Dial-A-Ride Zone Assessment Study and Implementation Plan for the Western Slope of El Dorado County

Final Report

February 5, 2016

Prepared for

El Dorado County Transit Authority

Prepared by

TRANSPORTATION
CONSULTANTS, INC.

LSC Transportation Consultants, Inc.

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Prepared for the

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The contents of this report reflect the view of the author who is responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views of El Dorado Transit. This report does not constitute a standard, specification, or regulation.

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Chapter 1
Introduction

The Dial-A-Ride program has long been an important element in the El Dorado County Transit Authority (El Dorado Transit) services in western El Dorado County, California. El Dorado Transit provides a wide range of transit services, including commuter services, fixed-route and flex-route transit services, complementary paratransit services, and the Dial-A-Ride program. The Dial-A-Ride service consists of the only service that is accessible to the extensive lower density rural and suburban portions of the service area, where fixed or flex route service is not viable. In addition, it is an important additional service within the more urban areas. Paratransit services are also a strategic part of the communities' efforts to address traffic congestion, air quality, and other "quality of life" issues.

The Dial-A-Ride service was initiated in 1975, and became part of El Dorado Transit services with the formation of the organization in 1993. The service prior to 2001 consisted of three zones: the area within 10 minutes of Placerville where service was available to elderly, disabled and general public, the area between 10 and 20 minutes of Placerville where service was only available to the General Public on a space available basis, and the area between 20 and 30 minutes of Placerville, limited to elderly and disabled passengers only. A *Dial-A-Ride Zone Assessment Study* was conducted in 2001 that formally defined the current zone system and graduated fares, which has been the basis of the program ever since. Since that time, there has been growth in various portions of the service area, as well as shifts in needs for transit services. There is also an interest in considering zone structures that differ from those identified in the 2001 study.

This 2015 report presents an updated plan for the Dial-A-Ride service. It ensures that the Dial-A-Ride program, going forward, can serve residents of the Western Slope of El Dorado County as effectively and efficiently as possible. The objectives of this study were to:

➤ Increase the equity of the Dial-A-Ride program by ensuring that passengers imposing equal costs on the system are treated equally.

➤ Improve the cost-effectiveness of the program by focusing limited resources on those trips that can be more effectively served.

➤ Provide an opportunity to refine the zone system in a systematic and careful manner.

➤ Aid the ability of El Dorado Transit staff and management to clearly communicate information on the system, and to explain the rationale behind its design.

➤ Provide clear maps of the zone system.

➤ Improve understanding among transit staff, riders, and decision makers regarding the actual cost of Dial-A-Ride service to various portions of the community.

➤ Fully meet the requirements of the Americans with Disabilities Act and Title VI of the Civil Rights Act of 1964.

➤ Ensure that Dial-A-Ride services best meet the overall goals of El Dorado Transit.

➤ Develop concise, accurate and readily-understandable summaries of the financial and managerial conditions of El Dorado Transit.

➤ Provide local decision-makers with valuable information regarding the condition of the transit operations and transportation planning organizations.

➤ Allow El Dorado Transit staff to gain an understanding of their organization's strengths and weaknesses, from an objective perspective.

At a greater level, the key objective of the study is to help in the continual development of the effectiveness and professionalism of the region's transit operations and transportation planning staffs, in a way that best serves the residents of El Dorado County.

This document first presents a summary of the study area characteristics followed by a review of existing service performance. Next, potential transit demand is evaluated. A range of alternatives are considered and used to develop a recommended plan.
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Study Area Description

This study considers the portion of El Dorado County to the west of the Sierra Crest, including Placerville, Cameron Park, El Dorado Hills, Pollock Pines, and Diamond Springs. Western El Dorado County is located in north-central California between the Sacramento Valley and the peaks of the Sierra Nevada Range. The urban area lies in a narrow valley. Placerville serves as the county seat, and is the only incorporated town within the study area. The attractiveness of the area coupled with the area's proximity to employment opportunities in Sacramento County have also combined to generate substantial suburban growth in the western portion of the county.

The major arterial east/west access is provided by U.S. Highway 50, connecting the area with Sacramento to the west and South Lake Tahoe to the east. North/south highway access to the area is provided by Highway 49, connecting the area with Auburn to the north and Sonora to the southeast. State Route 193 provides northern access to Georgetown. The study area is shown in Figure 1.

Study Area Population

The most recent available detailed demographic data on a census tract basis was used for this study. This consists of the US Census Bureau's 2009-2013 5-Year American Community Survey, and therefore, all demographic data are estimates for the year 2013. According to the survey, the population of the study area was 151,726 and the total number of households was 56,115.

High Potential Transit Usage Population

Transit system ridership is drawn in large part from segments of the population comprised of the elderly, young, low income, disabled persons, and members of households with no available vehicles. The estimated 2013 population of each group is presented in Tables 1 through 3.

Youths represent a market of potential transit users, as those under 16 are unable to drive and may not have a parent available to transport them. The latest census data does not give population "age 10 to 15", and we must use the category "age 10 to 14" as the most accurate representation of the youth demographic. There are approximately 10,601 youths (age 10 to 14) in western El Dorado County, comprising 7 percent of the total population, as presented in Table 1. This table also indicates that this segment is reasonably well-distributed between census tracts. The highest concentration is in the Southwest Cameron Park tract (10.6 percent of tract residents), followed by the Lakeridge Oaks tract (10.1 percent of tract residents), the Green Springs Ranch tract (10.0 percent of tract residents), and the Southeast El Dorado Hills tract (10.0 percent of tract residents). In absolute terms, the Southeast El Dorado Hills tract has the greatest number of youth (745 persons), followed by the East Cameron Park and Lakeridge tracts (733 persons and 663, respectively).

Table 1 also presents the distribution of the elderly population (age 65 and older) of the study area by census tract. The tract with the highest percentage of elderly residents is Southeast

Figure 1
Western El Dorado County Site and Location
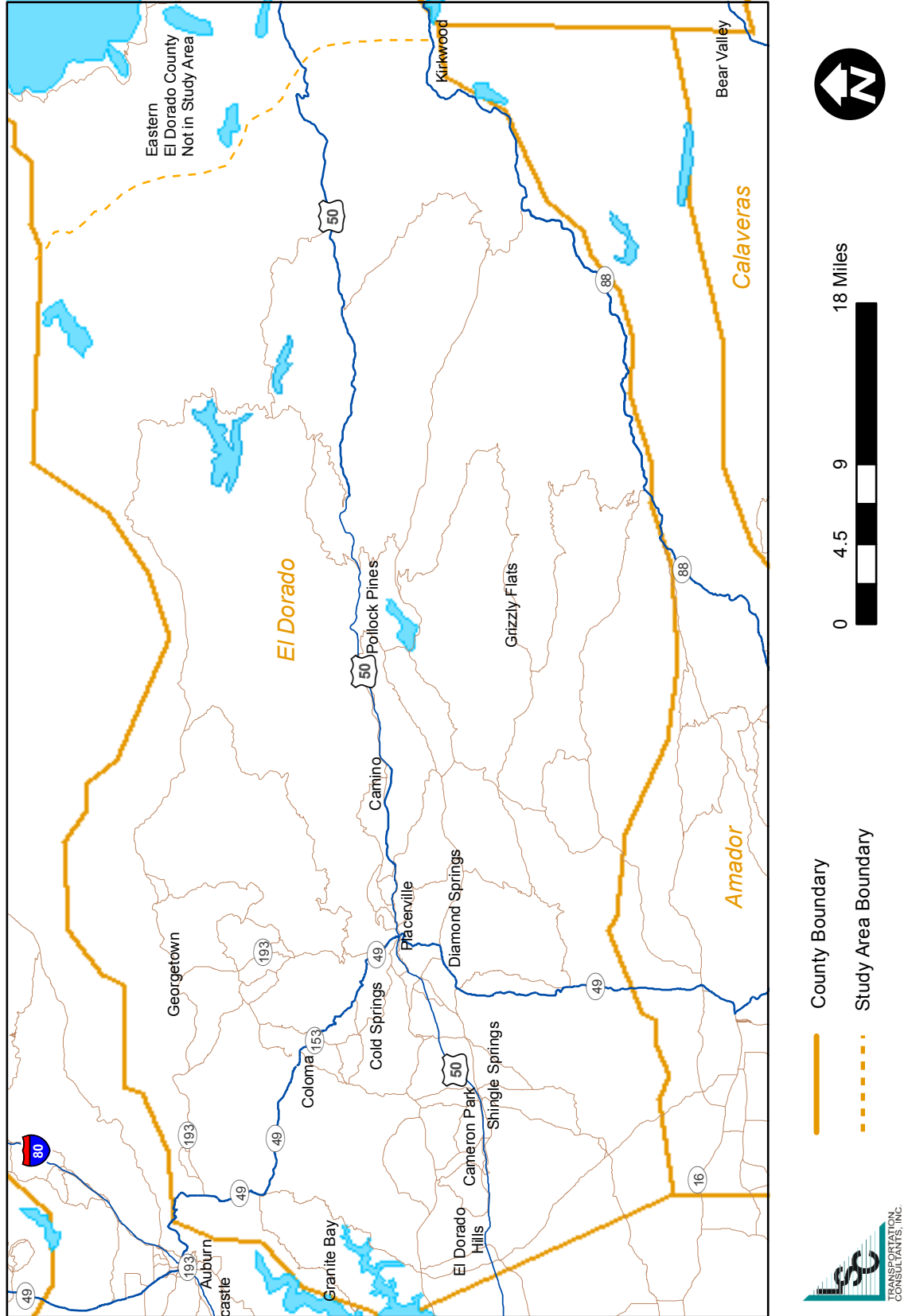
TABLE 1: Population and Age Characteristics by Census Tract in Western El Dorado County

Tract	Area Description	Total Population	Total Households	Population by Age							Percent Youth	Percent Elderly
				<10	10 to 14	15 to 19	20 to 59	60 to 64	65 to 74	>74		
306.01	Pilot Hill / Cool	5,105	1,894	551	439	337	2,558	332	444	444	8.6%	17%
306.02	Greenwood / Garden Valley	6,562	2,443	420	348	407	3,543	466	781	591	5.3%	21%
306.03	North Central County	3,300	1,356	323	132	201	1,709	277	406	248	4.0%	20%
307.01	Lakeridge Oaks	6,567	2,173	486	663	657	3,467	565	355	368	10.1%	11%
307.04	South El Dorado Hills / Latrobe	6,462	2,428	1,047	258	517	3,128	485	666	368	4.0%	16%
307.06	West El Dorado Hills	5,868	2,166	775	446	452	2,834	446	575	340	7.6%	16%
307.09	Green Springs Ranch	4,867	1,592	608	487	360	2,477	326	492	117	10.0%	13%
307.10	Northeast El Dorado Hills	5,356	1,737	787	407	311	2,715	450	498	171	7.6%	13%
308.01	Deer Valley / Rescue	4,193	1,468	398	243	323	2,235	306	423	264	5.8%	16%
308.03	East Cameron Park	7,631	2,873	763	733	534	3,678	580	588	763	9.6%	18%
308.04	Shingle Springs / Frenchtown	6,666	2,346	660	300	667	3,006	647	820	567	4.5%	21%
308.07	Southwest Cameron Park	4,052	1,422	316	430	430	2,123	215	284	251	10.6%	13%
308.08	Northwest Cameron Park	7,460	2,437	1,246	530	485	3,961	410	567	261	7.1%	11%
308.09	South Central Cameron Park	2,595	963	234	252	280	1,292	127	192	221	9.7%	16%
308.10	North Central Cameron Park	3,056	1,286	296	251	202	1,662	177	269	196	8.2%	15%
309.01	Coloma / Lotus Area	2,808	1,128	219	154	146	1,516	306	306	160	5.5%	17%
309.02	N.Greenstone / Missouri Flat Area	4,638	1,762	315	320	325	2,324	510	529	315	6.9%	18%
310	Northwest Placerville	5,631	2,326	721	248	422	2,748	310	743	434	4.4%	21%
311	North Placerville	5,627	2,238	619	394	293	2,904	484	557	371	7.0%	17%
312	South Placerville	4,778	1,745	440	263	268	2,384	440	459	526	5.5%	21%
313.01	Smith Flat / Camino	3,519	1,415	239	162	355	1,594	447	468	253	4.6%	21%
313.02	N. Pollock Pines / Cedar Grove	4,726	1,963	402	364	198	2,552	388	534	284	7.7%	17%
314.02	Somerset / Mt. Aukum	4,993	2,237	359	429	135	2,756	449	649	220	8.6%	17%
314.04	New Town / Old Fort Jim	2,257	873	142	102	135	1,259	192	269	160	4.5%	19%
314.05	Rancho del Sol / Gold Ridge	2,356	908	287	120	115	1,211	188	292	141	5.1%	18%
314.06	Fresh Pond / Pleasant Valley	5,776	2,134	757	179	439	3,125	427	601	260	3.1%	15%
315.02	South Missouri Flat Area	6,403	2,447	666	429	288	3,381	378	506	743	6.7%	20%
315.03	Kingsville / Nashville	2,885	1,157	110	237	185	1,454	352	271	283	8.2%	19%
315.04	Deer Park Area	5,255	2,114	452	300	294	2,727	347	394	736	5.7%	22%
317	Northwest El Dorado Hills	2,809	862	531	236	242	1,402	149	171	81	8.4%	9%
318	Southeast El Dorado Hills	7,451	2,181	1,602	745	440	3,875	194	395	209	10.0%	8%
319	Southeast County	74	41	2	2	8	21	10	29	2	2.7%	42%
	2013 Estimates	151,726	56,115	16,774	10,601	10,449	77,624	11,379	14,531	10,347	7%	16%

