 9375 South	Bikes Lane
A20	Monroe Street: Brandy Creek Drove to Approximately 9800 South	Signed Shared Roadway
A21	Monroe Street: Approximately 9800 South to Sego Lily Drive	Multi-use Trail
A23	Monroe Street/Mall Ring Road/Auto Mall Drive: Mall Ring Road to State Street	Signed Shared Roadway
A57	Harrison Street/Monroe Street: city boundary to 9600 South	Multi-use Trail
A59	9000 South: 700 West to State Street	Multi-use Trail
A60	Jordan and Salt Lake Canal Trail: 9000 South to 9400 South	Multi-use Trail
A61	East Jordan Canal Trail: 9000 South to Approximately 9270 South	Multi-use Trail
A62	Stadium Way/9270 South: Jordan and Salt Lake Canal Trail to Porter Rockwell Trail	Multi-use Trail
A63	East Jordan Canal Trail: State Street to 9400 South	Multi-use Trail
A64	Trail: 9400 South to Towne Ridge Parkway	Multi-use Trail
A65	Canal Trail: Monroe Street to State Street	Multi-use Trail
A66	Canal Trail: Sego Lily Drive to 11000 South	Multi-use Trail
A67	East Jordan Canal Trail: Hills Lane to Crescent Oak Way	Multi-use Trail
A68	10200 S Trail: State Street to East Jordan Canal Trail	Multi-use Trail
A90	Trail Connection: 10200 South to East Jordan Canal Trail	Multi-use Trail

A welcoming downtown supports a variety of transportation options that cater to the needs of residents, visitors, shoppers, workers, etc. within a geographically small footprint. This downtown transportation master plan offers a balanced mix of transit, active transportation, and roadway projects throughout downtown. **Figure 6–5** shows all potential projects within the boundaries of downtown Sandy. Projects are visually separated by color, and numbered to correspond with the tables on the previous two pages. Specific icons are also used to identify interchange and intersection projects.

Figure 6–5 Potential Downtown Projects by Type