

CHAPTER 1: PURPOSE AND NEED

1.1 BACKGROUND

In 2002, UDOT initiated a DEIS on 3500 South, a principal arterial located in West Valley City, between 8400 West and Redwood Road. The DEIS was never completed, but much of the information and data collected has been used in this study. Due to the high costs of alternatives originally identified in the DEIS, UDOT redefined the study limits into sections that would be more easily funded.

Therefore, this SES was initiated in the fall of 2005 to resume the study of transportation improvements for 3500 South – just within a smaller study area. It evaluates transportation needs, solutions, and impacts on 3500 South, between Bangerter Highway and Redwood Road. The project needs discussed in this chapter have been identified from results of the DEIS public involvement process as well as updated traffic analysis.

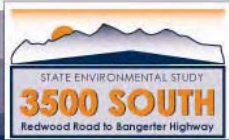
UDOT, UTA, West Valley City, WFRC, and local residents and businesses all have an interest in the functional operation of the 3500 South corridor. A brief summary of the responsibilities of the primary agencies involved in the SES is below.

- UDOT - The state agency responsible for implementing roadway improvements. The 3500 South corridor is a UDOT facility.
- UTA - The local transit agency along the Wasatch Front responsible for planning, construction, and operation of transit systems.
- West Valley City - Regulates land use within the city and has a keen interest in economic development and quality of life considerations in the study corridor.
- WFRC - The metropolitan planning organization responsible for transportation planning within the study area. It also serves to coordinate allocation of transportation funds for major roadway and transit projects between counties.

1.2 PURPOSE AND NEED

Transportation needs identified along the 3500 South corridor between Bangerter Highway and Redwood Road include:

- Address Roadway Deficiencies
- Improve Safety
- Address Pedestrian/Bicycle Opportunities
- Improve Transit Opportunities
- Improve Travel Mobility
- Maintain Consistency with Local Land Use Planning
- Improve Capacity



1.2.1 Address Roadway Deficiencies

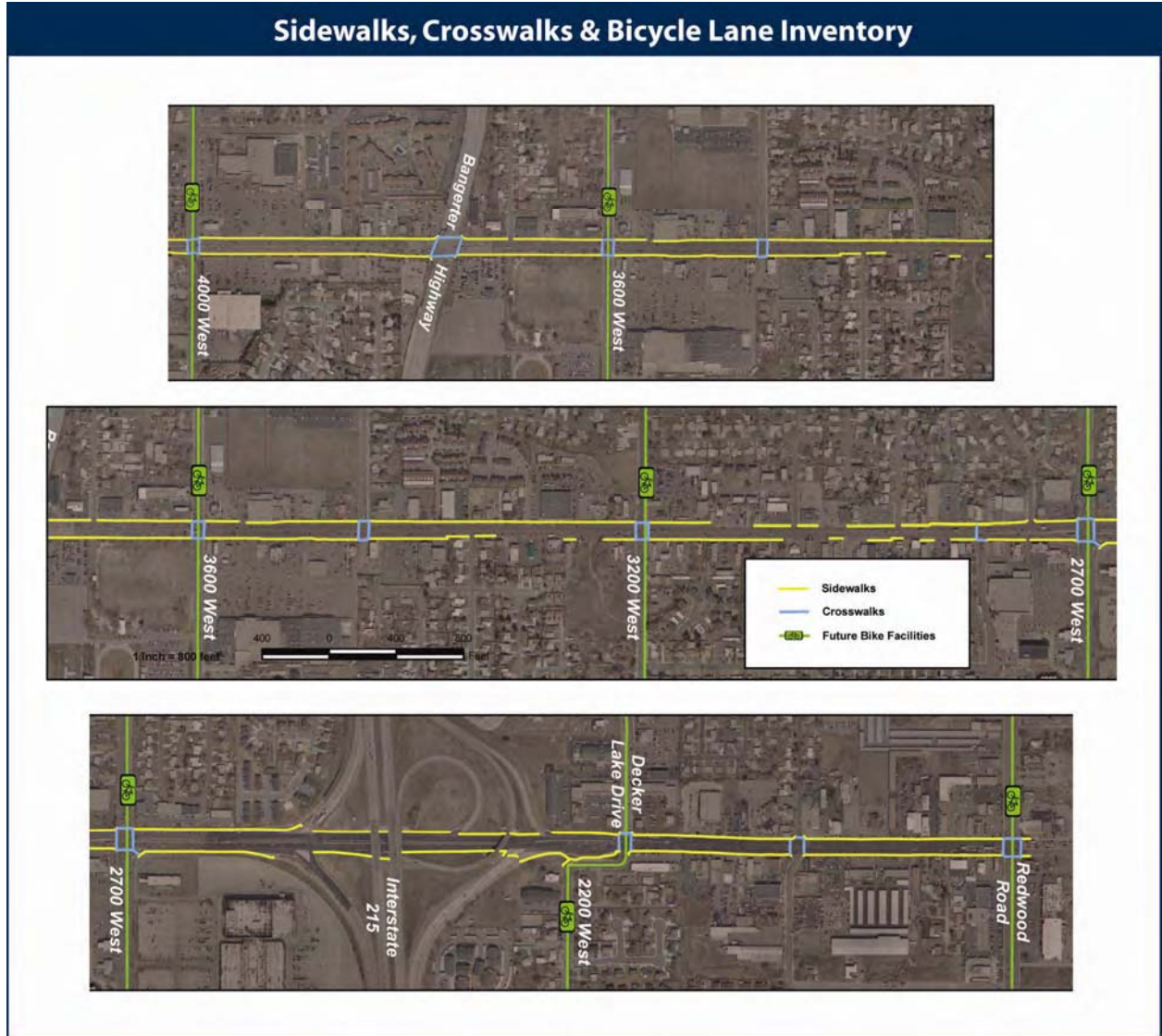
UDOT and American Association of State Highway and Transportation Officials (AASHTO) have created safety standards for building and updating transportation facilities. The term “roadway deficiencies” refers to roadway infrastructure that does not meet these standards. Deficiencies for 3500 South include varied roadway and shoulder widths, roadway surface and profile irregularities, insufficient clear zones, and the lack of continuous curb and gutter for reliable roadway surface drainage. These deficiencies create traffic flow problems for automobiles, public transit, bicyclists and pedestrians. They also reduce safety, pavement longevity and visual quality. Substandard features include:

