

DRAFT
SOUTH PARK SUB AREA
AND HIGH SCHOOL ROAD CORRIDOR
TRANSPORTATION ANALYSIS

Prepared for:

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I. INTRODUCTION

A. Project Background

Teton County is considering a northerly extension of Tribal Trail Road (Connector) to intersect with WY 22 in the proximity of the WY 22/Coyote Road intersection. While the Wyoming Department of Transportation (WYDOT) has created a travel demand forecasting model for Teton County that provides insight on the “macro” impacts on the surrounding road network, Teton County would like a better understanding of the Connector impacts on a more localized scale. In particular, Teton County is concerned about the Connector’s effects on High School Road and other roadways in the South Park area during the school term, including key intersection level of service analysis and identification of non-motorized user safety issues.

To address these issues, the project boundaries, for purposes of the network analysis, are generally described as follows:

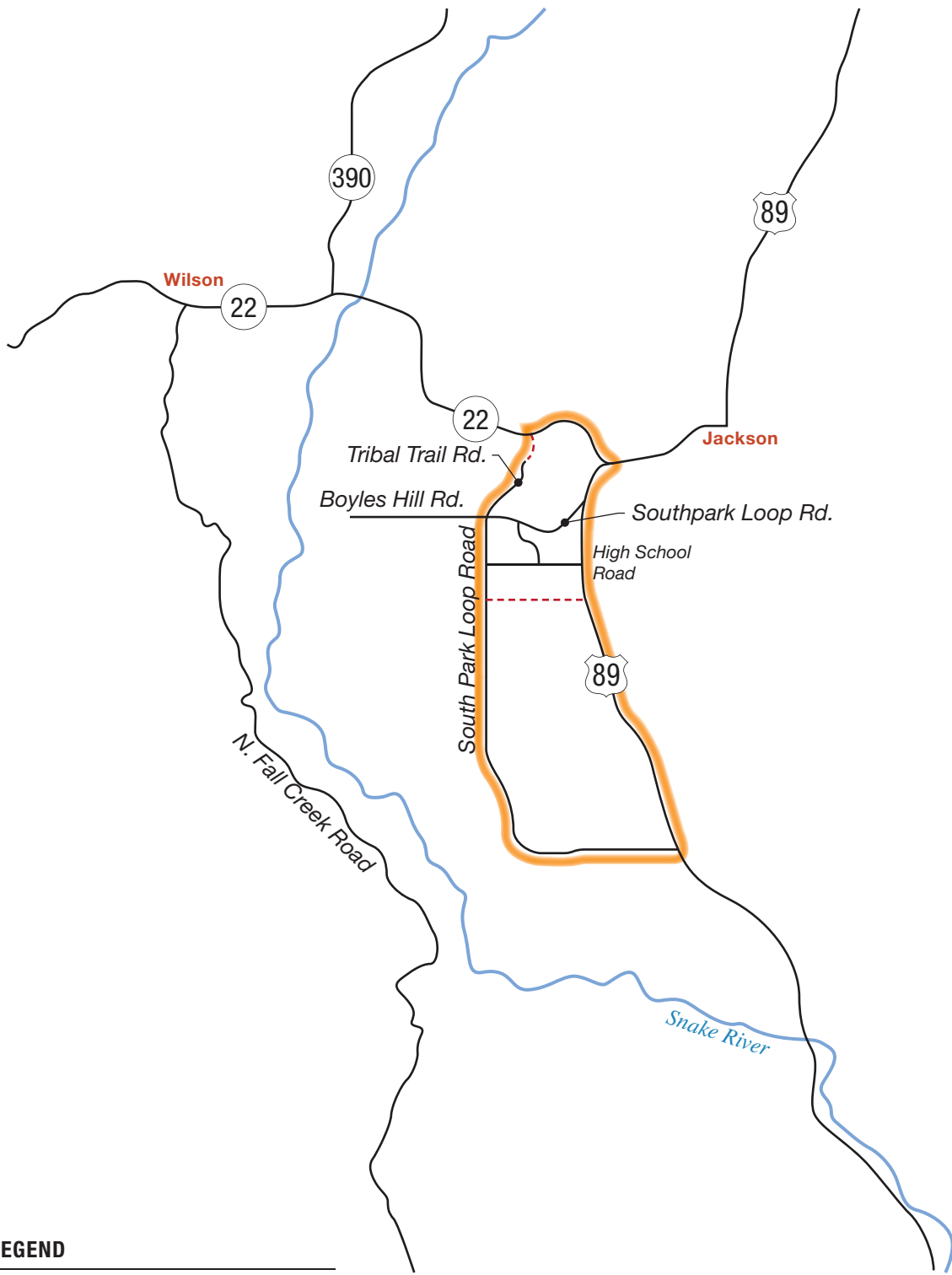
- East boundary - US Highway 26, 89, 189, 191 (WY 89)
- West boundary - South Park Loop Road and Tribal Trail Road
- North boundary – WY 22
- South boundary – South Park Loop Road

Figure 1 shows the study area and the site vicinity.

B. Study Purpose

The purpose of this study was to conduct detailed traffic analyses of the South Park Study Area road system for four roadway scenario and identify intersection/road corridor modifications that would address level of service concerns and non-motorized user safety issues. The scenarios studied included:

- **Existing Conditions** - This scenario examines traffic impacts created on the current road system under current traffic volumes. For the purpose of this analysis, the year 2008 was used.
- **Existing Volumes with Tribal Trail Connector** - This scenario examines traffic impacts in the study area if Tribal Trail was currently available as a travel route.
- **Year 2030 Baseline Conditions** - This scenario examines the traffic impacts associated with long range forecasted traffic volumes for the year 2030. It assumes that the only change to the road system in the study area would be the addition of an east-west connector roadway, located south of High School Road, that would be constructed in conjunction with development in that part of South Park.
- **Year 2030 Conditions with Tribal Trail Connector** – This scenario examines the traffic impacts associated with long-range traffic volumes, the new east-west connector, and the Tribal Trail Connector available as a travel option in the area.



LEGEND



-  = Study Area
-  = Potential Future Road

Figure 1
Vicinity Map

NORTH 

II. EXISTING CONDITIONS

A. Roadway Network

The existing roadway network within the study area includes:

- **WY 89** – WY 89 provides the connection between the Town of Jackson and Hoback Junction and other communities to the south. From Town through the study area it is a four-lane roadway with a center left turn lane, but it narrows to two lanes with no left turn lane just south of the south intersection of South Park Loop Road. The Wyoming Department of Transportation (WYDOT) is currently conducting an Environmental Impact Statement that is considering widening options for the two lane section. From town to High School Road the posted speed limit is 35 mph, which then increases to 55 mph from that point south.
- **WY 22** – WY 22 provides the connection between the Town of Jackson and Wilson, Teton Village and Teton Pass to the west. It is a four lane road with a 35 mph speed limit from the WY 89 intersection to Spring Gulch Road, then a two lane road with a 45 mph speed limit in winter and 55 mph speed limit in summer from that point west.
- **South Park Loop Road** – South Park Loop Road is an east-west collector roadway that runs along the south end of the study area, turns north and continues up to Tribal Trail Road/Boyles Hill Road, then turns east and connects back to WY 89. The north WY 89 intersection is signalized, but all other intersections along the road are unsignalized, including the south intersection with WY 89.
- **High School Road** – High School Road is an east-west collector roadway in the northern portion of the study area that connects South Park Loop Road to WY 89. As its name suggests, Jackson High School is located along the south side of the road about halfway between WY 89 and South Park Loop Road, with Colter Elementary School located on the north side of the road opposite the high school. As such, High School Road experiences significant activity, both vehicle and pedestrian, at the beginning and end of the school day. The WY 89 intersection is signalized (the southern-most signal on the highway), the Middle School Road intersection has all way stop control and all other intersections have two way stop control.
- **Tribal Trail Road** – Tribal Trail Road extends north from the South Park Loop Road/Boyles Hill Road intersection into a residential neighborhood. It currently terminates at Cherokee Lane about ¼ mile south of WY 22, but Teton County documents that date as far back as 1983 have identified the possibility of extending it from its current terminus north to the highway to provide a connection for the South Park area and help ease traffic at the WY 22/WY 89 intersection (the Y).

B. Surrounding Land Use

Currently the study area can be distinctly divided into two areas. From High School road north, the study area consists of suburban residential development on the west side and commercial development on the east along WY 89. South of High School Road the study area takes on a more rural feel of primarily ranch land and large lot residential properties, with industrial/commercial development located along WY 89 north of the south South Park Loop Road intersection. The Rafter J Ranch and Melody Ranch properties provide some higher density residential development along WY 89 near the south end of the study area, as well.

C. Traffic Conditions

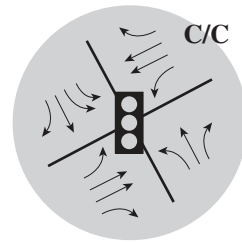
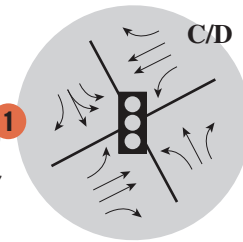
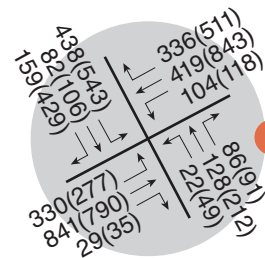
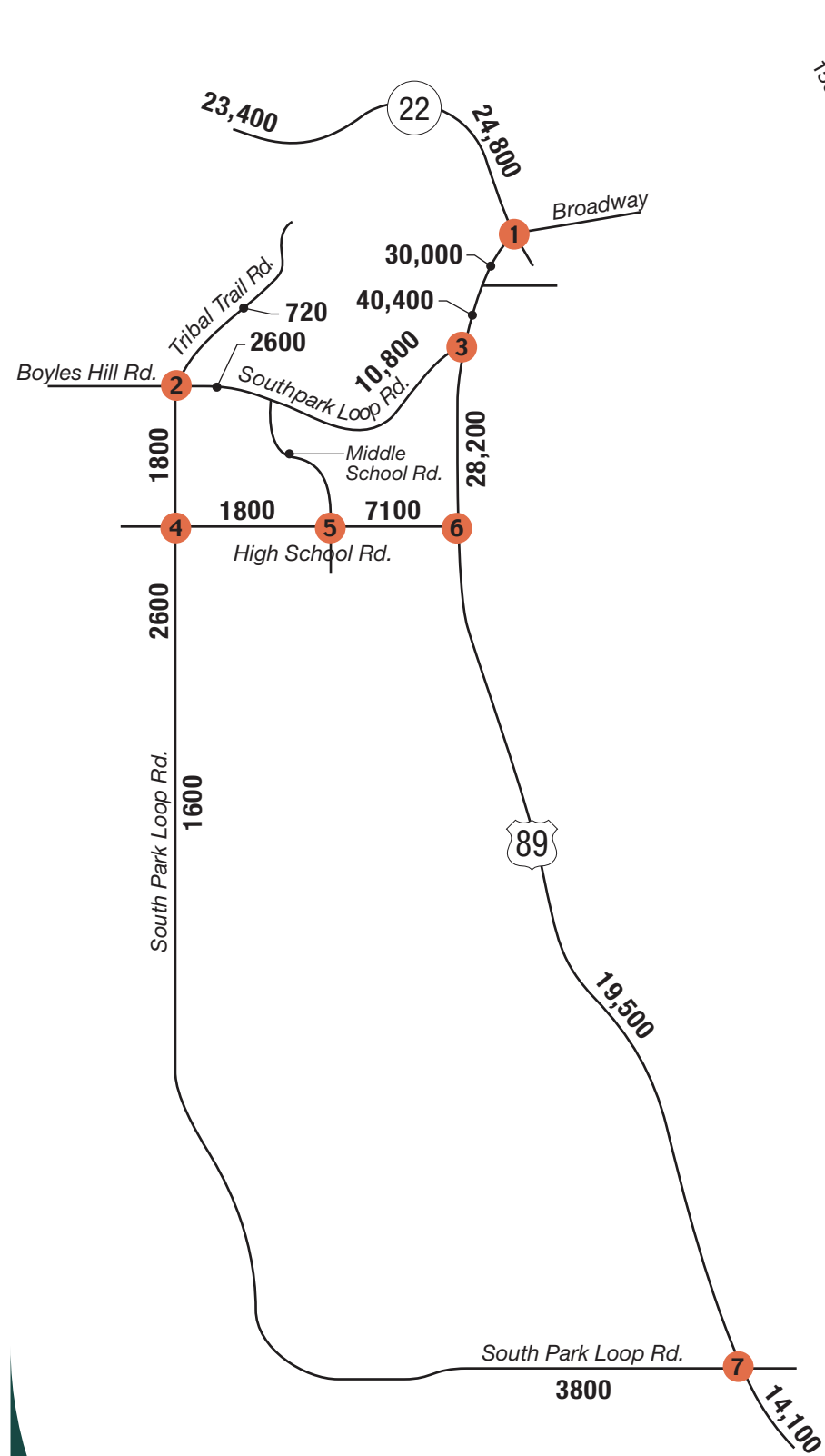
Traffic Volumes

Existing weekday peak hour and daily traffic volumes along vicinity roadways are shown on **Figure 2**. Peak hour and daily volume information was collected from several sources, including WYDOT (2006), the Teton Meadows Ranch Traffic Impact Analysis (July 2007 and February 2008), and an origin-destination study conducted for this project (July 2009). These data were compared and adjusted to reflect a common year (2008). As the figure indicates, traffic volumes on WY 89 are at their lowest at the south end of the study area (14,100 vehicles per day (vpd)) and steadily increase toward town, peaking at 40,400 vpd just north of the north South Park Loop Road intersection. Meanwhile, volumes on WY 22 are at their highest just north of the Y (24,800 vpd), then drop slightly to 23,400 vpd in the vicinity of Coyote Road where the Connector would intersect the highway.

