

Appendix K

Transportation Study

**TETON VILLAGE EXPANSION
RESORT MASTER PLAN, PUD**

**TRANSPORTATION ELEMENT
FINAL REPORT**

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EXECUTIVE SUMMARY

This report summarizes the transportation impacts associated with the proposed Teton Village Expansion Resort Master Plan (Master Plan Expansion). The results of the analysis indicate that there would be no significant change from the projected traffic impacts outlined in the Teton Village Master Plan Planned Unit Development (PUD) District for Planned Resort (Approved Plan). All improvements outlined in the Approved Plan are sufficient to accommodate traffic from the Master Plan Expansion.

Teton County approved the original Teton Village Master Plan (Approved Plan) in 1998. It called for the development of 5,240 guest beds and 208,000 square feet (SF) of commercial space at full buildout of Teton Village. The traffic analysis for the Approved Plan was conducted based on a peak skier day that was 20 percent higher than the ski area's comfortable carrying capacity (CCC) ($7,690 \times 1.20 = 9,228$ skiers). The results of that analysis were used as the starting point for the Master Plan Expansion analysis.

The Master Plan Expansion trip generation relies heavily on the trip assumptions used in the Approved Plan. Most importantly, the peak skier day analysis was again assumed to be 20 percent higher than the ski area's CCC; in other words, while additional guest beds, housing, and commercial space would be developed at the village, these new facilities would not increase the total number of skiers on the mountain. As a result, the additional guest beds and housing would shift skiers from off-site locations in and around the Town of Jackson to on-site locations within the village, effectively removing those ski area day trips from WY-390.

In addition to the 5,240 guest beds and 208,000 SF of commercial space included in the Approved Plan, the proposed Master Plan Expansion includes the following elements:

- 73 townhouse/cabin units
- 107 condominium units
- 100 single-family residences, primarily vacation homes not likely to be rented,
- 125 seasonal housing units for Teton Village employees (configured in apartments containing up to three bedrooms),
- 100 affordable housing units, available to qualified residents in Teton County,
- 18-hole golf course with a 4,000 SF clubhouse/fitness center,
- 10,000 SF of local convenience space, and
- 120-student elementary school.

This traffic analysis also included trips generated by 25,000 SF of general retail space and 35,000 SF of office space. This 70,000 SF of space was included in the traffic analysis because it can be permitted in the Master Plan Expansion.

Person-trips were generated for day skiers, the total projected village population, seasonal housing and affordable housing residents living and working in the village, the projected employment base, guest arrivals and departures, other non-skier-related activity, and other evening activity.

One aspect of this Plan that is new from the Approved Plan is the affordable and seasonal housing element. Currently, virtually all village and mountain employees live elsewhere and commute on WY-390 to work. However, with the addition of on-mountain housing, these employees would not need to drive to Teton Village for work. Thus, the work trips associated with them would be removed from the highway, effectively reducing traffic in the peak periods. Non-work trips from these employees (shopping, recreation, etc.) would still contribute to highway traffic volumes during the off-peak periods.

Resort Trip Generation (Refer to Tables 4, 6, 13 and 14)

The following highlights the results of the resort trip generation analysis for the winter and summer seasons:

- Winter season activity at Teton Village would generate a total of 30,335 externally oriented person-trips per day by the buildout of the area (refer to Table 4 in the report). Approximately 31 percent of these person-trips would be related to day-skier activity. Of the total person-trips, approximately 76 percent would arrive/depart via automobile, with the remaining 24 percent arriving by some form of transit (START bus, Alltrans bus, taxi, limousine, or private shuttle).
- During the winter season, the most frequent vehicle trips are inbound during the AM peak hour and outbound during the PM peak hour. Of the 10,365 vehicle-trips per day generated by the resort, not including transit vehicles (refer to Table 6 in the report) approximately eight percent (805 vehicle-trips) would be inbound during the AM peak hour and 11 percent (1,145 vehicle-trips) would be outbound during the PM peak hour.
- The Stilson Park transit facility would reduce resort traffic along WY-390 between WY-22 and Teton Village Road. It is estimated that this reduction would be approximately 1,455 vehicle-trips per day, or approximately 14 percent of the total resort trip generation (refer to Tables 6 and 7 in the report). It should be noted that an even greater reduction in traffic could result from a greater utilization of the Stilson facility by day skiers and resort employees.

- During the summer season the resort is expected to generate about 28,910 person-trips on an average day (refer to Table 13 in the report). Of this total, approximately 97 percent are expected to arrive/depart via automobile, with the remaining three percent arriving by some form of transit.
- It is estimated that a greater number of vehicle-trips would be generated by the resort during the summer season, with an estimated total of approximately 12,905 vehicle-trips per day (refer to Table 14 in the report). This is likely due to the lack of a strong internally based attraction such as skiing. However, this represents a worst case scenario and is not meant to imply that recreational opportunities would not be available to village residents and guests. On the contrary, since a variety of special events and activities are planned for Teton Village during the summer season, it is anticipated that a portion of the person-trips would be internally captured, and thereby, would reduce the amount of internal-external vehicle trips.
- Of the total 12,905 total vehicle-trips that are expected to be generated by the resort area during the summer season (including transit vehicles), approximately six percent would occur during the AM peak hour and 12 percent during the PM peak hour.
- In comparison to winter, the Stilson Park park and ride is not anticipated to see significant use by Teton Village residents and guests in the summer. As a result, no reduction in vehicle-trips along WY-390 was applied in the summer analyses.

Traffic Impacts***(Refer to Tables 11, 12, 17 and 18 in the report)***

The following highlights the results of the intersection and highway level of service analyses, and the recommended improvement measures identified from these analyses:

Intersection Impacts***WY-390 at Après Vous Way (Outer Skier Day Lot)***

A two-way access roadway would access WY-390 from the outer skier day lot. The lot would provide approximately 1/3 of the total parking spaces available for day skiers. Because the lot intersection would be located north of the main access to Teton Village (McCollister Road), very little background traffic would impact operations at this intersection, and a two-lane geometry on all three approaches would be adequate to accommodate traffic projections.

With this recommended lane geometry and with stop-sign control on the Après Vous Way approach, this intersection is expected to operate at acceptable levels of service during peak hours. Critical movements would operate at LOS A or better in both the summer and the winter (capacity analysis worksheets are provided in Appendix B).

WY-390 at Tram Line Road (Transit Access)

A two-way access road would access WY-390 between McCollister Road and the day skier lot. This access would provide direct access to the transit center at the base area and would be the primary route for transit vehicles entering and exiting Teton Village, but would also be open to other resort traffic. As with Après Vous Way, very little background traffic would impact operations at this intersection, and a two-lane geometry on all three approaches would be adequate to accommodate traffic projections.

With this recommended lane geometry and with stop-sign control on the Tram Line Road approach, this intersection is expected to operate at acceptable levels of service during peak hours. Critical movements would operate at LOS A or better in both the summer and the winter.

WY-390 at McCollister Road (Teton Village Entrance Road)

McCollister Road would provide the primary access to Teton Village. While a two-lane roadway would adequately handle the projected daily traffic demands along this road within Teton Village, a roundabout is recommended at the WY-390 intersection to accommodate traffic volumes and patterns. Such traffic control would improve traffic operations and provide a gateway entry feature to the resort. With a roundabout all movements at the intersection would operate at LOS A in the winter and LOS B in the summer.

WY-390 at WY-22

Presently, this intersection is signalized. Due to the forecasted high level of southbound to eastbound left-turning traffic, a second southbound left-turn lane would be needed by the buildout of the study area. The second southbound left turn lane would require two lanes on WY-22 east of the intersection to receive traffic, which would be provided via the planned widening of WY-22 between WY-390 and the Town of Jackson.

With the above improvements, the intersection would operate at LOS C or better in the winter and LOS D or better in the summer.

Stilson Park Accesses

Access to the Stilson Park park and ride facility will continue to be provided on both WY-390 and WY-22. However, to minimize the impact to non-site related traffic along these roadways, as well as to minimize stopped delay for outbound site traffic, several auxiliary turning lanes are recommended at each access:

- (1) A right-turn deceleration lane is recommended to accommodate inbound Stilson traffic along westbound WY-22.
 - (2) Left-turn deceleration lanes are recommended to accommodate inbound Stilson traffic on eastbound WY-22 and on northbound WY-390.
 - (3) Two outbound turning lanes are recommended at each of the Stilson access intersections to separate left and right turning traffic.
-

With these recommended lane geometries and with stop-sign control, both of the Stilson access intersections are expected to operate at reasonable levels during peak hours in the winter. At the WY-390 right turns out of the site would operate at LOS D or better during both peak periods, while left turns out of the site would operate at LOS E during the PM peak period. At the WY-22 access right turns out of the site would operate at LOS C and left turns out of the site would operate at LOS E during the afternoon peak period only. A more detailed analysis of the left turn movements at both driveways in the afternoon using the SimTraffic traffic simulation software indicated no excessive delays or significant queuing at the intersection, even with the LOS E conditions (the 95th percentile queue length was approximately six vehicles at WY 22 and two vehicles at WY 390).

The Stilson Park park-and-ride is anticipated to see very low use in the summertime. As a result, both accesses would operate at LOS A during that season.

Roadway Impacts

Highway 390

The north end of WY-390 is projected to carry 10,400 vpd in the winter and 12,700 vpd in the summer under buildout conditions and is projected to operate at LOS D or better at all times except for the afternoon peak in the winter, when it would operate at LOS E. These are the same levels of service projected for the roadway under the Approved Plan, and indicate that no additional through lanes would be needed along this segment of highway.

At the south end of WY-390, the roadway is projected to carry a total of 19,600 vpd in the winter and 25,700 vpd in the summer. Teton Village traffic is estimated to account for approximately 49 percent of this total projected daily traffic in the winter and 40 percent in the summer. The remaining traffic would be oriented to/from other developments along WY-390. The two-lane highway capacity analyses indicate that this segment would operate at LOS E by the buildout of the area. This is the same level of service projected for the roadway under the Approved Plan, and indicates that section would be approaching its capacity and may need widening in the future. However, the analysis indicates that the volume-to-capacity ratio for the road during the winter and summer would be 0.66 and 0.86, respectively; therefore, no additional through lanes are recommended at this time.

Highway 22

Highway 22 east of WY-390 is projected to carry a total of 35,300 vpd in the winter and 42,400 vpd in the summer. Teton Village traffic is estimated to account for approximately 21 percent of winter traffic and 18 percent of summer traffic. The roadway would operate at LOS F as a two-lane facility, indicating the highway would be over capacity and would need to be widened. It is therefore recommended that WY-22 be widened to four lanes from the Town of Jackson to the WY-390 intersection. As a four-lane facility, the highway would operate at LOS B or better in the winter and LOS C or better in the summer.

Highway 22 west of Stilson Park is projected to carry a total of 18,300 vpd in the winter and 28,500 vpd in the summer, with Teton Village traffic comprising 13 percent of winter traffic and nine percent of summer traffic. The roadway is projected to operate at LOS E during both seasons, but the volume-to-capacity ratios for the road are 0.58 and 0.68, indicating the roadway could carry approximately 1/3 more vehicles during the most congested peak periods before reaching capacity. As a result, no additional through lanes are recommended at this time.

Note that the above roadway capacity improvements (i.e., the second southbound left turn lane at the WY-390/WY-22 intersection and widening WY-22 from the Town of Jackson to WY-390) are the same as those identified in the current Teton Village Master Plan.

Interim Development Phasing and Roadway Improvement Schedule

Traffic volumes at Teton Village would increase over time as the resort is developed, and as a result, not all of the above roadway improvements would be needed immediately. To determine when the various roadway improvements would be needed, interim transportation analyses were conducted in five-year increments from 2010 through 2025. Table S-1 shows projected development levels for each interim year. It was assumed that the Approved Master Plan would be complete by 2020, and the SRA project would be complete by 2025. The interim development phases for the Approved Plan were derived by prorating the remaining approved development at Teton Village between now and 2020 (approximately 98,000 SF of commercial, 1,600 APOs, and mountain improvements that would increase skier capacity to 7,690 skiers), while the interim development phases for the SRA project were based on information provided by SRA. These phasing plans would appear to be reasonable based on historical development absorption rates at Teton Village.

Table S-1. Development Phasing

Year	Approved Village Development	SRA Development
Existing	110,000 SF Commercial 3,576 APOs Mountain Capacity: 5,212 Skiers	N/A
2010	143,000 SF Commercial 4,131 APOs Mountain Capacity: 6,038 Skiers	Golf Course 4,000 SF clubhouse/fitness center 5,000 SF Local Commercial 3,000 SF Office 540 APOs Affordable/attainable housing for 153 employees
2015	176,000 SF Commercial 4,686 APOs Mountain Capacity: 6,864 Skiers	Golf Course 4,000 SF clubhouse/fitness center 10,000 SF Local Commercial 3,000 SF Office 734 APOs Affordable/attainable housing for 254 employees
2020	Buildout 208,000 SF Commercial 5,240 APOs Mountain Capacity: 7,690 Skiers	Golf Course 4,000 SF clubhouse/fitness center 10,000 SF Local Commercial 12,500 SF General Commercial 12,000 SF Office 928 APOs Affordable/attainable housing for 372 employees
2025	Same as 2020	Buildout Golf Course 4,000 SF clubhouse/fitness center 10,000 SF Local Commercial 25,000 SF General Commercial 36,500 SF Office 1,152 APOs (including ARUs) Affordable/attainable housing for 372 employees

Table S-2 shows the recommended phasing plan for the off-site road system improvements based on the above development schedule. As the table indicates, the existing road system could accommodate project growth in the near term (up to 2010), with the first road system improvement (widening WY 22) needed between 2010 and 2015. The south end of WY-390 from WY-22 to The Aspens would be approaching capacity at buildout of the project in 2025, but would still be able to function as a two lane road. However, it would likely need to be widened between 2025 and 2030, as a result of continued background traffic growth after the project is completed.