Source: U.S. Census Bureau, 2009-2013 5-Year American Community Survey

TABLE 2: Poverty and Vehicle Availability by Census Tract in Western El Dorado County

Tract	Area Description	Poverty Population Age 0 to 64 Number	Percent	Age 65 and Above Number	Percent	Total Number	Percent	Zero Vehicle Households Number	Percent
306.01	Pilot Hill / Cool	265	5.2%	2	0.2%	267	5.2%	64	3.4%
306.02	Greenwood / Garden Valley	390	5.9%	49	3.6%	439	6.7%	95	3.9%
306.03	North Central County	318	9.6%	17	2.6%	335	10.2%	26	1.9%
307.01	Lakeridge Oaks	138	2.1%	50	6.9%	188	2.9%	106	4.9%
307.04	South El Dorado Hills / Latrobe	676	10.5%	29	2.8%	705	10.9%	45	1.9%
307.06	West El Dorado Hills	50	0.9%	94	10.3%	144	2.5%	43	2.0%
307.09	Green Springs Ranch	10	0.2%	1	0.2%	11	0.2%	47	3.0%
307.10	Northeast El Dorado Hills	58	1.1%	-	0.0%	58	1.1%	14	0.8%
308.01	Deer Valley / Rescue	68	1.6%	36	5.2%	104	2.5%	57	3.9%
308.03	East Cameron Park	331	4.3%	78	5.8%	409	5.4%	148	5.2%
308.04	Shingle Springs / Frenchtown	817	12.3%	69	5.0%	886	13.3%	84	3.6%
308.07	Southwest Cameron Park	311	7.7%	10	1.9%	321	7.9%	23	1.6%
308.08	Northwest Cameron Park	117	1.6%	-	0.0%	117	1.6%	22	0.9%
308.09	South Central Cameron Park	173	6.7%	6	1.5%	179	6.9%	53	5.5%
308.10	North Central Cameron Park	279	9.1%	11	2.4%	290	9.5%	135	10.5%
309.01	Coloma / Lotus Area	184	6.6%	-	0.0%	184	6.6%	26	2.3%
309.02	N.Greenstone / Missouri Flat Area	194	4.2%	18	2.1%	212	4.6%	34	1.9%
310	Northwest Placerville	1,290	22.9%	154	13.1%	1,444	25.6%	229	9.8%
311	North Placerville	753	13.4%	40	4.3%	793	14.1%	131	5.9%
312	South Placerville	169	3.5%	123	12.5%	292	6.1%	70	4.0%
313.01	Smith Flat / Camino	274	7.8%	57	7.9%	331	9.4%	20	1.4%
313.02	N. Pollock Pines / Cedar Grove	747	15.8%	2	0.2%	749	15.8%	77	3.9%
314.02	Somerset / Mt. Aukum	270	5.4%	77	8.9%	347	6.9%	21	0.9%
314.04	New Town / Old Fort Jim	233	10.3%	9	2.1%	242	10.7%	19	2.2%
314.05	Rancho del Sol / Gold Ridge	155	6.6%	8	1.8%	163	6.9%	26	2.9%
314.06	Fresh Pond / Pleasant Valley	529	9.2%	59	6.9%	588	10.2%	56	2.6%
315.02	South Missouri Flat Area	889	13.9%	84	6.7%	973	15.2%	271	11.1%
315.03	Kingsville / Nashville	122	4.2%	19	3.4%	141	4.9%	47	4.1%
315.04	Deer Park Area	268	5.1%	39	3.5%	307	5.8%	66	3.1%
317	Northwest El Dorado Hills	69	2.5%	-	0.0%	69	2.5%	5	0.6%
318	Southeast El Dorado Hills	336	4.5%	81	13.4%	417	5.6%	42	1.9%
319	Southeast County	24	32.4%	-	0.0%	24	32.4%	1	2.4%
TOTAL		10,507	8.3%	1,222	4.9%	11,729	7.7%	2,103	3.7%

Source: U.S. Census Bureau, 2009-2013 5-Year American Community Survey

TABLE 3: Population with Ambulatory Difficulty by Census Tract in Western El Dorado County

Tract	Area Description	Age 5 to 64		Age 65 and Above		Total	
		Number	Percent	Number	Percent	Number	Percent
306.01	Pilot Hill / Cool	65	1.5%	172	19.4%	237	4.6%
306.02	Greenwood / Garden Valley	349	6.7%	250	18.2%	599	9.1%
306.03	North Central County	165	6.2%	75	11.5%	240	7.3%
307.01	Lakeridge Oaks	160	2.7%	195	27.0%	355	5.4%
307.04	South El Dorado Hills / Latrobe	129	2.4%	175	16.9%	304	4.7%
307.06	West El Dorado Hills	96	1.9%	124	13.5%	220	3.7%
307.09	Green Springs Ranch	22	0.5%	31	5.1%	53	1.1%
307.10	Northeast El Dorado Hills	43	0.9%	24	3.6%	67	1.3%
308.01	Deer Valley / Rescue	101	2.9%	151	22.0%	252	6.0%
308.03	East Cameron Park	137	2.2%	183	13.5%	320	4.2%
308.04	Shingle Springs / Frenchtown	121	2.3%	208	15.0%	329	4.9%
308.07	Southwest Cameron Park	175	5.0%	61	11.4%	236	5.8%
308.08	Northwest Cameron Park	114	1.7%	206	24.9%	320	4.3%
308.09	South Central Cameron Park	68	3.1%	44	10.7%	112	4.3%
308.10	North Central Cameron Park	72	2.8%	85	18.3%	157	5.1%
309.01	Coloma / Lotus Area	20	0.9%	105	22.5%	125	4.5%
309.02	N.Greenstone / Missouri Flat Area	103	2.7%	124	14.7%	227	4.9%
310	Northwest Placerville	253	5.7%	299	25.4%	552	9.8%
311	North Placerville	190	4.0%	200	21.5%	390	6.9%
312	South Placerville	68	1.8%	152	15.4%	220	4.6%
313.01	Smith Flat / Camino	77	2.8%	153	21.2%	230	6.5%
313.02	N. Pollock Pines / Cedar Grove	371	9.5%	166	20.3%	537	11.4%
314.02	Somerset / Mt. Aukum	53	1.3%	65	7.5%	118	2.4%
314.04	New Town / Old Fort Jim	21	1.1%	34	7.9%	55	2.4%
314.05	Rancho del Sol / Gold Ridge	27	1.4%	85	19.6%	112	4.8%
314.06	Fresh Pond / Pleasant Valley	179	3.6%	161	18.7%	340	5.9%
315.02	South Missouri Flat Area	289	5.6%	318	25.5%	607	9.5%
315.03	Kingsville / Nashville	58	2.5%	126	22.7%	184	6.4%
315.04	Deer Park Area	243	5.9%	342	30.3%	585	11.1%
317	Northwest El Dorado Hills	78	3.0%	56	22.2%	134	4.8%
318	Southeast El Dorado Hills	26	0.4%	158	26.2%	184	2.5%
319	Southeast County	2	4.7%	-	0.0%	2	2.7%
	TOTAL	3,875	3.1%	4,528	18.2%	8,403	5.5%

Source: U.S. Census Bureau, 2009-2013 5-Year American Community Survey

Note 1: Per the EDT Title VI Plan, minority population is defined as all persons that are not White or that are Hispanic.

County (42 percent) – although the total population of this area is relatively low (only 74 persons). Other tracts with high concentrations of elderly are Greenwood/Garden Valley (1,371 elderly persons, or 21 percent of tract residents), North Central County (653 elderly persons, or 20.0 percent of area residents), Shingle Springs/Frenchtown (1,387 elderly persons, or 21.0 percent of tract residents) Northwest Placerville (1177 elderly persons, or 21.0 percent of tract residents), South Placerville (984 elderly persons, or 21.0 of tract residents), Smith Flat/Camino (721 elderly persons, or 21.0 percent of tract residents), South Missouri Flat Area (1,249 elderly persons, or 20.0 percent of tract residents), and Deer Park Area (1,130 elderly persons or 22.0 percent of tract residents).

The most telling demographic indicator of transit demand is the location of zero-vehicle households. As presented in Table 2, 2,103 households, or 3.7 percent of total households within the study area, had zero vehicles available. This percentage is significantly lower than the 2013 national average of 9.1 percent. The South Missouri Flat tract has the highest concentration of zero vehicle households (271 households, or 11.1 percent of the households in the tract). The other tracts with relatively high percentages of zero vehicle households are North Central Cameron Park (10.5 percent) and Northwest Placerville (9.8 percent).

Nationwide, approximately 6.5 percent of the population has some form of ambulatory disability, although this percentage is typically lower in rural areas. This pattern holds true for western El Dorado County; the number of persons with ambulatory difficulties is 8,403 (5.5 percent of the study area population). As shown in Table 3, the concentration of mobility-limited persons is highest in the N. Pollock Pines/Cedar Grove tract (537 persons, or 11.4 percent of tract residents), the Deer Park Area tract (585 persons, or 11.1 percent), the Northwest Placerville Tract (552 persons, or 9.8 percent), and the South Missouri Flat Area (607 persons, or 9.5 percent).

El Dorado Transit Services

Organization and Management

El Dorado Transit is formed through a joint powers agreement between the County of El Dorado and the City of Placerville. El Dorado Transit is governed by a five-member Board of Directors: three members appointed by the County Board of Supervisors and two members appointed by the Placerville City Council. The Board of Directors has final authority over the organization. The Transit Advisory Committee is responsible for reviewing the operation of the transit system, monitoring levels of service based upon budgets, and providing advice to the Executive Director. The Executive Director supervises a staff of 69 employees, including the Operations Manager, Human Resources/Administrative Services Manager, Fiscal Administration Manager, office and accounting staff, Operations Supervisors, a Planning/Marketing Manager, Transit Dispatchers, Mechanics, and 51 full-time, part-time, and extra-help Transit Drivers.

Facilities

El Dorado Transit is located in a modern facility that accommodates all transit administrative, operations and maintenance functions. This new facility was completed in 1998 and is located at 6565 Commerce Way in Diamond Springs. It features a dispatch center, three maintenance bays, a bus washing facility and a paved bus parking lot. This is the sole location for all El Dorado Transit operations and vehicle storage functions.

Existing El Dorado Transit Dial-A-Ride Service Plan

The Dial-A-Ride service, the focus of this study, is a door-to-door demand-response service designed for elderly and disabled passengers, with limited access available for the general public. The service is available weekdays between the hours of 7:30 AM and 5:00 PM and weekends between the hours of 8:00 AM and 5:00 PM.

The DAR service area consists of 12 geographic zones surrounding the Placerville/Diamond Springs area (Zone A). Zones B, E, C, and D provide service to Cameron Park, Camino, and other areas that can be reached from Zone A in 10-20 min. These zones are open to the general public on a space available basis. The remaining zones can be reached from Zone A in 20-30 min, and include the cities of El Dorado Hills, Coloma, Pollock Pines, and Garden Valley. In these seven remaining zones, DAR does not provide service to the general public. Reservations are accepted for all zones up to three business days in advance. Figure 2 identifies the existing DAR zones.

These 12 geographic zones are based off of the DAR zone system recommended in the 2001 study. Prior to the current zone system, a 3-zone system was used.