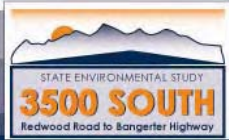
- **Roadway Widths and Shoulders.** Roadway widths are inconsistent over the length of the corridor. Shoulder widths vary and lanes suddenly narrow and end due to right-of-way constraints. Some segments of the roadway are sufficiently wide for full shoulder and curb and gutter, while others are just wide enough for travel lanes. These inconsistent roadway segments can affect a driver’s expectations and pose a safety hazard for motorists. Currently, drivers are presented with unpredictable conditions; a situation that is exacerbated under winter driving conditions.
- **Sidewalks.** The sidewalks in the corridor are generally discontinuous and in need of repair (see **Figure 1-1**).
- **Roadway Surface and Profile Deficiencies.** Pavement conditions at several locations throughout the corridor are substandard. The roadway profile, particularly for vehicles traveling in the outside lane in either direction, is uneven with the surface higher in some places than in others. These deficiencies can affect the quality and safety of driving conditions.
- **Curb and Gutter and Drainage.** Curb and gutter is required to maintain sufficient drainage systems. In the area between 3450 West and Market Street there are several locations that have discontinuous curb and gutter along both sides of the road. They are as follows:

North Frontage:

- At 2870 West – The curb, gutter, and sidewalk are offset by approximately 12 feet, meaning that these features protrude into the right-of-way and provide little warning or opportunity for motorists to merge left to avoid them.
- Between 2970 and 3000 West – The paved roadway shoulder blends directly into the Dee’s restaurant parking lot. There is no curb, gutter or sidewalk for approximately 170 feet.
- At 3140 West – The curb, gutter, and sidewalk are offset by approximately 12 feet.

Figure 1-1: Sidewalk Inventory





South Frontage:

- Between 3225 and 3255 West – A graveled roadway shoulder, with no curb, gutter, or sidewalk, fronts the undeveloped parcel for a distance of approximately 170 feet. In addition, approximately 770 feet of the curb and gutter, west of the undeveloped parcel, juts out into the roadway approximately 12 feet.
- At 3395 West – The curb, gutter, and sidewalk are offset by approximately 12 feet.