Table S-2. Off-Site Roadway Improvement Schedule

Improvement	Range of Years to be Constructed
Widening of WY-22 from 2 to 4 lanes from WY-390 to the Town of Jackson	2010 - 2015
Second southbound left turn lane from WY-390 to WY-22	2015 - 2020
Roundabout at WY-390/McCollister Way (Teton Village Entrance Road)	2015 - 2020
Widening of the south end of WY-390 from two to four through lanes ¹	2025 - 2030
Widening of WY 22 from WY 390 to the Stilson Park intersection ²	2025 - 2030
1. WY-390 from WY-22 to The Aspens would be functional as a two lane road at buildout of the project in 2025, but would be approaching capacity. It would likely need to be widened in the time frame identified due to continued background growth after the project is complete. 2. This improvement is needed to improve operations at the WY 22/WY 390 intersection.	

I. EXISTING CONDITIONS

A. Roadway System

Major roadways that serve the Jackson Hole Mountain Resort area are illustrated on Figure 1. The existing access road to Teton Village has a two-lane cross-section and serves both the resort area and the residential areas of the village. This access roadway currently extends a quarter-mile west of Wyoming State Highway 390 (WY-390). This rural two-lane highway provides the only means of access from the ski area to Wyoming State Highway 22 (WY-22), a distance of about 6.5 miles. WY-22 is also a two-lane rural highway that provides access to the Town of Jackson, a distance of 4 miles to the east. WY-22 also extends west to the Town of Wilson and continues west over Teton Pass into Idaho.

B. Traffic Volumes

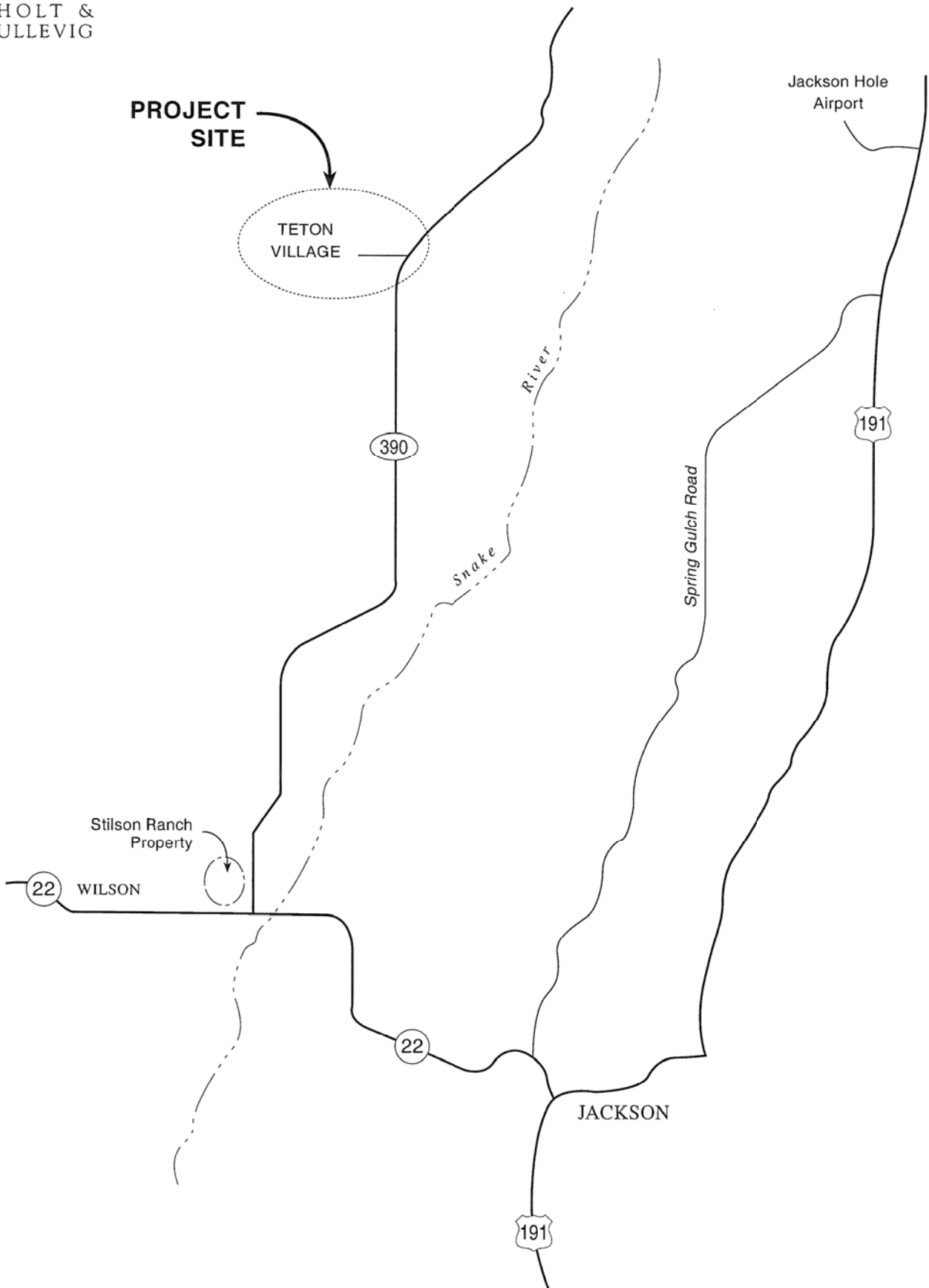
Average daily traffic volumes along WY-390 and WY-22 for the winter season were collected in February, 2005 as part of Teton Village's on-going Transportation Demand Management (TDM) monitoring program (refer to Table 1 and Figure 2). This program was established as part of the Teton Village Master Plan approval and is designed to help evaluate the effectiveness of the TDM plan and determine if the resort is meeting the long-term goal of maintaining acceptable traffic volumes and levels of service on WY-390. As shown in Table 1, average daily traffic volumes along WY-390, during the winter season, range from a high of about 11,700 vehicles per day (vpd) north of WY-22 to 7,200 vpd south of the Teton Village Entrance Road. WY-22 is also estimated to carry approximately 14,400 vpd east of WY-390 and 9,600 vpd west of WY-390. It should be noted that traffic on both roads has remained at approximately the same levels for the past four winter seasons, despite an increase of over 1,000 APOs and over 160 additional employees in Teton Village during that period.

Table 1. Existing Average Daily Traffic Volumes (Winter Season)

Road	Location	2005 Weekday ADT
Teton Village Entrance Road	West of WY 390	6,900
WY-390	North of Teton Village Road	300
	South of Teton Village Road	7,200
	North of WY-22	11,700
WY-22	East of WY-390	14,400
	West of WY-390	9,600
ADT = Average Daily Traffic (winter season)		

C. Transit System

The major public transportation system that operates in the Jackson Hole area is Southern Teton Area Rapid Transit (START). This transit agency serves the Town of Jackson and other major areas in Teton County. In winter, a general public (fixed-route) system is operated from the first week of December to the first week of April, and includes four different routes: the Blue Line, Red Line, Green Line, and the Worker's Special. All four provide service between Jackson and Teton Village. Table 2 summarizes the winter season schedule for each route.



NOT TO SCALE

Figure 1
Vicinity Map

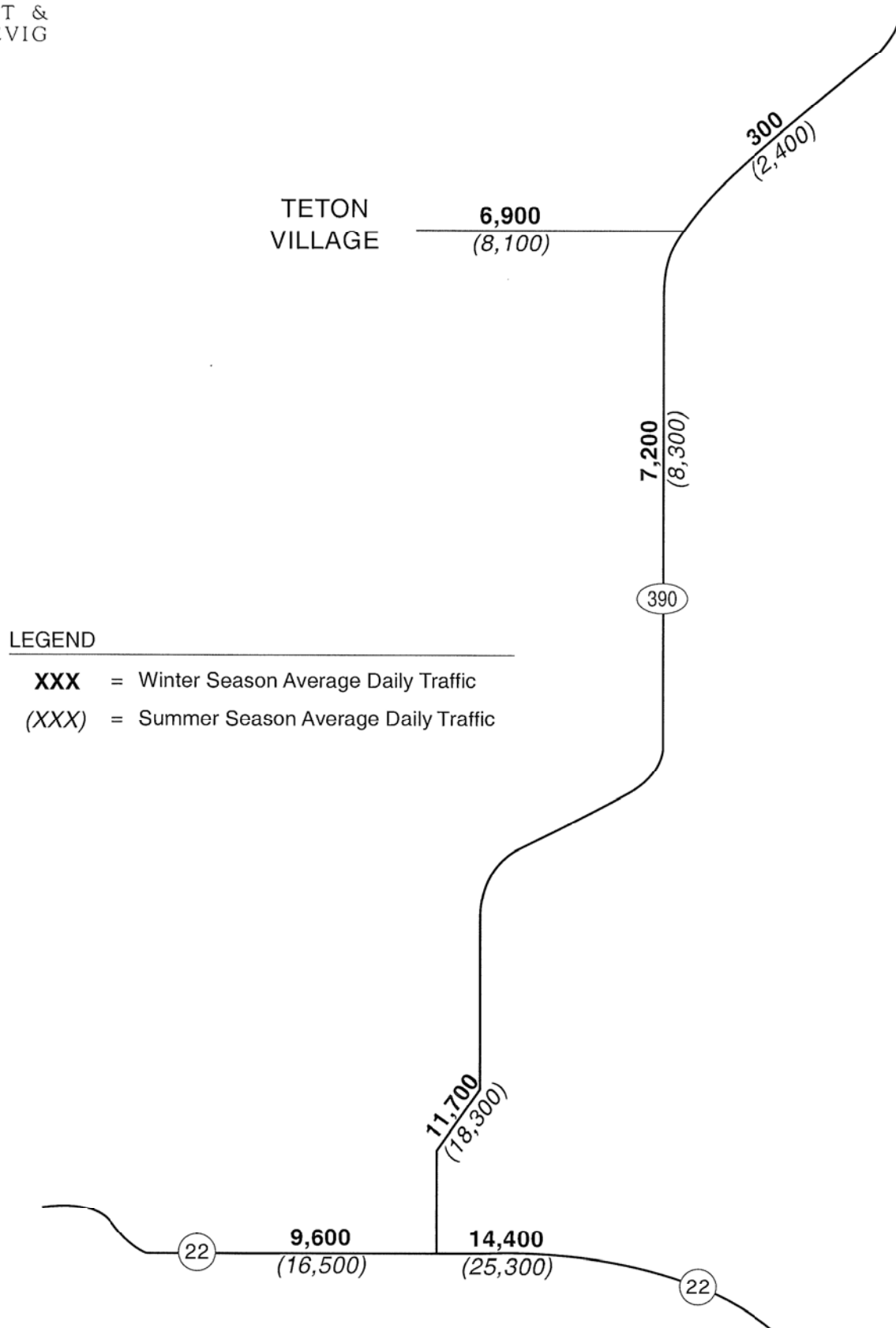


Figure 2
Existing Average Daily Traffic Volumes



Table 2. Existing Winter Season Bus Service (START)

Bus Route	Jackson - Teton Village			Teton Village - Jackson		
	Number of Runs	Headway (min)	Start Time	Number of Runs	Headway (min)	Start Time
Blue Line	13 morning	20 min	6:05 AM	13 morning	20 min	6:50 AM
	14 afternoon	20-30 min	1:15 PM	14 afternoon	20-30 min	2:10 PM
Red Line	13 morning	20 min	6:05 AM	13 morning	20 min	6:50 AM
	14 afternoon	20-30 min	1:20 PM	14 afternoon	20-30 min	2:10 PM
Green Line	1 morning	--	5:15 AM	1 morning	--	6:05 AM
	5 mid day	30 min	10:40 AM	5 mid day	30 min	11:40 AM
	6 night	30-60 min	6:52 PM	6 night	30-60 min	7:40 PM

Source: START Winter Season Service Schedule for 2004/05

A comparison of winter season ridership to and from Teton Village for the past six seasons is shown in Table 3. Ridership has increased significantly beginning with the 2003-04 season, when all parking lots at Teton Village became pay lots. Ridership by employees of Teton Village has increased by 260 percent since that change was implemented. This past season, approximately 1,640 (one-way) trips per day were made to/from Teton Village.

Table 3. Bus Ridership Comparison (START)

Month	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005
December	20,394	21,406	18,394	20,120	29,585	43,961
January	42,477	39,045	30,519	35,588	46,164	59,491
February	44,290	35,764	35,026	35,719	43,442	51,984
March	41,308	38,229	36,294	33,332	41,043	52,492
Total Winter Ridership	148,469	134,444	120,233	124,759	161,583	210,016
Teton Village Employee "Pass" Total Winter Ridership	31,510	25,587	29,622	35,566	61,801	92,560

Alltrans and other shuttle services represent other significant transportation providers to and from Teton Village and are anticipated to continue to provide transportation services in the future. Ridership data collected in 2003 as part of the TDM monitoring program indicated that Alltrans and other shuttle services accounted for approximately 25 percent of the total daily transit ridership at Teton Village (source: *Teton Village Area Travel Demand Management Report for the 2003 and 2004 Winter Seasons*, Felsburg Holt & Ullevig, 2004)

II. WINTER SEASON - TRAVEL DEMAND ANALYSIS

The primary steps in the travel demand process consist of trip generation, trip distribution, modal split, and peak hour traffic assignments. This section documents the processes used to develop traffic projections for Teton Village with the Master Plan Expansion.

A. Background

In 1998, Teton County approved the Teton Village Master Plan Planned Unit Development (PUD) District for Planned Resort (Approved Plan). The Approved Plan called for the development of 5,240 guest beds and 208,000 square feet (SF) of commercial space at full buildout of Teton Village. The traffic analysis for the Approved Plan was conducted based on a peak skier day that was 20 percent higher than the ski area's comfortable carrying capacity (CCC) ($7,690 \times 1.20 = 9,228$ skiers). The results of that analysis were used as the starting point for the Teton Village Expansion Resort Master Plan PUD (Master Plan Expansion) analysis.

The Master Plan Expansion trip generation relies heavily on the trip assumptions used in the Approved Plan. Most importantly, the peak skier day analysis was again assumed to be 20 percent higher than the ski area's CCC; in other words, while additional guest beds, housing, and commercial space would be developed at the village, these new facilities would not increase the total number of skiers on the mountain. As a result, the additional guest beds and housing would shift skiers from off-site locations in and around the Town of Jackson to on-site locations within the village, effectively removing those ski area day trips from WY-390.