Fare Structure

The fare structure for the Dial-A-Ride service is based primarily on the zone of origin, the zone of destination, and passenger type. Fares are defined that reflect all services begin and end at the operations center in Diamond Springs. Trips within Zone A cost $2.00 for senior/disabled passengers and $4.00 for general public, while trips within Zones B, C, D and E are $3.00 and $5.00 respectively and trips within the remaining zones are $5.00 for seniors/disabled riders and are not available for general public. In addition, there is a $0.50 charge for each zone boundary crossed. Prior to the 2001 study, fares ranged between $2.00 and $4.00 plus a $0.05 per mile charge.

Existing Ridership and Service Levels

Dial-A-Ride ridership and other service characteristics for Fiscal Years (FY) 2004-05 through 2013/14, along with preliminary data for FY 2014/15 are presented in Table 4, while ridership trends are shown in Figure 3. A shown, ridership has decreased over this ten-year period by 8.8 percent, consisting of a substantial increase from 2004/05 to 2006/07, a decline through FY 2013/14, and relatively flat ridership in the last two years. A review of a full week of ridership logs for April of 2014 indicated no general public ridership: all passengers were elderly, disabled or both elderly and disabled.

Vehicle-miles and vehicle-hours of service have increased by 11.1 percent and 16.6 percent, respectively. A graphic of vehicle-hours of service is shown in Figure 4. Figure 4 also shows the history of annual DAR operating costs, which increase between FY 2004/05 and FY 2008/09, dropped in FY 2009/10 (paralleling a drop in vehicle-hours of service), and has climbed modestly in more recent years. Annual operating costs currently slightly exceed $1.5M, which is a 47 percent increase from FY 2004/05 The DAR program has long used a maximum of six vehicles in service at any one time.

Figure 2
El Dorado County Dial-A-Ride Zones
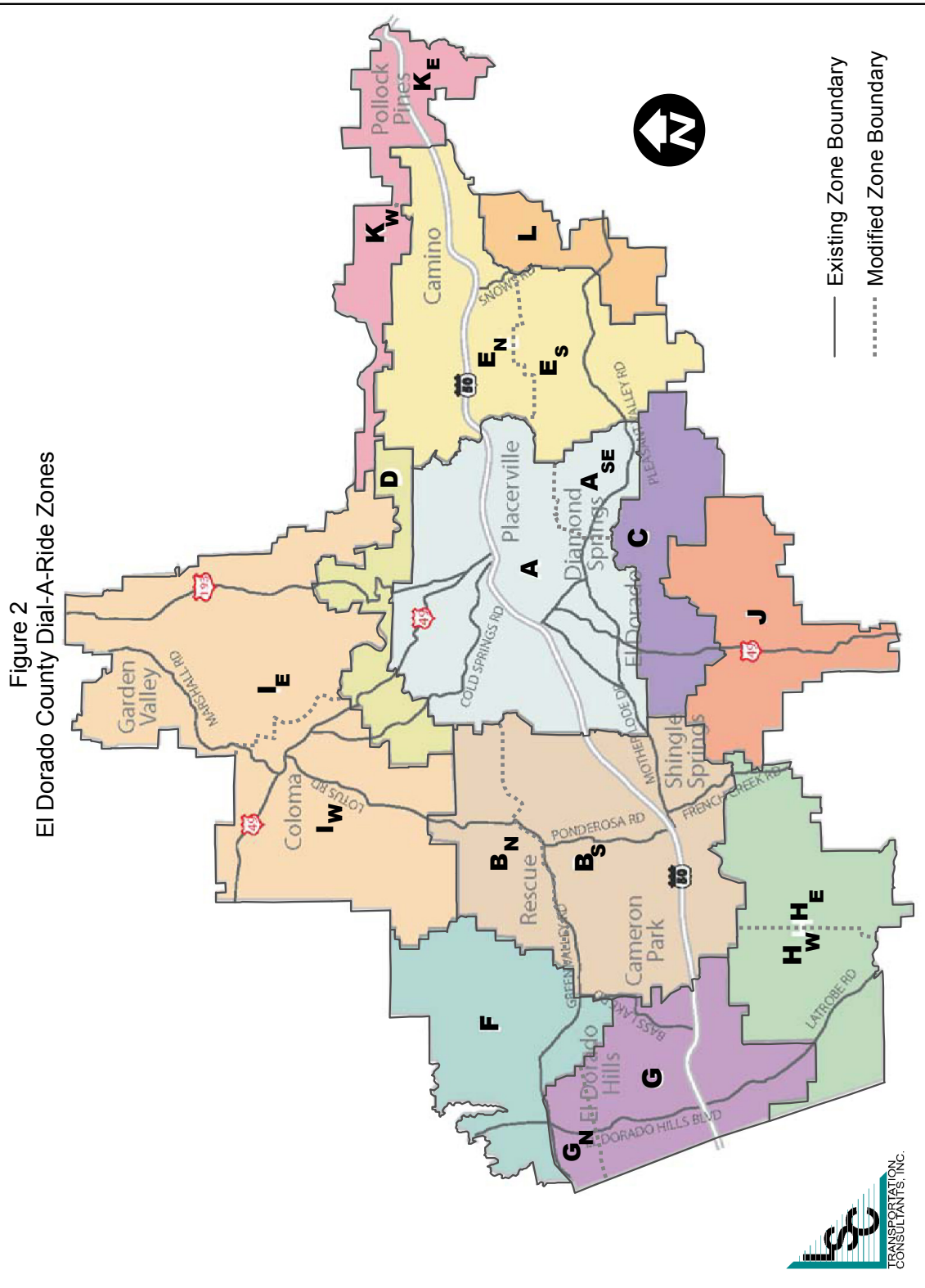
TABLE 4: El Dorado Transit Dial-A-Ride Service and Financial Characteristics

	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15
Annual Ridership											
#	27,227	32,302	33,230	31,550	30,683	27,650	26,720	26,523	26,475	24,831	24,660
% Change	-	18.6%	2.9%	-5.1%	-2.7%	-9.9%	-3.4%	-0.7%	-0.2%	-6.2%	-0.7%
Revenue Hours											
#	10,595	13,093	14,042	14,211	13,448	11,397	11,322	11,001	11,921	12,351	12,150
% Change	-	23.6%	7.2%	1.2%	-5.4%	-15.3%	-0.7%	-2.8%	8.4%	3.6%	-1.6%
Vehicle Miles											
$	220,171	281,294	319,318	317,503	310,619	271,315	268,350	262,731	246,994	244,656	232,181
% Change	-	27.8%	13.5%	-0.6%	-2.2%	-12.7%	-1.1%	-2.1%	-6.0%	-0.9%	-5.1%
Revenues											
TDA	$946,925	$1,239,437	$1,283,394	$1,038,130	$1,178,936	$980,667	$1,086,634	$1,112,726	$1,164,732	$1,094,908	$1,246,720
STA				$184,995		$107,655	$11,490			$3	
5311				$127,946	$132,309	$118,513	$115,845	$154,027	$133,031	$321,577	$190,840
OP Grants				$27,355	$7,207	$2,965					
Farebox	$74,149	$65,748	$67,444	$63,090	$68,184	$71,352	$73,743	$74,895	$70,801	$67,652	$66,011
Total Revenues	$1,021,074	$1,305,185	$1,350,838	$1,441,515	$1,386,637	$1,281,152	$1,287,712	$1,341,647	$1,368,563	$1,484,139	$1,503,571
Vehicles at Peak	6	6	6	6	6	6	6	6	6	6	6
Total Expenses	$1,021,074	$1,305,185	$1,283,394	$1,441,515	$1,594,343	$1,281,152	$1,287,712	$1,341,647	$1,368,563	$1,484,139	$1,503,571
Performance Measures											
Passengers per Mile	0.12	0.11	0.10	0.10	0.10	0.10	0.10	0.10	0.11	0.10	0.11
Passengers per Hour	2.57	2.47	2.37	2.22	2.28	2.43	2.36	2.41	2.22	2.01	2.03
Operating Cost per Vehicle-Hour	$96.37	$99.69	$96.20	$101.44	$118.56	$112.41	$113.74	$121.96	$114.80	$120.16	$123.76
Operating Cost per Passenger	$37.50	$40.41	$40.65	$45.69	$51.96	$46.33	$48.19	$50.58	$51.69	$59.77	$60.97
Operating Subsidy per Passenger	$34.78	$38.37	$38.62	$43.69	$42.97	$43.75	$45.43	$47.76	$49.02	$57.05	$58.30
Operating Farebox Ratio	7.3%	5.0%	5.0%	4.4%	4.9%	5.6%	5.7%	5.6%	5.2%	4.6%	4.4%
Annual Operating Subsidy	$946,925	$1,239,437	$1,283,394	$1,378,425	$1,526,159	$1,209,799	$1,213,969	$1,266,753	$1,297,762	$1,416,487	$1,437,560

Source: EDCTA Administrative Operations Reports 2004/05-2013/14

Notes: Data for 2014/15 is an estimation based off of DAR Routematch data and the 2014/15 6-month Administrative Operations Report

Figure 3: El Dorado Transit DAR Annual Ridership History
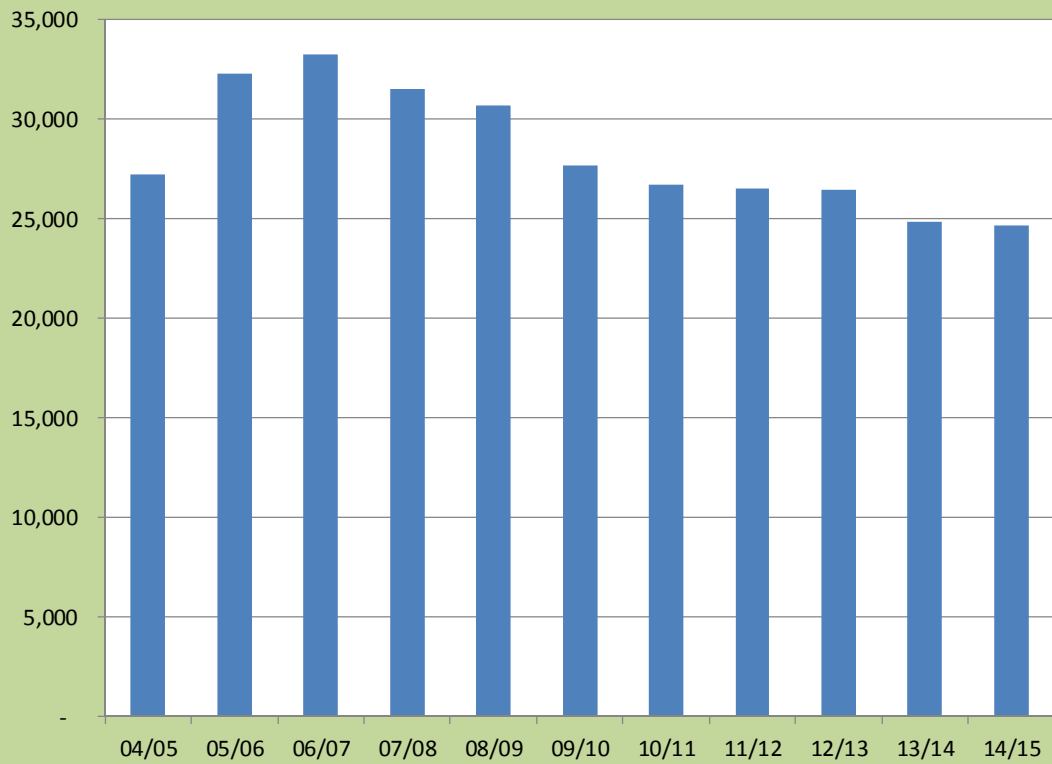
Figure 4: El Dorado Transit DAR Annual Operating Cost and Service Level History
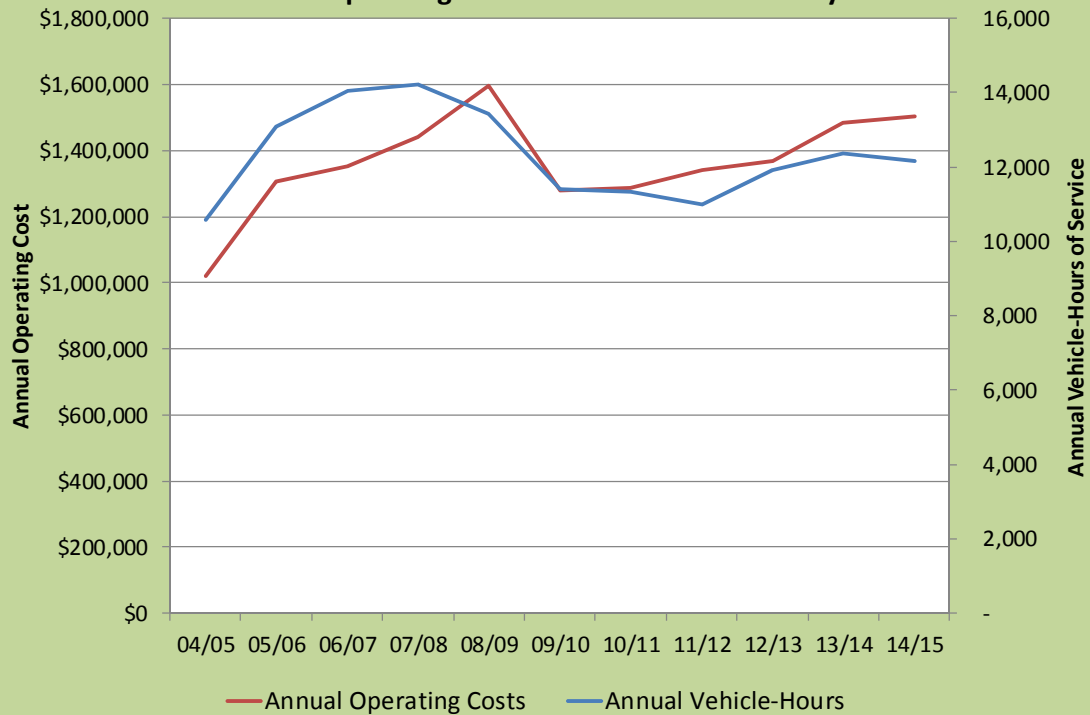
Existing DAR Performance

