

Transit Demand Estimates

INTRODUCTION

A key step in developing and evaluating transit plans is a careful analysis of the mobility needs of various segments of the population and the potential ridership of transit services. Transit demand analysis is the basic determination of demand for public transportation in a given area. There are several factors that affect demand, not all of which can be forecast. However, as demand estimation is an important task in developing any transportation plan, several methods of estimation have been developed in the transit field. The analysis makes intensive use of the demographic data and trends discussed previously.

This chapter presents an analysis of the demand for transit services in Grand and Jackson Counties based upon standard need estimation techniques. The transit demand identified in this section will be utilized in the identification of transit service alternatives and the evaluation of the various alternatives presented in the next Technical Memorandum. Three methods are used to estimate the maximum transit trip demand in Grand and Jackson Counties.

- Colorado Transit Needs and Benefit Study
- Ridership Trends
- Rural Transit Demand Methodology

COLORADO TRANSIT NEEDS AND BENEFITS STUDY

The Colorado Department of Transportation completed a Transit Needs and Benefits Study for the entire state in 1999. Transit need estimates were developed for the entire state on a county-by-county basis. The estimates of need incorporated needs related to households without transportation, seniors, persons with disabilities, and resorts. Program trips for Grand and Jackson Counties are those transportation needs associated with specific programs for mental health services (such as Head Start, Development Services programs, Senior Nutrition, or Shelter Workshop programs) reported by the Colorado Mental Health Department. The annual transit need estimates for Grand County were 92,000 trips for the general public including youth and seniors, 280 trips for persons with disabilities, 89,900 program trips, and 1,540,000 resort trips. The total transit need for Grand County is estimated at 1,722,000 annual trips.

According to the study, Jackson County annual transit needs were 16,500 trips for the general public including youth and seniors, 60 trips for persons with disabilities, and 30,500 program trips. Jackson County was not considered a resort area county. Therefore, any tourism demand is considered within the other categories. The total estimated annual need for Jackson County is approximately 47,000 trips.

SOCIAL SERVICES TRANSPORTATION NEEDS

The Grand and Jackson Counties Departments of Social Services compiled an extensive database of clients who may be eligible for public transportation reimbursement funding. These programs include Temporary Assistance of Needy Families (TANF), Medicaid, foster-care families with Medicaid, and disability families.

The Transportation Equity Act for the 21st Century included a Job Access and Reverse Commute Grant. This program was designed to increase the transportation options for low-income workers and develop transportation services to employment centers. Transit is the program's focus. Federal research in 1998 for the program included several facts that are relevant to households in Grand and Jackson Counties.

- 75 percent of welfare recipients live in rural areas or central cities.
- 94 percent of welfare recipients do not own cars.
- Increasing transit options for low-income workers, especially those who are receiving or who have recently received welfare benefits, will increase the likelihood of those workers getting and keeping jobs.

In awarding grants under this program and other federal programs, many factors are considered. These include the percentage of population in the area, the need for additional transportation services to transport welfare recipients and eligible low-income individuals to and from jobs, training and other services, coordination efforts, and the need for services identified in regional transportation plans. Figures V-1 through V-6 present the location of households within Grand and Jackson Counties which are eligible to receive reimbursement for transportation expenses. This factor is important when considering funding options for transit services. The database will also be used later in the study for transit alternatives. The Town of Winter Park did not have any households eligible for transportation funding through Social Services.



Figure V-1

Jackson County Existing Households with Transportation Funding Reimbursement through Social Services Department