The two areas without curb, gutter or sidewalk generally provide an ill-defined separation between vehicular and pedestrian areas. Also, several areas along the study corridor have insufficient and/or malfunctioning drainage that creates puddles in low-lying areas surrounding the street and sidewalks.

- **Clear Zone.** Clear zones are paved or landscaped areas included with roadway projects that act as “buffers” to allow drivers to regain control of their vehicles if something causes them to leave the roadway. AASHTO defines a clear zone as “the total roadside border area, starting at the edge of the traveled way, available for safe use by errant vehicles.” Clear zone widths are determined by several roadway factors such as average speeds and the presence of curbs. The existing clear zone in the 3500 South study area is generally inadequate for the average 40 mph speeds, specifically in areas without curb and gutter. Per AASHTO and UDOT standards, clear zones should be free of fixed objects, but those in the 3500 South Corridor have been used for utility poles, fire hydrants, signs, and bus stops. In addition to the clear zone, AASHTO recommends an operational offset of 1.5 feet (measured from the face of the curb) for corridors like 3500 South. This additional area between the curb and the outside travel lane provides enough space for a vehicle or a bus to stop at the curb without creating a negative impact on traffic flow. Except where shoulders are present, there is currently not a consistent operational offset on 3500 South in the study area.

1.2.2 Improve Safety

A need exists to improve safety conditions along the study corridor. This section discusses motorist safety, while **Section 1.2.3** discusses pedestrian and bicycle safety.

Crash rates are the ratio of crashes to the total volume of traffic on a roadway segment, shown by the crashes-per-million vehicle miles traveled along a roadway segment. They are prepared from the accumulated accident data covering the most recent three-year period and are used to provide a basis of comparison for the safety of roadways.

The severity index that is applied to accidents is derived by assigning various categories of severity, which increase in rank proportional to the severity of the injuries resulting from the crash. Each accident is assigned a severity level based on the most severe injury observed at the scene. The lowest severity, “1”, means no injury occurred, and the highest severity, “5”, means there was at least one fatality. The severity index for a roadway segment is the average of all severity ratings reported within the segment.

Several factors can contribute to the occurrence of crashes including: speed differentials, driver error, vehicle malfunction, weather conditions, and the design of the roadway. On 3500 South, several conditions contribute to circumstances where speed differences occur. They include multiple business accesses and driveways, lack of dedicated turning lanes for right and left-turning vehicles, poor signal progression, and unstable traffic flows resulting from congestion.

Table 1-1 gives a summary of the traffic crash data for 3500 South from 1999-2001. The expected values represent an average of the crash rates and severity indices for roads in Utah of similar facility type, population setting, and daily traffic. A roadway segment with a reported crash rate or severity index above the expected value for that type of facility should be evaluated to determine the cause for the higher values.

Table 1-1: Three-Year Average Crash and Severity Data per Segment

Segment Location	Crash Rate	Expected Crash Rate	Severity Index	Expected Severity
Bangerter Hwy to 3200 West	13.77	5.70	1.69	1.64
3200 West to I-215	7.59	6.53	1.69	1.70
I-215 to Redwood Rd	11.28	6.53	1.64	1.70

Source: UDOT Division of Traffic & Safety, 2002

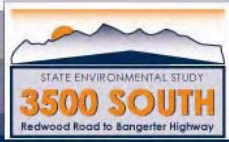
The data indicate that crashes occur more frequently in the study corridor than for comparable roadways. However, severity indices are similar.

1.2.3 Improve Pedestrian and Bicycle Opportunities

Pedestrian and bicycle opportunities refers to non-motorized mobility and the presence of appropriate infrastructure to facilitate the movement of pedestrians, bicyclists and people with disabilities. Infrastructure elements such as continuous sidewalks, designated bike routes, and curbs that easily accommodate people with disabilities serve to enhance non-motorized mobility.

Pedestrian

The need to improve pedestrian mobility and safety on 3500 South has been identified by the community as a high priority. Typically, pedestrian trips are short local trips between neighborhoods, from residences to bus stops, or to and from schools. The community has expressed that pedestrian travel conditions in the corridor are uncomfortable at best and unsafe at worst.