Analysis and trends in a series of standard transit performance measures are shown in the bottom of Table 4, and indicates the following:

- The **passenger-trips per vehicle-mile of service** has been relatively flat, ranging from a high of 0.12 in FY 2004/05 to a low of 0.10 in various years, and now stands at 0.11 for the most recent year.

- The **passenger-trips per vehicle-hour of service** has declined, as is also shown in Figure 5. This measure dropped from 2.57 in FY 2004/05 to a low of 2.01 in FY 2013/14, before increasing slightly to 2.03 in FY 2014/15. As most of the costs of operating transit service relate to the hours of operation rather than the miles of operating, this decline indicates a long-term reduction in service efficiency, due in part to longer passenger trip lengths.

Figure 5: Key El Dorado Transit DAR Performance Measure Trends
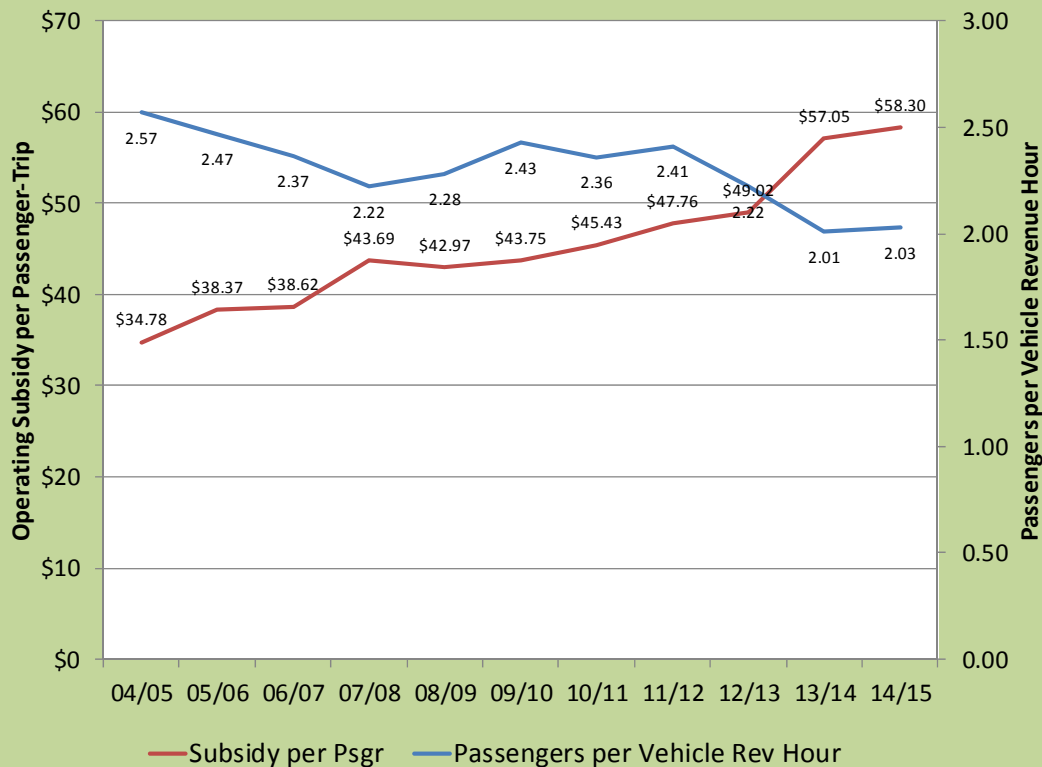
- The **operating cost per vehicle-hour** currently stands at $123.76, which is a 28 percent increase over FY 2004/05 figures.

- The decline in ridership and increase in hourly costs combine to result in an increase in **operating cost per passenger-trip**, from a FY 2004/05 figure of $37.50 to a currently value of $60.97.

- Increasing costs coupled with declining ridership and static fare levels have resulted in a decline in the **farebox return ratio** (the proportion of fare revenues to operating costs), from a 2004/05 value of 7.3 percent to a current level of 4.4 percent.

- The **average trip length** (vehicle miles divided by ridership) has increased from 8.1 miles in 2004 -05 to 9.4 in 2014-15. All else being equal, this would generate a 16 percent increase in the costs of serving each passenger-trip.

- Subtracting fare revenue from operating costs and dividing by the ridership yields the key **subsidy per passenger-trip**. This measure relates the key public "input" (subsidy funding) to the key desired output (passenger trips) as also shown in Figure 5, this measure rose from a FY 2004/05 figure of $34.78 to a FY 2014/15 figure of $58.30, equivalent to a 68 percent increase. Most of this increase is due to the increase in operating costs, though a substantial portion is attributable to the decrease in passenger-trips.

Existing Financial Characteristics

System Revenues

The revenue sources required to support El Dorado Transit's administration, operations, and maintenance are drawn from a number of sources. Funding for the system for FY 2004/05 through 2014/15 is presented in Table 4. As indicated, presently the single largest source of El Dorado Transit funding is the Local Transportation Fund (TDA), with 83 percent of total revenues for FY 2014/15. Section 5311 funds, a federal grant for rural areas, is the second largest source of funding providing 23 percent of funding. Farebox revenues account for 4.4 percent of funding. These sources of funding vary heavily from year-to-year. Other significant sources of funding over the last ten years include the State Transit Assistance Fund (STA) and funding for County Fair and Apple Hill Shuttle services.

System Expenses and Cost Allocation Model

El Dorado Transit operating costs are presented in Table 5 (Cost Model). El Dorado Transit expenditures were analyzed to assess those factors that impact cost levels. Each cost item is allocated to that quantity – vehicle-hour, vehicle-mile, or fixed-cost – upon which it is most dependent. Fuel costs, for example, are allocated to vehicle-miles, while driver salaries are allocated to vehicle-hours. The costs for each service quantity are then summed. When divided by the total quantity of service supplied in Fiscal Year 2014-15, a "cost equation" can be developed. This equation is:

Operating Cost = ($61.79 x number of vehicle-hours) +
($1.81 x number of vehicle-miles) +
$1,910,191 fixed costs

This equation can be used to estimate the cost of any changes in service, such as the operation of additional routes or changes in operating times. It is used as part of this study to evaluate the cost impacts of service alternatives.

TABLE 5: El Dorado Transit Cost Allocation Model, Fiscal Year 2014-15				
Line Item	Total	Vehicle Miles	Vehicle Hours	Fixed
Salaries and Wages	$2,695,025	$336,240	$1,630,610	$728,174
Employee Benefits	$1,498,000	$166,401	$970,746	$360,854
Payroll Taxes	$40,000	$3,762	$26,401	$9,837
Worker's Compensation Insurance	$199,000	$19,900	$153,230	$25,870
General Liability Insurance	$249,605	-	-	$249,605
Fuel & Lubricants	$942,000	$942,000	-	-
Vehicle Maintenance	$304,700	$304,700	-	-
Professional Services	$150,000	-	-	$150,000
Service Contracts/Equipment	$92,000	-	-	$92,000
Utilities	$46,000	-	-	$46,000
Special Department Expense	$3,800	-	-	$3,800
Communications	$53,000	-	-	$53,000
Postage, Publications, Notices, Printing	$41,000	-	-	$41,000
Marketing	$10,000	-	-	$10,000
Office Expense/Building Maintenance	$34,300	-	-	$34,300
Equipments Rents Leases	$18,000	-	-	$18,000
Uniforms	$11,300	-	-	$11,300
Household Supplies	$15,750	-	-	$15,750
Membership and Publications	$5,000	-	-	$5,000
Staff Development and Training	$18,400	-	-	$18,400
Park and Ride & Bus Stop Expenses	$37,301	-	-	$37,301
Total Expenditures	**$6,464,181**	**$1,773,003**	**$2,780,987**	**$1,910,191**
Unit Quantities		**982,250**	**45,010**	**–**
Cost Per Unit		**$1.81**	**$61.79**	**–**

Source: El Dorado Transit, Oct 2013: FY 2012-13 Approved 8-27-13; FY 2013-14 Adopted 5-2-13. Does not include contingency.

Analysis of Dial-A-Ride Service Effectiveness and Financial Requirements

It is possible to use existing ridership, financial, service, and geographic data to assess the service and financial requirements associated with providing Dial-A-Ride service to various portions of El Dorado County. This analysis was conducted in the following steps:

1. The existing 12 geographic zones were utilized to determine fare structure and encompass the DAR service area. These zones were defined based upon the existing roadway system to encompass areas with equivalent travel times. Seven of these zones were divided into sub-zones in order to allow the evaluation of changes in the current zone boundaries. Zones are depicted in Figure 2.

2. DAR RouteMatch[1] data for the weekdays from Monday, April 6, 2015 to Friday, April 10,

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[1] RouteMatch is a software and data collection program that dispatchers, administrators and drivers use to make reservations, track ridership and service, and compile reports.

2015 were entered into a spreadsheet. A summary of total service provided over this period is shown in Table 6. The origin zone, destination zone, pickup zone, and next zone of each passenger-trip was identified and also entered into the spreadsheet. In total, 325 individual passenger-trips were included in the analysis. A full list of individual vehicle-trips provided over this study period is presented in Appendix A. In addition, a table presenting the number of trips carried over an extended study period, April 6-10, 2015 and April 13-17, 2015, between each origin/destination zone pair is presented as Table 7. As indicated, over half (48.3 out of 91.0, or 53 percent) of trips are wholly within Zone A (Placerville). Another 31 percent are trips connecting Placerville with other portions of the service area. In particular, there are 18.1 passenger-trips per day carried between Cameron Park (Zone B) and Placerville. Outside of trips with at least one trip-end in Placerville (Zone A), the only pattern of significant trips is within Zone B (5.2 trips per day) and between Zones B and G (El Dorado Hills) with 3.8 trips per day.