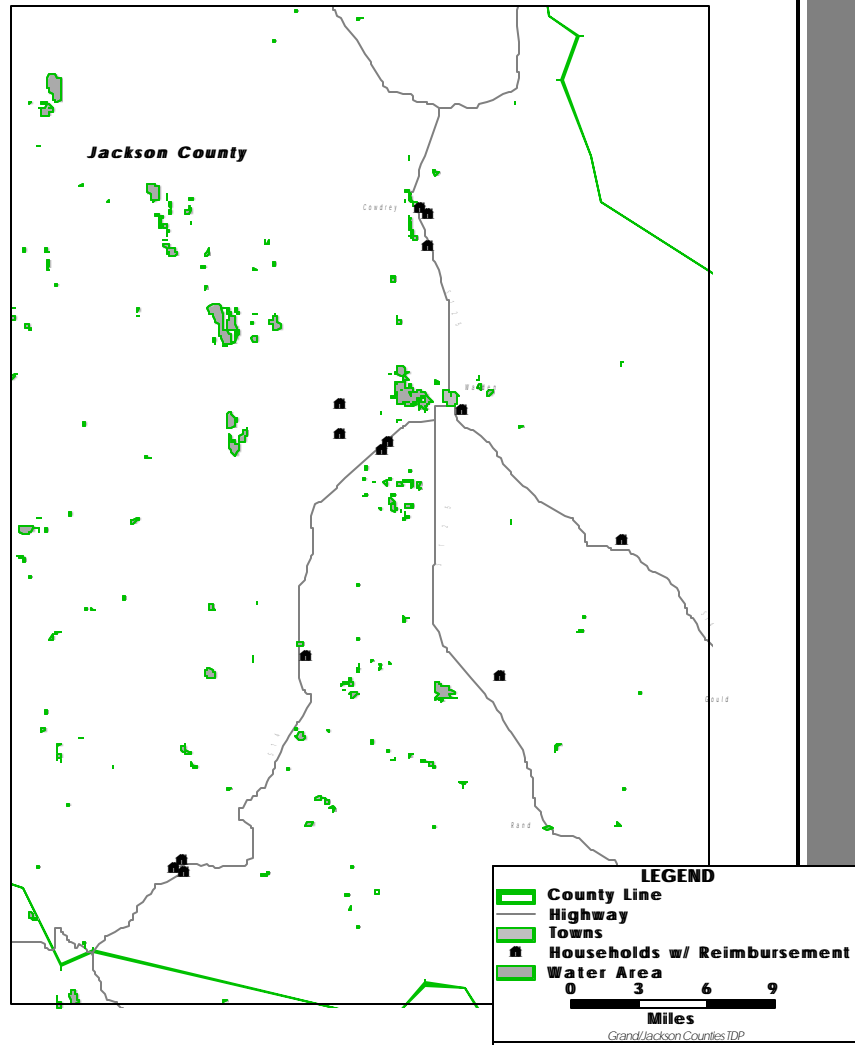


Figure V-2

Kremmling Existing Households with Transportation Funding Reimbursement through Social Services Department

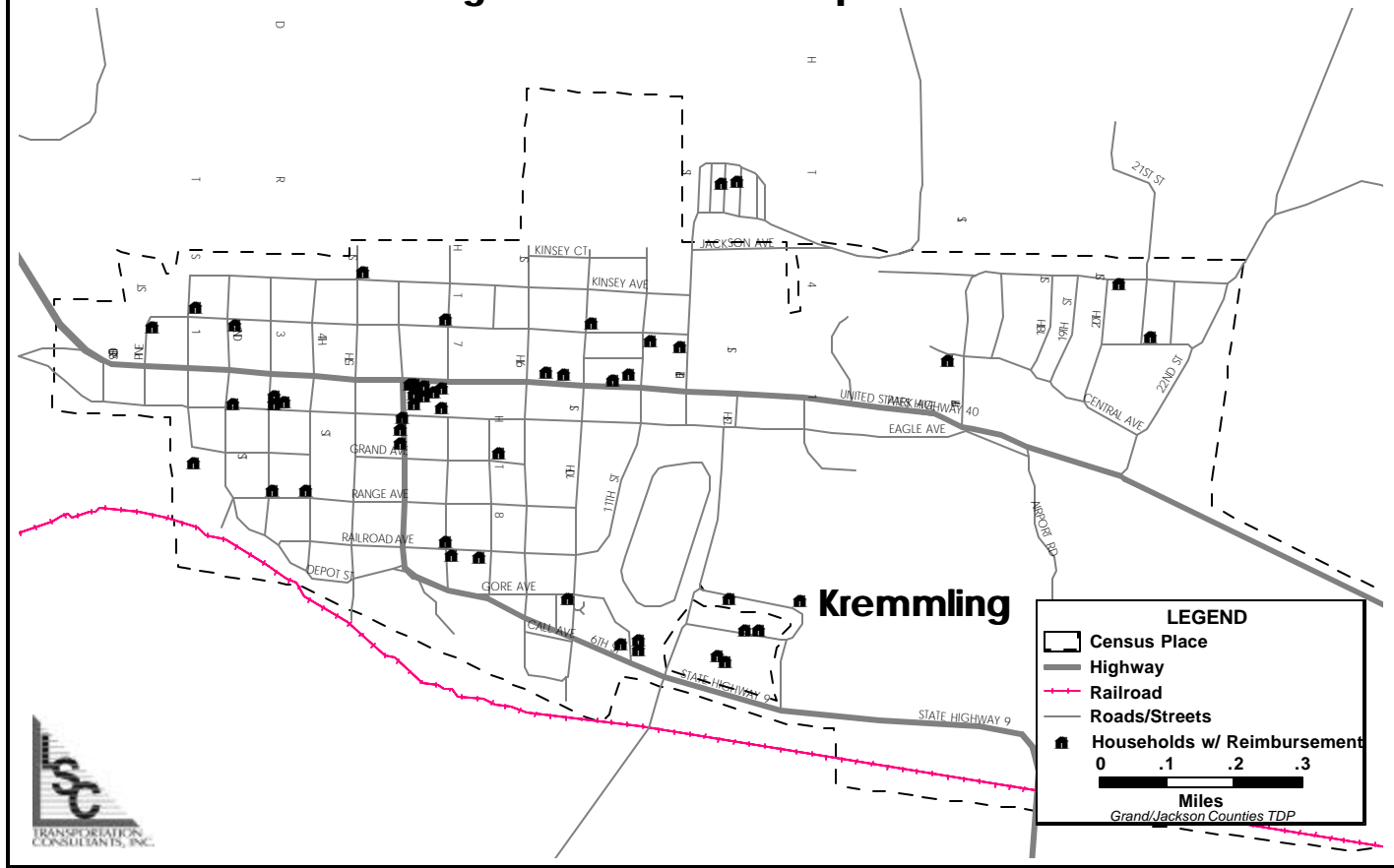


Figure V-3

Hot Sulphur Springs Existing Households with Transportation Funding Reimbursement through Social Services Department