B. Resort Trip Generation

Trip generation estimates for buildout conditions at Teton Village were based on several key elements, including (1) the comfortable carrying capacity of the mountain; (2) overnight population projections derived from the proposed lodging/residential densities; (3) the projected employment base; (4) the number of parking spaces available at the village for affordable housing and seasonal housing residents; and (5) the proposed commercial densities. In general, trips in or out of the village would include day-skier trips, employee trips, and other non-ski-related activity.

Comfortable Carrying Capacity (CCC). As noted above, the Jackson Hole Ski Area is proposed to have a total CCC of 7,690 skiers per day. A peak day of operations is expected to exceed the comfortable carrying capacity of the mountain by about 20 percent. Therefore, a peak day of operations would generate a total of 9,228 skiers.

Overnight Guest/Resident Population Projections. Day-skier trips include all skiers that arrive during the day by auto or by transit, but do not include skiers that are lodged at Teton Village. The Approved Plan called for 5,240 beds at Teton Village; the Master Plan Expansion calls for an additional 1,120 beds. To this was added an additional 16 beds to account for auxiliary residential units (ARUs) that may be constructed on the single family lots (15 percent of the single family lot total). Based on information provided by the Jackson Hole Ski Corporation (JHSC), an occupancy rate of 80 percent is typical for lodging at destination resorts during an average (non-peak) day of operations. Therefore, with a proposed Teton Village bed base of 6,376 beds, the overnight population is estimated to be approximately 5,101 people (on an average day). However, on a peak day it is estimated that the occupancy rate of Teton Village would be nearly 100 percent, and therefore an overnight population of 6,376 guests/residents was used in the analysis. Based on survey data from JHSC and several other ski resorts, it is estimated that the propensity for lodged guests/residents to ski on any given day is around 70 percent. Based on these percentages, on a peak day it is estimated that a total of 4,463 lodged guests would ski. In addition, it is estimated that 50 percent of the employees living in Teton Village who are not working would ski. Since Teton Village would house 372 employees and 29 percent would not be working on a given day (see discussion below), employees skiing on the mountain would account for an additional 54 skiers. With an estimated 9,228 skiers on the mountain on a peak day, and with 4,463 of these skiers guests in Teton Village, and an additional 54 skiers who are employees lodged in Teton Village, the remaining 4,711 skiers would be day visitors arriving via auto or other travel modes, such as START, Alltrans, taxis, limousines, and courtesy vans/shuttles.

Projected Employment Base. The projected employment base includes all employees working at Teton Village, either for Jackson Hole Ski Corporation or for one of the commercial employers at Teton Village. The Approved Plan estimated that 990 employees would be working on a typical day. However, Teton Village Travel Demand Management report for the 2003 and 2004 seasons indicated that Teton Village currently has approximately 1,565 employees working on a typical day. This larger number was used for the purpose of this analysis, to which was added an additional 541 employees to account for future expansion of the ski area and buildout of the undeveloped portion of the approved plan. An adjustment was also made for the 40 employees that currently live and work at Teton Village, 71 percent of whom were assumed to be working on any given day (5 days out of 7 = 71%). Thus, it was assumed that a total of 2,077 employees would make daily work trips to and from the Approved Teton Village area.

The Housing Support Study for the SRA expansion was used to forecast the additional number of employees required due to proposed the Teton Village expansion. This study indicates that the expansion would generate 210 employees, 71 percent of whom would be working on any given day.

On-Site Affordable and Employee Housing: In addition to free-market lodging, the expanded area would include 100 affordable housing units and 125 seasonal employee housing units, housing a total of 372 people. The employee housing was assumed to house 151 working adults, all of which would work at Teton Village, while the affordable housing was assumed to house 164 working adults, 75 percent of whom would work at Teton Village and 25 percent would work off-mountain. Thus, the seasonal and affordable units would house a total of 315 working adults (and 57 non-working persons), 274 of whom would work at Teton Village. Of those, it was assumed that 71 percent (195 employees) would be working on a given day.

Currently, virtually all Teton Village and mountain employees live elsewhere and commute on WY-390 to work. Thus, the work trips associated with those 195 Teton Village employees/residents working on a given day would be removed from the highway. Non-work trips from all 340 Teton Village employee/residents (shopping, recreation, etc.) would still contribute to highway traffic volumes.

Seasonal Employee Parking: Parking spaces would be provided for seasonal employees and affordable/attainable housing residents based on Teton County guidelines. These parking ratios would result in 309 parking spaces for the 340 employee/residents. The purpose of limiting parking is manifold: to reduce traffic on WY-390; to encourage ridership of START buses; to support the pedestrian nature of the village; and to reduce core village parking impacts. All seasonal housing employees would be able to walk to work, as well as many non-work destinations (skiing, shopping, the post office, etc.), and those employees without vehicles would have transit and carpooling available for trips made outside of Teton Village. Thus, as a result of the parking limitation, traffic on WY-390 would be reduced by approximately 85 trips per day, with transit use (either START or Alltrans) and carpooling increasing accordingly.

Commercial Densities. The Approved Plan included 208,000 SF of commercial space in Teton Village. This space would provide many of the services required by on-mountain guests (shopping, restaurants, etc.); thus, the Approved Plan estimated that 95 percent of the trips associated with the commercial space would come from within the village (i.e. a 95 percent internal capture rate). This assumption was based on an economic study for the commercial properties in Snowmass Village conducted by Briscoe, Maphis, Murray and Lamont. A subsequent study conducted in winter, 2003, at 14 commercial establishments in Teton Village (a total of 110,000 SF of commercial space has been constructed at Teton Village at that time) appears to support this assumption (Appendix D). However, the County was concerned that as Teton Village grows, the commercial core would become more of a primary destination than it is currently, and this internal capture rate will drop. Therefore, at the County's request, a lower internal capture rate of 65 percent was applied to the remaining un-built commercial properties in the original expansion plan (98,000 SF), and the original 95 percent capture rate was applied to the already constructed properties.

It should be noted that this capture rate revision was done at the County's request **for the purpose of this analysis only**. While the change affects the number of trips from the original master plan area, it does not supersede the values in approved document for that area; i.e., the total trips for the original master plan area as documented in the Approved Master Plan remain valid.

The Master Plan Expansion includes an additional 10,000 SF of local convenience space, 25,000 SF of general retail space, and 36,500 SF of office space; the 95 percent internal capture rate was applied to the local convenience retail and the 65 percent internal capture rate was applied to the general retail and office space.

Nordic Center (winter only): 50 skiers per day were assumed for the nordic center based on Jackson Hole Mountain Resort estimates, 50 percent of whom are staying at Teton Village.

Fitness Center: The Institute of Transportation Engineers (ITE) trip generation rate was used for the fitness center (land use code (LUC – 492, Fitness Center). It was estimated that approximately 2/3 of the fitness center guests would be staying in Teton Village.

Golf Course (summer only): Golf course trips were generated based on the following operational information:

- 240 rounds per day at buildout, 80 percent from Teton Village guests and residents;
- First tee time 7 AM, last tee time 5 PM (6 tee times per hour during the peak);
- 1 golfer arriving per vehicle;
- 37 employees;
- 1.2 employees per vehicle (from the Summer 2004 TDM Report); and
- 10 deliveries per day

Because the morning peak hour of the resort occurs in late morning sometime between 10 AM and noon it was assumed that most employees would have already arrived; only 20 percent were assumed to arrive at that later hour along with golfers. It was further assumed that two deliveries would be made during that late morning peak. In the afternoon peak it was assumed that, in addition to the golfers, half of the staff would leave (the rest either leaving slightly before or slightly after) and no deliveries would be made.

Trips were also generated for other resort-support activities that would be available at Teton Village; specifically, two visitor centers, a fire station, a sheriff substation and an elementary school. For the elementary school trips were generated based on trip rates in Trip Generation, Seventh Edition, Institute of Transportation Engineering (ITE). It was assumed that 60 percent of elementary school traffic would come from guests/students within Teton Village. Trips associated with the other resort support facilities were generated based on discussions with JHMR staff; approximately 60 external trips per day are anticipated for those uses.

Note that all of the above assumptions incorporate various transportation-related comments received in the conditions of approval for the project.

Based on the above assumptions, person-trips were generated for day skiers, the projected Teton Village population, the projected employment base, other non-skier-related activity, and other evening activity. Modal splits for automobile and transit were applied to the estimated person-trips based on the trip purpose. These mode splits were based on information provided by START, JHSC and data collected in February, 2003 and 2004 as part of the Teton Village TDM Monitoring Program. Table 4 summarizes the person-trip generation and modal splits associated with trips oriented to or from Teton Village.

As shown in Table 4, it is estimated that a total of 30,335 person-trips per day would be oriented to/from Teton Village, with approximately 23,030 daily person-trips (76 percent of the total) made by automobile. The remaining 7,305 trips, or 24 percent of the total daily person-trips, would be made by transit modes including START, Alltrans, taxis and shuttles.

Table 4. Winter Season - Person-Trip Generation and Modal Split Projections (1)

Trip Maker and Purpose	Number of Trip Makers	Average Trip Rate	Daily Person Trips	Automobile		Non-Automobile	
				Mode Split (10)	Daily Trips	Mode Split (10)	Daily Trips
Day Visitor							
Skiing	4,701	2.0	9,400	65%	6,110	35%	3,290
Other (2)	2,201	2.0	4,400	95%	4,180	5%	220
Teton Village Employees							
Work (3)	2,227	2.0	4,455	55%	2,450	45%	2,005
Trips Removed due to Housing (4)	-225	2.0	-450	55%	-250	45%	-200
Other Non-work Day Trips (5)	46	3.0	140	86%	120	14%	20
Night Trips (6)	111	2.0	220	77%	170	23%	50
Elementary School							
Daily Trips (7)	48	1.3	60	100%	60	0%	0
Non-Village Employees							
Daily Trips (8)	55	3.4	185	82%	150	18%	35
Overnight Guests							
Arrivals (9)	1,278	1.0	1,280	62%	795	38%	485
Departures (9)	1,278	1.0	1,280	62%	795	38%	485
Overnight Guests/Residents							
Other Day Activity (5)	1,629	3.0	4,890	95%	4,645	5%	245
Other Night Activity (6)	2,237	2.0	4,475	85%	3,805	15%	670
		Total	30,335		23,030		7,305

- (1) Person-trips are internal-external trips only (i.e. trips oriented to and from Teton Village).
- (2) Person-trips oriented to commercial areas are estimated to be equal to 40 one-way person-trips per 1,000 square feet of commercial area. Overall, about 95 percent of the person-trips to the existing retail properties and to the additional local convenience retail would be generated within the village, and the remaining five percent would be the external trips shown above. For the new general retail properties, about 65 percent of the person trips would be generated from within the village and 35 percent would be external to the village.
- (3) Total projected number of on-duty village and ski area employees at buildout.
- (4) Employee work trips that remain in the village due to on-mountain seasonal and affordable housing.
- (5) Other Day Activity includes all non-skier activity that is oriented outside of the village during the day (85% of non-skiers).
- (6) Other Night Activity includes trips for evening activities such as dining outside the village (assumption 35% of overnight population).
- (7) Based on ITE Land Use Code 520-Elementary School trip rate, with 70 percent of the students living within Teton Village.
- (8) Residents of affordable housing who work outside the village (based on ITE Land Use Code 220-Apartment trip rate)
- (9) Accounts for an arrival and departure rate of 20 percent of the estimated 6,376 overnight guests, which equates to an average stay of 5 days.
- (10) Modal splits based, in part, on START ridership data, JHSC operational data, and the Teton Village TDM Monitoring Program.

Table 5. Winter Season - Peak Hour and Directional Distribution Factors

Trip Purpose	Peak Hour Percentage		Directional Distribution	
	AM Peak	PM Peak	AM Inbound	PM Inbound
Day Skiing	30%	25%	100%	0%
Work	10%	15%	85%	15%
Site Access (guest arrivals/departures)	8%	9%	60%	55%
Other (non-ski) Commercial Attractions	2%	20%	65%	50%
Other Day Activity	8%	10%	15%	65%
Other Night Activity	0%	20%	0%	50%
Note: Peak hour and directional distribution factors based on ski operations at other resorts and/or on trip generation data documented in the Institute of Transportation Engineers (ITE) <i>Trip Generation Manual</i> .				

The person-trips shown in the Table 4 were converted to daily vehicle-trips by applying the vehicle occupancy factors in Table 6 to the daily (automobile) person-trips. The estimated peak hour and directional distribution factors shown in Table 5 were then applied to the daily vehicle-trips to obtain the peak hour travel demand generated by the Teton Village Resort area.

Table 6 summarizes the estimated vehicle-trips generated by the resort area. As shown, approximately 10,365 daily vehicle-trips are expected to be generated by the resort area, with a total of 1,045 vehicle-trips in the AM peak hour and 1,785 trips during the PM peak hour. It should be noted that a portion of these vehicle-trips would be captured by the proposed Stilson Park transit facility to be located at the intersection of WY-390 and WY-22. Travel demand estimates for Stilson Ranch are provided in the following section, and the resulting vehicle-trip adjustments are summarized in Table 6. Overall, it is estimated that the Stilson Ranch facility would capture approximately seven percent of the total daily vehicle-trips oriented to the resort area.

C. Stilson Park Transit Facility Trip Generation

The Stilson Park property would consist of two land uses: residential dwelling units and a park and ride lot for the ski area. The residential portion of the Stilson property is proposed to include approximately 28 dwelling units. The Scott property, located adjacent to the project site, would also be accessible through the Stilson residential area, and this property would potentially include a total of 8 dwelling units. Trip rates documented in the ITE *Trip Generation Manual* were used to estimate daily and peak hour vehicle-trips generated by the residential portion of the project site.