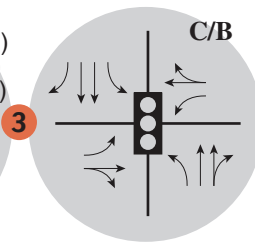
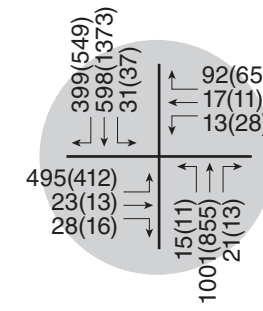
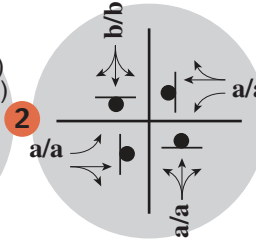
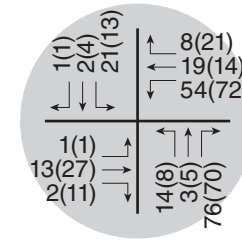
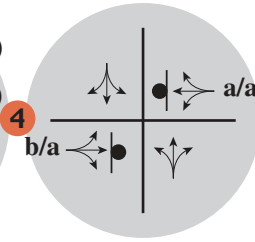
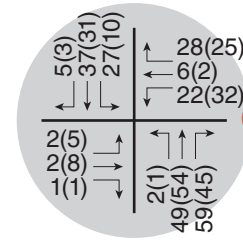
South Park Loop Road carries 3,800 vpd just west of the south WY 89 intersection, drops down to 1,600 vpd west of Melody Ranch, then increases slowly as it turns north, peaking at 2,600 vpd just south of High School Road the dropping slightly just north of there. Once it turns east at Boyles Hill Road traffic increases steadily until it reaches 10,800 vpd just west of the north WY 89 intersection.

High School Road carries approximately 7,100 vpd just west of WY 89, with Gregory Lane and the High School drawing off significant volumes so that traffic drops to 1,800 vpd east of South Park Loop Road.

Tribal Trail Road currently carries around 700 vpd, which is consistent with its current function as a neighborhood collector road.

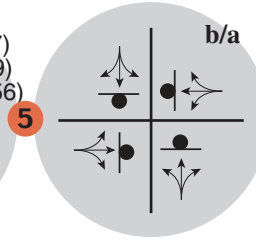
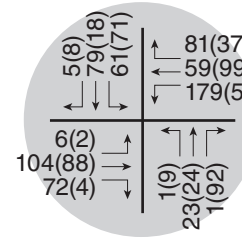


IMPROVED



LEGEND

- xxx(xxx) = AM(PM) Peak Hour Traffic Volumes
- XXXX = Daily Traffic Volumes
- X/X = AM/PM Peak Hour Signalized Intersection Level of Service
- x/x = AM/PM Peak Hour Unsignalized Intersection Level of Service
- - - - = Potential Future Road
- X = Intersection Number
- XX% = Site Trip Distribution
- = Stop Sign
- ⬆ = Traffic Signal



ALL WAY STOP

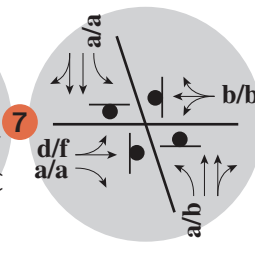
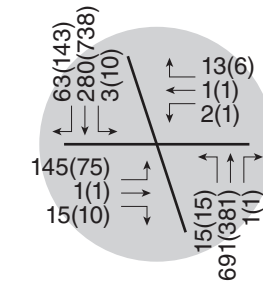
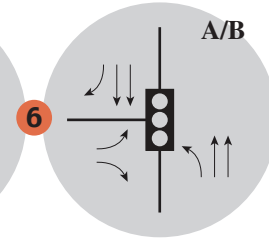
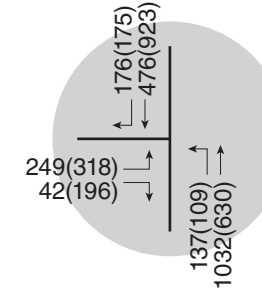


Figure 2
Existing Traffic Conditions

Traffic Operations

Traffic operations were evaluated according to techniques documented in the Highway Capacity Manual, Transportation Research Board (TRB), 2000. Level of Service (LOS) is a qualitative measure of traffic operational conditions, based on roadway capacity and vehicle delay. Levels of service are described by a letter designation ranging from A to F, with LOS A representing the best possible operating conditions and LOS F representing over-capacity, or congested conditions. At signalized intersections an overall level of service is reported, representing a weighted average vehicle delay for all movements. For unsignalized intersections, levels of service are calculated for each movement that must yield the right-of-way to other traffic movements; levels of service are not calculated for free-flow movements, as they are not subject to intersection delay.

To assess the sufficiency of traffic operations at each intersection, two different sets of level of service standards are used within the study area. For intersections on state highways, WYDOT's level of service standard of LOS C or better applies, while for intersections of non-state highways, Teton County's level of service standard of LOS D or better applies.

Figure 2 shows current levels of service at the key intersections within the study area during the morning (7-9 AM) and afternoon (4-6 PM) peak periods. As the figure indicates, all three of the unsignalized non-state highway intersections in the study area operate at LOS B or better and therefore meet Teton County's Level of Service Standard (LOS D or better).

For the four intersections along state highways, two--the WY 89/North South Park Loop Road and WY 89/High School Road intersections--operate at LOS C or better during both peak periods and therefore meet WYDOT's standard.

At the WY 22/WY 89 signalized intersection, afternoon operations currently perform at LOS D, which exceeds WYDOT's standard. Reconstructing the north leg of the intersection to provide dual left turn lanes, a through lane and a right turn lane would improve operations to LOS C in the afternoon and therefore enable it to meet the standard.

At the unsignalized WY 89/South Park Loop Road intersection the eastbound left turn operates at LOS F during the PM peak hour and thus also exceeds WYDOT's standard. With a traffic signal the intersection would operate at LOS A in the afternoon and meet the standard. However, it should be noted that is not uncommon for movements from driveways and side streets along higher volume roadways to experience poor levels of service, and, as noted in Chapter 17 (Unsignalized Intersections) of the Highway Capacity Manual (2000):

In evaluating the overall performance of two-way stop control intersections, it is important to consider measures of effectiveness in addition to delay, such as v/c ratios for individual movements, average queue lengths, and 95th percentile queue lengths. By focusing on a single measure of effectiveness for the worst movement only, such as delay for the minor street left turn, users may make less effective traffic control decisions.

In the afternoon, the volume to capacity (v/c) ratio for the left turn movement is 0.57, with a 95th percentile queue length (generally regarded as the longest anticipated queue) of 75 feet, which is about three vehicles. These measures indicate the movement is operating under capacity (the v/c ratio is less than 1.0) with relatively minor backups during that period, and suggests the intersection would not necessarily need to be signalized. In other words, while a signal would be needed to meet WYDOT's level of service standard, the intersection currently functions adequately based on other measures. Given this, no improvements would be recommended for existing conditions.

Based on the analysis, it would appear that the existing road system would need one roadway improvement to meet County and/or WYDOT level of service standards under current traffic volume levels:

- **WY 22/WY 89** – Widen the north leg of this intersection to provide dual southbound left turn lanes, a through lane and a right turn lane.

All levels of service worksheets are included in Appendix B.

High School Road Traffic Operations

As noted above, all intersections in the north study area operate at levels of service that meet Teton County's standards. For High School Road, the signalized intersection at WY 89 operates at LOS A in the morning and LOS B in the afternoon, the unsignalized all way stop at Middle School Road operates at LOS B in the morning and LOS A in the afternoon and the High School Road approaches at South Park Loop Road operate at LOS A/B in the morning and LOS A in the afternoon.

While these represent excellent to very good levels of service in general, the presence of the high school does create localized periods of congestion immediately before and immediately after school. In those cases, the drop off/pick up area within the high school fills up with vehicles and traffic spills back onto High School Road. These queues peak around five minutes before school begins and five minutes after it ends, and extend from the Middle School Road intersection east to the Smith's parking lot. At no time over the course of several days of observations did the queue extend into the High School Road intersection, but that may occur with either an expansion of school enrollment or increased westbound traffic volumes on High School Road during those localized periods.

A discussion of nonmotorized conditions on High School Road and other roadways in the north study area is presented in Section VI of this study.

III. EXISTING CONDITIONS WITH TRIBAL TRAIL CONNECTOR

A. Origin Destination Study

To assist in determining traffic projections for the Tribal Trail Connector, an origin-destination study was conducted in July 2009. The O-D study was undertaken to provide field data that quantifies the traffic volume that could potentially use the proposed Connector to WY 22 west of town. The intent of the study was to quantify the traffic volumes traveling between the west side (i.e., Teton Pass, Wilson and the Teton Village Road) and the north end of South Park (local traffic); south South Park (also local traffic); and areas south of Jackson (through traffic), so survey stations were set up on the west side, in north South Park, in south South Park and on WY 89 south of South Park. This field data was then used in conjunction with Teton County’s travel demand forecasting model to project traffic volumes on that road in both the near term and long term. A detailed summary of the O-D study methodology and results is provided in Appendix A.

Table 1 summarizes the overall traffic forecast for travel between the west side, South Park and areas south of town and provides the percentage of traffic from each area relative to the total traffic volume on WY 22 on the west side. As the table indicates, approximately 6,150 vehicles per day travel between those areas, which represents 27 percent of the total daily traffic volume on WY 22 on the west side. Of that total, approximately 2,690 vpd (12 percent) is from the north end of South Park, 1,710 vpd (seven percent) is from south South Park, and 1,710 (eight percent) is through traffic from south of town.

Table 1. Origin Destination Study Results

Between	Total Daily Volume	West-South Forecast Volume	Percent Of Total
Hwy 22 east of Hwy 390	23,100	6,150	27%
And			
North South Park Loop		1,730	8%
High School Road		960	4%
North South Park Total		2,690	12%
Big Trail Drive		410	2%
South South Park Loop Road		500	2%
Other South South Park Road and Driveways		800	3%
South South Park Total		1,710	7%
Combined South Park Total		4,400	19%
Hwy 89 South of South Park Loop		1,750	8%
Through Traffic Total		1,750	8%

It should be noted that the above volumes represent the total traffic travelling between the west side and the south end that might potentially use the Connector, but it does not represent an actual traffic forecast for that road, since it is anticipated that some drivers will continue to use WY 89 and WY 22 even after the extension is complete and some traffic may use the Connector to travel between the west side and the Town of Jackson.

B. Travel Demand Forecasting Model

As noted previously, WYDOT developed a travel demand forecasting model for Teton County to assist in providing future traffic projections throughout the area. For this analysis, the WYDOT model was updated with the most recent existing socio-economic forecasts from the comprehensive plan (data compiled in April 2010) and then calibrated to reflect the existing traffic volumes within the South Park study area. Once the initial calibration was complete, as a further check, the model’s traffic forecasts of travel between the west side, South Park and south of town were compared to the results of the O-D study. Table 2 shows the comparison and indicates the model does a reasonable job of match the O-D study results, forecasting both south of town to west side and South Park to west side trips within two percent of the O-D study results.