TABLE 6: Summary of El Dorado Transit DAR Service							
April 6, 2015 to April 10, 2015							
Day	Vehicle	Time In	Time Out	Lunch Break (Hours)	In Service Time (Hours)	Total Miles	Miles per Hour
Mon	1101	8:07 AM	3:45 PM	1.00	6.63	109	14.32
	1301	8:00 AM	4:45 PM	1.00	7.75	166	19.61
	1302	8:45 AM	4:52 PM	1.00	7.12	118	14.61
	1303	7:15 AM	3:20 PM	1.00	7.08	134	16.94
	1304	8:38 AM	5:11 PM	1.00	7.55	135	16.03
Tue	1010	8:20 AM	12:48 PM	1.00	3.47	105	26.25
	1101	7:30 AM	3:40 PM	1.00	7.17	144	18.14
	1301	7:15 AM	2:33 PM	1.00	6.30	158	22.86
	1302	8:28 AM	4:45 PM	1.00	7.28	207	26.50
	1303	7:30 AM	3:43 PM	1.00	7.22	180	23.00
	1304	8:38 AM	5:06 PM	1.00	7.47	146	17.68
Wed	1010	7:50 AM	1:45 PM	1.00	4.92	87	17.72
	1101	7:30 AM	3:30 PM	1.00	7.00	167	21.86
	1301	7:30 AM	3:25 PM	1.00	6.92	162	21.40
	1302	8:33 AM	5:02 PM	1.00	7.48	135	16.17
	1303	7:15 AM	3:25 PM	1.00	7.17	190	24.56
	1304	9:00 AM	5:11 PM	1.00	7.18	176	22.55
Thu	1010	8:51 AM	2:10 PM	1.00	4.32	170	36.14
	1101	7:30 AM	3:12 PM	1.00	6.70	152	20.60
	1301	7:20 AM	3:13 PM	1.00	6.88	144	18.89
	1302	8:55 AM	5:06 PM	1.00	7.18	196	25.34
	1303	7:30 AM	3:25 PM	1.00	6.92	173	22.99
	1304	9:00 AM	4:32 PM	1.00	6.53	114	15.31
Fri	1010	8:50 AM	1:25 PM	0.00	4.58	119	22.91
	1101	7:49 AM	3:25 PM	1.00	6.60	159	21.97
	1301	7:30 AM	2:22 PM	1.00	5.87	132	20.11
	1302	8:40 AM	4:33 PM	1.00	6.88	138	18.01
	1303	8:00 AM	3:21 PM	1.00	6.35	172	24.88
	1304	8:38 AM	5:11 PM	1.00	7.55	140	16.69
Total					192.1	4,325	20.04
Avg Weekday					38.4	865	
Source: El Dorado Transit RouteMatch Data							

TABLE 7: El Dorado Transit DAR Average Weekday Passenger Trip Origin & Destination
Based on Data For April 6 to 10 and 13 to 17, 2015

		Trip Destination Zone																			Total	
		A	A_{SE}	B_N	B_S	C	D	E_N	E_S	F	G_N	G	H_W	H_E	I_W	I_E	J	K_W	K_E	L	#	%
Trip Origin Zone	A	48.3	0.0	0.0	10.3	0.4	0.0	1.3	0.0	0.1	0.0	0.8	0.0	0.3	0.6	0.4	0.0	0.0	0.1	0.1	62.7	69%
	A_{SE}	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1%
	B_N	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0%
	B_S	7.8	0.9	0.0	5.2	1.0	0.0	0.0	0.1	0.0	0.0	2.4	0.0	0.4	0.0	0.0	0.3	0.0	0.4	0.0	18.5	20%
	C	0.4	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	2%
	D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0%
	E_N	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	2%
	E_S	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0%
	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0%
	G_N	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0%
	G	0.1	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	3%
	H_W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0%
	H_E	0.3	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1%
	I_W	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1%
	I_E	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1%
	J	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0%
	K_W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0%
	K_E	0.1	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1%
	L	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0%
Total #		60.06	0.9	0	20.3	1.4	0	1.3	0.1	0.1	0	4.5	0	0.6	0.6	0.4	0.3	0	0.5	0.1	91.0	100%
Total %		66%	1%	0%	22%	2%	0%	1%	0%	0%	0%	5%	0%	1%	1%	0%	0%	0%	1%	0%	100%	

Source: El Dorado Transit RouteMatch data

3. Summarizing this service data of the extended study period by zone yields the information presented in Table 8. This table summarizes both vehicle-trips and passenger-trips on weekdays. A graph depicting the average number of daily, weekday trip ends (origins plus destinations) is shown in Figure 6. As indicated, a majority 67.8 percent of all weekday trips begin or end in Zone A. Other zones with a substantial percentage of the total trip activity include Zone B_s (20.4 percent) and Zone G (4.0 percent). The remaining 16 zones, combined, account for only 7.8 percent of total trip activity.

4. Zone-to-zone distances between commonly traveled routes (i.e. A to A, A to B_s, etc.) were identified using odometer readings from DAR Routematch data from April 6, 2015 to April 10, 2015, they are presented in Table 9.

5. The vehicle-miles of service associated with each passenger trip, per zone, were estimated. For commonly traveled routes, total vehicle-miles involved with each passenger trip was determined by adding the following zone-to-zone distances: half of the distance from the previous zone to the pick-up (PU) zone, the distance from the PU zone to the drop-off (DO) zone, and half of the distance from the DO zone to the next zone. A factor was obtained by relating the average PU to DO mileage with the total trip mileage.

6. The decimal number of vehicle hours was identified based upon the average speed of the drivers calculated in Table 6.

7. The estimated mileage and running time of all trips were then summed. These sums were then compared with the total actual mileage and running time (as shown in Table 6), and adjusted to equal the actual totals.

TABLE 8: Total El Dorado Transit DAR Trip Activity

Based on Data For April 6 to 10 and 13 to 17, 2015

Zone	Vehicle Trips			Passenger Trips			Revenue Generated by Pick-ups	Percent of Total Revenue
	Pick-ups	Drop-offs	Total Trip Ends	Pick-ups	Drop-offs	Total Trip Ends		
A	467	453	920	492	471	963	$1,221.00	57.32%
A_{SE}	8	7	15	8	7	15	$31.50	1.48%
B_N	0	0	0	0	0	0	$0.00	0.00%
B_S	136	141	277	145	159	304	$535.50	25.14%
C	12	11	23	12	11	23	$49.50	2.32%
D	0	0	0	0	0	0	$0.00	0.00%
E_N	13	10	23	13	10	23	$49.00	2.30%
E_S	1	1	2	1	1	2	$4.00	0.19%
F	0	1	1	0	1	1	$5.50	0.26%
G_N	0	0	0	0	0	0	$0.00	0.00%
G	21	33	54	22	35	57	$111.00	5.21%
H_W	0	0	0	0	0	0	$0.00	0.00%
H_E	5	5	10	5	5	10	$23.50	1.10%
I_W	6	5	11	6	5	11	$41.50	1.95%
I_E	4	3	7	4	3	7	$24.00	1.13%
J	2	2	4	2	2	4	$13.00	0.61%
K_W	0	0	0	0	0	0	$0.00	0.00%
K_E	4	4	8	4	4	8	$15.00	0.70%
L	1	1	2	1	1	2	$6.00	0.28%
Total	680	677	1357	715	715	1430	$2,130.00	-

Source: El Dorado Transit RouteMatch Data

Figure 6: Avg Weekday DAR Passenger Trips
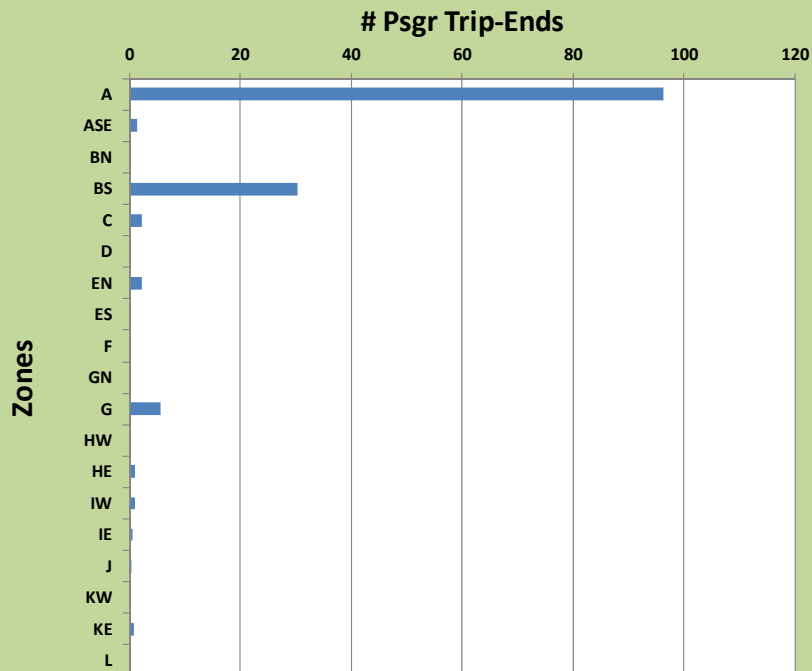
TABLE 9: Zone-To-Zone Travel Distances

		Trip Destination Zone																	
		A	A_{SE}	B_N	B_S	C	D	E_N	E_s	F	G_N	G	H_W	H_E	I_W	I_E	J	K_W	K_E	L
Trip Origin Zone	A	3.4	4.0		10.8	5.0		9.3		14.0		16.3		16.0	13.8	21.0	**7.0**		**13.0**	
	A_{SE}	4.0			10.3	4.0														
	B_N																			
	B_S	11.6	10.5		2.8	9.7						6.7		6.0	**12.6**		9.0		23.5	
	C	5.0	4.0		8.8															
	D																			
	E_N	6.8																		
	E_s																			
	F	14.0																		
	G_N																			
	G	16.3			8.2							1.5		**11.0**						
	H_W																			
	H_E	16.0			6.0							**11.0**								
	I_W	8.0			12.6															
	I_E	18.3																		
	J	**7.0**			10.0															
	K_W																			
	K_E	**13.0**			**23.0**															
	L																			

Notes: 1. Distances in bold font determined from Google Maps

2. Distances are in miles

Source: Driver Manifest Odometer Readings (April 6, 2015 to April 10, 2015) and Google Maps

8. The total, adjusted vehicle-miles and total, adjusted vehicle-hours of service required to serve trip origins in each of the zones served over the analysis period were averaged, as shown in Table 10.

9. For the less commonly traveled routes from outlying zones, zone-to-zone distances were identified using Google Maps. This information is also presented in Table 9. Using the assumption that passenger trips originating from outlying zones would most likely travel to Zones A, B_s, or G, the average PU to DO distances were calculated to these three zones. The factor calculated in step 5 was then applied to the average PU to DO distances, for the outlying zones, to determine the total vehicle-miles of service associated with each passenger trip. The associated vehicle-hours were calculated using the same method from step 6.

10. Using the cost model, the mileage, and running time required for each vehicle-trip serving each individual zone, it is possible to estimate the operating cost associated with service to each zone. Note that these are marginal operating costs, which include factors such as driver salary, fuel, and vehicle maintenance, but which exclude fixed costs (such as administrative and facility costs).

11. The cost per vehicle-trip can then be divided by the average number of passenger-trips per vehicle-trip, to identify the average cost per passenger-trip. Due to the low level of demand for zones with little trip activity, and considering the fact that only 1.05 passenger-trips are currently served per vehicle-trip and that a value exceeding 1.00 is only currently found in the relatively dense A, B and G Zones, a value of 1.00 passenger-trips per vehicle-trip was assumed for zones without sufficient Routematch data.

12. The average fare per passenger-trip can be identified from the DAR Routematch Data for each zone. Subtracting the fare from the cost yields the marginal subsidy per passenger-trip. For zones with insufficient Routematch data, the average fare was calculated based off of a weighted average between trips to zones A, B_s, and G.

13. In addition, the passenger-trips per vehicle-hour can be divided by the vehicle-hours per passenger-trip to identify the passenger-trips serviced per vehicle-hour.