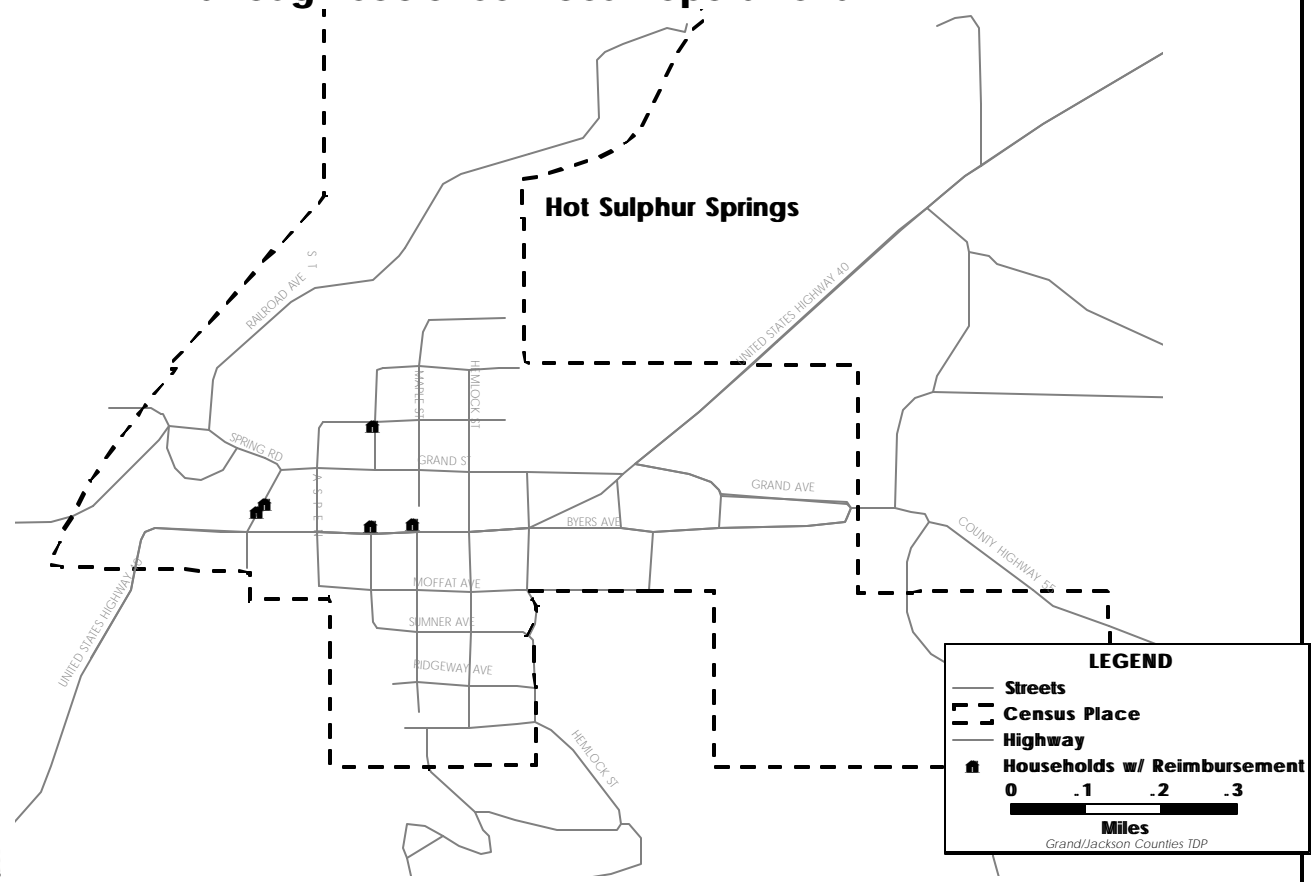