Table 2. Comparison of O-D Study Results and Model Travel Forecasts

Location	Daily Volume ¹	O-D Study Trips		Model Volume	Model Trips ²	
		South of Town	South Park		South of Town	South Park
Hwy 22 east of Hwy 390	23,100	1,750	4,400	29,073	1,697	4,799
		8%	19%		6%	17%
		West of Town			West of Town	
Hwy 89 S of South Park Loop	14,050	1,750		13,652	1,697	
		12%			12%	

- 1. July 2008 Count
- 2. Existing (2008) High School Road Travel Demand Forecasting Model

C. Traffic Forecasts for Tribal Trail Connector

The calibrated travel demand model was then used to forecast travel pattern changes that would result from the Tribal Trail Connector under existing traffic conditions. First, a select link analysis was conducted for the Connector to determine the trip distribution on the local roads within the study area and to determine the ultimate destinations within the community of all trips using the new link.

Figure 3 shows the results of the select link analysis for the Connector. As the figure indicates, the vast majority of the Connector traffic (70 percent) would use the east-west segment of South Park Loop Road at the north end of the study area to travel between the Connector and either the local neighborhood/schools/businesses on the west side of WY 89 (in the case of local trips) or WY 89 (in the case of through trips).



Figure 3
 Distribution of Existing Tribal Trail
 Connector Traffic on Study Area Roads

NORTH

Furthermore, as indicated in the figure and in Table 3, a relatively high portion of the traffic on the Connector is from local trips that have origins or destinations within the South Park area; over 60 percent of the traffic on the Connector is local traffic that already uses the South Park study area road system. Of the 3,600 through trips using the Connector, roughly two out of three are headed to and from town and only one out of three is headed to and from south of town.

As a final note, the model forecasts indicate that approximately 72 percent of the through trips between south of Town and the west side would shift to the Connector (1,225 out of 1,700 vpd).

Table 3. Existing Tribal Trail Connector Traffic by Destination

Between	And	Volume	Percent
West Side	South Park ¹ (local)	4,960	55%
	Town (through)	2,330	26%
	South of Town (through)	1,225	13%
South Park	Town (local)	500	6%
	Total	9,015	
	Local Traffic	5,460	61%
	Through Traffic	3,555	39%

1. Local trips include trips to/from the developments on the east side of WY 89 between South Park Loop Road and High School Road. If those 750 daily trips are re-classified as through trips, the percentages change to 52 percent local and 48 percent through trips.

Connector Traffic Using High School Road

High School Road is the second most popular travel route for Connector traffic, but it is projected to carry far less traffic than the north end of South Park Loop Road in the near term. As Figure 3 indicates, the west end of High School Road would only attract nine percent of Connector traffic (roughly 850 vpd). Around 200 vpd of these trips are local traffic with origins or destinations along High School Road and the rest (650 vpd) is traffic that travels the length of High School Road to WY 89 and continues south to either other parts of South Park or out of the study area.

D. Overall Traffic Forecasts for South Park Study Area

Since the Connector attracts local trips from within South Park in addition to through trips, its construction will result in changes to existing travel patterns that will increase traffic on some study area roads and decrease traffic on others.

For instance, a person living along High School Road heading to the west side currently travels east to WY 89 then north to the Y and WY 22, but with the new Connector might travel west to South Park Loop Road, then north to WY 22 via Tribal Trail Road. As a result, their change in travel pattern would reduce traffic on the east end of High School Road and the north part of WY 89 by one trip, but would add a trip to the west end of High School Road and the north part of South Park Loop Road.

At the same time a vehicle travelling north on WY 89 might shift over to the Connector using High School Road, further reducing traffic on WY 89 by one trip north of there, replacing the local trip on the east end of High School Road, and adding an additional trip to the west end of High School Road and the north part of South Park Loop Road.

The net result of these two travel pattern changes would be two fewer trips on the north part of WY 89, no change in trips on the east end of High School Road, and two additional trips on the west end of High School Road and the north part of South Park Loop Road. With the Connector, it would be anticipated that similar types of trip changes would occur throughout the study area, and therefore change overall traffic forecasts on each link of most of the study area roads.

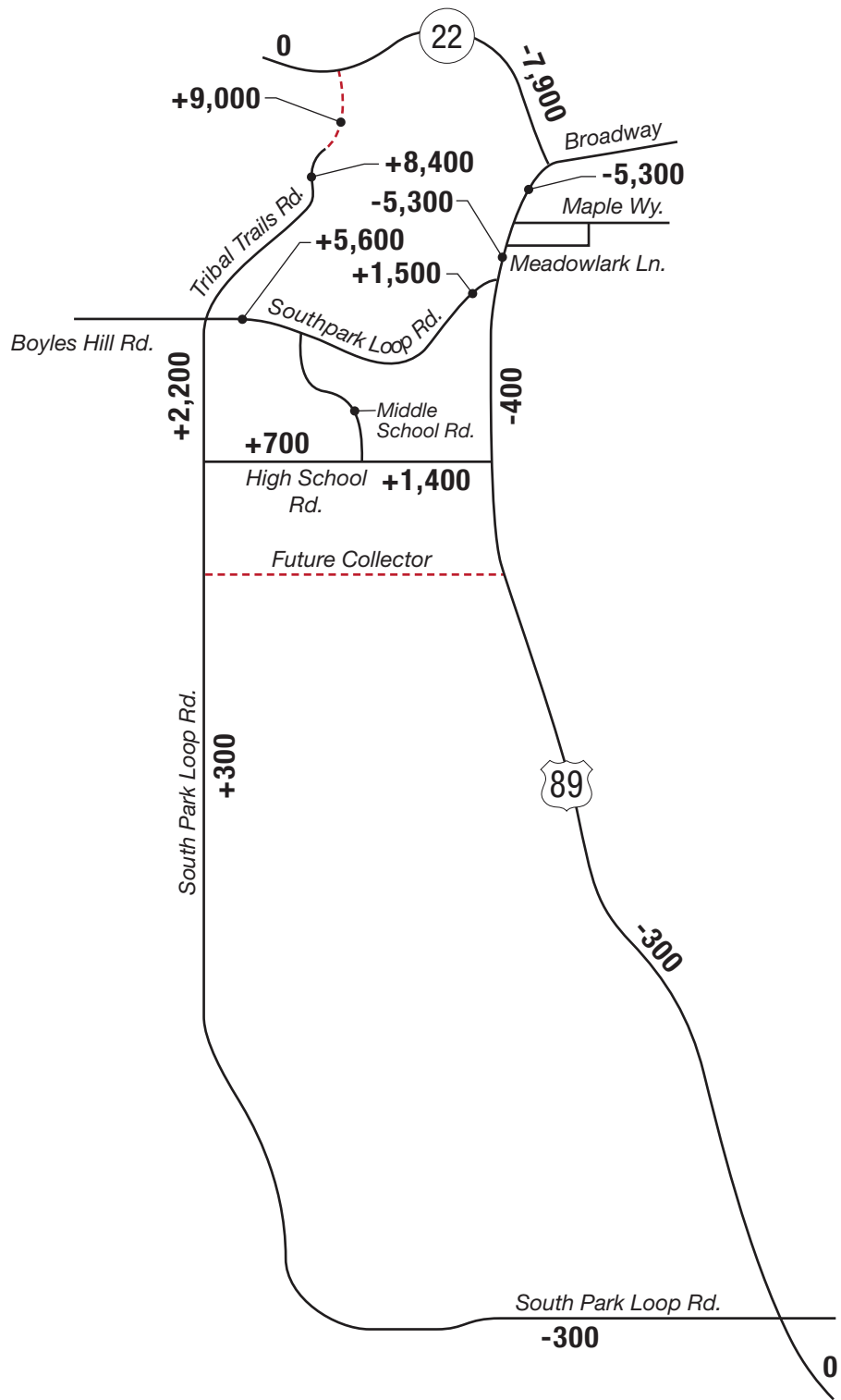
So, to determine the overall net changes in traffic on study area roadways that result from the Connector's construction, model runs were conducted both with and without the Connector, and the difference between the two model runs was applied to the existing traffic volumes on the road network for each critical roadway link. The net changes in daily traffic resulting from the Connector are presented in **Figure 4** and the overall traffic forecasts for the study area are presented in **Figure 5**.

Traffic Operations

Figure 5 also shows the projected levels of service at each key intersection within the study area. As the figure indicates, all four signalized intersections along state highways in the study area continue to operate at LOS C or better during both peak hours and therefore meet WYDOT's Level of Service Standards. Of particular note, the shift in traffic away from the Y due to the Connector improves operations there from LOS D in the afternoon today, with an average delay per vehicle of 39 seconds, to LOS C with an average delay of 23 seconds per vehicle. This equates to an overall reduction of approximately 23 vehicle-hours of delay each day during the afternoon peak hour alone.

Similarly, all three unsignalized non-state highway intersections in the north part of the study area operate at LOS B or better and therefore also meet Teton County's level of service standard (while traffic volumes increase because of the Connector, they still remain at a level where the current traffic control and lane geometry can adequately accommodate them). It should be noted that construction of the Connector would require a change in traffic control at the South Park Loop Road/Tribal Trail Road intersection from two-way stop control to all-way stop control, but no roadway geometry improvements (such as additional turn lanes) would be required there.