TABLE 10: Cost Analysis of El Dorado Transit DAR Service by Zone

Analysis Zone	Mileage per Vehicle Trip	Hours per Vehicle Trip	Marginal Cost per Vehicle Trip	Psgr Trip per Vehicle Trip	Psgr - Trip per Veh - Hour	Marginal Cost per Psgr Trip	Avg. Fare per Psgr Trip	Marginal Subsidy per Psgr Trip	Farebox Return Ratio
A	9.8	0.49	$48.10	1.05	2.13	$45.95	$2.49	$43.46	5.4%
A_{SE}	10.4	0.52	$50.59	1.00	1.94	$50.59	$3.50	$47.09	6.9%
B_N	16.8	0.84	$82.11	1.00	1.19	$82.11	$3.48	$78.63	4.2%
B_S	14.2	0.71	$69.55	1.10	1.55	$63.37	$3.66	$59.72	5.8%
C	13.4	0.67	$65.54	1.00	1.49	$65.54	$3.90	$61.64	6.0%
D	17.5	0.87	$85.70	1.00	1.14	$85.70	$3.78	$81.92	4.4%
E_N	19.0	0.95	$92.88	1.00	1.05	$92.88	$3.78	$89.10	4.1%
E_S	19.2	0.96	$93.86	1.00	1.04	$93.86	$3.78	$90.09	4.0%
F	22.3	1.11	$108.89	1.00	0.90	$108.89	$5.78	$103.12	5.3%
G_N	21.0	1.05	$102.75	1.00	0.95	$102.75	$5.58	$97.17	5.4%
G	16.0	0.71	$72.93	1.06	1.48	$69.10	$5.50	$63.60	8.0%
H_W	19.8	0.99	$97.00	1.00	1.01	$97.00	$5.65	$91.35	5.8%
H_E	16.6	0.83	$81.21	1.00	1.21	$81.21	$5.67	$75.54	7.0%
I_W	18.3	0.91	$89.38	1.00	1.10	$89.38	$5.88	$83.50	6.6%
I_E	27.4	1.37	$134.15	1.00	0.73	$134.15	$5.88	$128.28	4.4%
J	15.1	0.76	$74.03	1.00	1.32	$74.03	$6.18	$67.86	8.3%
K_W	33.2	1.66	$162.42	1.00	0.60	$162.42	$6.18	$156.25	3.8%
K_E	30.1	1.50	$147.17	1.00	0.67	$147.17	$6.18	$140.99	4.2%
L	25.1	1.25	$122.76	1.00	0.80	$122.76	$6.18	$116.58	5.0%
Average	11.6	0.58	$56.69	1.05	1.82	$53.80	$2.98	$50.82	5.5%

The results of this analysis can be summarized as follows:

- As shown in Table 10, the cost per passenger-trip ranges from a low of $48.10 for Zone A to a high of $162.42 for Zone K_w. It is important to note that Zone A has the highest rate of activity while, in our study period, Zone K_w had zero trip activity. Zones B_s and G have the second and third highest rates of trip activity, and cost $69.55 per passenger trip and $72.93 per passenger trip, respectively. As a comparison, the existing average marginal cost per passenger-trip is $56.69.

- Subtracting average passenger fares from the marginal operating cost, the subsidy required to serve a passenger in each zone currently generating trips ranges from a low of $43.46 for Zone A to a high of $156.25 for service Zone Kw. Zones Bs and G require a subsidy of $59.72 per passenger trip and $63.60 per passenger trip, respectively. In comparison, the existing marginal operating subsidy required per passenger-trip is $50.82, as shown in Figure 7.

Figure 7
Marginal Subsidy per Passenger Trip by Zone

Zone	Subsidy
A	$43.46
ASE	$47.09
BN	$78.63
BS	$59.72
C	$61.64
D	$81.92
EN	$89.10
ES	$90.09
F	$103.12
GN	$97.17
G	$63.60
HW	$91.35
HE	$75.54
IW	$83.50
IE	$128.28
J	$67.86
KW	$156.25
KE	$140.99
L	$116.58
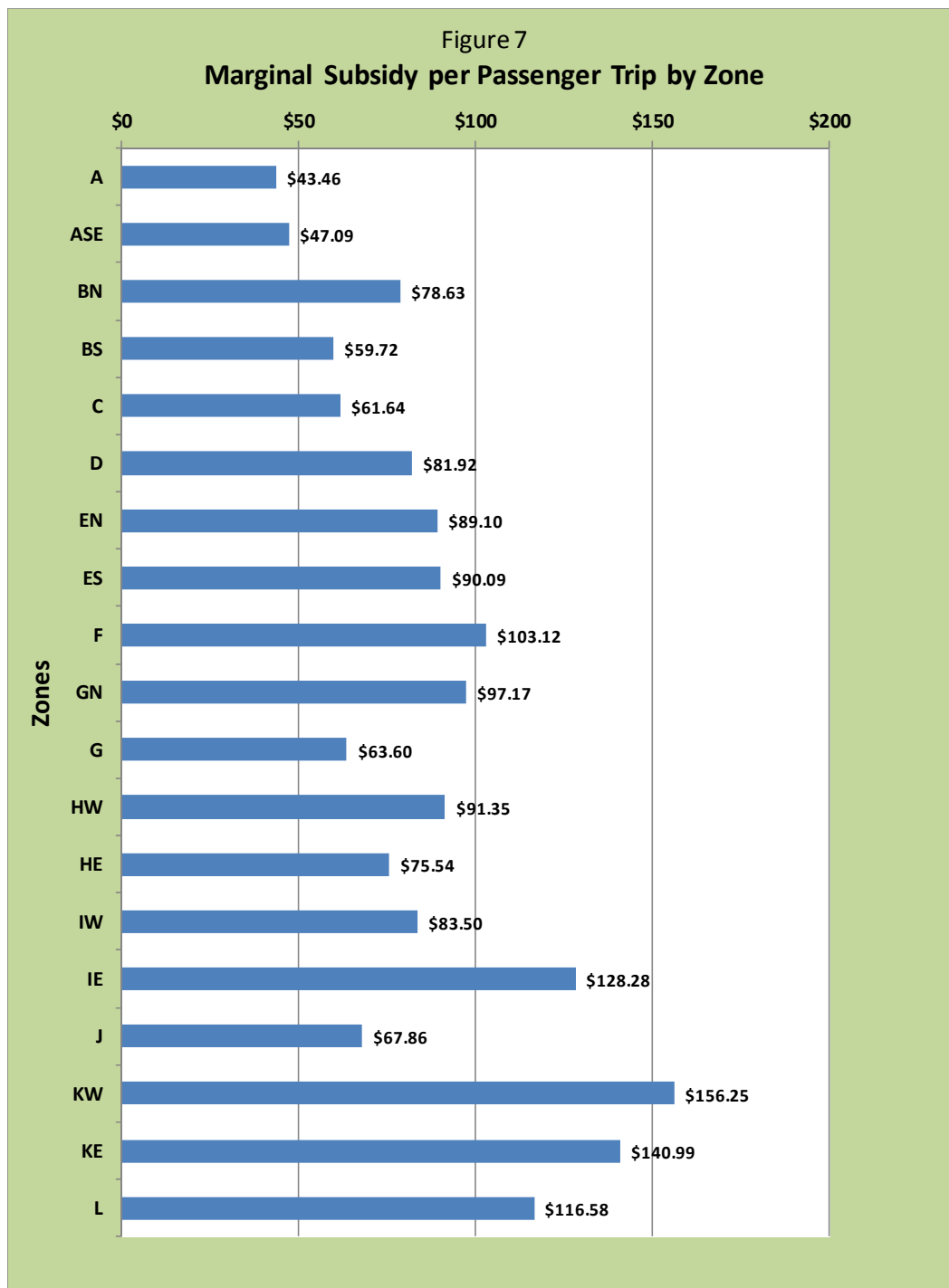
The "performance measure" of subsidy per passenger-trip is of particular importance to a public transit provider, as it directly relates the principal "input" (public funding) to the principal output (passenger-trips). This figure can also be used to begin comparing the effectiveness of funding services in various portions of the county. Under the assumptions presented above, for example, serving a passenger in Placerville or Diamond Springs (Zone A) requires $43.46, while serving a passenger in Pollock Pines (Zone K_e) requires $140.99. In rough terms, therefore, 3 passengers in Placerville or Diamond Springs can be served for the same level of resources required to serve 1 passenger in Pollock Pines.

Using the marginal costs required to serve a passenger in each zone, it is possible to calculate the total annual costs required to serve each zone. Annual ridership for 2015 was estimated based off of the DAR Routematch data from April 5, 2015 through April 18, 2015. The total annual ridership per zone was then estimated based on the percentage of the total weekday trip origins by zone, as presented in Table 7. With the total annual ridership per zone, it is possible to calculate the total, annual vehicle-miles, vehicle-hours, operating costs, operating subsidies, and fare revenues associated with serving each zone.

Analysis of Existing Dial-A-Ride Equity

The concept of equity is important in any public service, particularly for transit service. While it is also important to focus resources where they are most efficient or productive (such as in denser travel corridors), the fact that public funds are used brings with it a need to also consider providing service in an equitable manner. Of course, there are many versions of "equity" that can be considered:

- The current DAR zone and fare system is designed to be "equitable" in that **fares are graduated roughly in line with the cost of providing service,** intended to yield roughly equal proportions of fare revenue to operating costs for passengers ("farebox return ratio") in various portions of the County. The cost of providing service is, in turn, a function of the distance and travel time from the operating base in Diamond Springs. As shown in Table 11, the current service is reasonably equitable by this measure, in that the farebox return ratio varies in a relatively narrow band from 4.0 percent (for the southern Camino zone) to 8.0 (for the El Dorado Hills Zone). Put another way, however, the farebox return ratio in Zones E (Camino) and Ie (Garden Valley) are only 72 percent and 78 percent of the system wide average, while the value for Zone G (El Dorado Hills) is 142 percent of the system wide average. This would indicate a need for increased fares in the Camino and Garden Valley areas and a decrease for the El Dorado Hills area to make the fare levels more equitable.

- Another measure of equity would be that **all passengers would pay the same fare**. The current system, with graduated fares, is specifically designed not to be equitable in this manner, with average fares in the most outlying areas such as Garden Valley that are more than 3 times the average fare.

- The equity by which transit services are allocated across the service area can be measured by the **subsidy per capita** (as subsidy is the key resource to be allocated) for the various zones. This measure reflects the argument that all citizens have the same claim on public transit funds, regardless of where they live. As also shown in Table 11, the current system is quite inequitable by this measure. While $34.95 of subsidy is expended for every resident of Zone A (Placerville) and $33.86 for every resident of Zone C (southern El Dorado and Diamond Springs), only $1.65 is expended for every resident of Zone L (southeast Camino area) and $1.80 is expended for every resident of Zone Es (southern Camino area). As a demand-response service, of course, much of the annual expenditures in the various areas depends on the level of ridership generated in each area. It is therefore not surprising that the lowest per-capita spending occurs in the lowest per-capita ridership areas.

- A final measure of equity would be the **subsidy per passenger-trip**. This measure reflects the argument that all transit ridership (once residents choose to use transit service) have the same claim to transit resources, regardless of where they live. By this measure, Zone A has

TABLE 11: El Dorado Transit DAR Equity Analysis

Zone	Zone Population	Annual Ridership	Annual Vehicle-miles	Annual Vehicle-hours	Daily Fare Revenue	Annual Fare Revenue	Annual Operating Cost	Annual Operating Subsidy	Farebox Return Ratio		Average Fare		Operating Subsidy Per Capita		Operating Subsidy per Passenger	
									Value	Proportion of Average Systemwide Value	Value	Proportion of Average Systemwide Value	Value	Proportion of Average Systemwide Value	Value	Proportion of Average Systemwide Value
A	22,352	17,001	159,668	7,979	$119.41	$42,391	$781,221	$738,829	5.4%	97%	$2.49	83%	$33.05	281%	$43.46	86%
A_{SE}	1,281	276	2,861	143	$2.73	$968	$13,986	$13,018	6.9%	124%	$3.50	117%	$10.17	87%	$47.09	93%
B_S	29,056	5,010	65,004	3,240	$51.61	$18,322	$317,523	$299,202	5.8%	103%	$3.66	122%	$10.30	88%	$59.72	119%
C	803	415	5,560	277	$4.56	$1,617	$27,177	$25,559	6.0%	106%	$3.90	131%	$31.84	271%	$61.64	122%
E_N	5,061	449	8,535	426	$4.78	$1,696	$41,720	$40,025	4.1%	73%	$3.78	126%	$7.91	67%	$89.10	177%
E_S	1,806	35	664	33	$0.37	$130	$3,243	$3,113	4.0%	72%	$3.78	126%	$1.72	15%	$90.09	179%
G	25,846	760	11,523	513	$11.78	$4,181	$52,526	$48,345	8.0%	142%	$5.50	184%	$1.87	16%	$63.60	126%
H_E	3,615	173	2,870	143	$2.76	$979	$14,031	$13,052	7.0%	125%	$5.67	190%	$3.61	31%	$75.54	150%
I_W	4,286	207	3,791	189	$3.43	$1,218	$18,530	$17,312	6.6%	117%	$5.88	197%	$4.04	34%	$83.50	166%
I_E	3,941	138	3,793	189	$2.29	$812	$18,542	$17,730	4.4%	78%	$5.88	197%	$4.50	38%	$128.28	255%
J	1,731	69	1,047	52	$1.20	$427	$5,116	$4,689	8.3%	149%	$6.18	207%	$2.71	23%	$67.86	135%
K_E	3,752	138	4,161	208	$2.40	$853	$20,341	$19,487	4.2%	75%	$6.18	207%	$5.19	44%	$140.99	280%
L	2,440	35	868	43	$0.60	$213	$4,242	$4,028	5.0%	90%	$6.18	207%	$1.65	14%	$116.58	231%
Totals:	105,969	24,706	270,344	13,437	208	$73,808	$1,318,198	$1,244,390	5.6%		$2.99		$11.74		$50.37	

Note 1: Zones experiencing zero ridership in the weekday study period not included in analysis
Note 2: Data is projected for 2015 based off of two week study period Apr 6, 2015 to Apr 10, 2015 and April 13, 2015 to Apr 17, 2015

the lowest allocation of service ($43.46 per passenger-trip), while the outlying zones such as Zone K and L exceed $100 per passenger-trip).