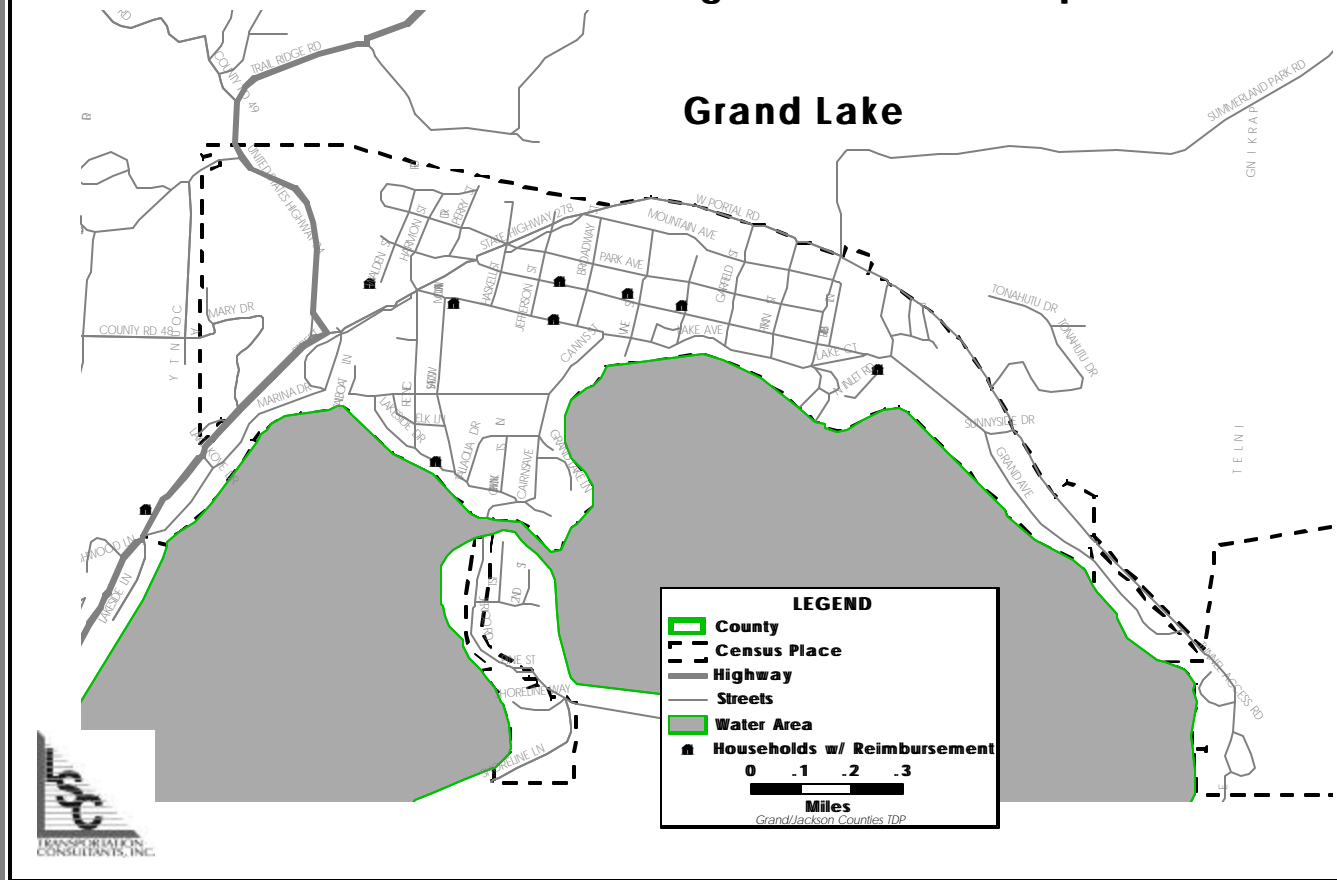