Table 6. Winter Season - Teton Village Vehicle-Trip Generation

Trip Maker	Trip Purpose	Daily Person Trips	Vehicle Occupancy Factor (1)	Daily Vehicle Trips	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
Day Visitors	Skiing	6,110	2.98	2,050	615	0	615	0	510	510
	Other-Commercial	4,180	2.0	2,095	25	15	40	215	205	420
On-mountain Employees	Work	2,450	2.2	1,115	100	15	115	25	140	165
Trips Removed due to Employee Housing		-250	2.2	-115	-10	0	-10	0	-15	-15
Other Non-work Day Trips		120	2.0	60	0	5	5	5	0	5
Night Trips		170	2.0	85	0	0	0	10	5	15
Elementary School	All Trips	60	1.0	60	15	15	30	0	0	0
Off-Mountain Employees	All Trips	150	1.0	150	0	15	15	15	5	20
Overnight Guests	Site Access	1,590	2.5	635	30	20	50	30	25	55
Overnight Guests/	Other - Day Activity	4,645	2.0	2,325	30	155	185	150	80	230
Residents	Other - Night Activity	3,805	2.0	1,905	0	0	0	190	190	380
	Subtotal	23,030		10,365	805	240	1,045	640	1,145	1,785
Stilson Park	Work	1,470	2.0	(730)	(60)	(10)	(70)	(15)	(95)	(110)
Reduction (2)	Skiing	2,145	2.98	(720)	(215)	0	(215)	0	(180)	(180)
	Adjusted Total			8,915	530	230	760	625	870	1,495
	Transit, Shuttle and Taxi Trips			1,000	40	40	80	30	30	60
	Total			9,915	570	270	840	655	900	1,555
(1)	Day skier and employee vehicle occupancy rates based on Jackson Hole Ski Corporation data.									
(2)	Refer to Stilson Park evaluation.									

The first phase of the Stilson Park transit facility--the park and ride lot--was opened for the 2003/2004 ski season. Ultimately, the facility will include 600 parking spaces, with a potential for up to 725 additional (overflow) spaces. Several factors were considered in the process to estimate traffic generated by the facility, such as resort parking supply versus peak day demands, vehicle occupancy factors, employee utilization levels, and bus capacities. While the proportion of skiers and employees that drive and utilize the Stilson Park transit facility would be dependent on factors such as lot capacities, lot visibility/familiarity, and parking incentives, for analysis purposes it was assumed that 75 percent of Jackson Hole Ski Corporation (JHSC) employees, 20 percent of other Teton Village employees, and about 35 percent of day-skiers that drive would park at the Stilson facility.

With these proportions and the travel demand estimates shown in Table 6, it was estimated that the Stilson Park transit facility would generate approximately 1,455 vehicle-trips per day (not including residential or transit vehicle trips). It was also estimated that about 275 vehicles would enter the site during the AM peak hour, and about 275 vehicles would exit the site during the PM peak hour.

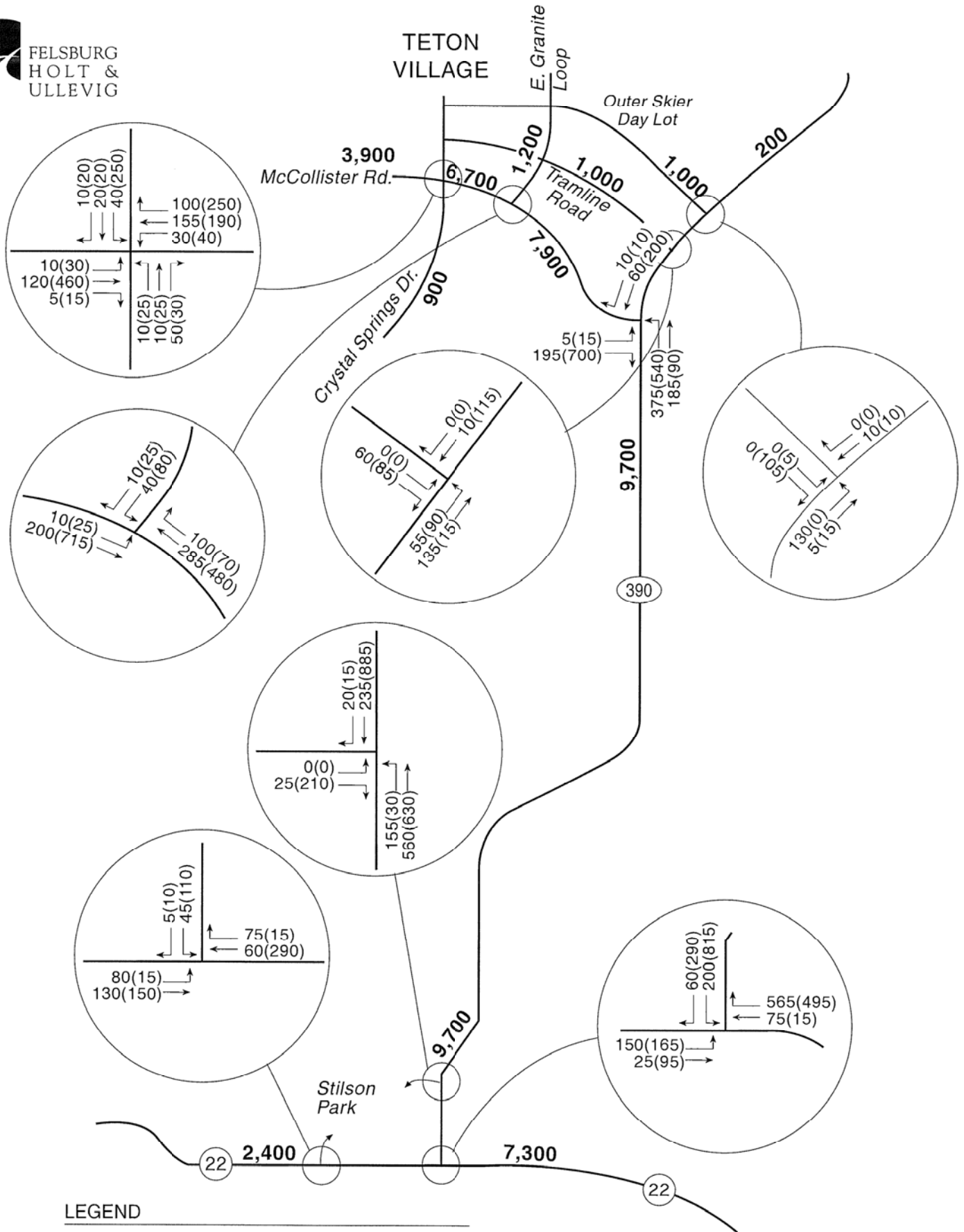
Of the total 275 (inbound) vehicle-trips generated during the AM peak hour, approximately 215 trips would be day-skiers, with the remaining 70 trips being JHSC and village employees. Of the estimated 275 (outbound) PM peak hour trips, approximately 180 trips would be day-skiers and 95 would be employees. Accounting for estimated auto occupancy rates of about 2.0 persons per vehicle for employees, and 2.98 for day-skiers, it is estimated that there would be approximately 780 person-trips during the AM peak hour and 740 person-trips during the PM peak hour. With an estimated bus capacity of 47 passengers per bus, this equates to a maximum demand of about 17 bus-trips per hour.

The estimated travel time, including passenger loading and unloading, for a round-trip between the Stilson Park transit facility and the Jackson Hole Ski Area is about 25 minutes. Therefore, to meet the forecasted demand of 17 bus-trips per hour at the buildout of the ski area, a minimum of seven buses would be appropriate.

Daily and peak hour vehicle-trips generated by the Stilson Park property have been summarized in Table 7. As shown, it is estimated that the site would generate a total of approximately 1,955 vehicle-trips per day, of which less than 20 percent would be attributable to the residential area of the Stilson Park property. Overall, the trip estimates indicate that the Stilson Park transit facility has the potential of intercepting a minimum of 1,455 vehicles per day that would otherwise have to travel on WY-390 to/from Teton Village.

Resort Vehicle-Trip Distribution and Assignment

In terms of the off-site distribution of ski area traffic, it is estimated that 98 percent of all vehicle-trips would be oriented to or from the south via WY-390, with the remaining two percent oriented to/from the north. The vehicle-trip generation estimates shown in Table 6 were assigned to the area roadway system to produce the site generated traffic assignment shown on Figure 3. These volumes were adjusted to account for transit vehicle-trips.



LEGEND

XXX(XXX) = AM(PM) Peak Hour Traffic Volumes

XXXX = Average Daily Traffic Volumes

Figure 3
Site Generated Traffic Volumes
Winter Season - Buildout



Table 7. Stilson Ranch Estimated Vehicle-Trip Generation

Stilson Ranch Land Uses	Size	Daily Trips	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Residential Area								
Stilson Ranch Property	28 du	270	5	15	20	20	10	30
Scott Property	8 du	75	0	5	5	5	5	10
Subtotal		345	5	20	25	25	15	40
Transit Center								
Parking/Drop-Off Area (2)	1,325 sp	1,450	280	10	290	15	275	290
Bus Loading/Unloading (3)		160	20	20	40	15	15	30
Subtotal		1,610	300	30	330	30	290	320
Total		1,955	305	50	355	55	305	360
du = dwelling units								
sp = parking spaces (600 spaces are proposed with a potential of 725 overflow spaces at buildout)								
(1) Vehicle-trip estimates are based on ITE trip rates for Single-Family Detached Homes, ITE Land Use Code #210 (note: trips generated by the Scott property have been included in the trip estimates as a conservative measure).								
(2) Vehicle-trip estimates for the Transit Center are based on the following assumptions:								
-35% of day-skiers that drive utilize the Stilson lot.								
-75% of JHSC employees that drive utilize the Stilson lot.								
-20% of other village employees that drive utilize the Stilson lot.								
(3) Bus-trips are based on the following estimates:								
-AM Demand = 755 person-trips								
-PM Demand = 700 person-trips								
-Bus Capacity = 47 passengers								

D. Stilson Park Vehicle-Trip Distribution and Assignment

Two entry points are proposed to serve the Stilson Park property. A northeastern access would be located along WY-390, approximately 1,000 feet north of WY-22. A southwestern access would be located along WY-22 approximately 1,500 feet west of WY-390. The residential area of the property would be served primarily by the WY-390 access due to the close proximity of its internal access road to this intersection, however, the WY-22 access could still be utilized by residential-oriented traffic. The transit facility would be located between the two access intersections, and slightly closer to the WY-390 access.

In general, it is anticipated that skier-trips originating along the WY-390 corridor (north of Stilson) would not travel out of their way to the ski area. Therefore, traffic generated by the transit center, excluding buses, is not anticipated to be oriented to/from the north via WY-390. Since the Town of Jackson is a major regional production and attraction zone that generates a large number of vehicular trips in the area, the distribution of site traffic (including the residential area) would be heavily oriented to/from the town via WY-22. However, production and attraction zones also exist west of the Stilson property and, therefore, a portion of the total vehicular site trips would also be oriented to/from this area. Overall, a 75/25 east-west split, respectively, was applied to trips oriented to/from the transit center, and a 90/10 east-west split was applied to the residential-oriented trips. The assignment of the total site-generated traffic is illustrated on Figure 3.

E. Background and Total Traffic Volume Projections

Background traffic volumes were derived from historical daily traffic volumes along WY-390 and WY-22. Existing ski area traffic was removed from this traffic count data, and the remaining traffic was then factored by an annual rate of 1.7 percent per year on WY-390 and 3.8 percent per year on WY-22 over a 20-year period. These growth factors are based on historical growth trends calculated from 1991 and 2005 average daily traffic volumes for both facilities (refer to Table 8).

Table 8. Historical Traffic Volume Growth

Road	Location	1991 ADT	2005 ADT	Annual Growth
WY-390	n/o Teton Village Road	1,700	2,400	2.5%
	s/o Teton Village Road	6,800	8,300	1.4%
	n/o WY 22	14,300	18,300	1.8%
		WY-390 Growth		1.7%
WY-22	e/o WY 390	16,100	25,300	3.3%
	w/o WY 390	8,700	16,500	4.7%
		WY-22 Growth		3.8%
		Overall Growth		2.9%
Note: All of the ADTs shown are for the peak month of July.				

Table 9 summarizes the breakdown of existing site traffic versus existing background (non-site) related traffic volumes. As shown, the existing daily background traffic component along WY-390 adjacent to Teton Village is approximately 500 vehicles per day (vpd), or seven percent of the total existing daily traffic (south of Teton Village Road). North of WY-22, the existing daily background traffic component along WY-390 is approximately 6,700 vpd, or 58 percent of the total existing daily traffic. Forecasted background traffic demands are provided on Figure 4.

The total projected traffic volumes at buildout of the resort area are provided on Figure 5. These volumes are the sum of site generated traffic and background (non-site related) traffic volume projections.

Table 9. Existing and Background Average Daily Traffic Volumes - Winter Season

Road	Location	Existing ADT		Background ADT	
		Total (1)	Village (2)	Existing	Future (3)
Teton Village Rd	West of WY-390	6,900	6,900	0	0
WY-390	North of Teton Village Rd.	400	200	200	300
	South of Teton Village Rd.	7,200	6,700	500	700
	North of WY-22	11,700	6,700	5,000	7,000
WY-22	East of WY-390	14,400	5,600	8,800	18,600
	West of WY-390	9,600	1,400	8,200	17,300
(1) Average Daily Traffic volumes (Refer to Table 1).					
(2) Estimated ADTs are based on a distribution of 6,900 total village vehicle-trips per day.					
(3) Future ADTs are based on a 1.7 percent annual growth rate for WY-390 and a 3.8 percent annual growth rate for WY-22, applied to existing background ADTs over a 20-year period.					