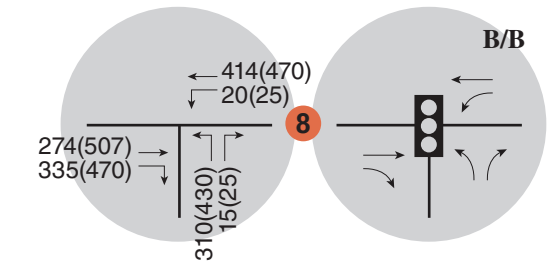
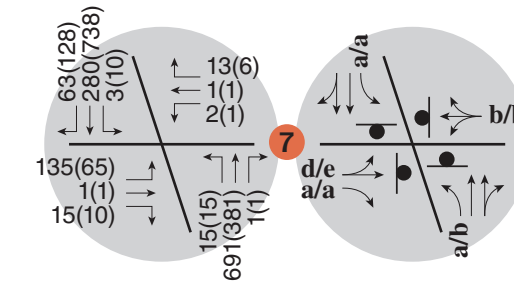
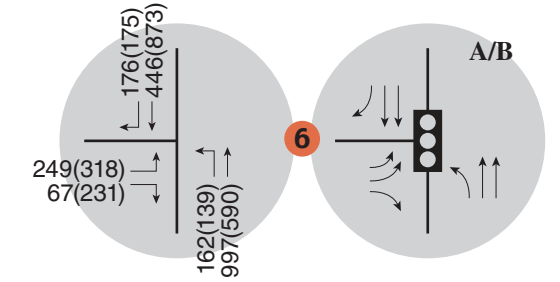
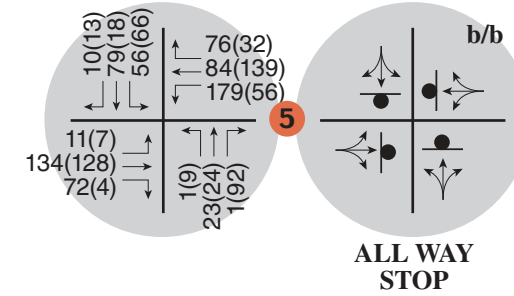
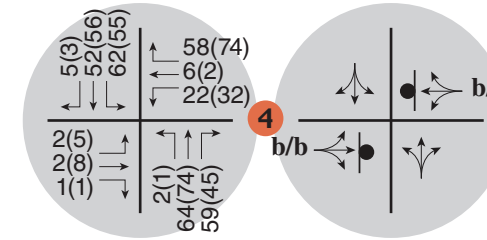
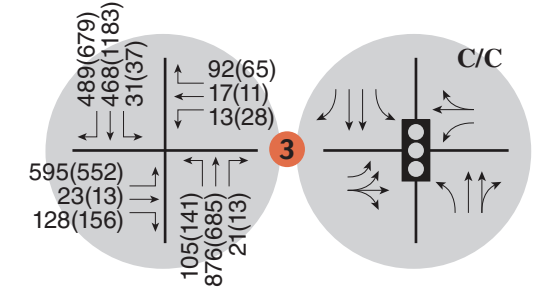
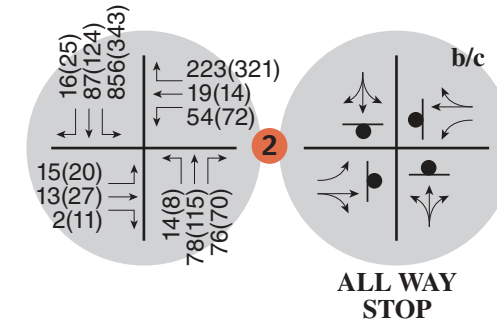
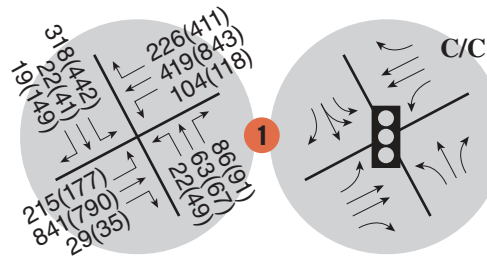
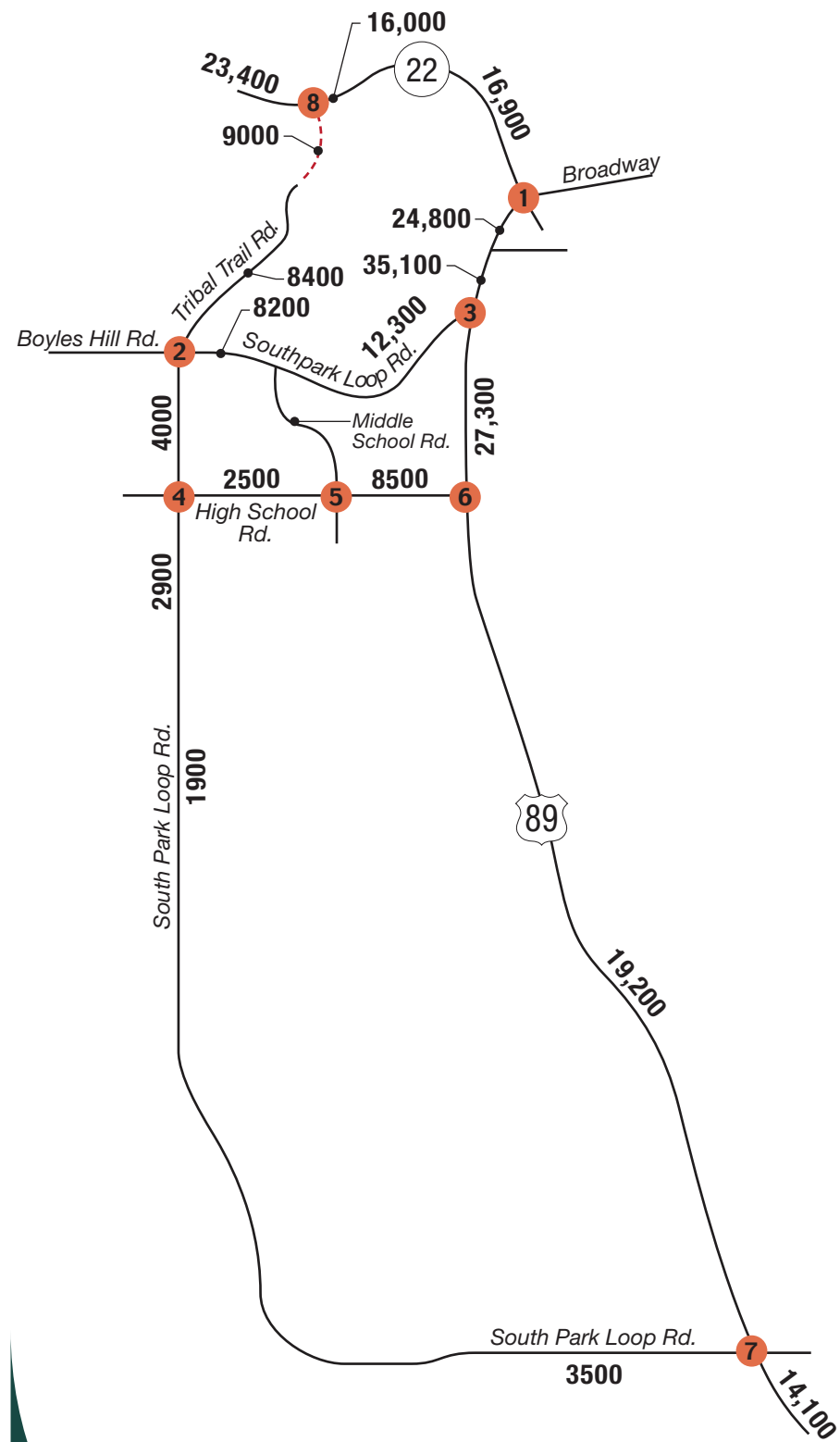
Based on the traffic volume forecasts for Tribal Trail Road and the Connector, it would appear that the appropriate lane geometry would be one lane in each direction plus a center lane that would be used for a left turn lane at intersections and a median between intersections (three lane cross-section). This geometry will allow traffic from the existing local roads along it to turn left out of their neighborhoods with relatively minor delays (around 10-15 seconds per vehicle, which represents LOS B/C conditions).



- LEGEND**
- XXXX = Overall Volume Change
 - - - - = Potential Future Road

Figure 4
 Overall Changes in Existing Traffic Volumes
 Resulting from Tribal Trail Connection

NORTH



- LEGEND**
- xxx(xxx) = AM(PM) Peak Hour Traffic Volumes
 - XXXX = Daily Traffic Volumes
 - X/X = AM/PM Peak Hour Signalized Intersection Level of Service
 - x/x = AM/PM Peak Hour Unsignalized Intersection Level of Service
 - - - - = Potential Future Road
 - X = Intersection Number
 - XX% = Site Trip Distribution
 - = Stop Sign
 - ⬆️ = Traffic Signal

Figure 5
Existing Traffic Conditions with
Tribal Trail Road Connection

The only location that exceeds WYDOT's standard is at the unsignalized WY 89/South Park Loop Road intersection, where the eastbound left turn operates at LOS E during the PM peak hour. In the afternoon, the volume to capacity (v/c) ratio for the left turn movement is 0.45, with a 95th percentile queue length of 50 feet, or two vehicles. These conditions are slightly better than they are currently because the Connector draws a small volume of traffic from the developments in the southwest portion of the study area away from this location (roughly 300 vpd). As a result, the movement continues to operate under capacity (the v/c ratio is less than 1.0) with relatively minor queuing during that periods, and would not warrant any improvements.

Based on the analysis, it would appear that the road system could adequately accommodate the immediate changes in travel patterns and traffic volumes that would result from constructing the Tribal Trail Connector, with the appropriate laneage and traffic control provided on the new Connector and one minor improvement to the existing road system:

- **WY 22/Tribal Trail Connector** – Signalize this new intersection and provide an eastbound right turn lane, a westbound left turn lane and separate northbound left and right turn lanes.
- **Tribal Trail Road** – Construct the Connector as a two lane road. The road's should be designed to a 30 mph design speed to maintain reasonable travel speeds and discourage it's use as a cut-through route.
- **South Park Loop Road/Tribal Trail Road** – convert this existing intersection from two way stop control to all-way stop control.

High School Road Traffic Operations

For High School Road, Figure 4 indicates that construction of the Connector would increase traffic on the east end by approximately 1,400 vpd and on the west end by 700 vpd, while Figure 5 indicates that these traffic volume changes are slight enough that they don't significantly change levels of service from existing conditions. Specifically, with the increased traffic the signalized intersection at WY 89 would continue to operate at LOS A in the morning and LOS B in the afternoon, the unsignalized all way stop at Middle School Road would continue to operate at LOS B in the morning but drop from LOS A to LOS B in the afternoon and the High School Road approaches at South Park Loop Road would drop from LOS A/B to LOS B in the morning and from LOS A to LOS B in the afternoon. So although there would be some additional delay associated with the increased traffic, overall corridor operations would continue to be very good.

It should be noted, however, that the localized congestion created by the high school will continue to occur with the Connector, and that if any increases in traffic due to the Connector occur during those short periods before and after school, it might result in traffic queues spilling back past the Smith's parking lot into the WY 89 intersection. It seems more likely, however, that Connector traffic would avoid High School Road during those brief periods of school activity and instead use north South Park Loop Road.

IV. 2030 FUTURE BACKGROUND TRAFFIC CONDITIONS

A. Road System Changes

One road system change was assumed for the 2030 background analysis. Teton County is considering constructing a new connector road between WY 89 and South Park Loop Road south of High School Road to accommodate future development associated with that part of the study area, so for the purpose of this analysis, that new connector was assumed to be completed by 2030 and a part of the background road system.

B. 2030 Traffic Forecasts

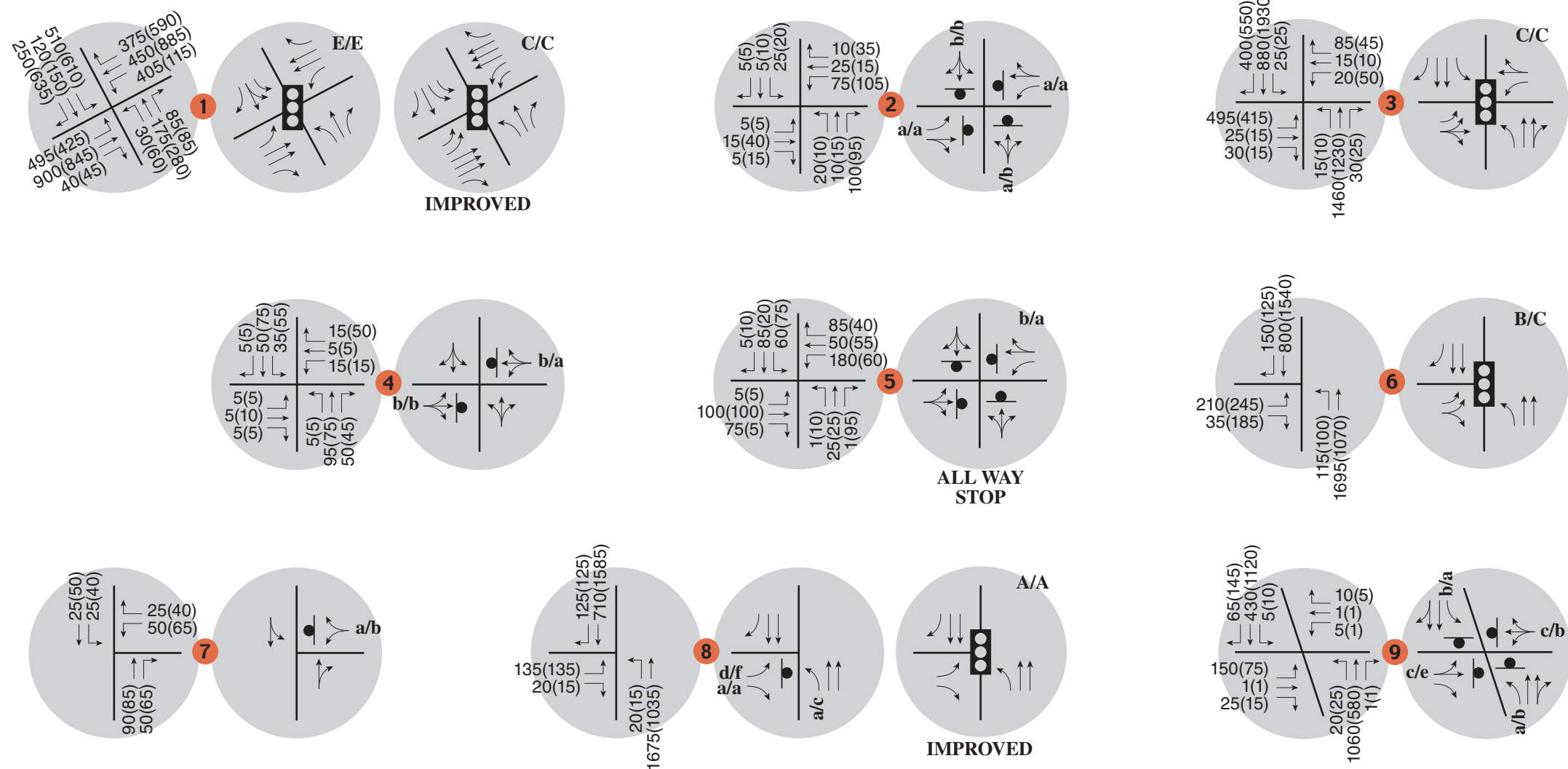
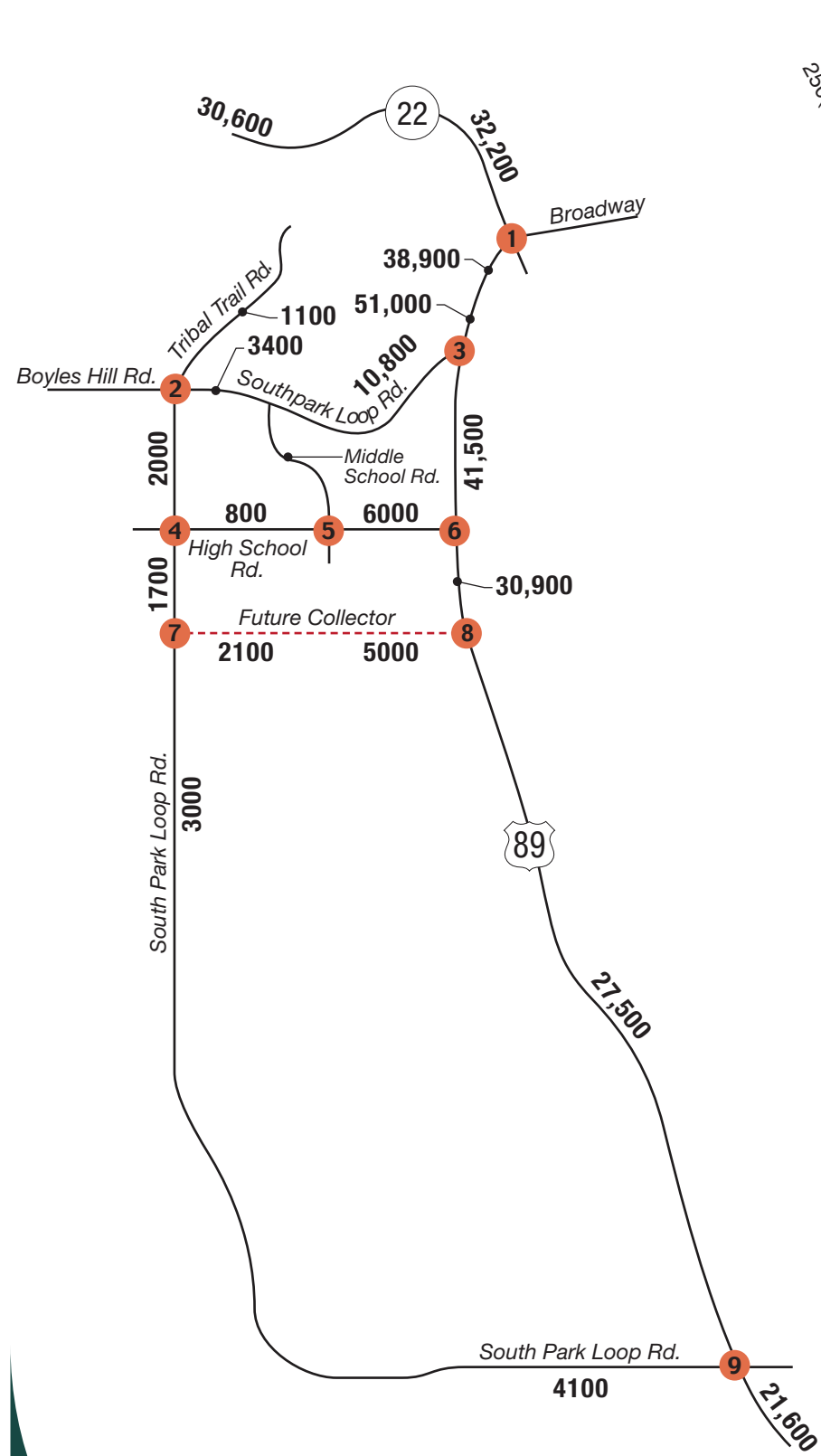
The WYDOT travel demand model used to generate the existing traffic volume forecasts discussed above was also used to generate future traffic conditions. To achieve this, the socio-economic data that had been developed for the Teton County Comprehensive Plan Update (from April 2010) was input into the baseline travel demand model that consisted of the existing road network plus the new connector roadway. The resulting traffic forecasts were used in conjunction with the forecasts from the existing conditions model to develop growth rates for each link in the sub area, which were then applied to the existing traffic counts on those links. **Figure 6** shows the projected 2030 baseline traffic conditions that resulted from this process. As the figure indicates, the new east-west connector south of High School Road is anticipated to carry 5,000 vpd on the east end and 2,100 vpd on the west end. Around 60 percent of this traffic is from the new development planned for that part of South Park, with the other 40 percent (2,000 vpd) is traffic that has shifted away from South Park Loop Road and High School Road. As a result of this shift, the 2030 traffic forecasts for north South Park Loop Road just west of WY 89 is 10,800 vpd, which is the same as existing volumes, while the future forecast for High School Road is 6,000 vpd, or 1,100 vpd less than existing conditions.