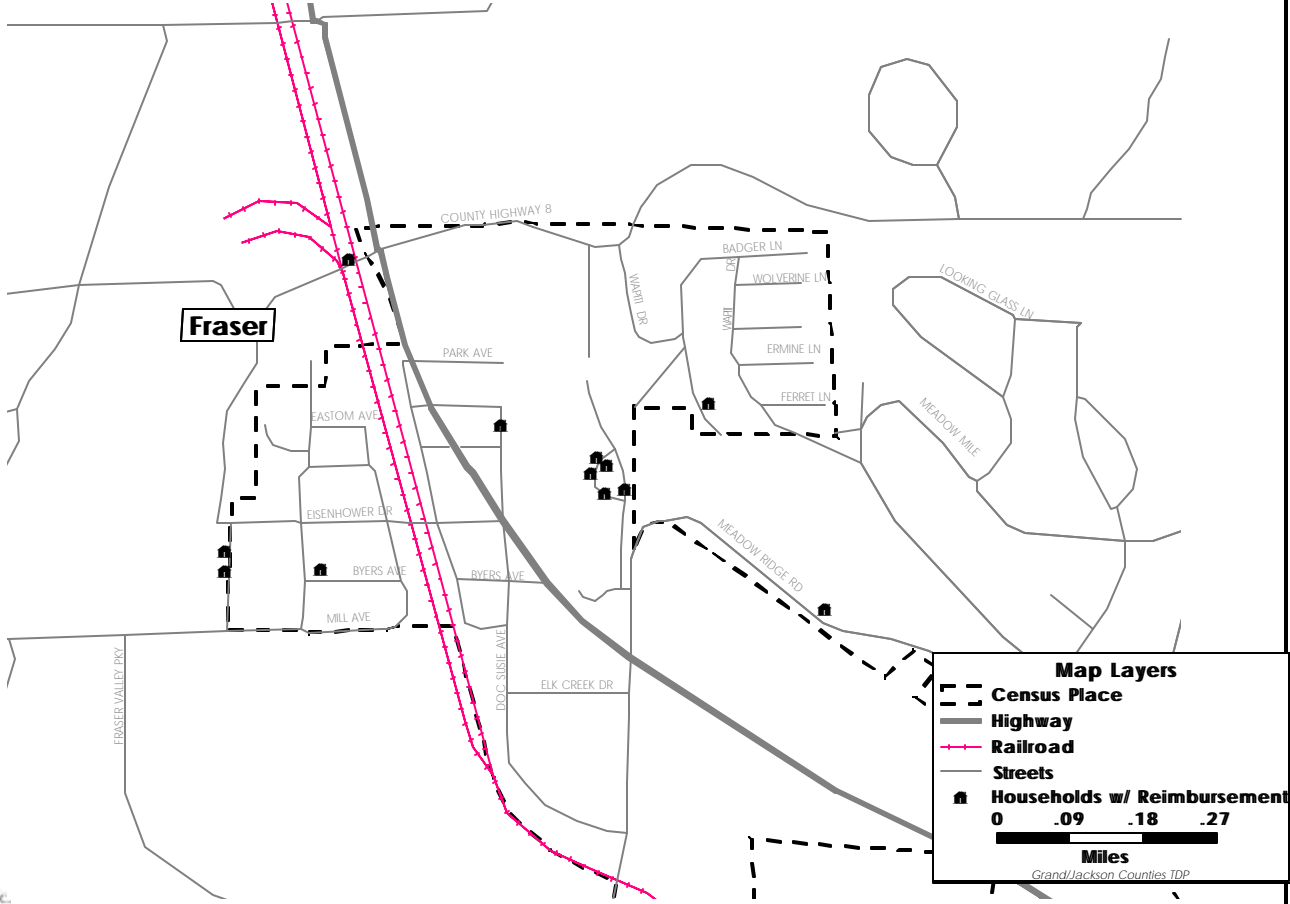
Figure V-5

Grand Lake Existing Transportation Funding Reimbursement through Social Services Department

Grand Lake



**Figure V-6
Fraser Existing Transportation Funding Reimbursement
through Social Services Department**



There are currently 122 households within Grand and Jackson Counties eligible for transportation reimbursement funds. The transit demand calculation for these program households is shown below.

$$\begin{aligned} 122 \text{ hhs} \times 2 \text{ trips (to the site and return trip)} &= 244 \text{ trips} \\ 244 \text{ trips} \times 200 \text{ days per year} &= 48,800 \text{ annual trips} \\ \text{hhs} &= \text{households} \end{aligned}$$

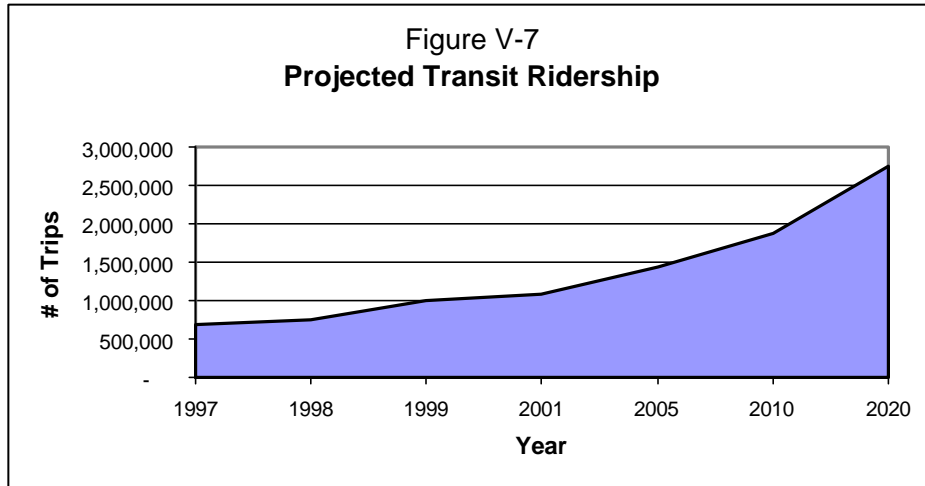
Approximately 48,800 annual trips are estimated as the transportation need for these existing households within Grand and Jackson Counties.