3500 South is a heavily traveled corridor with inadequate pedestrian crossings, particularly at schools. In much of the corridor there is so much distance between crosswalks that pedestrians tend to “dart” across traffic rather than going out of their way to use a crosswalk (see **Figure 1-1**). The 3500 South corridor has several areas that experience heavy pedestrian traffic, such as the Granger High School and West Lake Junior High School areas. Students traveling to and from these schools come from a wide residential area located both north and south of 3500 South.

During the public involvement process stakeholders also identified concerns about existing mobility restrictions for the elderly or disabled. UDOT will give special attention to improving accessibility and mobility for elderly and disabled persons within the corridor.

Bicycle

Bicycle use is recognized as a feasible form of transportation in the corridor. This is based on the residential nature of the area, the potential number of bicyclists, and the proximity of destinations that would encourage bicycle use (schools, homes, parks, churches, etc.). No designated bicycle routes currently exist in the study corridor. Bicyclists generally travel in the traffic lane presenting safety concerns for both motorized and non-motorized travelers. Bicycles are, however, allowed on existing sidewalks and roadway shoulders unless otherwise noted by posted signs. As discussed in **Section 1.2.1**, these accommodations do not exist in many locations and, if they do, usually lack sufficient width to accommodate both pedestrian and bicycle use. Additionally, the current sidewalks are in poor repair, and have numerous obstructions.

1.2.4 Improve Transit Opportunities

UTA relies on this corridor as a crucial link to areas beyond the corridor. The 3500 South corridor is home to one of the most used bus transfer points in the UTA system. As many as 18 bus routes provide service to the transfer point located adjacent to Valley Fair Mall near 2700 West. An intermodal hub is proposed to be built near this transfer point with construction slated to start in 2008. Also, an east-west spur from the current TRAX system (light-rail service provided by UTA) will cross 3500 South at 2700 West to provide connecting service to the proposed intermodal hub.

Bus Route 37 provides the primary service on 3500 South to an average of 1,800 customers per day. Despite the high ridership, Route 37 serves only a small number of total trips in the corridor. Ridership peaks during midday, not during typical peak commuting hours. A UTA survey of current and potential riders found that people in this area are highly sensitive to travel time and are very concerned with bus reliability. Route 37 frequently experiences problems due to traffic congestion, vehicles entering and existing the roadway, difficulty merging, frequent stops, and lack of adequate shelters. Conditions are especially poor for transit users with disabilities or special needs because of inadequate or non-existent shelters,



poor lighting near stops, and difficulty boarding buses because of sidewalk or landscaping barriers. Public comments received during the DEIS indicated an almost universal opinion that transit service should be improved.

Through rider surveys and market analysis conducted between 2003 and 2004, UTA found that people living and working near 3500 South would be very willing to use transit if the service better met their needs. Demographic information indicates that 40.3 percent of the corridor's population is under age 15 or over 65, which is higher than city, county, and statewide averages (2000 Census). This population category represents infrequent or non-drivers who depend on transit and carpooling for many of their transportation needs.

UTA has chosen 3500 South as one of the first corridors where it will implement a new bus rapid transit system (BRT) in spring of 2007. BRT will first be introduced on 3500 South as a demonstration project between 8400 West and the existing TRAX station at approximately 230 West. UTA has approved new shelter designs that it will build as temporary stations sited along 3500 South. In addition, UTA plans to construct and operate exclusive right-of-way transit along 3500 South from approximately 2700 West to west of Bangerter Highway. There will be four stations within the 3500 South corridor - Redwood Road, east of the I-215 Interchange, the Intermodal Hub at 2700 West, and 3600 West. While these plans are still in development, broad right-of-way requirements are known. Finally, the Wasatch Front 2030 Long Range Plan (LRP) for Transit includes exclusive right-of-way transit on 3500 South. There are no immediate city plans to re-designate land uses at or near these stations, however West Valley City has completed a Transit Oriented Development (TOD) report.

1.2.5 Improve Travel Mobility

Travel mobility refers to driving conditions as measured by levels of delay and the ability to travel close to posted speeds. Travel mobility will decrease as traffic volumes continue to increase along the 3500 South corridor. Traffic on 3500 South has increased over the past decade and steady growth is expected to continue in the future. **Table 1-2** shows the historical average daily traffic volumes and growth on 3500 South between 1991 and 2000. It indicates the sustained long term historical growth that the 3500 South corridor has experienced.