It is also worth noting that 2030 baseline traffic forecasts on WY 89 would exceed 50,000 vpd north of South Park Loop Road and traffic forecasts on WY 22 north of the Y exceed 40,000 vpd. The volume forecast for WY 89 would be at or above the upper capacity threshold for a four lane arterial, which would lead to longer periods of higher congestion and call for the widening of that road to six lanes.

Traffic Operations

Figure 6 also shows the projected levels of service at each key intersection within the study area. As the figure indicates, under baseline conditions, the Y intersection would operate at LOS E in both the morning and afternoon. To meet WYDOT's LOS C Standard, WY 89 would need to be widened to six lanes in each direction through the area (i.e. between north South Park Loop Road and Pearl Street) and the intersection would need to be widened to provide dual left turn lanes on the eastbound, westbound and southbound approaches.

The north WY 89/South Park Loop Road and WY 89/High School Road intersections both operate at LOS C or better and therefore meet WYDOT's standard.



- LEGEND**
- XXX(XXX) = AM(PM) Peak Hour Traffic Volumes
 - XXXX = Daily Traffic Volumes
 - X/X = AM/PM Peak Hour Signalized Intersection Level of Service
 - x/x = AM/PM Peak Hour Unsignalized Intersection Level of Service
 - - - - = Potential Future Road
 - X = Intersection Number
 - XX% = Site Trip Distribution
 - = Stop Sign
 - ⬢ = Traffic Signal

Figure 6
2030 Baseline Traffic Conditions

At the WY 89/New East-West Connector Road intersection, outbound left turns would operate at LOS F in the afternoon peak period. The v/c ratio would exceed 1.0 and 95th percentile queues are projected to be around 10 vehicles, which would indicate that the intersection would be better served by a traffic signal.

At the south WY 89/South Park Loop Road intersection, eastbound left turns would continue to operate at LOS E during the PM peak hour, and the v/c ratio and projected queues would also continue to be similar to what occurs there today, largely because future traffic volumes are projected to be quite similar to existing volumes. As a result, it would appear that location would not warrant any improvements in the long term.

All three of the existing unsignalized non-state highway intersections in the north part of the study area operate at LOS B or better and therefore also meet Teton County's level of service standard (while traffic volumes increase as a result of further development throughout the area, they still remain at a level where the current traffic control and lane geometry can adequately accommodate them). The unsignalized intersection of the new east-west connector road and South Park Loop Road would also operate at LOS B or better.

Based on the analysis, it would appear that the baseline road system would need the following improvements to adequately accommodate 2030 baseline traffic forecasts:

- **WY 89** – Widen the highway to three through lanes in each direction between north South Park Loop Road and Pearl Street.
- **WY 89/WY 22 (aka the Y)** – Widen this intersection to provide two eastbound left turn lanes and two southbound left turn lanes.
- **WY 89/New Connector** – At this new intersection, install a traffic signal and provide a northbound left turn lane, a southbound right turn lane, and separate eastbound left and right lanes.
- **WY 89 north of South Park Loop Road** – Traffic forecasts on this road segment exceed 50,000 vpd, which suggests that it may be better served as a six lane roadway.

High School Road Traffic Operations

As noted above, future traffic volumes on High School Road are forecast to drop by around 1,100 vpd from existing conditions due to the construction of the new east-west connector roadway to the south. As a result, traffic operations on High School Road are anticipated to be similar to existing conditions, even with increased development in the South Park area. Specifically, while the signalized intersection at WY 89/High School Road would drop from LOS A to LOS B in the morning and from LOS B to LOS C in the afternoon due to increased through traffic on the highway, the unsignalized all way stop at Middle School Road would continue to operate at LOS B in the morning and LOS A in the afternoon and the High School Road approaches at South Park Loop Road would operate at LOS B in the morning and LOS A/B in the afternoon.

The reduction in traffic volumes may also reduce the length of the queues during the localized congestion immediately before and immediately after school, but it is anticipated that nearly all of the traffic on High School Road during those periods is associated with the high school, so residents should not expect any dramatic change from current conditions. In other words, instead of vehicles back up to the Smith's parking lot, in the future they may instead only back up to just beyond Gregory Lane, but in either case roadway travelers caught up in that congestion would experience similar delays.

DRAFT

V. 2030 FUTURE TRAFFIC CONDITIONS WITH TRIBAL TRAIL CONNECTOR

C. Traffic Forecasts for Tribal Trail Connector

The travel demand model used to project the above 2030 baseline traffic conditions was also used to forecast future travel pattern changes that would result from the Tribal Trail Connector. To do so, the Connector was added to the baseline road system in the model, and traffic forecasts were developed based on the most recent (April 2010) socio-economic forecasts for the County from the Comprehensive Plan update.

As was done for existing conditions with the Connector, a select link analysis was conducted for the Connector to determine the trip distribution on the local roads within the study area and to determine the ultimate destinations within the community of all future trips using the new link. **Figure 7** shows the results of the select link analysis for the Connector. As the figure indicates, while most Connector traffic uses the east-west segment of South Park Loop Road at the north end of the study area (similar to existing conditions with the Connector), in the future a much greater percentage of Connector traffic shifts down to High School Road. This is likely a result of increased traffic and higher congestion on WY 89 north of High School Road in the future, which increases delays at the north WY 89/South Park Loop Road intersection and makes shifting over to the new Connector on a road further south a more appealing option.

Furthermore, as indicated in the figure and in Table 4, in the future a higher portion of the traffic on the Connector would be from local trips that have origins or destinations within the South Park area; 70 percent of the trips in the future would be local trips, versus 60 percent in the existing analysis. Additionally, of the 4,000 through trips using the Connector, only one out of four are headed to and from town (down significantly from two out of three in the existing analysis) and three out of four is headed to and from south of town. This shift away from using the Connector as alternate route into town may also be a result of increased traffic and congestion on WY 89 north of South Park Loop Road; with fewer trips and less congestion on WY 22 and shorter delays at the Y, staying on that road would become the more appealing travel option for trips between the west side and town.

The model forecasts also indicate that approximately 86 percent of the through trips between south of Town and the west side would shift to the Connector (3,200 out of 3,700 vpd), an increase of 14 percent from the 72 percent under existing volumes.



Figure 7
Distribution of Future Tribal Trail Connector Traffic on Study Area Roads

NORTH

Table 4. 2030 Tribal Trail Connector Traffic by Destination

Between	And	Volume	Percent
West Side	South Park ¹ (local)	9,250	69%
	South of Town (through)	3,180	24%
	Town (through)	855	6%
South Park	Town (local)	35	<1%
	Total	13,320	
	Local Traffic	9,285	70%
	Through Traffic	4,035	30%

1. Local trips include trips to/from the developments on the east side of WY 89 between South Park Loop Road and High School Road. If those 785 daily trips are re-classified as through trips, the percentages change to 64 percent local and 36 percent through trips.