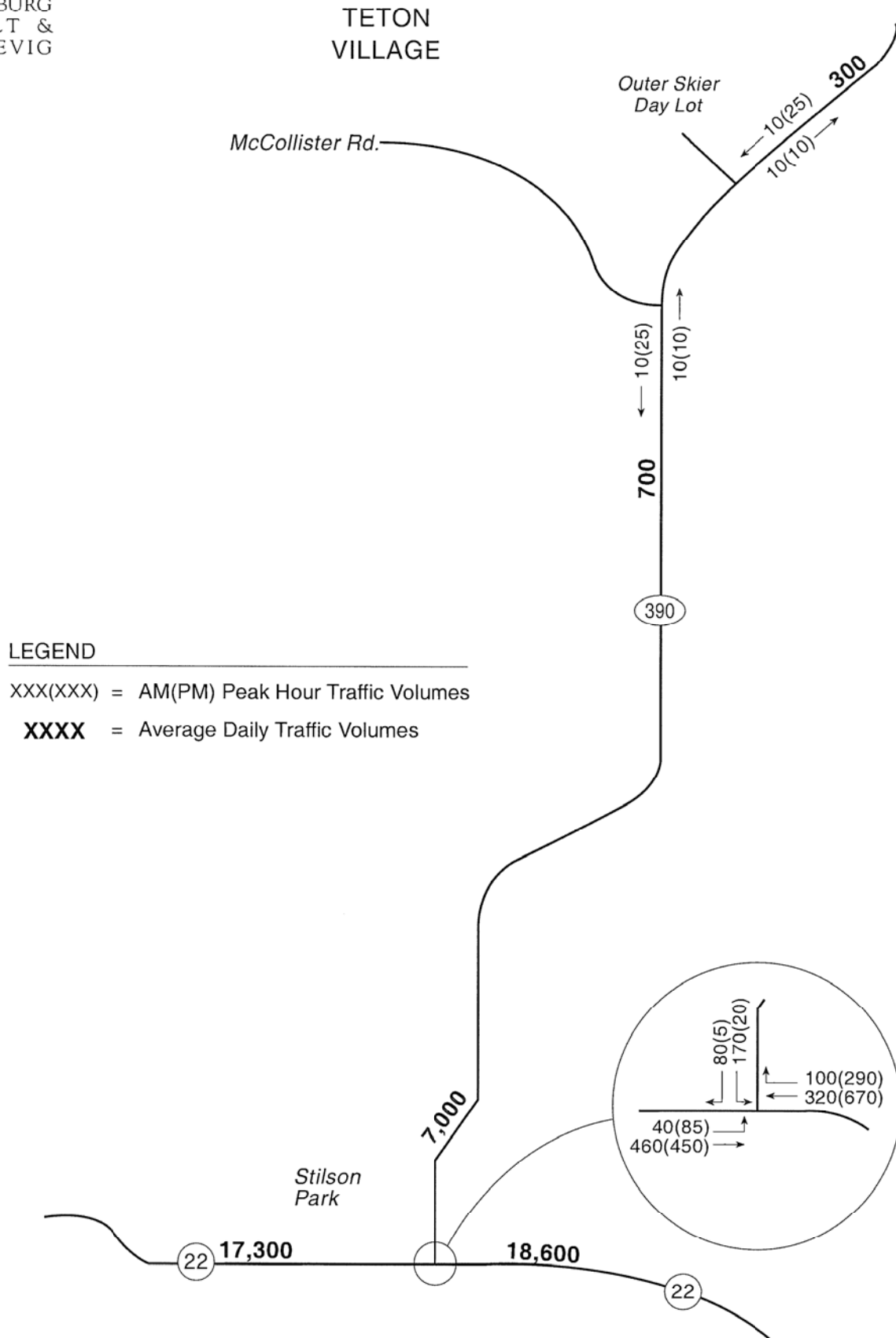


Figure 4
Background Traffic Volume Projections
Winter Season - Buildout

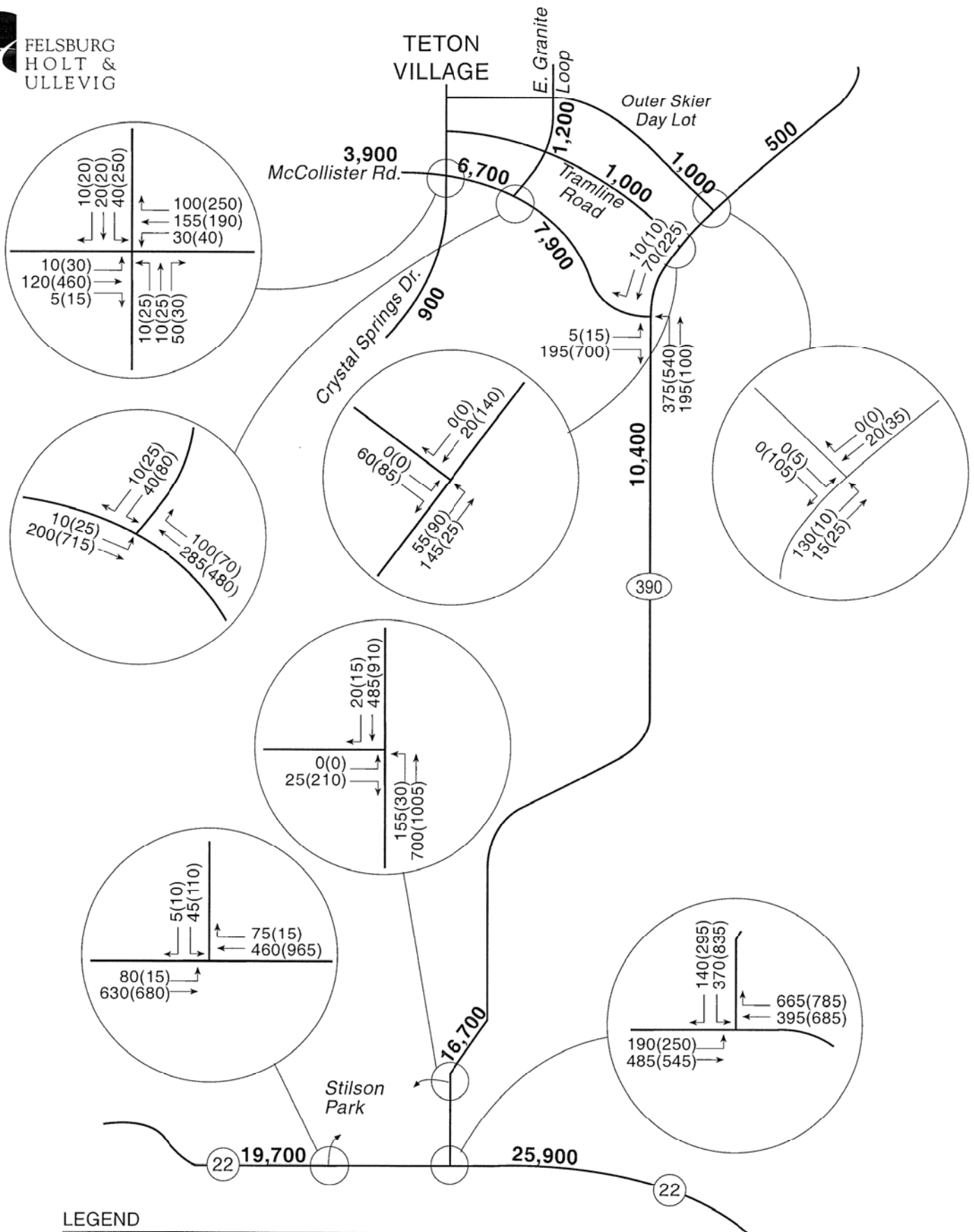


Figure 5
Total Traffic Volume Projections
Winter Season - Buildout



III. WINTER SEASON - RIDERSHIP PROJECTIONS FOR OTHER TRAVEL MODES

As was estimated in Table 4, the resort area would generate a total of 30,335 daily person-trips. Of this total, approximately 76 percent would be automobile related, and the remaining 24 percent (7,305 person-trips) would be non-automobile related (i.e. bus, taxi, limousines, or courtesy vans/shuttles).

Table 10 provides a summary of the projected number of person-trips that would utilize other modes, with an adjustment to account for additional demand from the Stilson Park transit facility. As shown, the resort would generate a total of 11,060 daily trips using modes other than personal automobile, with approximately 20 percent of this demand occurring during the peak hour. Of the total non-automobile travel demand, approximately 49 percent is related to day skiers and 31 percent is related to work trips.

Table 10. Ridership Projections for Other (Non-Automobile) Travel Modes - Winter Season

Trip Maker	Trip Purpose	Total Person Trips		
		Daily Trips	AM Peak Hour	PM Peak Hour
Day Visitors	Skiing	3,290	985	825
	Other-Commercial	220	5	40
Employees	Work	2,005	200	300
	Trips Removed due to Employee Housing	-200	-20	-30
	Other Non-work Day Trips	20	0	0
	Night Trips	50	0	10
Elementary School	All Trips	0	0	0
Off-mountain Employees	All Trips	35	5	5
Overnight Guests	Site Access	970	80	85
Overnight Guests/ Residents	Other - Day Activity	245	20	25
	Other - Night Activity	670	0	135
Subtotal		7,305	1,275	1,395
Stilson Ranch	Skiing	2,140	640	535
Transit Facility	Work	1,615	135	205
Total		11,060	2,050	2,135

The Stilson Park transit facility is expected to generate a minimum of 3,755 person-trips per day, which is about 34 percent of the total daily transit demand.

During the winter season, the average peak monthly ridership to/from Teton Village for the START bus service is approximately 59,500 passengers, or about 1,920 passengers per day. As noted previously, based on data in the *Teton Village Area Transportation Demand Management Report for the 2003 and 2004 Winter Seasons*, approximately 75 percent of all transit trips are made using START service, with the remaining 25 percent using Alltrans, taxis, limousines, or courtesy vans/shuttles. If START were to maintain a 75 percent share of all transit ridership in the future, this would translate into a demand of approximately 5,500 person-trips per day, or about three times the existing ridership. During the peak hour, it is estimated that the demand for START service would be 1,045 person-trips. Based on a round-trip time of 40 minutes between Teton Village and Jackson and a bus capacity of 47 passengers, a maximum of 17 buses would be needed to meet this projected demand.

As noted previously, the projected peak hour transit demand at the Stilson facility would be approximately 775 person-trips. For an estimated round-trip travel time (including loading and unloading) of 25 minutes and a bus capacity of 47 passengers, this translates into a need for eight buses.

IV. WINTER SEASON - OFF-SITE TRAFFIC IMPACTS

A. Intersection Operations

Utilizing the total projected daily and peak hour traffic volume assignments shown on Figure 5, intersection capacity analyses were performed for the following intersections:

1. WY-390 at Après Vous Road (Outer Skier Day Lot)
2. WY-390 at Tram Line Road (Transit Access Road)
3. WY-390 at McCollister Road (Teton Village Road)
4. WY-390 at WY-22
5. WY-390 at Stilson Park Access
6. WY-22 at Stilson Park Access

Intersection capacity analyses performed for these locations are based on methodologies documented in the *Highway Capacity Manual* (TRB Special Report No. 209), 2000 update (HCM-2000). The end result of such an analysis is a level of service (LOS), which is a qualitative assessment of the traffic flow characteristics described by a letter designation ranging from LOS A to LOS F. LOS A represents traffic conditions with essentially uninterrupted flow and minimal delay, while LOS F represents the breakdown of traffic flow with excessive congestion and delay. Level of service criteria are described in greater detail in Appendix A. Level of service worksheets are presented in Appendix B.

The resulting levels of service for the study intersections are summarized in Table 11 and described below.

WY-390 at Après Vous Road

A two-way roadway would access WY-390 from the outer skier day lot. The lot would provide approximately 1/3 of the total parking spaces available for day skiers. Because the lot intersection would be located north of the main access to Teton Village (McCollister Road), very little background traffic would impact operations at this intersection, and a two-lane geometry on all three approaches would be adequate to accommodate traffic projections.

With this recommended lane geometry and with stop-sign control, this intersection is expected to operate at acceptable levels of service during peak hours. As shown in Table 11, critical movements would operate at LOS A or better (capacity analysis worksheets are provided in Appendix B).

WY-390 at Tram Line Road (Transit Access)

A two-way access road would access WY-390 between McCollister Road and the day skier lot. This access would provide direct access to the transit center at the base area and would be the primary route for transit vehicles entering and exiting Teton Village, but would also be open to other resort traffic. As with Après Vous Way, very little background traffic would impact operations at this intersection, and a two-lane geometry on all three approaches would be adequate to accommodate traffic projections.

Table 11. Intersection Levels of Service - Winter Season

Intersection	Critical Movements	AM Peak LOS	PM Peak LOS
WY 390 Après Vous (stop controlled)	NB Left EB Left EB Right	A A A	A A A
WY 390 Tram Line Road (Transit Access) (stop controlled)	NB Left EB Left EB Right	A A A	A A A
WY 390 McCollister Road (stop controlled)	NB Left EB Left EB Right	A D A	A F E
<i>(roundabout)</i>	<i>All Movements</i>	<i>A</i>	<i>A</i>
WY 390 Stilson Access (stop controlled)	NB Left EB Left EB Right	A D B	B E D
WY 22 Stilson Access (stop controlled)	EB Left SB Left SB Right	A C B	B E C
WY 390 at WY 22 (signalized w/ single SB left)	All Movements	B	F
<i>(signalized w/ dual SB left turn lanes)</i>	<i>All Movements</i>	<i>A</i>	<i>C</i>
LOS = Level of service.			
<i>Italic = conditions with identified intersection improvements</i>			

With this recommended lane geometry and with stop-sign control on the Tram Line Road approach, this intersection is expected to operate at acceptable levels of service during peak hours. Critical movements would operate at LOS A or better in both the summer and the winter.

WY-390 at McCollister Road (Teton Village Road)

Under the Expanded Master Plan, McCollister Road would provide the primary access to Teton Village. While a two-lane roadway would adequately handle the projected daily traffic demands along this road, a roundabout is recommended to accommodate traffic patterns at this intersection. Such traffic control would improve traffic operations and provide a gateway entry feature to the resort. With a roundabout, all movements at the intersection would operate at LOS B or better during both peak periods.

WY-390 at WY-22

Presently, this intersection is signalized. Due to the forecasted high level of southbound to eastbound left-turning traffic and increases in east-west through traffic on WY-22, a second southbound left-turn lane would be needed by the buildout of the study area. Two lanes would be required on WY-22 to accept dual left-turning traffic; this second lane would be provided via the widening WY-22 east of WY-390 (i.e. between WY-390 and the Town of Jackson).

The capacity analyses conducted for this intersection indicate that it would operate at LOS C during the PM peak hour with dual southbound left turn lanes on the WY-390 approach, and at LOS F with only a single left-turn lane on WY-390.

Stilson Park Accesses

Access to the Stilson Park park and ride facility will continue to be provided on both WY-390 and WY-22. However, to minimize the impact to non-site related traffic along these roadways, as well as to minimize stopped delay for outbound site traffic, several auxiliary turning lanes are recommended at each access:

- (1) A right-turn deceleration lane is recommended to accommodate inbound Stilson traffic along westbound WY-22.
- (2) Left-turn deceleration lanes are recommended to accommodate inbound Stilson traffic on eastbound WY-22 and on northbound WY-390.
- (3) Two outbound turning lanes are recommended at each of the Stilson access intersections to separate left and right turning traffic.