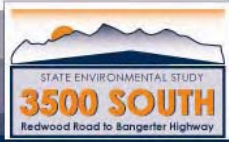


Table 1-2: Historical Traffic Data

3500 South Historical Traffic											
Segment	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Rate
Bangerter - 3600 W	36,310	37,450	38,335	40,230	40,990	40,990	38,940	35,824	36,540	38,001	0.5%
3600 W - 3200 W	34,400	31,365	32,105	33,695	34,300	34,300	31,899	29,820	31,012	32,562	-0.6%
3200 W - 2700 W	34,630	35,715	36,560	38,050	38,740	38,740	35,195	34,139	36,187	37,996	1.0%
2700 W - I-215	40,800	42,080	43,075	45,205	46,060	44,680	40,658	40,658	43,910	46,550	1.5%
I-215 - Redwood	39,900	41,150	41,850	43,920	44,750	42,515	38,688	41,155	45,270	48,438	2.2%

**Traffic on Utah Highways (UDOT 1993, 1995, 1998, 2000)*

Population within the study area is expected to grow by 30%, and employment is expected to almost double between 2001 and 2030. Travel demand on 3500 South is expected to substantially increase as the result of the increasing population and employment in the area. **Table 1-3** provides the projected future traffic volumes on 3500 South in the years 2010, 2020 and 2030, based on the Build Alternative. These future traffic volumes show an average increase of 64% in total of traffic along the entire 3500 South corridor between 2000 and 2030.

Table 1-3: Projected Future Traffic

3500 South Projected Future Traffic *			
Build Alternative			
Segment	2010	2020	2030
Bangerter - 3600 W	45,900	55,400	67,000
3600 W - 3200 W	40,900	51,400	64,700
3200 W - 2700 W	47,200	58,700	73,100
2700 W - I-215	63,400	72,500	84,000
I-215 - Redwood	48,800	49,200	50,000

** Bases on SocioEconomic data and the WFRC Travel Demand Model Rounded to nearest 100.*

Table 1-4 shows existing average travel speeds and times compared to future conditions if no improvements are made to the 3500 South corridor. Although the facility has a posted speed limit of 40 mph, speeds during the PM peak hour currently average 13 mph. By the year 2030, the average peak hour speed is projected to decrease to 5 mph.

The high travel times experienced in the corridor reflect these reduced travel speeds. Currently, travel times between these intersections are 8 and 12 minutes for east and westbound travel, respectively. Projected peak-hour travel times along 3500 South between the Bangerter Highway and Redwood Road intersections will double by year 2030, with significant periods of gridlock expected.

Table 1-4: Corridor Travel Average Speeds and Time

Scenario	P.M. Peak Hour Average SPEEDS		P.M. Peak Hour Corridor Travel Time*	
	Eastbound	Westbound	Eastbound	Westbound
Existing Conditions	17 mph	11 mph	8 mins.	12 mins.
Year 2030 No-Build Conditions	7 mph	<5 mph	19 mins.	>28 mins.

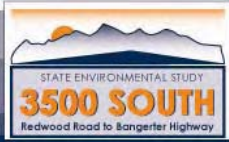
*Travel time measured between center of Bangerter Highway and Redwood Road intersections

1.2.6 Consistency with Local Land Use Planning

West Valley City officials have completed a number of planning efforts aimed at outlining a vision for growth and development in specific areas of the city. A major focus of many of these efforts has been the portion of 3500 South in the SES study area, specifically between 3200 West and the I-215 interchange. The guiding documents that discuss visioning for this area include the *West Valley City General Plan: Vision 2020*, the *City Center Vision*, and the *West Valley City: City Center TOD Study*. These documents support each other and detail the kind of development that the city has identified for the SES study area. Examples include:

- TOD supportive land uses on 3500 South require access by automobile as well as transit (*West Valley City: City Center TOD Study*)
- BRT Stations West of Constitution Blvd will provide access for commuters (*West Valley City: City Center TOD Study*)
- 3500 South between I-215 and 3200 West
 - Encourage more activity and a pedestrian oriented environment (*City Center Vision*, December 21, 2004)
 - Complement the town center of West Valley City (*City Center Vision*, December 21, 2004)

The study team reviewed these plans and reports to evaluate consistency between the 3500 South project and city land use plans. When plans were not consistent, coordination work was done with West Valley City. This evaluation facilitated an understanding of future



travel conditions that will come with land use changes and new development, and was in keeping with the principles of context sensitive solutions.