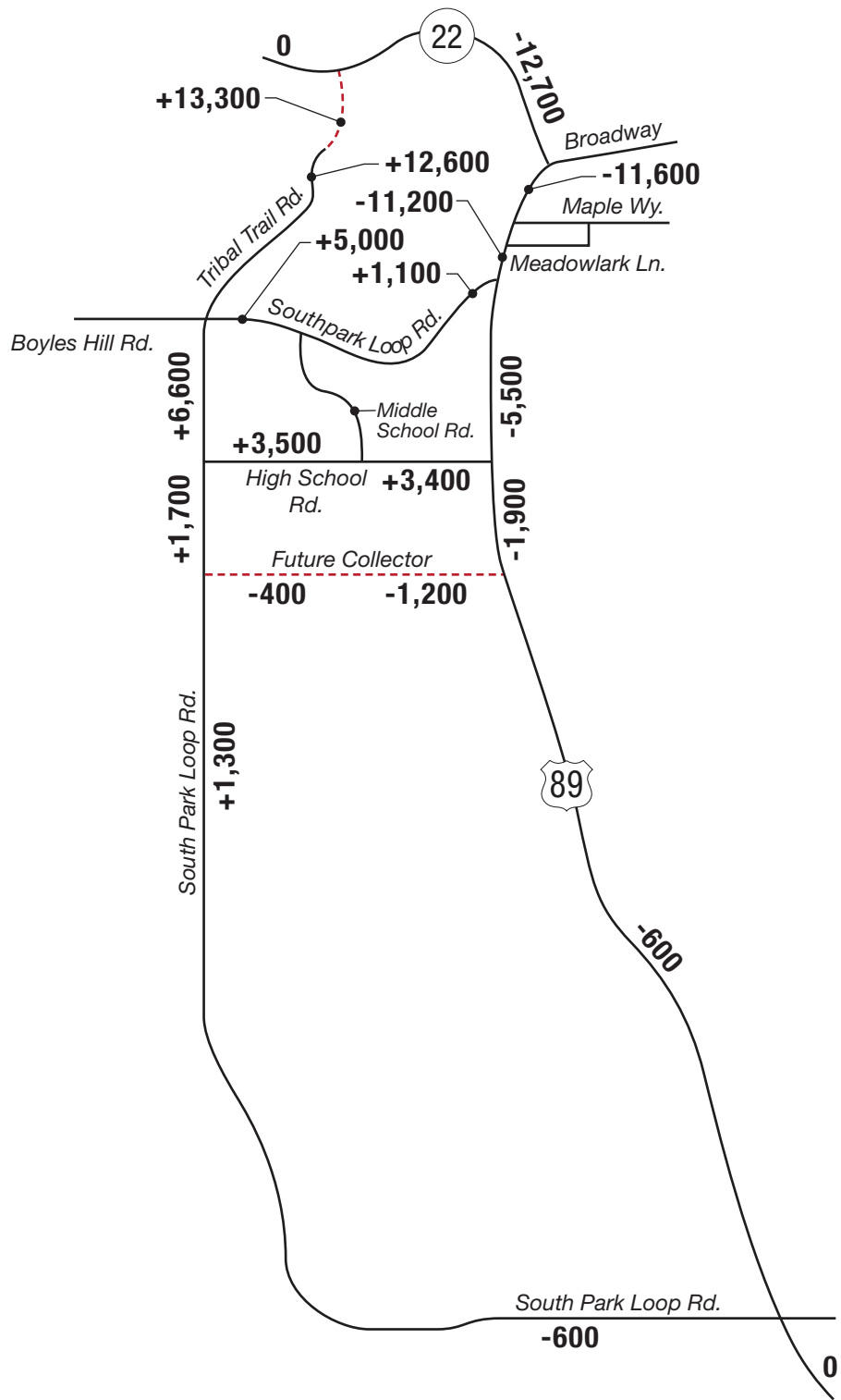
As a final note, construction of the Connector is forecast to reduce the travel demand on WY 89 north of north South Park Loop Road and on the new east-west connector south of High School Road over baseline conditions. As a result, volumes on the highway would peak at 39,700 vpd and not appear to require widening of the roadway. Meanwhile, volumes on the new collector are anticipated to be 3,800 vpd on the east end near WY 89 and 1,700 vpd on the west end near South Park Loop Road.

Connector Traffic Using High School Road

As noted above, High School Road becomes a much more popular travel route for Connector traffic in the long term future than it is in the near term. As Figure 3 indicates, the west end of High School Road would attract 28 percent of Connector traffic (roughly 3,700 vpd). As with existing volumes, around 200 vpd of these trips are local traffic with origins or destinations along High School Road while the rest (3,500 vpd) is traffic that travels the length of High School Road to WY 89 and continues south to either other parts of South Park or out of the study area.

D. Overall Traffic Forecasts for South Park Study Area

As with the existing analysis of the Tribal Trail Connector, to determine the overall net changes in traffic on study area roadways in the future that result from the Connector’s construction, model runs were conducted both with and without the Connector, and the difference between the two model runs was applied to the 2030 baseline traffic volumes on the road network for each critical roadway link. The net changes in daily traffic resulting from the Connector are presented in **Figure 8** and the overall traffic forecasts for the study area are presented in **Figure 9**.



LEGEND

- XXXX** = Overall Volume Change
- - - - -** = Potential Future Road

Figure 8
 Overall Changes in Traffic Volumes from
 2030 Baseline Conditions Resulting from
 Tribal Trail Connector

NORTH

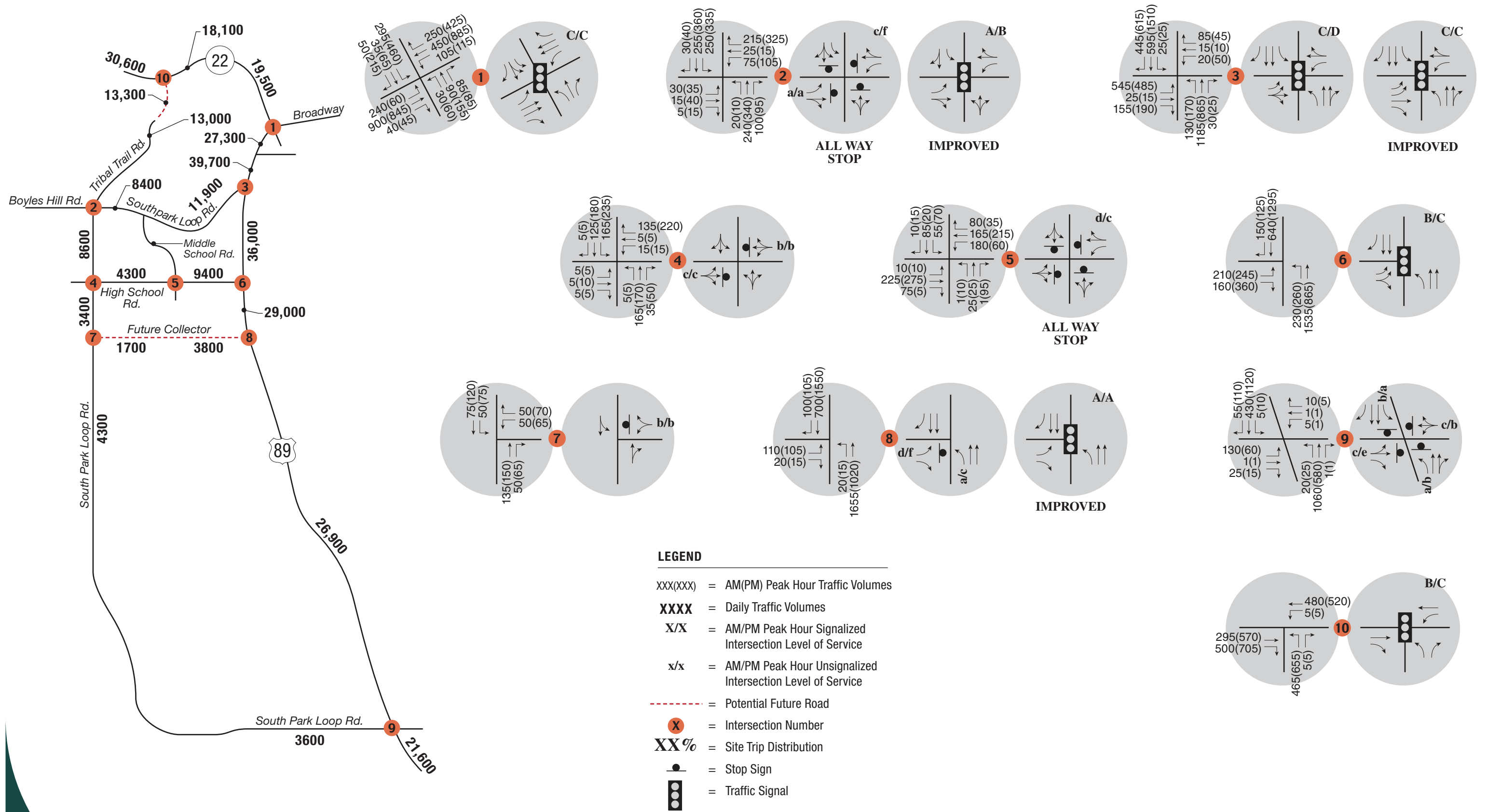


Figure 9
2030 Overall Traffic Conditions
with Tribal Trail Connector

Traffic Operations

Figure 9 also shows the projected levels of service at each key intersection within the study area. Of particular note, the shift in traffic away from the Y due to the Connector would enable that intersection to operate at LOS C during both peak periods without any need for improvements, with delays that are similar to or slightly better than conditions today.

The north WY 89/SouthPark Loop Road intersection would operate at LOS D in the afternoon with the Connector and therefore exceed WYDOT's level of service standard. Widening the eastbound approach to provide dual left turn lanes and a shared through/right turn lane would improve operations there to LOS C in the afternoon and thus meet the standard.

The traffic shift also requires a change in traffic control at the unsignalized South Park Loop Road/Tribal Trail Road intersection, which would need to be upgraded from all-way stop control (identified as appropriate traffic control for existing volumes with the Connector) to either a signalized intersection or a roundabout. No roadway geometry improvements (such as additional turn lanes) would be required there, however. Based on the future traffic volume forecasts for Tribal Trail Road and the Connector, it would appear that the appropriate lane geometry would continue to be one lane in each direction (two lane cross-section). This geometry will allow traffic from the existing local roads along it to turn left out of their neighborhoods with delays that are slightly longer than in the near term, yet are still reasonable (around 30 seconds per vehicle, which represents LOS D conditions), and continue to discourage the use of the road as a high speed cut-through route.

The remaining unsignalized intersections in the north study area operate at LOS B or better and therefore would continue to meet Teton County's level of service standard (while traffic volumes increase because of the Connector, they still remain at a level where the current traffic control and lane geometry can adequately accommodate them). The new east-west connector road south of High School Road would also operate at LOS B or better at the South Park Loop Road intersection, but outbound left turns at its intersection with WY 89 would operate at LOS F in the afternoon peak period. With a traffic signal the intersection would operate at LOS A during both peak periods and meet WYDOT level of service standards.

At the south WY 89/South Park Loop Road intersection, eastbound left turns would continue to operate at LOS E during the PM peak hour as they do under existing conditions, and the v/c ratio and projected queues would also continue to be similar to what occurs there today, largely because future traffic volumes are projected to be quite similar to existing volumes. As a result, it would appear that location would not warrant any improvements in the long term.

Based on the analysis, it would appear that the future road system with the Tribal Trail Connector would need the following improvements to adequately accommodate 2030 baseline traffic forecasts:

- **WY 22/Tribal Trail Connector** – Signalize this new intersection and provide an eastbound right turn lane, a westbound left turn lane and separate northbound left and right turn lanes.

- **Tribal Trail Road** – Construct the Connector as a three lane road and widen the existing portion of the road to three lanes, with the center lane providing either a median or a left turn lane at intersections.
- **Tribal Trail Road/South Park Loop Road** – Upgrade the traffic control from all way stop control to a signalized intersection.
- **WY 89/North South Park Loop Road** – Widen the eastbound approach to provide dual left turn lanes and a shared through/right turn lane.
- **WY 89/New Connector** – Signalize this new intersection and provide a northbound left turn lane, a southbound right turn lane, and separate eastbound left and right lanes.

High School Road Traffic Operations

Future traffic volumes on High School Road with the Connector are forecast to increase to 9,400 vpd west of WY 89, or roughly 2,300 vpd more than existing conditions. As a result, traffic operations on that road are anticipated to be slightly more congested than they currently are. Specifically, the signalized intersection at WY 89/High School Road would drop from LOS A to LOS B in the morning and from LOS B to LOS C in the afternoon, the unsignalized all way stop at Middle School Road would drop from LOS B to LOS D in the morning and from LOS A to LOS C in the afternoon and the High School Road approaches at South Park Loop Road would drop from LOS A/B to LOS B/C in the morning and from LOS A/B to LOS B/C in the afternoon.

As with all other scenarios, the localized congestion created by the high school will continue to occur with Connector, and if any of forecast traffic increases in the long term with the Connector occur during those short periods before and after school, it might result in traffic queues spilling back past the Smith's parking lot into the WY 89 intersection. It seems more likely, however, that Connector traffic would avoid High School Road during those brief periods of school activity and instead use north South Park Loop Road.

VI. NONMOTORIZED ANALYSIS

In addition to the above traffic assessment, an evaluation of existing conditions that affect the safety of non-motorized users within the High School Road Corridor study area was conducted. The types of non-motorized users include recreational bicyclists and pedestrians, commuter bicyclists, and school children biking or walking to and from school. The study area encompasses four schools: Colter Elementary, Jackson Hole Middle, Jackson Hole High, and Summit High Schools. Therefore, the evaluation provides a particular focus on school zone signing and pavement markings relative to current standards contained in the *Manual on Uniform Traffic Control Devices*, FHWA, 2003. Other physical features that influence safety or functionality, including separate bike/ped paths, sidewalks, on-street bike lanes, roadway geometrics, and traffic control, have also been considered.

A. Data Collection

A field data collection effort was conducted in June, 2009. As an initial step, a meeting was held with Mr. Brian Schilling, Pathways Coordinator for the Jackson Hole Community Pathways program. The purpose of the meeting was to gain an understanding of the local perspectives relative to operational or safety concerns with non-motorized travel within the study area. During the meeting, Mr. Schilling identified the following issues:

- The Town has recently restriped High School Road to add bike lanes. A westbound left-turn lane at the High School has also been added.
- A large number of students ride bikes to school from the Rafter J neighborhood, many of whom are elementary school kids.
- There is a separated bike path along High School Road from WY 89 west to Middle School Road. The Town has plans to extend this path to South Park Loop Road.
- The Town is considering installing roundabouts as a means to reduce vehicle speeds and calm traffic at five intersections within the school area: at High School Road/Gregory Lane, High School Road/Jackson Hole High School east access, High School Road/Middle School Road, Middle School Road/Blair Drive, and Blair Drive/South Park Loop Road.
- There are established bike/ped crossings along South Park Loop Road at three intersections; at High School Road, Rangeview Drive, and Blair Drive. These non-motorized crossings connect the Cottonwood Park neighborhood to the existing bike path located along the west side of South Park Loop Road.
- There is a need for improved on-street bike facilities at the east end of High School Road. The new left-turn lane for the high school has also reduced the available space for bike lanes.