RIDERSHIP TRENDS

Another approach to looking at short-term transit demand is to evaluate recent trends in ridership. The ridership trends were presented in Chapter IV and are presented again in this chapter. Figure V-7 shows the ridership trend and ridership projections based on recent trends for Grand County. These trends include The Lift, Silver Creek, and Grand County Council on Aging transit ridership. The LSC Team would like to clarify that this section is based on the existing ridership and is projected to year 2020. The ridership trends and projections do not estimate the transit **need** within the study area.

As can be seen in this graph, the transit ridership is expected to increase at a fast rate in the future based on recent trends. Much of the transit demand pertains to the Winter Park base lodge development, the future gondola for Winter Park, and the expansion to Silver Creek and Berthoud Ski Area. Transit ridership for year 2005 is estimated at approximately 1,500,000 and for 2010 is estimated at 1,890,000 annual trips for Grand County.

Jackson County existing ridership at OATS is approximately 1,450 annual trips. Using a straightline projection, OATS will provide approximately 1,630 trips in 2005 and approximately 1,780 trips in 2010.



The Winter Park Village Master Plan, completed by Felsburg, Holt and Ullevig in 1999, estimated ridership within the Winter Park Village development for 2015 at approximately 14,800 daily trips for the winter season. This equates to approximately 2,220,000 (14,800 x 150 days of service) annual trips for 2015. This estimate is fairly close to the estimate (2,700,000 trips) in Figure V-7, using recent ridership trends.



RURAL TRANSIT DEMAND METHODOLOGY

Background

An important source of information and the most recent research regarding demand for transit services in rural areas and for persons who are elderly or disabled is the *Transit Cooperative Research Program (TCRP) Project A-3: Rural Transit Demand Estimation Techniques*. This study, completed by SG Associates, Inc. and LSC, represents the first substantial research into demand for transit service in rural areas and small communities since the early 1980s.

The TCRP study documents present a series of formulas relating the number of participants in various types of programs in 185 transit agencies across the country. The TCRP analytical technique uses a logit model approach to the estimation of transit demand, similar to that commonly used in urban transportation models. This model incorporates an exponential equation, which relates the quantity of service and the demographics of the area.

This analysis procedure considers transit demand in two major categories:

- “program demand” which is generated by transit ridership to and from specific social service programs, and
- “non-program demand” generated by other mobility needs of elderly persons, persons with disabilities, and the general public, including youth. Examples of non-program trips may include shopping, employment, and medical trips.

As with any other product or service, the demand for transit services is a function of the level of supply provided. To use the TCRP methodology to identify a feasible maximum demand, it is necessary to assume a high supply level, as measured in vehicle-miles per square mile per year. The high supply level is the upper-bound density of similar rural services provided in this country. This assessment of demand for the rural areas, therefore, could be considered to be the maximum potential ridership if a high level of rural service were made available throughout the two counties.

The TCRP methodology is based on the *permanent resident population* and does not consider the special conditions of high demand in the resort areas. Therefore the TCRP methodology is a good demand method to use for western Grand County and Jackson County. However, for the Fraser

Valley area and Grand Lakes area, the TCRP methodology would need to be used with another methodology (i.e., existing ridership trends, Transit Needs and Benefits Study) to provide an accurate transit need.

For Grand and Jackson Counties, a reasonable **maximum** level of service would be to serve every portion of the county with four round-trips (eight one-way trips) daily, Monday through Friday. This equates to approximately 2,400 vehicle-miles of transit service per square mile per year. This is at the upper range of observed rural systems.

Applying this feasible maximum service density to the population of Grand and Jackson Counties yields the 1999 estimated transit demand for the general population including youth, as well as the elderly and mobility-limited populations as shown in Table V-1. The 1999 Grand County potential demand for elderly transit service is 7,760 annual trips; disabled demand is 370 annual trips; and general public demand is 4,890 annual trips. The Grand County total estimated demand for 1999, using the TCRP method, is 13,020 annual trips.

The Lift, Grand County Council on Aging, and Silver Creek provided approximately 1,002,000 total transit trips in 1998-1999 fiscal year. The actual amount of trips provided is significantly higher than the projected amount of 13,000 annual trips from the TCRP methodology. The reason for this difference between the amounts is that the TCRP rural demand methodology *ignores* the unique requirements of resort areas and gives an estimate of only a small portion of the overall transit need within Grand County. As mentioned previously, the resort areas have unique characteristics that require several methodologies to be used for an accurate transit need estimate.

The Jackson County potential demand for elderly transit service is 1,900 annual trips; disabled demand is 60 annual trips; and general public demand is 890 annual trips. The Jackson County 1999 total estimated demand using the TCRP method is 2,850 annual trips. This amount would be desired by the elderly, mobility-limited, and general public if a very high level of transit service could be provided. The demand would be concentrated in the Town of Walden.