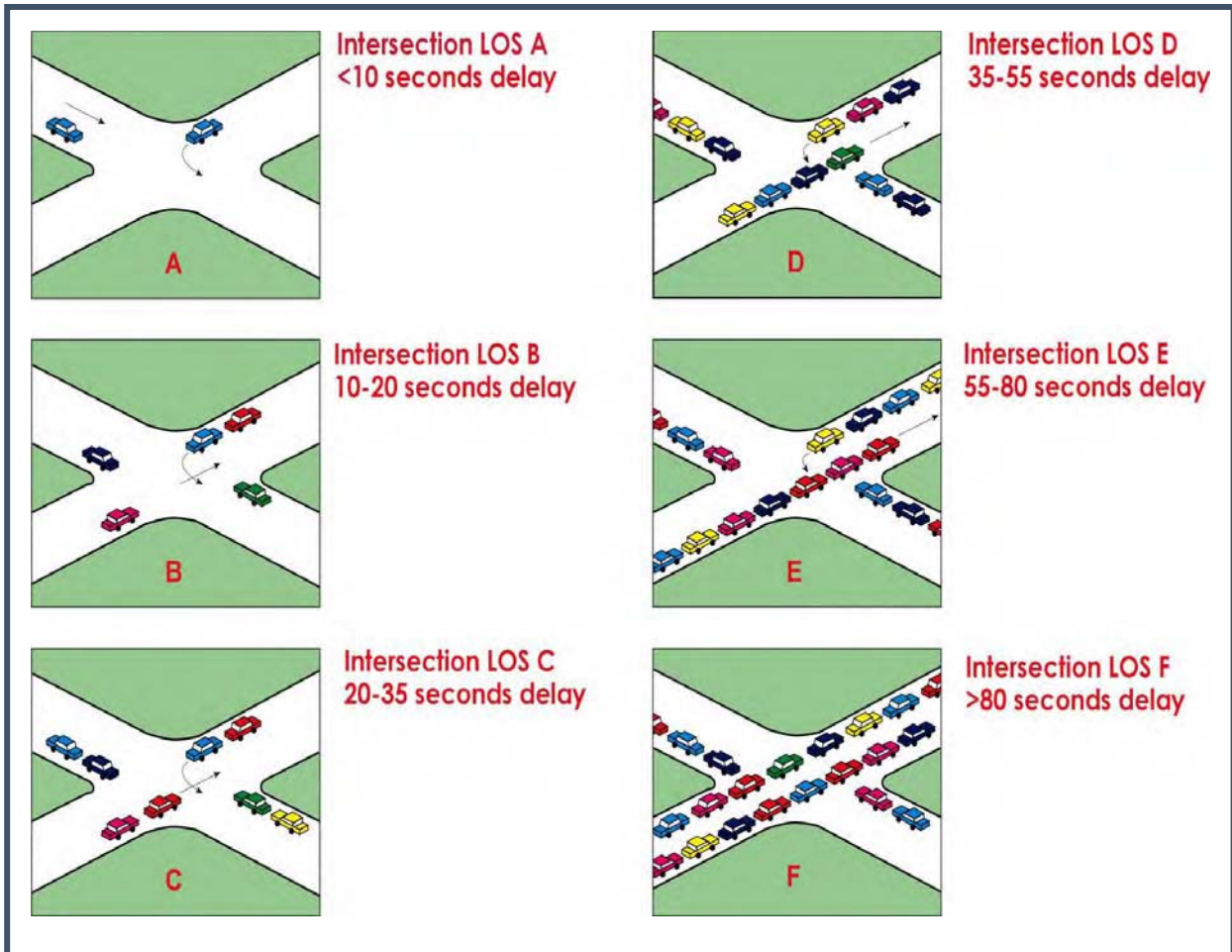
A major component of all West Valley City plans is a City Center redevelopment project located in the study corridor between 3200 West and the I-215 interchange. The city's redevelopment agency approved this project to help implement some of the land use changes identified in the City Center Vision. These land use changes have been incorporated into the General Plan Land Use map as well. The focus is to create more transit oriented spaces with mixed use developments and a centralized town center. An intermodal center is planned within the City Center Redevelopment Area (RDA), which will accommodate a planned light rail extension.