It is clear from this review that the various definitions of "equity" result in very different findings. In general, the current program is closer to equitable as measured by the farebox return ratio (though modifications may still be warranted, as discussed above). If a greater emphasis is placed on the subsidy per capita measure, a reduction in the relative fare for the outlying areas could be considered.

Transit Demand Analysis

The analysis presented below segments the potential ridership for El Dorado Transit services into two categories:

1. General public intra-county trips
2. Elderly/disabled trips not associated with a social service program

The transit trips associated with social service programs are not considered in this evaluation, as this need is addressed by El Dorado Transit's contracted services.

This analysis yields estimates of the demand that could be expected given a high level of transit service for each category of ridership, and for each zone of the study area. It represents an "upper bound" for an idealized transit service that could serve all of the needs of the community. In reality, no service can efficiently serve one hundred percent of this potential demand; additional analysis will be conducted for various service alternatives to determine the proportion of this total demand that can be realistically achieved.

As a first step, the demographic data available for the study area was reviewed. The data used in the demand analysis is summarized in Table 12. This data was then applied to a series of analytical techniques, to provide a series of estimates of the various types of transit demand. Finally, these estimates were considered as a whole to develop overall estimates of total transit demand.

Social Service Program Transit Demand

In rural and suburban areas, such as western El Dorado County, the transit trips made by residents to and from specific social programs (such as for job training or sheltered workshops) typically comprise approximately half of the total transit demand. This demand differs from other types of demand in that it is specifically generated by each program. As this demand is addressed by the contracted services, it does not materially impact El Dorado Transit's decision-making process regarding directly provided services.

Elderly/Disabled Non-Program-Related Transit Demand

An important source of information regarding demand generated by programs is the Transit Cooperative Research Program (TCRP) Project B-36: <u>Methods for Forecasting Demand and Quantifying Need for Rural Passenger Transportation</u>. This study represents substantial research into demand for transit service in rural areas and small communities. 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.

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 of annual transit service per square mile of service area.

			Estimated 2013 Population			
Tract	Area Description	Area (Square Miles)	Total	Age 60 or Over	Mobility Limited Age 5 - 64	Below Poverty, Age 0 - 64
306.01	Pilot Hill / Cool	63.6	5,105	1220	65	265
306.02	Greenwood / Garden Valley	138.0	6,562	1837	349	390
306.03	North Central County	470.7	3,300	931	165	318
307.01	Lakeridge Oaks	5.2	6,567	1287	160	138
307.04	South El Dorado Hills / Latrobe	55.2	6,462	1519	129	676
307.06	West El Dorado Hills	3.2	5,868	1361	96	50
307.09	Green Springs Ranch	5.5	4,867	934	22	10
307.10	Northeast El Dorado Hills	3.1	5,356	1119	43	58
308.01	Deer Valley / Rescue	23.9	4,193	994	101	68
308.03	East Cameron Park	9.5	7,631	1931	137	331
308.04	Shingle Springs / Frenchtown	26.6	6,666	2033	121	817
308.07	Southwest Cameron Park	1.9	4,052	750	175	311
308.08	Northwest Cameron Park	2.2	7,460	1238	114	117
308.09	South Central Cameron Park	0.9	2,595	540	68	173
308.10	North Central Cameron Park	0.9	3,056	642	72	279
309.01	Coloma / Lotus Area	25.1	2,808	772	20	184
309.02	N.Greenstone / Missouri Flat Area	19.5	4,638	1354	103	194
310	Northwest Placerville	10.4	5,631	1487	253	1290
311	North Placerville	14.2	5,627	1412	190	753
312	South Placerville	8.1	4,778	1424	68	169
313.01	Smith Flat / Camino	17.9	3,519	1168	77	274
313.02	N. Pollock Pines / Cedar Grove	12.9	4,726	1205	371	747
314.02	Somerset / Mt. Aukum	304.6	4,993	1318	53	270
314.04	New Town / Old Fort Jim	15.9	2,257	621	21	233
314.05	Rancho del Sol / Gold Ridge	10.9	2,356	622	27	155
314.06	Fresh Pond / Pleasant Valley	29.9	5,776	1288	179	529
315.02	South Missouri Flat Area	10.2	6,403	1626	289	889
315.03	Kingsville / Nashville	38.4	2,885	906	58	122
315.04	Deer Park Area	22.9	5,255	1477	243	268
317	Northwest El Dorado Hills	1.5	2,809	402	78	69
318	Southeast El Dorado Hills	3.1	7,451	797	26	336
319	Southeast County	190.6	74	41	2	24
	2013 Estimates	1,546	151,726	36,256	3,875	10,507

TABLE 12: Service Area Demand Analysis Input Data

Employing this service density to the population of each of the census tracts comprising the study area yields the estimated of elderly/disabled transit demand shown in Table 13. As indicated, a total of 981,900 one-way passenger-trips would be generated by the elderly/disabled for non-program transportation if this very high level of service could be provided. By census tract, this demand varies from 1,100 annual trips from Southeast County to 53,600 from Shingle Springs/Frenchtown.

TABLE 13: Estimated Non-Program Transit Demand

Census Tract		Estimated Annual Passenger-Trip Demand					Calibrated DAR Demand	Estimated Daily (Weekdays) Transit Demand	
		Elderly	Mobility Limited	Elderly and Mobility Limited	General Public	TOTAL		#	%
306.01	Pilot Hill / Cool	31,110	940	32,100	4,800	36,900	2,698	11	3.3%
306.02	Greenwood / Garden Valley	46,850	5,030	51,900	7,100	59,000	4,362	17	5.3%
306.03	North Central County	23,730	2,380	26,100	5,800	31,900	2,193	9	2.7%
307.01	Lakeridge Oaks	32,770	2,300	35,100	2,500	37,600	2,950	12	3.6%
307.04	South El Dorado Hills / Latrobe	38,720	1,860	40,600	12,200	52,800	3,412	14	4.1%
307.06	West El Dorado Hills	34,580	1,380	36,000	900	36,900	3,025	12	3.7%
307.09	Green Springs Ranch	23,900	320	24,200	200	24,400	2,034	8	2.5%
307.10	Northeast El Dorado Hills	28,780	620	29,400	1,100	30,500	2,471	10	3.0%
308.01	Deer Valley / Rescue	25,340	1,460	26,800	1,200	28,000	2,252	9	2.7%
308.03	East Cameron Park	49,200	1,970	51,200	6,000	57,200	4,303	17	5.2%
308.04	Shingle Springs / Frenchtown	51,850	1,740	53,600	14,800	68,400	4,504	18	5.5%
308.07	Southwest Cameron Park	19,060	2,520	21,600	5,600	27,200	1,815	7	2.2%
308.08	Northwest Cameron Park	31,900	1,660	33,600	2,100	35,700	2,824	11	3.4%
308.09	South Central Cameron Park	14,090	1,000	15,100	3,200	18,300	1,269	5	1.5%
308.10	North Central Cameron Park	16,750	1,060	17,800	5,200	23,000	1,496	6	1.8%
309.01	Coloma / Lotus Area	19,690	290	20,000	3,300	23,300	1,681	7	2.0%
309.02	N.Greenstone / Missouri Flat Area	34,550	1,480	36,000	3,500	39,500	3,025	12	3.7%
310	Northwest Placerville	37,940	3,650	41,600	23,300	64,900	3,496	14	4.2%
311	North Placerville	36,070	2,740	38,800	13,600	52,400	3,261	13	4.0%
312	South Placerville	36,340	980	37,300	3,100	40,400	3,135	12	3.8%
313.01	Smith Flat / Camino	29,830	1,110	30,900	5,000	35,900	2,597	10	3.1%
313.02	N. Pollock Pines / Cedar Grove	30,750	5,350	36,100	13,500	49,600	3,034	12	3.7%
314.02	Somerset / Mt. Aukum	33,610	760	34,400	4,900	39,300	2,891	12	3.5%
314.04	New Town / Old Fort Jim	15,830	300	16,100	4,200	20,300	1,353	5	1.6%
314.05	Rancho del Sol / Gold Ridge	15,870	390	16,300	2,800	19,100	1,370	5	1.7%
314.06	Fresh Pond / Pleasant Valley	32,840	2,580	35,400	9,600	45,000	2,975	12	3.6%
315.02	South Missouri Flat Area	41,450	4,160	45,600	16,100	61,700	3,832	15	4.6%
315.03	Kingsville / Nashville	23,100	840	23,900	2,200	26,100	2,008	8	2.4%
315.04	Deer Park Area	37,680	3,500	41,200	4,800	46,000	3,462	14	4.2%
317	Northwest El Dorado Hills	10,140	1,120	11,300	1,200	12,500	950	4	1.2%
318	Southeast El Dorado Hills	20,380	380	20,800	6,100	26,900	1,748	7	2.1%
319	Southeast County	1,050	30	1,100	400	1,500	92	0	0.1%
	Total Study Area	925,750	55,900	981,900	190,300	1,172,200	82,516	329	100%

General Public Transit Demand

The TCRP methodology can also be applied to general public non-work trips, as also shown in Table 13. As indicated, a total demand of 190,300 annual passenger-trips are estimated for the study area as a whole, ranging from 400 for the Southeast County tract to 23,300 for the Northwest Placerville tract.

Total Intra-County Non-Program Transit Demand

By adding the elderly/disabled non-program and the general public demand estimates, it is possible to identify the total demand for transit services (other than those required for specific social service programs) within the study area to be 1,172,200 one-way passenger-trips per year. This figure can be considered to represent the total demand for El Dorado Transit service (other than the Sacramento Commuter and Medical services). An important conclusion of this analysis is that roughly 84 percent of the total demand for service is generated by the elderly/disabled.

Demand for Dial-A-Ride Service – Existing Service Area

While the figures discussed above represent a feasible potential demand for *all* transit service, it is very useful for purposes of this specific study to assess the specific demand for Dial-A-Ride service, calibrated based upon observed ridership levels in the portion of the El Dorado Transit service area best served by the existing Dial-A-Ride system: Zone A. This specific demand analysis was conducted in the following steps:

1. The existing annual ridership generated within the Dial-A-Ride Zone A area was estimated based upon the forecast of 2014/15 Dial-A-Ride ridership (24,660 one-way passenger-trips) times the proportion of existing passenger trips generated by residents of Dial-A-Ride Zone A (roughly 67 percent), as reflecting in the origin/destination data presented in Table 7. The resulting figure is 16,621 passenger-trips per year.

2. Dividing this figure by the *total* potential elderly/disabled demand in Dial-A-Ride Zone A (197,780), the existing Dial-A-Ride program is found to generate ridership equal to 8.4 percent of the total potential demand. (Elderly/disabled demand was used in this analysis, reflecting the fact that Dial-A-Ride ridership falls within these categories.)

3. Applying this factor to the elderly/mobility limited total demand estimates for each census tract yields the calibrated Dial-A-Ride demand for each tract.

The resulting figures can be considered to represent the ridership that would be generated in each census tract, if the existing level of service provided to Zone A (with equivalently low fares) could be provided to the entire service area. As shown in Table 14, a total of 82,516 passenger-trips would be generated per year (329 per weekday), representing a roughly 300 percent increase over current ridership levels. It is important to note, none of the top three census tracts in terms of total Dial-A-Ride demand (Greenwood/Garden Valley, Shingle Springs/Frenchtown, or East Cameron Park) are currently within the Zone A service area.

For purposes of this analysis, it is also necessary to consider Dial-A-Ride demand based upon the system of 19 (12 current, 7 additional) service zones depicted in Figure 2. The correlation between the service analysis zones and the census tracts was determined, based upon census

tract maps. Considering only the existing DAR service area, the existing potential demand is 66,831 passenger-trips per year. Comparing with the existing ridership, the DAR program is currently serving just over 33 percent of the potential demand *assuming that Zone A service could be provided throughout the service area*. (Actually serving this demand, of course, would be a very expensive undertaking, as much of the additional demand would be generated in areas relatively remote and hard to serve.)