With these recommended lane geometries and with stop-sign control, both of the Stilson access intersections are expected to operate at reasonable levels during peak hours in the winter. At the WY-390 right turns out of the site would operate at LOS D during the or better during both peak periods, while left turns out of the site would operate at LOS E during the PM peak period. At the WY-22 access right turns out of the site would operate at LOS C and left turns out of the site would operate at LOS E during the afternoon peak period only.

It is not uncommon for left turns from driveways and side streets along higher volume roadways to experience poor levels of service. 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.

A more detailed analysis of both Stilson access intersections using the SimTraffic traffic simulation software indicated no excessive delays or significant queuing for the outbound left turn movement (the 95th percentile queue length was approximately six vehicles at WY 22 and two vehicles at WY 390). Therefore, no additional improvements are recommended at that driveway.

B. Highway Operations

Highway capacity analyses were also performed for several sections of WY-390 and WY-22, including:

1. WY-390 North of McCollister Road
2. WY-390 South of McCollister Road
3. WY-390 North of WY-22
4. WY-22 East of WY-390
5. WY-22 West of Stilson Park

Highway segments, such as WY-390, are assigned levels of service based on the directional split of traffic during a peak hour of the day. Highway capacity analyses were performed using methodologies documented in the *Highway Capacity Manual*. The results of the analyses are summarized in Table 12.

Table 12. Highway Levels of Service - Winter Season

Highway	Section	Travel Lanes (1)	AM Peak Hour		PM Peak Hour	
			Flow Rate	LOS	Flow Rate	LOS
WY 390	North of Teton Village	2	35	B	70	A
	South of Teton Village	2	845	D	1,570	E
	North of WY-22	2	1,250	D	1,965	E
WY 22	East of WY-390	2	2,015	E	2,950	F
		4	650	B	894	B
	West of Stilson Park	2	1,255	D	1,765	E

LOS = Level of service.
 Flow rates are in vehicles per hour.
Italics = conditions with identified roadway widening improvements
 (1) Plus auxiliary speed change lanes.

South of Teton Village, WY-390 is projected to carry 10,400 vpd. From the analyses, it was determined that WY-390 would operate at LOS D during the morning peak and LOS E during the afternoon peak under buildout conditions. The volume-to-capacity ratio during the afternoon peak period is 0.53; i.e., the projected volume would be approximately ½ of the available capacity of the roadway; therefore, no additional through lanes would be needed along this segment of highway.

North of WY-22, WY-390 is projected to carry a total of 16,700 vehicles per day. Teton Village traffic is estimated to account for approximately 58 percent of this total projected daily traffic. The remaining 42 percent of the total daily traffic would be oriented to/from other developments along WY-390. The two-lane highway capacity analyses indicate that this segment would operate at LOS D during the morning peak and LOS E during the afternoon peak by buildout of the area. This is the same level of service projected for the roadway under the Approved Plan, and indicates that section would be approaching its capacity during the winter and may need widening.

Highway 22 east of WY-390 is projected to carry a total of 25,900 vpd. Teton Village traffic is estimated to account for approximately 28 percent of this total. The results of the analyses indicate that it would operate at LOS F as a two-lane facility during the PM peak period, meaning the highway would be over capacity. The highway would operate at LOS C as a four-lane facility.

Highway 22 west of Stilson Park is projected to carry a total of 19,700 vpd, with Teton Village traffic comprising 12 percent of this total. It is expected to operate at LOS D during the morning peak and LOS E during the afternoon peak by the buildout of the area. However, the analysis indicates that the volume-to-capacity ratio for the road is 0.58 in the afternoon, i.e., the projected volume would be approximately 60 percent of the capacity of the roadway during the peak hour; therefore, no additional through lanes are recommended at this time.

V. SUMMER SEASON - TRAVEL DEMAND ANALYSIS

A technical analysis of summer season traffic operations for the Teton Village Expansion Master Plan was also conducted. As with the winter season, the travel demand analysis included trip generation, distribution, and assignment of project-related traffic. Future traffic operational analyses were conducted at key intersections and along key roadway links based on buildout travel demand assignments.

A. Resort Trip Generation

The travel demand analysis performed for the summer season was derived in a similar manner as the winter analysis. However, assumptions regarding employment, village population, and mountain activity were adjusted to reflect the difference between summer and winter season operations. Table 13 summarizes the person-trip generation estimates for the summer season and is based on the buildout of the village, with a bed base of 6,376 beds, an occupancy rate of 80 percent, and a reduction in the total winter (JHSC) employment base by about 65 percent. As shown, the total person-trips into and out of the village area are projected to be approximately 28,910 person-trips per day, which is only slightly less than the projections for the winter season.

Table 13 also summarizes modal split estimates for internal-external person-trips. As shown, an estimated 785 person-trips, or three percent of the total daily person-trips, would be transit related. The remaining 28,125 daily person-trips (97 percent of the total) would be automobile trips.

Vehicle occupancy factors were applied to the automobile-related person-trips shown in Table 13 to derive the daily vehicular trip generation shown in Table 14. As shown, about 12,905 vehicle-trips per day are projected to be oriented to or from the village area during the summer season. This is approximately 30 percent more than the projected winter daily vehicle-trips. Two factors may be contributing to the higher vehicle trips. The first is the absence of a strong internally-based attraction (i.e. skiing) during the summer season. The second is a reduction in transit ridership due to the lack of a single central attraction in the area (in the summer, visitor attractions include the two national parks, hiking, biking, horseback riding, and other area activities, whereas in the winter visitors are primarily drawn to the ski area). Limited summer transit service may also contribute to lower ridership percentages, although that may be somewhat less of a causal relationship and more of a reaction to the lower transit demand during that season.

Peak hour percentages and directional distribution factors for various trip purposes shown in Table 15 were applied to the daily vehicle-trip generation estimates to determine peak hour trip generation. Upon buildout of the village area, a total of approximately 805 vehicle-trips would be generated during the AM peak hour and a total of 1,555 vehicle-trips would be generated during the PM peak hour. These volumes are similar to the winter peak trip generation, indicating that the 33 percent increase in trips in the summer would occur in the middle of the day, outside of the peak periods.

Table 13. Summer Season - Person-Trip Generation and Modal Split Projections (1)

Trip Maker and Purpose	Number of Trip Makers	Average Trip Rate	Daily Person Trips	Automobile		Transit	
				Mode Split (9)	Daily Trips	Mode Split (10)	Daily Trips
Day Visitor							
Shopping/Recreation (2)	2,207	2.0	4,415	95%	4,195	5%	220
Village Employees							
Work (3)	1,248	2.0	2,495	76%	1,895	24%	600
Trips Removed due to Housing (4)	-225	2.0	-450	76%	-340	24%	-110
Other Non-work Day Trips (5)	83	3.0	250	91%	225	9%	25
Night Trips (6)	159	2.0	315	91%	285	9%	30
Off-mountain Employees							
Daily Trips (ITE Trip Rate) (7)	55	3.4	185	89%	165	11%	20
Golf/Fitness Center Trips							
Local Trips/Deliveries (8)	115	2.0	230	100%	230	0%	0
Overnight Guests							
Arrivals (9)	1,278	1.0	1,280	100%	1,280	0%	0
Departures (9)	1,278	1.0	1,280	100%	1,280	0%	0
Overnight Guests/Residents							
Other Day Activity (5)	4,601	3.0	13,800	100%	13,800	0%	0
Other Night Activity (6)	2,556	2.0	5,110	100%	5,110	0%	0
		Total	28,910		28,125		785
(1) Person-trips are internal-external trips only (i.e. trips oriented to and from Teton Village). (2) Person-trips oriented to commercial areas are estimated to be equal to 40 one-way person-trips per 1,000 square feet of commercial area. Overall, about 95 percent of the person-trips to the existing retail properties and to the additional local convenience retail would be generated within the village, and the remaining five percent would be the external trips shown above. For the new general retail properties, about 65 percent of the person trips would be generated from within the village and 35 percent would be external to the village. Also includes trips associated with the equestrian center, which was based on information from the current center. It was assumed that the center would generate 150 riders per day and that 60 percent would come from within Teton Village. (3) Total projected number of on-duty village and ski area employees at buildout. (4) Employee work trips that remain in the village due to affordable housing. (5) Other Day Activity includes all non-skier activity that is oriented outside of the village during the day (90% of overnight population). (6) Other Night Activity includes trips for evening activities such as dining outside the village (assumption 50% of overnight population). (7) Residents of affordable housing who work off the mountain (based on ITE Land Use Code 220-Apartment trip rate) (8) Based on 50 rounds/day made by golfers not staying in the Village, 10 deliveries/day, and ITE Land Use Code 492-Health/Fitness Club trip rate. It was further assumed that 70 percent of the fitness center trips would be from within Teton Village and 30 percent would be from outside Teton Village. (9) Accounts for an arrival and departure rate of 25 percent of the estimated 5,101 overnight guests, which equates to an average stay of 4 days. (10) Modal splits based, in part, on START ridership data, JHSC operational data, the Teton Village TDM Monitoring Program, and summer operations at other resort areas.							

Table 14. Summer Season - Teton Village Vehicle-Trip Generation

Trip Maker	Trip Purpose	Daily Auto Person Trips	Vehicle Occupancy	Daily Vehicle Trips	AM Peak Hour Trips			PM Peak Hour Trips		
					In	Out	Total	In	Out	Total
Day Visitors	Shopping/Recreation	4,220	2.5	1,680	20	15	35	170	165	335
Village Employees	Work	1,900	1.2	1,585	200	35	235	35	200	235
Trips Removed due to Employee Housing		-295	1.2	-285	-40	-5	-45	-5	-40	-45
Other Non-Work Day Trips		195	2	115	0	10	10	5	5	10
Night Trips		250	2	145	0	0	0	10	10	20
Off-Mountain Employees	All Trips	120	1	165	0	15	15	15	5	20
Golf/Fitness Center Trips	Off-Site Trips	160	1	230	15	5	20	0	30	30
Overnight Guests	Site Access	2,550	2.13	1,200	60	35	95	60	50	110
Overnight Guests/ Residents	Other - Day Activity	13,775	2.5	5,525	65	375	440	360	195	555
	Other - Night Activity	5,100	2.5	2,045	0	0	0	160	125	285
	Total	27,975		12,405	320	485	805	810	745	1,555
Transit, Shuttle and Taxi Trips				500	10	10	20	10	10	20
Total				12,905	330	495	825	820	755	1,575

Table 15. Summer Season - Peak Hour and Directional Distribution Factors

Trip Purpose	Peak Hour Percentage		Directional Distribution	
	AM Peak	PM Peak	AM Inbound	PM Inbound
Work	15%	15%	85%	15%
Site Access (guest arrivals/departures)	8%	9%	60%	55%
Other (non-ski) Commercial Attractions	2%	20%	65%	50%
Other Day Activity	8%	10%	15%	65%
Other Night Activity	0%	14%	0%	55%

B. Resort Vehicle-Trip Distribution and Assignment

The off-site distribution of Teton Village traffic is estimated as follows:

- Approximately 20 percent of the trips from Teton Village are expected to be oriented to or from the north via WY-390, with the remaining 80 percent oriented to/from the south.
- Of the resort traffic that is oriented to/from WY-22, approximately 25 percent is expected to be oriented to the west and 75 percent to the east.

Daily and peak hour vehicle-trips generated by Teton Village were assigned to the area roadway system based on these summer season distribution estimates. This assignment of site generated traffic is provided on Figure 6.

C. Background and Total Traffic Volume Projections

As with the winter season analysis, background traffic volumes for the summer season were derived from existing daily traffic volume counts conducted along WY-390 and WY-22. Existing Teton Village traffic was removed from this traffic count data, and the remaining traffic was then factored by an annual rate of 1.7 percent per year for WY-390 traffic and 3.8 percent per year for WY-22 traffic over a 20-year period (refer to Table 8).

Table 16 summarizes the breakdown of existing site traffic versus existing background (non-site) related traffic volumes. As shown, the existing daily background traffic component along WY-390 adjacent to Teton Village is estimated to be about 1,700 vehicles per day (vpd), which is about 22 percent of the total existing daily traffic (south of Teton Village Road). North of WY-22, the existing daily background traffic component along WY-390 is estimated to be about 11,100 vpd, which is about 65 percent of the total existing daily traffic. Forecasted background traffic demands are provided on Figure 7.

Total summer season traffic volumes for the buildout of the village area are provided on Figure 8. These volumes are the result of combining site-generated traffic with background (non-site related) traffic volume forecasts.