**Table V-1
1999 Estimated Non-Program Transit Demand using the TCRP Method**

Census Tract	Census Block Group	Estimated Annual Passenger-Trip Demand				TOTAL	Estimated Daily Transit Demand		Daily Demand Density (Trips per Sq. Mile per Day)
		Elderly	Mobility Limited	Elderly + Mobility Limited	General Public		#	%	
Grand County									
Three Lakes/Grand Lake									
9561	1	80	20	100	90	190	1	1.5%	0
9561	2	690	40	730	350	1,080	4	8.3%	1
9561	3	50	0	50	30	80	0	0.6%	0
9561	4	390	0	390	140	530	2	4.1%	6
9561	5	40	0	40	0	40	0	0.3%	0
9562	1	240	80	320	0	320	1	2.5%	0
9562	2	500	0	500	40	540	2	4.1%	1
9562	3	40	0	40	90	130	1	1.0%	0
9562	4	150	0	150	0	150	1	1.2%	0
9562	5	0	0	0	0	0	0	0.0%	0
	Subtotal	2,180	140	2,320	740	3,060	12	23.5%	8
Hot Sulphur Springs/Granby/Silver Creek/YMCA/Red Dirt Hill									
9563	1	0	0	0	0	0	0	0.0%	0
9563	2	340	30	370	230	600	2	4.6%	0
9563	3	0	0	0	0	0	0	0.0%	0
9563	4	1,060	30	1,090	700	1,790	7	13.7%	3
9563	5	140	30	170	50	220	1	1.7%	0
9563	6	0	0	0	0	0	0	0.0%	0
	Subtotal	1,540	90	1,630	980	2,610	10	20.0%	3
Kremmling/Parshall									
9564	1	610	0	610	300	910	4	7.0%	0
9564	2	490	60	550	530	1,080	4	8.3%	1
9564	3	1,050	50	1,100	490	1,590	6	12.2%	6
9564	4	170	0	170	210	380	1	2.9%	0
	Subtotal	2,320	110	2,430	1,530	3,960	16	30.4%	7
Fraser Valley/Tabernash/Fraser/Winter Park									
9565	1	220	0	220	70	290	1	2.2%	0
9565	2	270	0	270	90	360	1	2.8%	0
9565	3	440	0	440	290	730	3	5.6%	0
9566	1	240	20	260	380	640	3	4.9%	8
9566	2	60	0	60	200	260	1	2.0%	2
9566	3	60	10	70	80	150	1	1.2%	0
9566	4	190	0	190	240	430	2	3.3%	0
9566	5	160	0	160	130	290	1	2.2%	0
9566	6	80	0	80	160	240	1	1.8%	0
	Subtotal	1,720	30	1,750	1,640	3,390	13	26.0%	12
	TOTALS	7,760	370	8,130	4,890	13,020	51		30
Jackson County									
9556	1	470	0	470	80	550	2	19.3%	0
9556	2	1,180	60	1,240	630	1,870	7	65.6%	6
9556	3	250	0	250	180	430	2	15.1%	0
	TOTALS	1,900	60	1,960	890	2,850	11		6

Source: LSC, 2000.

Demand estimates by the TCRP methodology for 2006 are provided in Table V-2. Total demand for the year 2006 is estimated to be 16,460 one-way, annual passenger-trips for Grand County and 3,060 for Jackson County. Again, the 2006 estimate is low for Grand County due to the fact that the methodology projections are based on the permanent population of the county and ignore the unique characteristics of high transit usage within the Grand County resort areas. However, the Jackson County demand estimate is fairly accurate with the existing rural conditions of the county.

UNMET TRANSIT NEED

During 1999, transit providers in Grand County provided approximately 1,002,000 passenger-trips. This is approximately 58 percent of the potential need ($1,002,000/1,722,000 = 58\%$) within the county. When individual components of need are considered, however, there are markets with significant unmet needs. There is virtually no general public service in the county. The Grand County COA provided 13,200 trips in 1999, meeting a significant portion of the senior transportation needs.

Within Jackson County, the existing total transit demand using the TCRP methodology is approximately 2,850 annual trips. The demand for *senior* trips only is approximately 1,900. The Jackson County Council on Aging is meeting approximately 75 percent of those needs with 1,450 annual existing trips. The potential need for all market segments, not just seniors, is approximately 30,500 annual trips according to the Transit Needs and Benefits Study. Jackson County Council on Aging meets approximately five percent of the total need as the only transit provider in the county. However, similar to Grand County, as the population increases, transit demand will also increase and services must be provided to meet the demand.