Following the meeting, a field inventory of existing non-motorized conditions was conducted within the study area. The inventory included traffic control devices, pavement markings, and roadway geometrics for the following study area roads:

- High School Road, WY 89 to South Park Loop Road
- South Park Loop Road, High School Road to WY 89
- Middle School Road, High School Road to Blair Drive
- Tribal Trail Road, South Park Loop Road to northern terminus

A photographic log was compiled, and existing conditions and potential deficiencies relative to bicycle and pedestrian travel modes were observed.

B. Existing Deficiencies

High School Road

This two-lane collector roadway extends east-west between WY 89 and South Park Loop Road. Vehicular travel lanes are generally 12 feet in width, with the remainder of the paved way striped for on-street bicycle use. The on-street bike lane varies in width, from approximately eight feet west of Middle School Road to none adjacent to the westbound left-turn lane that has been striped at the western High School access (aligning with Middle School Road). Between WY 89 and Middle School Road, a separate, paved bike/ped path runs along the north side of High School Road. This path has some discontinuity adjacent to the Smith's building.

With the exception of the traffic signal at WY 89, traffic control along High School Road is unsignalized, with all-way STOP sign control at the east high school access and at Middle School Road. Two-way stop control is used on minor cross street approaches and on westbound High School Road at South Park Loop Road.

Several speed limits are posted along High School Road: adjacent to Colter Elementary and Jackson Hole High Schools, a reduced speed zone of 20 mph (7:00 AM to 4:00 PM) is established by school zone signing. West of the school zone, the speed limit is posted 25 mph. East of the school zone, the eastbound direction is posted 30 mph, while the westbound direction is not posted.

Based on the inventory of existing conditions, the following deficiencies were observed along High School Road (all nonmotorized figures are provided in Appendix B):

- A masonry trash enclosure at Smith's creates a sight distance hazard for users of the bike/ped path, as shown in **Figure 1**.
- The separate bike/ped path becomes discontinuous adjacent to the Smith's building, with bike traffic diverted onto the roadway; pedestrians have the option to use the sidewalk along the building. **Figure 2** is a view looking westbound at the diversion point.
- A bike/ped crossing near the east edge of the high school does not have crosswalk pavement marking, as shown on **Figure 3**.
- Several school zone signs are yellow, rather than the high-visibility fluorescent yellow-green color used on most of the school zone signs in this area. **Figures 4 and 5** illustrate this issue.
- In addition to the incorrect coloring, the S1-1 school crosswalk sign shown in **Figure 5** is obsolete (crosswalk bars) and is used as an advance warning sign. The use of the older style S1-1 is typical throughout the study area.

- **Figure 6** shows the westbound view approaching South Park Loop Road. Two old edge stripes are still visible and may create confusion for on-street bicyclist and motorists.
- **Figure 7** shows an existing R2-1 Speed Limit 20 sign on eastbound High School Road within the school zone. As the school zone is posted 20 mph between the hours of 7:00 AM and 4:00 PM, this sign gives a conflicting message.
- **Figure 8** shows an existing R2-1 Speed Limit 30 sign on eastbound High School Road just east of the school zone. This is inconsistent with the remainder of the roadway, which is posted 25 mph except within the school zone during school hours.
- The recent addition of the westbound left turn lane into the high school creates narrow shoulders for on-street bike use, as depicted on **Figure 9**.
- **Figure 10** gives the eastbound view at Middle School Road. The westbound left-turn lane creates a through-lane off-set for eastbound motorists; note the white minivan straddling the centerline.

Middle School Road

Middle School Road is a two-lane local roadway which provides access for Colter Elementary, Summit High, and Jackson Hole Middle Schools. It extends north from High School Road to Blair Drive (a neighborhood minor collector). The typical cross section consists of two travel lanes and no shoulders. A separate, paved bike/ped path is provided along the east side starting at High School Road; the path crosses over to the west side approaching the middle school. Traffic control consists of all-way STOP signs at High School Road and at Blair Drive. The posted speed limit is 20 mph.

The following deficiencies related to non-motorized use were observed along Middle School Road:

- The view north at the first school crosswalk is shown on **Figure 11**. The S1-1 signs denoting the crosswalk are inconsistent; on the right is an old style S1-1 sign (with cross bars). There is no advance warning sign on the northbound approach to this crossing.
- **Figure 12** is the view south at the same crossing, showing mismatched S1-1 signs and worn pavement markings. Worn crosswalk paint is typical throughout the study area.
- **Figure 13** is the view southbound along Blair Drive approaching the intersection with Middle School Road. Note the obsolete S1-1 sign used as an advance warning sign for the school zone.

Tribal Trail Road

This two-lane collector roadway extends north from the South Park Loop Road/Boyle Hill Road intersection, providing access for residential users. The roadway is discontinuous just beyond Cherokee Lane. The basic cross section includes two 12-foot travel lanes and four-foot shoulders; a southbound left-turn lane to eastbound South Park Loop Road is provided. Traffic control consists of a STOP sign on southbound Tribal Trail Road at South Park Loop Road/Boyle Hill Road, and minor cross street approaches are also STOP sign controlled. A separate, paved bike/ped lane runs along the east side of the roadway, beginning just north of Seneca Lane. The speed limit on Tribal Trail Road is posted at 35 mph.

During the field inventory of existing conditions, the following deficiency was observed:

- As shown on **Figure 14**, the southbound left-turn lane creates a southbound through-lane misalignment at the South Park Loop Road/Boyle Hill Road intersection.

South Park Loop Road

South Park Loop Road is a two-lane collector road that extends west from WY 89 through residential neighborhoods south of town, curving north to Boyle Hill Road, then east to intersect again with WY 89 within Jackson. The study area includes the north-south segment between High School Road and Boyle Hill Road and the east-west segment from Tribal Trail Road to WY 89. The cross-section on the north-south segment consists of two 11-foot lanes with no shoulders. A separate, paved bike/ped path is provided along the west side of the roadway. Traffic control consists of a STOP sign on the northbound approach at Boyle Hill Road, with STOP sign control on minor cross-street approaches. The speed limit on this segment is posted 40 mph.

The east-west segment has a wider cross section, with 12-foot lanes and four-foot shoulders. A separate bike/ped path extends along the south side from Tribal Trail Road to Blair Drive; east of this point, an attached four-foot sidewalk is provided. Traffic control is unsignalized, with STOP signs on the minor cross-street approaches to South Park Loop Road. The speed limit on this segment is posted 30 mph, except within a signed school zone (approaching Blair Drive), which is signed 20 mph, 7:00 AM to 4:00 PM.

Based on the inventory of existing conditions, the following deficiencies were observed along South Park Loop Road:

- The north-south segment is very narrow, with willow trees closely lining the roadway. **Figure 15** depicts the narrow cross section and potential sight distance issues due to roadside vegetation. The 40 mph speed limit seems uncomfortably high, and a recent speed study by the Teton County Sheriff's Office indicates the 85th percentile speed at 33 mph.
- **Figure 16** shows a bike/ped crossing at Rangeview Drive. The crosswalk pavement markings are much worn. This crossing is not signed, either with crossing signs or with advance warning signs.
- **Figure 17** is a view looking west at the bike/ped crossing at High School Road. This crossing is not signed and the pavement is not marked. It should be noted that the willow trees which line South Park Loop Road restrict sight distance for motorists approaching the crossing.
- **Figure 18** is a view west of the bike/ped crossing at Boyle Hill Road. There is no crosswalk pavement marking.
- The pedestrian crossing at White House Drive is depicted on **Figure 19**. There are warning signs at the crossing; however, no advance warning signs are present. There is no crosswalk pavement marking.
- **Figure 20** is a view east towards Blair Drive. The advance school warning sign assembly incorrectly uses an obsolete style S1-1 sign.

- The westbound advance school warning sign approaching Blair Drive is yellow, rather than fluorescent yellow green. **Figure 21** shows this sign, which is partially obscured by vegetation.
- There is an unsigned, unmarked, crossing for an unpaved pedestrian trail at the rear of the middle school accessing a mountainside trail. **Figure 22** is a view north from the middle school property of the crossing.

C. Improvement Recommendations

Based on the above existing deficiencies, the following improvements are recommended:

General

- Replace any yellow warning signs within the school zones with fluorescent yellow-green signs.
- As existing obsolete style S1-1 signs (with cross bars) become faded or damaged, replace them with new style S1-1 signs (without cross bars). Advance school warning sign installations should include W16-9p supplemental AHEAD plaques. School crossing sign installations should include W16-7P Down Arrow supplemental plaques. All new school zone signs and supplemental plaques should be fluorescent yellow-green in color.
- Refresh worn crosswalk pavement markings throughout the study area.
- Maintain vegetation away from signs.

High School Road

- Relocate, when feasible, the masonry trash enclosure adjacent to the bike/ped path at Smith's to improve sight lines to path users for motorists exiting the parking lot.
- Provide crosswalk pavement marking at the bike/ped path crossing near the eastern high school property line.
- Remove extraneous edge line pavement markings where present.
- Remove the existing R2-1 Speed Limit 20 mph sign on eastbound High School Road within the school zone. This sign conflicts with the school zone signs.
- Replace the existing eastbound R2-1 Speed Limit 30 mph sign just beyond the eastern high school boundary with a new Speed Limit 25 mph sign, to be consistent with the rest of High School Road.
- Widen the cross section through the new left-turn lane at the high school access to provide shoulders for on-street bicycle use.
- Widen the cross section west of Middle School Road to provide redirect striping (or, alternatively, an eastbound left-turn lane) and improve lane alignment for eastbound through-movements.

Middle School Road

- Provide an advance school warning sign assembly (S1-1, W16-9p) on the northbound approach prior to the first crosswalk.

South Park Loop Road

- Widen the cross section on the north-south segment to provide sufficient paved shoulders for on-street bicycle use.
- Lower the posted speed limit on the north-south segment to reflect recent speed studies.
- Trim roadside vegetation to improve sight distance at bike/ped crossings.
- Widen the cross section just south of Boyle Hill Road to provide either redirect striping or a northbound left-turn lane to improve lane alignment for southbound through-movements from Tribal Trail Road.
- Provide advance warning sign assemblies (W11-1, W16-9p) on the northbound and southbound approaches prior to the existing bike/ped crossing at High School Road. Install crosswalk pavement marking across South Park Loop Road at this location. Provide crossing sign assemblies (W11-1, W16-7p), northbound and southbound, at the crosswalk.
- Provide advance warning sign assemblies (W11-1, W16-9p) on the northbound and southbound approaches prior to the existing bike/ped crossing at Rangeview Drive. Provide crossing sign assemblies (W11-1, W16-7p), northbound and southbound, at the crosswalk.
- Provide advance warning sign assemblies (W11-1, W16-9p) on the northbound and southbound approaches prior to the existing bike/ped crossing at Boyle Hill Road. Install crosswalk pavement marking across South Park Loop Road at this location.
- Install crosswalk pavement marking at the existing crossing at White House Drive. Provide advance warning sign assemblies (W11-2, W16-9p) on the eastbound and westbound approaches prior to the crossing.
- Provide crosswalk warning sign assemblies (W11-2, W16-7p) on eastbound and westbound South Park Loop Road at the trail crossing at the rear of the middle school. Install crosswalk pavement marking at this location.

The above recommendations will help improve safety within the study area for non-motorized users and school children.

Roundabouts

Other potential improvements, such as roundabouts at select school zone intersections, will help reduce vehicle speeds and discourage cut-through traffic. Roundabouts tend to reduce the frequency and severity of accidents, including pedestrian-vehicle collisions, in comparison to conventional signalized or two-way STOP controlled intersections. Studies in Europe, where roundabouts are more common, indicate a potential 75 percent reduction in pedestrian accidents; in the United States, studies suggest the potential reduction is 30 to 40 percent. Factors that contribute to the safety benefits of roundabouts include:

- Reduced vehicle speeds (15 to 20 mph)
- Simplified vehicle movements (right-turns only)
- Half as many pedestrian/vehicle conflict points
- The splitter islands allow pedestrians to cross one direction of traffic at a time

All-way STOP sign controlled conventional intersections are typically safer than roundabouts for pedestrians, and blind pedestrians in particular. Because pedestrian crosswalks are provided at the splitter islands and away from the intersection, travel paths for pedestrians may be longer and less convenient.