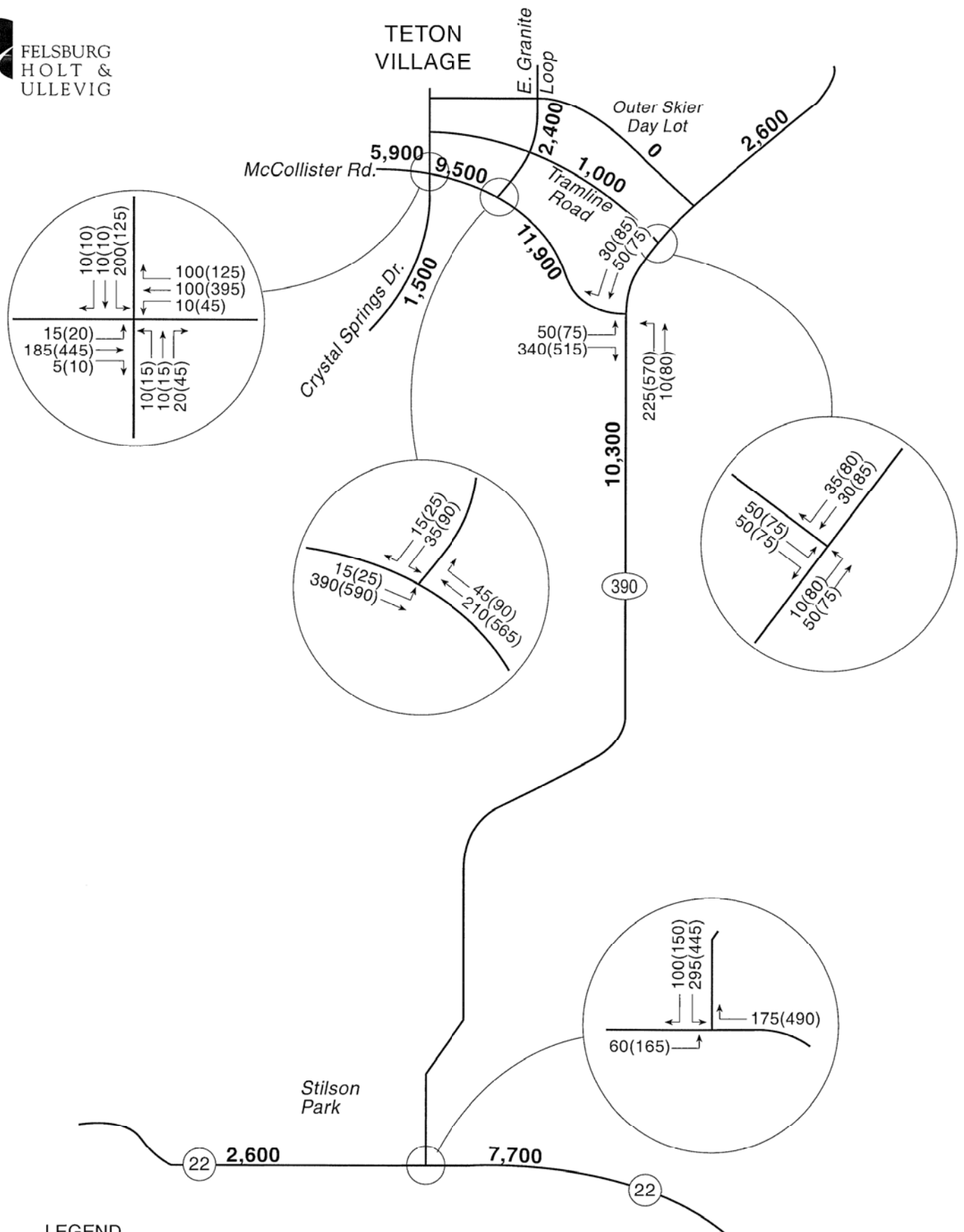


Figure 6
Site Generated Traffic Volumes
Summer Season - Buildout

**TETON
VILLAGE**

LEGEND

XXX(XXX) = AM(PM) Peak Hour Traffic Volumes

XXXX = Average Daily Traffic Volumes

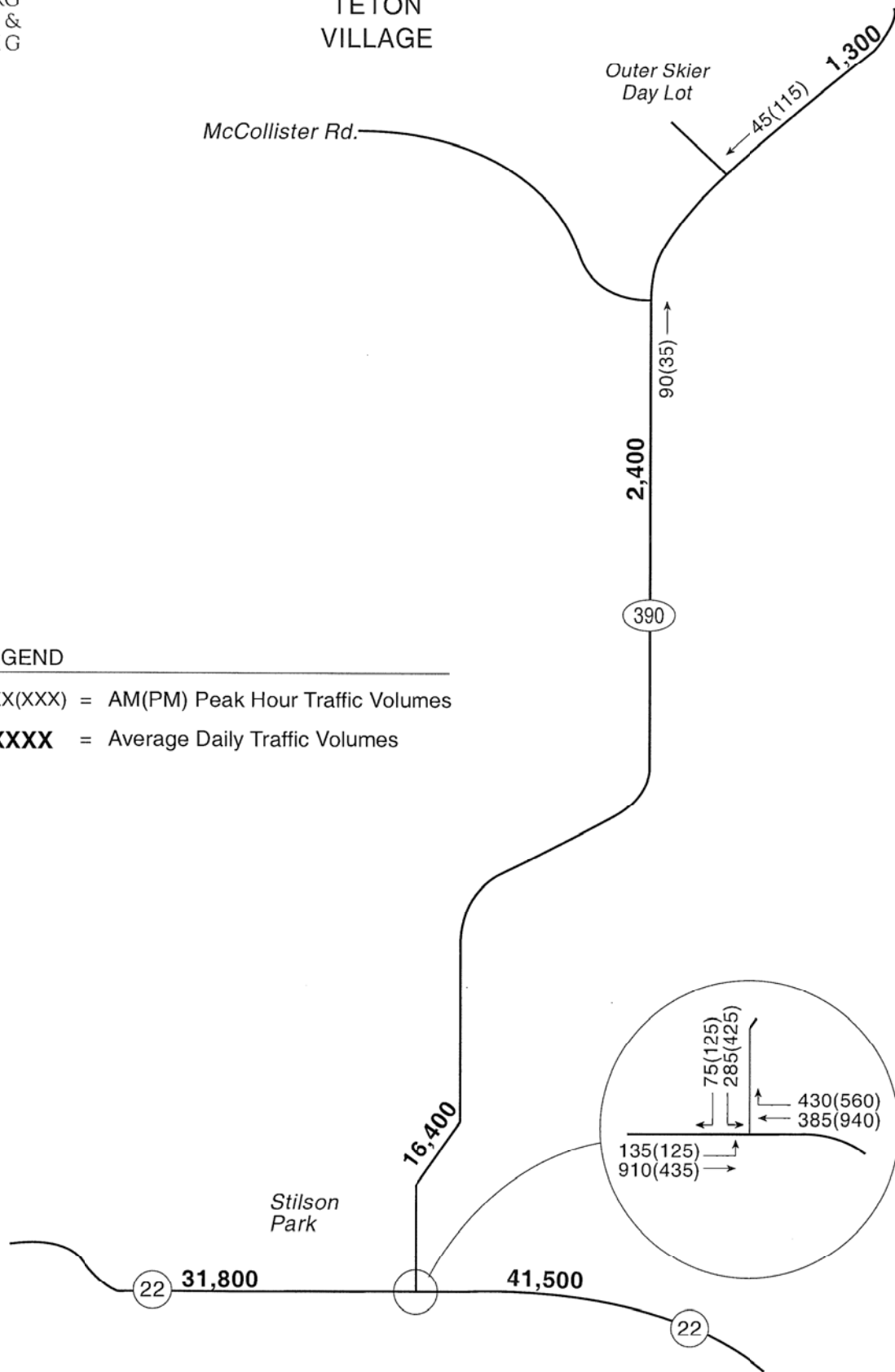


Figure 7
Background Traffic Volume Projections
Summer Season - Buildout

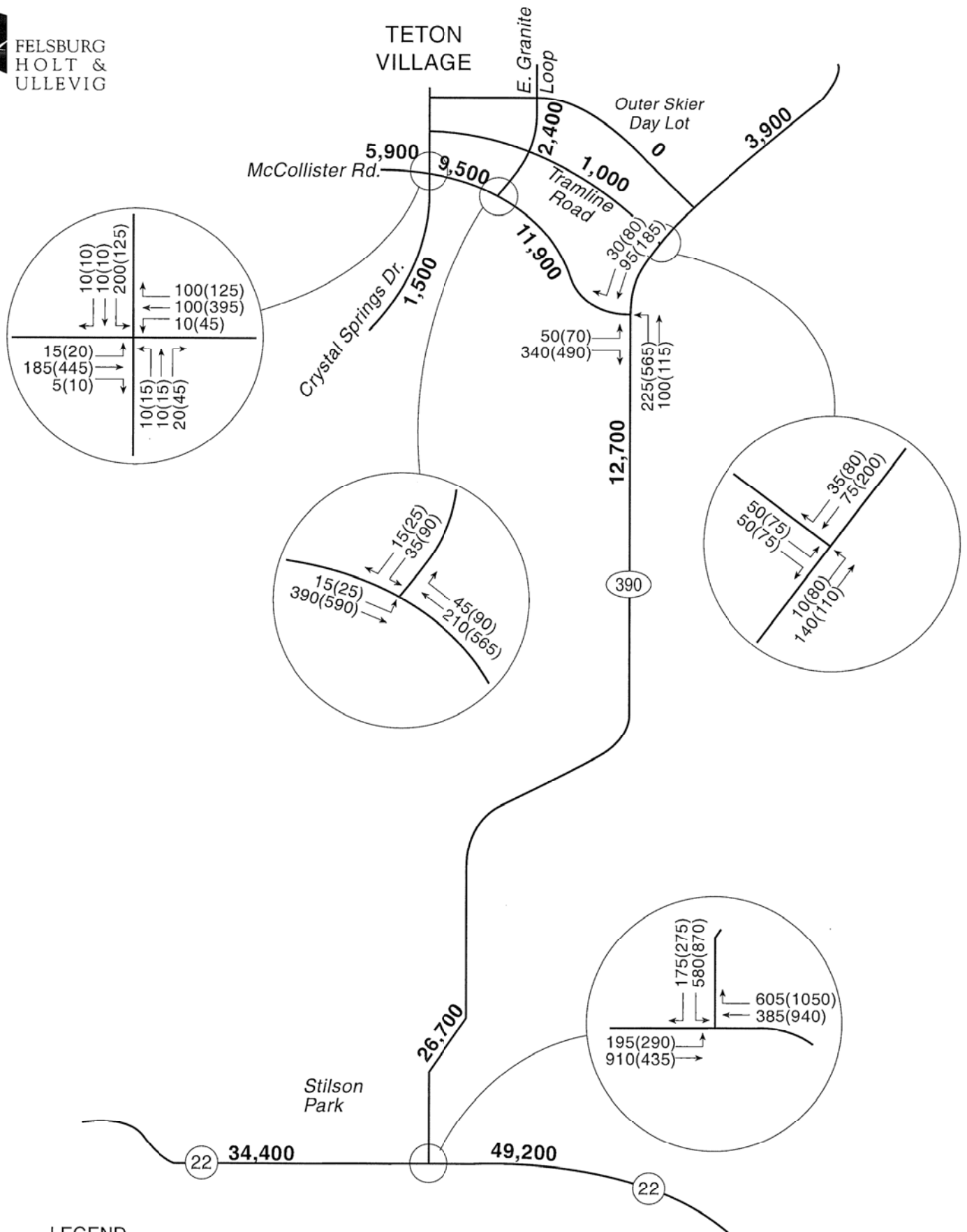


Figure 8
Total Traffic Volume Projections
Summer Season - Buildout



Table 16. Existing and Background Average Daily Traffic Volumes - Summer Season

Road	Location	Existing ADT		Background ADT	
		Total (1)	Village (2)	Existing	Future (3)
Teton Village Rd	West of WY-390	8,100	8,100	0	0
WY-390	North of Teton Village Rd.	2,400	1,500	900	1,300
	South of Teton Village Rd.	8,300	6,600	1,700	2,400
	North of WY-22	18,300	6,600	11,700	16,400
WY-22	East of WY-390	25,300	5,600	19,700	41,500
	West of WY-390	16,500	1,400	15,100	31,800
(1) Average Daily Traffic volumes (Source: Jackson Hole Mountain Resort, July 2005 traffic count data).					
(2) Estimated ADTs based on a distribution of 8,100 total village vehicle-trips per day.					
(3) Future ADTs based on a 1.7 percent annual growth rate for WY-390 and a 3.8 percent annual growth rate for WY-22 applied to existing background ADTs over a 20-year period.					

While daily traffic volumes along WY-390 and WY-22 for the summer season are higher than daily traffic volumes for the winter season, traffic demands during the summer season are spread more evenly throughout the day. In winter, traffic demands along WY-390 and WY-22 experience heavy morning and evening peak hour demands due to skiing activity, but traffic demands decrease during off-peak hours, resulting in lower overall daily traffic volumes.

D. Transit Ridership

Presently, transit ridership during the summer season is approximately 90 percent less than winter demand. While demand would increase to approximately 785 person-trips per day with the buildout of the Teton Village area (refer to Table 13), this ridership would only be approximately seven percent of the total projected daily winter demand, and would be primarily associated with Teton Village employees traveling to and from work. Overall, transit demand is expected to fluctuate during the summer season, with increased demand whenever special events are held at Teton Village.

VI. SUMMER SEASON - OFF-SITE TRAFFIC IMPACTS

A. Intersection Operations

Utilizing the total projected daily and peak hour traffic volume assignments shown on Figure 8, intersection capacity analyses were performed for the following intersections:

1. WY-390 at Tram Line Road (Transit Access Road)
2. WY-390 at McCollister Road (Teton Village Road)
3. WY-390 at WY-22

As with the winter analyses, the intersection capacity analyses conducted for the summer season are based on methodologies documented in the *Highway Capacity Manual* (TRB Special Report No. 209). The resulting levels of service for the study intersections are summarized in Table 17 and discussed below.

Table 17. Intersection Levels of Service - Summer Season

Intersection	Critical Movements	AM Peak LOS	PM Peak LOS
WY 390 Tram Line Road (stop controlled)	NB Left EB Left EB Right	A B A	A B A
WY 390 McCollister Road (stop controlled)	NB Left EB Left EB Right	A C B	B F C
<i>(roundabout)</i>	<i>All Movements</i>	<i>A</i>	<i>B</i>
WY 390 at WY 22 (signalized w/ single SB left)	All Movements	C	F
<i>(signalized w/ dual SB lefts)</i>	<i>All Movements</i>	<i>B</i>	<i>D</i>
LOS = Level of service. <i>Italic = conditions with identified intersection improvements</i>			

WY-390 at Tram Line Road

The single-lane approach geometry with stop-sign traffic control on the Tram Line Road approach recommendations that were identified for winter operations would also accommodate traffic demands during the summer season. The intersection critical movements would operate at LOS B or better.

WY-390 at McCollister Road (Teton Village Road)

The roundabout recommendation that was identified for winter operations would also accommodate traffic demands during the summer season. With that type of traffic control, all movements would operate at LOS B or better in the summer.

WY-390 at WY-22

As in the winter season, the high volume of southbound to eastbound left-turning traffic would require an additional southbound left-turn lane by buildout of the study area. With the existing single left turn lane, the intersection would operate at LOS F during the PM peak period, while with dual left turn lanes the intersection would operate at LOS C. As noted in the Winter Traffic Operations section, it is recommended that WY-22 be widened to four lanes from the Town of Jackson to the WY-390 intersection to accommodate traffic demand in the area and provide the second receiving lane needed for the dual southbound left turn lanes.