**Table V-2
2006 Estimated Non-Program Transit Demand using the TCRP Method**

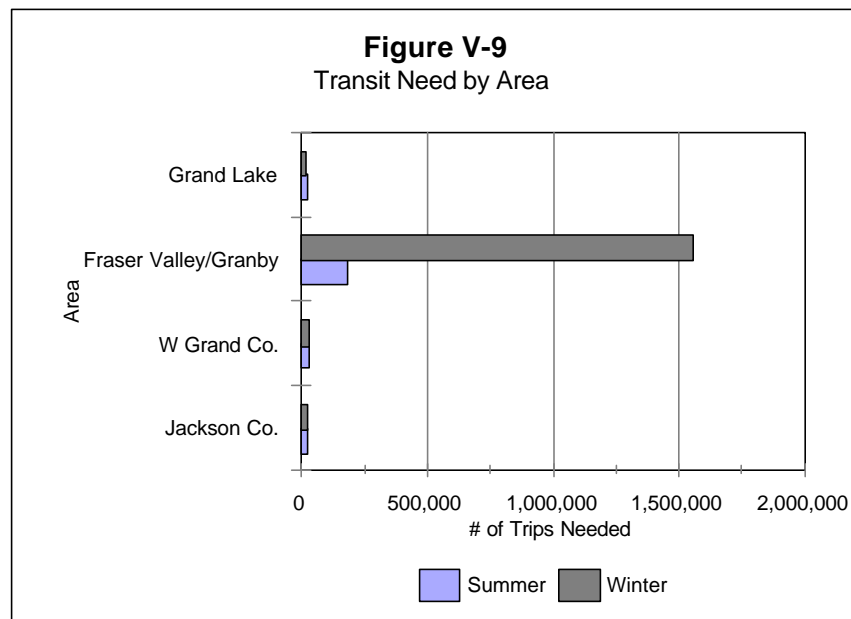
Census Tract	Census Block Group	Estimated Annual Passenger-Trip Demand				TOTAL	Estimated Daily Transit Demand		Daily Demand Density (Trips per Sq. Mile per Day)
		Elderly	Mobility Limited	Elderly + Mobility Limited	General Public		#	%	
Grand County									
Three Lakes/Grand Lake									
9561	1	100	30	130	120	250	1	1.5%	0
9561	2	860	50	910	460	1,370	5	8.3%	1
9561	3	70	0	70	40	110	0	0.7%	0
9561	4	480	0	480	180	660	3	4.0%	7
9561	5	50	0	50	0	50	0	0.3%	0
9562	1	300	100	400	0	400	2	2.4%	0
9562	2	630	0	630	50	680	3	4.1%	1
9562	3	50	0	50	110	160	1	1.0%	0
9562	4	190	0	190	0	190	1	1.2%	0
9562	5	0	0	0	0	0	0	0.0%	0
	Subtotal	2,730	180	2,910	960	3,870	15	23.5%	10
Hot Sulphur Springs/Granby/Silver Creek/YMCA/Red Dirt Hill									
9563	1	0	0	0	0	0	0	0.0%	0
9563	2	420	30	450	290	740	3	4.5%	0
9563	3	0	0	0	0	0	0	0.0%	0
9563	4	1,310	30	1,340	910	2,250	9	13.7%	4
9563	5	170	30	200	60	260	1	1.6%	0
9563	6	0	0	0	0	0	0	0.0%	0
	Subtotal	1,900	90	1,990	1,260	3,250	13	19.7%	4
Kremmling/Parshall									
9564	1	750	0	750	390	1,140	4	6.9%	0
9564	2	610	80	690	690	1,380	5	8.4%	1
9564	3	1,300	70	1,370	640	2,010	8	12.2%	8
9564	4	210	0	210	280	490	2	3.0%	0
	Subtotal	2,870	150	3,020	2,000	5,020	20	30.5%	9
Fraser Valley/Tabernash/Fraser/Winter Park									
9565	1	280	0	280	100	380	1	2.3%	0
9565	2	340	0	340	120	460	2	2.8%	0
9565	3	540	0	540	380	920	4	5.6%	0
9566	1	300	30	330	490	820	3	5.0%	11
9566	2	80	0	80	260	340	1	2.1%	3
9566	3	80	10	90	100	190	1	1.2%	0
9566	4	230	0	230	310	540	2	3.3%	0
9566	5	200	0	200	160	360	1	2.2%	0
9566	6	100	0	100	210	310	1	1.9%	0
	Subtotal	2,150	40	2,190	2,130	4,320	17	26.2%	15
	TOTALS	9,650	460	10,110	6,350	16,460	65		38
Jackson County									
9556	1	490	0	490	90	580	2	107.4%	0
9556	2	1,250	70	1,320	700	2,020	8	374.1%	7
9556	3	260	0	260	200	460	2	85.2%	0
	TOTALS	2,000	70	2,070	990	3,060	12		7

Source: LSC, 2000.

SUMMARY

This chapter has presented several approaches to estimate the need for public transportation. The best estimate for the short-range TDP is to use a projection based on a combination of methodologies for Grand County. The TCRP methodology is the best estimate to use for Jackson County and those areas outside of the Fraser Valley region. The Department of Social Services estimates should be used for both counties. These methodologies are quantitative estimates of transit demand and must be incorporated with qualitative needs, which are identified through the study process.

Figures V-8 (on the following page) and V-9 show the annual transit need for different areas of the two counties. The highest demand is in the Fraser Valley with other concentrations of demand in the communities.



**Figure V-8
Seasonal Transit Need**