Roundabouts generally do not provide the same level of safety benefits for bicyclists. Typically, it is better to remove bikes from vehicular traffic onto a separate path, or merge them directly with traffic through the roundabout. However, because of the reduced speeds and same-direction travel, the severity of bike/vehicle collisions tends to be less with roundabouts.

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VII. SUMMARY AND RECOMMENDATIONS

Teton County is considering a northerly extension of Tribal Trail Road (Connector) to intersect with WY 22 in the proximity of the WY 22/Coyote Road intersection. The purpose of this study was to conduct detailed traffic analyses of the South Park Study Area road system, including the High School Road corridor, for four roadway scenario and identify intersection/road corridor modifications that would address level of service concerns and non-motorized user safety issues. The scenarios studied included:

- Existing Conditions
- Existing Volumes with Tribal Trail Connector
- Year 2030 Baseline Conditions
- Year 2030 Conditions with Tribal Trail Connector

The traffic analysis indicated the following:

Under **existing conditions**, traffic volumes on WY 89 are at their lowest at the south end of the study area (14,100 vehicles per day (vpd)) and steadily increase toward town, peaking at 40,400 vpd just north of the north South Park Loop Road intersection. Meanwhile, volumes on WY 22 are at their highest just north of the Y (24,800 vpd), then drop slightly to 23,400 vpd in the vicinity of Coyote Road where the Connector would intersect the highway.

The north end of South Park Loop Road is the highest volume non-highway road in the study area, carrying 10,800 vpd just west of the north WY 89 intersection. High School Road carries approximately 7,100 vpd just west of WY 89, and south South Park Loop Road carries 3,800 vpd just west of WY 89. Traffic on all three roads decreases significantly as one travels west through the study area. Tribal Trail Road currently carries around 700 vpd, which is consistent with its current function as a neighborhood collector road.

Based on the analysis, it would appear that the existing road system would need one roadway improvement to meet County and/or WYDOT level of service standards under current traffic volume levels:

- **WY 22/WY 89** – Widen the north leg of this intersection to provide dual southbound left turn lanes.

Under **existing conditions with the Connector**, over 60 percent of the 9,000 vpd on the Connector is local traffic that already uses the South Park study area road system (5,400 vpd), and of the 3,600 through trips using the Connector, roughly two out of three are headed to and from town and only one out of three is headed to and from south of town. The vast majority of the Connector traffic (6,200 vpd, or 70 percent) would use the east-west segment of South Park Loop Road at the north end of the study area to travel between the Connector and either the local neighborhoods on the west side of WY 89 (in the case of local trips) or WY 89 (in the case of through trips).

High School Road is the second most popular travel route for Connector traffic, but it is projected to carry far less traffic than the north end of South Park Loop Road in the near term. The west end of High School Road would attract 850 vpd of Connector trips, with around 200 vpd of these trips being local traffic with origins or destinations along High School Road and 650 vpd traffic that travels the length of High School Road to WY 89 and continues south to either other parts of South Park or out of the study area.

Based on the analysis, it would appear that the road system could adequately accommodate the immediate changes in travel patterns and traffic volumes that would result from constructing the Tribal Trail Connector, with the appropriate laneage and traffic control provided on the new Connector and one minor improvement to the existing road system:

- **WY 22/Tribal Trail Connector** – Signalize this new intersection and provide an eastbound right turn lane, a westbound left turn lane and separate northbound left and right turn lanes.
- **Tribal Trail Road** – Construct the Connector as a two lane road with a 30 mph design speed to maintain reasonable travel speeds and discourage it's use as a cut-through route.
- **South Park Loop Road/Tribal Trail Road** – Convert this intersection from two way stop control to all-way stop control.

Under **2030 background traffic conditions**, a new east-west connector would be constructed south of High School Road. The new connector is anticipated to carry 5,000 vpd on the east end and 2,100 vpd on the west end. Around 60 percent of this traffic is from the new development planned for that part of South Park, with the other 40 percent (2,000 vpd) being traffic that has shifted away from South Park Loop Road and High School Road. As a result of this shift, the 2030 traffic forecasts for north South Park Loop Road just west of WY 89 is 10,800 vpd, which is the same as existing volumes, while the future forecast for High School Road is 6,000 vpd, or 1,100 vpd less than existing conditions.

It is also worth noting that 2030 background traffic forecasts on WY 89 would exceed 50,000 vpd north of South Park Loop Road and traffic forecasts on WY 22 north of the Y exceed 40,000 vpd. At these volumes the Y would operate at LOS E during both peak periods and exceed the County's level of service standard. Furthermore, the volume forecast for WY 89 would be at or above the upper capacity threshold for a four lane arterial, which would lead to longer periods of higher congestion and call for the widening of that road to six lanes.

Based on the analysis, it would appear that the baseline road system would need the following improvements to adequately accommodate 2030 baseline traffic forecasts:

- **WY 89** – Widen the highway to three through lanes in each direction between north South Park Loop Road and Pearl Street.
- **WY 89/WY 22** – Widen this intersection to provide two eastbound left turn lanes and two southbound left turn lanes.
- **WY 89/New East-West Connector** – At this new intersection, install a traffic signal and provide a northbound left turn lane, a southbound right turn lane, and separate eastbound left and right lanes.

Under **2030 traffic conditions with the Connector**, while most Connector traffic uses the east-west segment of South Park Loop Road at the north end of the study area, a much greater percentage of Connector traffic shifts down to High School Road than under existing conditions. This is likely a result of increased traffic and higher congestion on WY 89 north of High School Road in the future, which increases delays at the WY 89/north South Park Loop Road intersection and makes shifting over to the new Connector on a road further south a more appealing option.

Furthermore, in the future a higher portion of the traffic on the Connector would be from local trips that have origins or destinations within the South Park area; 70 percent of the trips in the future would be local trips, versus 60 percent in the existing analysis. Additionally, of the 4,000 through trips using the Connector, only one out of four are headed to and from town (down significantly from two out of three in the existing analysis) and three out of four is headed to and from south of town. This shift away from using the Connector as alternate route into town may also be a result of increased traffic and congestion on WY 89 north of South Park Loop Road; with fewer trips and less congestion on WY 22 and shorter delays at the Y, staying on that road would become the more appealing travel option for trips between the west side and town.

Finally, construction of the Connector is forecast to reduce the travel demand on WY 89 north of north South Park Loop Road and on the new east-west Connector south of High School Road over baseline conditions. As a result, volumes on the highway would peak at 39,700 vpd and not appear to require widening of the roadway. Of particular note, the shift in traffic away from the Y due to the Connector would enable that intersection to operate at LOS C during both peak periods without any need for improvements, with delays that are similar to or slightly better than conditions today.

Based on the analysis, it would appear that the future road system with the Tribal Trail Connector would need the following improvements to adequately accommodate 2030 baseline traffic forecasts:

- **WY 22/Tribal Trail Connector** – Signalize this new intersection and provide an eastbound right turn lane, a westbound left turn lane and separate northbound left and right turn lanes.
- **Tribal Trail Road Connector** – Construct the Connector as a two lane road with a 30 mph design speed to maintain reasonable travel speeds and discourage it's use as a cut-through route.
- **Tribal Trail Road/South Park Loop Road** – Upgrade the traffic control from all way stop control to a signalized intersection.
- **WY 89/North South Park Loop Road** – Widen the eastbound approach to provide dual left turn lanes and a shared through/right turn lane.
- **WY 89/New East-West Connector** – Signalize this new intersection and provide a northbound left turn lane, a southbound right turn lane, and separate eastbound left and right lanes.

In summary, the following roadway improvements are recommended for each of the four scenarios studied:

Existing Conditions

- **WY 22/WY 89** – Widen the north leg of this intersection to provide dual southbound left turn lanes.

Existing Volumes with Tribal Trail Connector

- **WY 22/Tribal Trail Connector** – Signalize this new intersection and provide an eastbound right turn lane, a westbound left turn lane and separate northbound left and right turn lanes.
- **Tribal Trail Road Connector** – Construct the Connector as a two lane road with a 30 mph design speed to maintain reasonable travel speeds and discourage it's use as a cut-through route.
- **South Park Loop Road/Tribal Trail Road** – Convert this intersection from two way stop control to all-way stop control.

Year 2030 Baseline Conditions

- **WY 89** – Widen this highway to three through lanes in each direction between north South Park Loop Road and Pearl Street.
- **WY 89/WY 22** – Widen this intersection to provide two eastbound left turn lanes and two southbound left turn lanes.
- **WY 89/New East-West Connector** – At this new intersection, install a traffic signal and provide a northbound left turn lane, a southbound right turn lane, and separate eastbound left and right lanes.

Year 2030 Conditions with Tribal Trail Connector

- **WY 22/Tribal Trail Connector** – Signalize this new intersection and provide an eastbound right turn lane, a westbound left turn lane and separate northbound left and right turn lanes.
- **Tribal Trail Road Connector** – Construct the Connector as a two lane road with a 30 mph design speed to maintain reasonable travel speeds and discourage it's use as a cut-through route.
- **Tribal Trail Road/South Park Loop Road** – Upgrade the traffic control from all way stop control to a signalized intersection or roundabout.
- **WY 89/North South Park Loop Road** – Widen the eastbound approach to provide dual left turn lanes and a shared through/right turn lane.
- **WY 89/New East-West Connector** – Signalize this new intersection and provide a northbound left turn lane, a southbound right turn lane, and separate eastbound left and right lanes.

In addition to the above, the following nonmotorized improvements are recommended for the study area around High School Road:

General

- Replace any yellow warning signs within the school zones with fluorescent yellow-green signs.
- As existing obsolete style S1-1 signs (with cross bars) become faded or damaged, replace them with new style S1-1 signs (without cross bars). Advance school warning sign installations should include W16-9p supplemental AHEAD plaques. School crossing sign installations should include W16-7P Down Arrow supplemental plaques. All new school zone signs and supplemental plaques should be fluorescent yellow-green in color.
- Refresh worn crosswalk pavement markings throughout the study area.
- Maintain vegetation away from signs.

High School Road

- Relocate, when feasible, the masonry trash enclosure adjacent to the bike/ped path at Smith's to improve sight lines to path users for motorists exiting the parking lot.
- Provide crosswalk pavement marking at the bike/ped path crossing near the eastern high school property line.
- Remove extraneous edge line pavement markings where present.
- Remove the existing R2-1 Speed Limit 20 mph sign on eastbound High School Road within the school zone. This sign conflicts with the school zone signs.
- Replace the existing eastbound R2-1 Speed Limit 30 mph sign just beyond the eastern high school boundary with a new Speed Limit 25 mph sign, to be consistent with the rest of High School Road.
- Widen the cross section through the new left-turn lane at the high school access to provide shoulders for on-street bicycle use.
- Widen the cross section west of Middle School Road to provide redirect striping (or, alternatively, an eastbound left-turn lane) and improve lane alignment for eastbound through-movements.

Middle School Road

- Provide an advance school warning sign assembly (S1-1, W16-9p) on the northbound approach prior to the first crosswalk.

South Park Loop Road

- Widen the cross section on the north-south segment to provide sufficient paved shoulders for on-street bicycle use.
- Lower the posted speed limit on the north-south segment to reflect recent speed studies.
- Trim roadside vegetation to improve sight distance at bike/ped crossings.
- Widen the cross section just south of Boyle Hill Road to provide either redirect striping or a northbound left-turn lane to improve lane alignment for southbound through-movements from Tribal Trail Road.

- Provide advance warning sign assemblies (W11-1, W16-9p) on the northbound and southbound approaches prior to the existing bike/ped crossing at High School Road. Install crosswalk pavement marking across South Park Loop Road at this location. Provide crossing sign assemblies (W11-1, W16-7p), northbound and southbound, at the crosswalk.
- Provide advance warning sign assemblies (W11-1, W16-9p) on the northbound and southbound approaches prior to the existing bike/ped crossing at Rangeview Drive. Provide crossing sign assemblies (W11-1, W16-7p), northbound and southbound, at the crosswalk.
- Provide advance warning sign assemblies (W11-1, W16-9p) on the northbound and southbound approaches prior to the existing bike/ped crossing at Boyle Hill Road. Install crosswalk pavement marking across South Park Loop Road at this location.
- Install crosswalk pavement marking at the existing crossing at White House Drive. Provide advance warning sign assemblies (W11-2, W16-9p) on the eastbound and westbound approaches prior to the crossing.
- Provide crosswalk warning sign assemblies (W11-2, W16-7p) on eastbound and westbound South Park Loop Road at the trail crossing at the rear of the middle school. Install crosswalk pavement marking at this location.

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