1.2.7 Improve Capacity

Capacity refers to the ability of a transportation facility to accommodate a moving stream of people or vehicles (*Highway Capacity Manual; Transportation Research Board*). The capacity of 3500 South to handle regional, commuter, destination, and local traffic is limited by roadway conditions throughout the study area that vary widely. Such variations include inconsistent shoulder widths and medians, lack of access control, and inconsistency in the number of travel lanes.

Level of Service (LOS) is a rating of traffic operating conditions that is calculated by comparing traffic volumes to available capacity along a roadway segment or intersection. LOS provides a qualitative definition of the extent of congestion with LOS "A" representing minimal delay and congestion and LOS "F" representing substantial delay (see **Figure 1-2**).

Figure 1-2 Intersection Level of Service Examples



As travel demand increases with future planned development, so will the congestion level in the corridor. **Table 1-5** shows existing and forecasted LOS for intersections in the study corridor. The Decker Lake Road and Redwood Road intersections would experience LOS F conditions in the design year with greater than 100 seconds delay. While most of the intersections in the study corridor would experience LOS F conditions under the 2030 No Build scenarios.

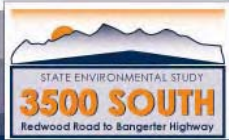


Table 1-5: Corridor Travel Average Speeds and Time

Intersection	2005 Existing LOS / Delay ¹	2030 No Build LOS / Delay ¹
3600 West/3500 South	D / 49.0	F / >100
3450 West/3500 South	B / 15.9	D / 37.0
3200 West/3500 South	D / 40.2	F / >100
2800 West/3500 South	B / 15.4	F / >100
Constitution Blvd/3500 South	E / 74.8	F / >100
I-215 Southbound Ramps/3500 South	D / 46.9	F / >100
Decker Lake Road/3500 South	F / >100	F / >100
1940 West/3500 South	C / 20.5	F / >100
Redwood Road/3500 South	F / >100	F / >100
Eastbound Travel Time	8 mins.	19 mins.
Westbound Travel Time	12 mins.	> 28 mins.

Source: Fehr & Peers, December 2005

1. Intersection LOS and delay (seconds/vehicle) values represent the overall intersection average.

2. Travel time measured from average time between Redwood Road and Bangerter Highway. Travel time reported in mm:ss format.

1.3 UDOT STRATEGIC GOALS

UDOT issued the following Strategic Direction Goals for 2006:

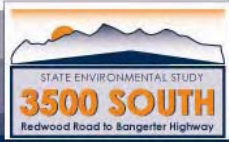
1. Take Care of What We Have
2. Make the System Work Better
3. Improve Safety
4. Increase Capacity

Each project that UDOT implements will strive to meet the UDOT Strategic Direction Goals for 2006, to the fullest extent feasible.

Each of the transportation needs described above support one or more of UDOT's strategic goals. **Table 1-6** shows these needs in relation to the UDOT strategic goal they support.

Table 1-6: Relationship Between Transportation Needs and UDOT Strategic Goals

Purpose and Need	Corresponding UDOT Strategic Goal
Address Roadway Deficiencies	<ul style="list-style-type: none"> ▪ Take care of what we have ▪ Make the system work ▪ Improve safety
Improve Safety	<ul style="list-style-type: none"> ▪ Improve Safety
Improve Pedestrian and Bicycle Opportunities	<ul style="list-style-type: none"> ▪ Make the system work ▪ Improve safety ▪ Increase capacity
Improve Transit Opportunities	<ul style="list-style-type: none"> ▪ Take care of what we have ▪ Make the system work ▪ Increase capacity
Improve Travel Mobility	<ul style="list-style-type: none"> ▪ Make the system work ▪ Increase capacity
Improve Capacity	<ul style="list-style-type: none"> ▪ Increase Capacity
Consistency with Land Use Planning	<ul style="list-style-type: none"> ▪ Make the system work



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