B. Highway Operations

Highway capacity analyses were performed for the following sections of WY-390 and WY-22:

1. WY-390 North of Teton Village
2. WY-390 South of Teton Village
3. WY-390 North of WY-22
4. WY-22 East of WY-390
5. WY-22 West of Stilson Park

Highway segments are assigned levels of service based on the directional split of traffic during a peak hour of the day. Highway capacity analyses were performed for the segments of WY-390 and WY-22 identified above using methodologies documented in the *Highway Capacity Manual*. The results of the analyses are summarized in Table 18.

Table 18. Highway Levels of Service - Summer Season

Highway	Section	Travel Lanes (1)	AM Peak Hour		PM Peak Hour	
			Flow Rate	LOS	Flow Rate	LOS
WY 390	North of Teton Village	2	315	B	480	C
	South of Teton Village	2	785	C	1,425	D
	North of WY-22	2	1,640	E	2,600	E
WY 22	East of WY-390	2	2,655	F	3,500	F
		4	906	B	1,201	C
	West of WY-390	2	1,795	E	2,075	E

LOS = Level of service.
Flow rates are in vehicles per hour.
Italic = conditions with identified roadway widening improvements
(1) Plus auxiliary speed change lanes.

From the highway operational analyses, it was determined that WY-390 north of Teton Village Road would operate at LOS C or better during peak hours under future (buildout) conditions and LOS D or better during peak hours south of Teton Village. This indicates that no additional through lanes would be needed along this section of the highway.

North of Highway 22, WY-390 is projected to carry a total of 26,700 vehicles per day. Resort area traffic is estimated to account for approximately 40 percent of this total projected daily traffic. The remaining 60 percent would be oriented to/from other developments along WY-390. The two-lane highway capacity analyses indicate that this segment would operate at LOS E during both the morning and afternoon peak periods by buildout of the area. This is the same level of service projected for the roadway under the Approved Plan, and indicates that section would be approaching its capacity during the summer and may need widening in the future. However, at buildout the volume-to-capacity ratio of that segment would be 0.86 during the afternoon peak, i.e., projected volumes would be approximately 86 percent of the available capacity; therefore, no additional through lanes are recommended at this time.

Highway 22 east of WY-390 was analyzed as both a two-lane and a four-lane facility. The results of the analyses indicate that it would operate at LOS F as a two-lane facility, meaning the highway would be beyond its capacity. As a four-lane facility, that section would operate at LOS C or better during peak periods. As noted in the Winter Season – Off Site Traffic Impacts section, it is recommended that the four-lane section extend to the WY-390 intersection to accommodate traffic demand in the area.

Highway 22 west of Stilson Park, is expected to operate at LOS E by the buildout of the area. However, the analysis indicates that the volume-to-capacity ratio is 0.68, i.e., projected volumes would be approximately 68 percent of the available capacity; therefore, no additional through lanes are recommended at this time.

APPENDIX A

COMPARISON OF CURRENT PLAN TO THE EXISTING MASTER PLAN

The impacts from the SRA project and the Approved Master Plan were not separated in this Transportation Element because once complete, the entire Teton Village area will function as one unit; guests and residents staying in SRA property would ski at JHMR, and guests and residents staying at JHMR would shop or use facilities on SRA property. Likewise, skiers at JHMR that without SRA would drive or use transit to go skiing, may now stay in an SRA property and walk to the slopes; making it difficult to answer the question: should SRA get credit for removing trips from the highway, or should JHMR? Similarly, this Transportation Element report has changed some of the assumptions used to derive the traffic forecasts for the Approved Master Plan; raising the question of whether the impacts of the SRA project should be measured against the original Master Plan forecasts on record, or against the revised forecasts for the Master Plan.

It is not FHU's decision to make on these matters. Therefore, the following tables show three sets of person-trip, traffic volume, transit ridership forecasts and levels of service that attempt to separate SRA impacts from JHMR impacts. The three scenarios include:

- The Approved Master Plan;
- The Approved Master Plan with Revised Trip Assumptions; and
- The SRA Project.

Table A-1. Winter Vehicle Trip Generation (Including Transit Vehicle-Trips)

Scenario	Daily Trips	AM Peak Trips	PM Peak Trips
Approved Plan	7,050	820	1,220
Revised Master Plan	8,350	800	1,345
SRA Proposed Plan	9,910	840	1,555

Revised Master Plan = Approved plan with changes to internal capture rate (65 percent for remaining 98K of commercial development in village core that has yet to be built, as opposed to 95 percent), and lower transit ridership percentages.

SRA Proposed Plan = 95 percent internal capture rate for local convenience development, 65 percent internal capture rate for general retail, and lower transit ridership percentages.

Table A-2. Summer Vehicle Trip Generation (Including Transit Vehicle-Trips)

Scenario	Daily Trips	AM Peak Trips	PM Peak Trips
Approved Plan	10,400	630	1,125
Revised Master Plan	10,370	705	1,260
SRA Proposed Plan	12,905	825	1,575

Revised Master Plan = Approved plan with changes to internal capture rate (65 percent for remaining 98K of commercial development in village core that has yet to be built, as opposed to 95 percent) and increased vehicle occupancy for guests (2.5 occupants per vehicle as opposed to 2), and lower transit ridership percentages.

SRA Proposed Plan = 95 percent internal capture rate for local convenience development, 65 percent internal capture rate for general retail, increased vehicle occupancy, and lower transit ridership percentages.

Table A-3. Winter Transit Person-Trip Generation

Scenario	Daily Trips	AM Peak Trips	PM Peak Trips
Approved Plan	10,960	2,555	2,360
Revised Master Plan	11,740	2,345	2,335
SRA Proposed Plan	11,060	2,050	2,135

Revised Master Plan = Approved plan with changes to internal capture rate (65 percent for remaining 98K of commercial development in village core that has yet to be built, as opposed to 95 percent), and lower transit ridership percentages.

SRA Proposed Plan = 95 percent internal capture rate for local convenience development, 65 percent internal capture rate for general retail, and lower transit ridership percentages.

Table A-4. Summer Transit Person-Trip Generation

Scenario	Daily Trips
Approved Plan	1,050
Revised Master Plan	715
SRA Proposed Plan	785

Revised Master Plan = Approved plan with changes to internal capture rate (65 percent for remaining 98K of commercial development in village core that has yet to be built, as opposed to 95 percent), increased vehicle occupancy for guests, and lower transit ridership percentages.

SRA Proposed Plan = 95 percent internal capture rate for local convenience development, 65 percent internal capture rate for general retail, increased vehicle occupancy, and lower transit ridership percentages.

Table A-5. Winter Intersection Levels of Service (Buildout)

Intersection	Critical Movements	AM Peak			PM Peak		
		Approved	Revised	SRA	Approved	Revised	SRA
WY 390 Apres Vous (stop controlled)	NB Left EB Left EB Right	N/A N/A N/A	N/A N/A N/A	A A A	N/A N/A N/A	N/A N/A N/A	A A A
WY 390 Tram Line Road (stop controlled)	NB Left EB Left EB Right	N/A N/A N/A	N/A N/A N/A	A A A	N/A N/A N/A	N/A N/A N/A	A A A
WY 390 McCollister Road (stop controlled)	NB Left EB Left EB Right	A C A	A D A	A D A	A C B	A D C	A F E
<i>(roundabout)</i>	<i>All Movements</i>	<i>N/A</i>	<i>N/A</i>	<i>A</i>	<i>N/A</i>	<i>N/A</i>	<i>B</i>
WY 390 Stilson Access (stop controlled)	NB Left EB Left EB Right	B F B	A D B	A D B	B F D	B D C	B E D
WY 22 Stilson Access (stop controlled)	EB Left SB Left SB Right	A C A	A C B	A C B	B E B	B E C	B E C
WY 390 at WY 22 (signalized w/ single SB left)	All Movements	B	B	C	D	F	F
<i>(signalized w/ dual SB lefts)</i>	<i>All Movements</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>C</i>	<i>C</i>

Italic = conditions with identified intersection improvements

Table A-6. Summer Intersection Levels of Service (Buildout)

Intersection	Critical Movements	AM Peak			PM Peak		
		Approved	Revised	SRA	Approved	Revised	SRA
WY 390 Tram Line Road (stop controlled)	NB Left EB Left EB Right	N/A N/A N/A	N/A N/A N/A	A B A	N/A N/A N/A	N/A N/A N/A	A B A
WY 390 McCollister Road (stop controlled)	NB Left EB Left EB Right	A B A	A B A	A C B	A E A	A F B	B F C
<i>(roundabout)</i>	<i>All Movements</i>	<i>N/A</i>	<i>N/A</i>	<i>A</i>	<i>N/A</i>	<i>N/A</i>	<i>B</i>
WY 390 at WY 22 (signalized w/ single SB left)	All Movements	B	C	C	C	F	F
<i>(signalized w/ dual SB lefts)</i>	<i>All Movements</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>D</i>	<i>D</i>

Italic = conditions with identified intersection improvements

APPENDIX B

LEVEL OF SERVICE DEFINITIONS

The quality of roadway operations is measured as a level of service (LOS), rated on a scale from LOS A to LOS F. LOS A represents a stable and unhindered flow of traffic, while LOS F represents congested traffic, slow speeds, and many starts and stops.

Unsignalized Intersection Level of Service

Unsignalized intersections base the level of service on the amount of delay experienced by vehicles turning out of or onto the minor, stop-sign controlled roadway. Qualitative measures are described below:

LOS A Little or no delays are experienced by drivers. A very high level of service usually found only in rural areas or during off-peak hours.

LOS B Short delays are experienced by drivers. Overall, LOS B represents a good operating condition.

LOS C Drivers experience average delays. Waiting time begins to be noticeable. Freedom to enter major street traffic is somewhat restricted.

LOS D Drivers experience long delays at this level. Due to large volumes of traffic on the major street, vehicles on the minor street are restricted in their ability to enter the traffic stream.

LOS E Drivers experience very long delays at this level, but are generally tolerable for short periods of time. If LOS E conditions are present for long periods, queue buildup on the minor street becomes noticeable due to the difficulty of entering the major street traffic stream.

LOS F Extremely long delays are experienced by drivers on the minor street, and long vehicle queues result. This level exists when there are insufficient gaps of suitable size to allow vehicles to safely enter the traffic stream.

Signalized Intersection Level of Service

Level of service for signalized intersections is described in terms of average stopped delay per vehicle for a 15-minute (peak) analysis period. In general, delay is a measure of driver discomfort/frustration, fuel consumption, and lost travel time. Delay is a complex measure, and is dependent upon a number of variables such as cycle length, the distribution of green time, and the volume-to-capacity ratio for the lane group in question. The Highway Capacity Manual (TRB Special Report No. 209) 2000 update defines the various levels of service as follows:

LOS A describes operations with very low delay, less than 10 seconds per vehicle. This level of service occurs when a relatively low volume of vehicles are present and/or when most vehicles arrive during the green phase. Short cycle lengths may also contribute to low delay.

LOS B describes operations with average delays greater than 10 and up to 20 seconds per vehicle. Less vehicles arrive during a green phase than with LOS A, thus causing a higher level of average delay. Again, a short cycle length may contribute to low delay.

LOS C describes operations with average delays greater than 20 and up to 35 seconds per vehicle. These higher delays may result from longer cycle lengths and a greater number of vehicles arriving during the red phase. However, many vehicles would still pass through the intersection without stopping.

LOS D describes operations with delays greater than 35 and up to 55 seconds per vehicle. At this level, the influence of congestion becomes more noticeable with longer delays resulting from a combination of vehicle arrivals during red phases, longer cycle lengths, or high volume-to-capacity ratios. Many vehicles stop at this level, and the proportion of vehicles that pass through the intersection without stopping declines.

LOS E describes operations with delays greater than 55 and up to 80 seconds per vehicle. This level of service is considered by many agencies to be the limit of acceptable delay. Again these delays are a result of higher volumes of traffic arriving during red phases, longer cycle lengths, and/or high volume-to-capacity ratios.

LOS F describes operations with delays in excess of 80 seconds. This level represents oversaturated conditions, that is, when the traffic carrying capacity of the intersection is exceeded. This level is considered to be unacceptable to most drivers.

Two-lane Highway Level of Service

The concept of level of service is defined as a measure quantifying the traffic operational conditions within a traffic stream. A LOS definition describes these conditions in terms of speed and freedom to maneuver for two-lane highways. There are six defined levels of service that are given letter designations ranging from LOS A to LOS F, with LOS A representing the best operating conditions and LOS F the worst. The *Highway Capacity Manual* defines the various levels of service as follows:

LOS A represents free flow conditions where individual drivers are virtually unaffected by the presence of other vehicles in the traffic stream. Drivers have an extremely high level of freedom to select desired speeds. The general level of comfort and convenience provided to the driver is excellent.

LOS B is in the range of stable flow where the presence of other vehicles in the traffic stream becomes somewhat noticeable, but speeds of 55 mph or higher are still expected on level terrain. The level of comfort and convenience provided to the driver is somewhat less than that for LOS A conditions.

LOS C is also in the range of stable flow, but the operation of individual vehicles can be significantly affected by interactions with other vehicles in the traffic stream. Average speeds can still exceed 50 mph on level terrain, but passing maneuvers become more difficult. Platooning of vehicles becomes more noticeable at this level, and the general comfort and convenience to drivers begins to decline.

LOS D represents conditions with stable flow, but where opposing traffic streams essentially begin to operate separately. Mean platoon sizes of 5 to 10 vehicles are common, although speeds of 50 mph can still be achieved. Passing demands can be high at this level, but the ability for drivers to pass is severely restricted. Since turning vehicles and/or other roadside distractions can cause major shock waves in the traffic stream, it is critical that auxiliary speed change lanes be provided at this level of service.

LOS E represents operating conditions at or near the capacity level which results in unpredictable traffic flows. Speeds would drop below 50 mph under ideal conditions, and as low as 25 mph on sustained upgrades. Passing is virtually impossible and platooning becomes significant when slower vehicles or other interruptions are encountered.

LOS F represents heavily congested, unstable flow with traffic demands that exceed capacity. This condition characterizes the condition when traffic flows operating at a LOS E breaks down due to interruptions in the traffic stream.