TABLE 14: Ridership Demand Forecast by Analysis Zone

	Zone	Annual Growth in Demand	Annual Residential Demand		Average Weekday Residential Demand		Growth in Demand 2015-20	
			2015	2020	2015	2020	#	%
EXISTING DAR SERVICE AREA	A	0.4%	13,794	14,085	49.5	50.5	291	2.1%
	A_{SE}	1.2%	766	811	2.7	2.9	45	5.8%
	B_N	1.1%	743	785	2.7	2.8	42	5.6%
	B_S	1.1%	15,285	16,122	54.8	57.8	837	5.5%
	C	0.9%	537	561	1.9	2.0	24	4.4%
	D	1.8%	1,012	1,102	3.6	4.0	90	8.9%
	E_N	0.6%	3,442	3,551	12.3	12.7	109	3.2%
	E_S	1.2%	1,082	1,145	3.9	4.1	63	5.8%
	F	1.3%	3,906	4,155	14.0	14.9	249	6.4%
	G_N	1.3%	1,966	2,091	7.1	7.5	124	6.3%
	G	1.3%	10,545	11,211	37.8	40.2	666	6.3%
	H_W	0.4%	853	871	3.1	3.1	18	2.1%
	H_E	1.0%	2,204	2,311	7.9	8.3	106	4.8%
	I_W	1.4%	2,524	2,695	9.1	9.7	171	6.8%
	I_E	1.5%	2,619	2,810	9.4	10.1	191	7.3%
	J	1.0%	1,205	1,264	4.3	4.5	59	4.9%
	K_W	1.0%	823	863	3.0	3.1	40	4.9%
	K_E	1.0%	2,219	2,327	8.0	8.3	108	4.9%
	L	1.2%	1,303	1,379	4.7	4.9	76	5.8%
	Total		66,831	70,139				
POTENTIAL ADDITIONAL DAR AREAS	Somerset Area	1.5%	1,012	1,071	3.6	3.8	59	5.8%
	Georgetown Area	1.5%	1,857	1,994	6.7	7.2	137	7.4%
	Cool Area	2.3%	2,324	2,494	8.3	8.9	169	7.3%
	Pilot Hill Area	2.7%	809	904	2.9	3.2	95	11.7%
	Mosquito/Swansboro Area	2.8%	877	995	3.1	3.6	118	13.5%
	Total		6,880	7,458				
TOTAL			73,711	77,596				
Source: BAE 2035 Growth Projections - El Dorado County								

In addition, population growth forecasts for the various sections of the study area for the period between 2015 and 2020 were obtained from the BAE 2035 Growth Projections for El Dorado County. As shown in Table 14, these forecasts identify a growth rate of 0.3 to 1.8 percent per year for all of the study area. In terms of absolute numbers, Zones B_s and G (Cameron Park and

El Dorado Hills) are projected to have the largest five-year increase of annual residential demand with growths 837 and 666 respectively.

These transit demand forecasts are based solely on demographic trends, and do not include any consideration of changes in transit usage rates for each population subcategory. Factors such as increases in fuel cost, increases in parking fees, or growth in traffic congestion which can increase the attractiveness of transit service are not included. As a result, these forecasts are considered to be conservative.

Potential Demand for Expanded DAR Areas

This same analysis procedure can be applied to other potential service areas, as shown in the bottom portion of Table 14. A total of five such areas were considered, based upon public input: the Somerset area, the Georgetown area, the Cool area, the Pilot Hill area, and the Mosquito/Swansboro area. For each, demographic data was obtained and the calibrated demand rates applied to estimate potential demand. As shown, as a whole these five area would generate demand for 6,880 passenger-trips per year, or roughly a 10 percent increase over the demand of the existing area. By area, the greatest demand is in the Cool area (2,324) followed by the Georgetown area (1,857).

Chapter 4
Alternatives Analysis

Based upon the analysis presented in the previous chapters, the following are alternatives that merit evaluation in subsequent portions of this study:

- Elimination of general public (non-elderly or disabled) ridership from the program, given the lack of current ridership.

- Modifications to fares to increase the fare equity and simplify the zone system, such as an increase in Zone E fares and decrease in Zone G fares.

- Elimination of areas with low observed ridership (such as Zones F, J, and L) or combination with other zones to simplify the zone system.

- Expansion of the service area to include one or more of the five potential expansion areas discussed above.

- Reconfiguring the fare structure to reflect the existing required operating cost per passenger-trip (as shown in Table 10) and to simplify the zone structure. As an example, Zone 1 could be defined as all areas that require less than $75 per passenger-trip, Zone 2 as those requiring $75 to $110, and Zone 3 as those requiring over $110. This would result in the following three zones:

New Zone	Existing Zones
1	A, A_{SE}, B_S, C, G, J
2	B_N, D, E, F, G_N, H, I_W
3	I_E, K, L

Analysis of Potential Alternatives

One of the most important steps in analyzing potential alternatives is estimating the future levels of ridership by zone. In the analysis of potential alternatives involving a change in fare pricing, future ridership was determined by the "price elasticity of demand", a measure used to show the change in the quantity of demand as a result of a change in price. Based on the field of microeconomics, this standard methodology reflects how the demand for a good or service (in this case, transit ridership) is impacted by the price for that good or service (the fare). In this case, it involved the following equation:

$$\textit{\# of Future Psgrs} = \textit{\# of Existing Psgrs} \times \left(\frac{\textit{Future Fare}}{\textit{Existing Fare}}\right)^{\textit{Elasticity}}$$

For the case of Dial-A-Ride services, an "Elasticity" value of -0.35 was used, based upon the response to fare changes seen in other dial-a-ride services serving lower density areas. The negative value of the elasticity factor reflects that a fare increase results in a change in demand in the opposite direction. The values for "# of Existing Passengers" and "Existing Fare" were obtained from Tables 11 and 12, above.

The analysis of alternatives for a demand-response system also need to reflect the fact that (unlike fixed route services), a change in ridership demand also results in the service levels needed to serve the ridership, and thus impact the operating costs of service.

Increase Dial-A-Ride Fares

One self-evident means of reducing subsidy requirements would be to increase passenger fares. The disadvantage, of course, is the resulting loss in ridership, as well as the impact on individual passengers. For purposes of this analysis, a $0.50 across-the-board fare increase was assumed. Border crossing charges were kept at $0.50. Under this option, the Zone A base fare would increase from $2.00 to $2.50 per one-way trip, while at the other extreme the Zone G fare would increase from $5.00 to $5.50.

As shown in Table 15, this option would have the following impacts:

- Total annual ridership would be reduced by an estimated 1,368 passenger-trips per year (or on the order of 5 per weekday). Reflecting the concentration of existing ridership within Zone A, most of this reduction (1,053) would be among Zone A riders.

- Overall farebox revenues would be increased by approximately $7,800, or 11 percent.

- Reflecting the lower ridership, the required vehicle-hours of service and associated costs would be reduced by an estimate 5 percent. This results in an annual operating cost saving of approximately $69,800 per year.

- Considering both increased fare revenues and reduced costs, this option would reduce operating subsidies for DAR service by an estimated $77,600 per year.

Considering the specific alternative, this option is equitable in that all portions of the existing DAR service area would be impacted equally. However, the current disparity of fares would be continued (though it would be slightly reduced on a proportionate basis).

In considering a fare increase, it is worthwhile to compare the current fares with those of other similar Dial-A-Ride systems that provide service over a relatively wide area:

System	Fare Range	Passengers Served
Placer County Transit	$2.50	Disabled Only
Roseville Transit	$2.50	Disabled Only
Butte County B-Line	$2.75	Disabled + Seniors
Monterey Salinas Transit	$3.00-$7.00	Disabled Only
Livermore-Amador Valley	$3.50	Disabled Only
Yolobus	$3.00-$5.00	Disabled Only
Merced "The Bus"	$5.00	Disabled Only
El Dorado Transit	**$2.00 -- $5.00**	**General Public (5 of 7 Zones)**

As indicated, El Dorado Transit's lowest (Zone A) fare of $2.00 is $0.50 below the lowest fare of these peer systems, and roughly $1.00 below the average of the lowest fares.

Fares were last raised in 2010, when the lowest Zone A fare was increased from $1.50 to $2.00 for senior/disabled riders, and from $3.00 to $4.00 for general public. Since that time, inflation

TABLE 15: Alternative Analysis - 50 Cent Fare Increase (Border Charge Remains 50 cents)

Analysis Zone	Existing Ridership	Existing Fare[1]	New Fare	Projected Ridership	Change in Ridership #	Change in Ridership %	Vehicle Trips	Annual Miles	Annual Hours	Operating Cost	Total Fare Revenue	Annual Subsidy
A	17,001	$2.49	$2.99	15,947	-1,053	-6%	15,235	149,775	7,485	$732,815	$47,739	$685,077
Ase	276	$3.50	$4.00	264	-13	-5%	264	2,730	136	$13,347	$1,055	$12,292
Bs	5,010	$3.66	$4.16	4,791	-220	-4%	4,365	62,152	3,098	$303,595	$19,913	$283,682
Bn	-	$3.48	$3.98	-	0	-	-	-	-	$0	$0	$0
C	415	$3.90	$4.40	398	-17	-4%	398	5,330	266	$26,053	$1,749	$24,304
D	-	$3.78	$4.28	-	0	-	-	-	-	$0	$0	$0
En	449	$3.78	$4.28	430	-19	-4%	430	8,171	408	$39,943	$1,839	$38,105
Es	35	$3.78	$4.28	33	-1	-4%	33	635	32	$3,105	$141	$2,964
F	-	$5.78	$6.28	-	0	-	-	-	-	$0	$0	$0
G	760	$5.50	$6.00	737	-23	-3%	699	11,177	498	$50,950	$4,424	$46,526
Gn	-	$5.58	$6.08	-	0	-	-	-	-	$0	$0	$0
Hw	-	$5.65	$6.15	-	0	-	-	-	-	$0	$0	$0
He	173	$5.67	$6.17	168	-5	-3%	168	2,787	139	$13,622	$1,034	$12,587
Iw	207	$5.88	$6.38	201	-6	-3%	201	3,684	184	$18,008	$1,284	$16,723
Ie	138	$5.88	$6.38	134	-4	-3%	134	3,686	184	$18,020	$856	$17,164
J	69	$6.18	$6.68	67	-2	-3%	67	1,019	51	$4,979	$449	$4,530
Kw	-	$6.18	$6.68	-	0	-	-	-	-	$0	$0	$0
Ke	138	$6.18	$6.68	135	-4	-3%	135	4,049	202	$19,794	$898	$18,896
L	35	$6.18	$6.68	34	-1	-3%	34	844	42	$4,128	$224	$3,903
Totals	24,706			23,339	-1,368	-6%	22,162	256,041	12,725	$1,248,358.7	$81,607	$1,166,752
Change #									-712	-$69,839.2	$7,799	-$77,638
Change %									-5%	-5%	11%	-6%

Note 1: Average fare, including zone charges.

has reduced the value of a dollar by 9 percent, indicating that a fare of $2.18 in 2015 is needed to be equivalent to a $2.00 fare in 2010.

Flat Fare

The current 12-zone system was established based on the concept that all passengers should pay approximately the same proportion of operating costs through their fares. While equitable from this perspective, the fact that the operating costs of service are in large part a function of the travel distance from the El Dorado Transit operating base in Diamond Springs results in the wide range of fares, from $2.00 to $5.00, as well as the zone boundary charges. This zone system has proven to be somewhat cumbersome to explain to passengers, as well as a complication to the operation and management of the system.

One very straightforward option would be to simply do away with the zone boundaries, implementing a single flat fare for all services throughout the DAR service area. Implementation of a flat fare could be used to increase ridership in outlying zones with high levels of demand. In the analysis, the fare was set at $3.00 throughout the entire, existing zone system. The results can be seen in Table 16:

- Annual ridership would be effectively unchanged (reduction of less than 1 rider per week). This is the result of a reduction of 1,212 passenger-trips in Zone A (due to the relatively high fare increase from the current average fare including zone boundary charges of $2.49. This loss is offset by ridership increases in the other zones, notably in Zone B (Cameron Park) with 430 additional passenger-trips and in Zone G (El Dorado Hills with 254 additional passengers-trips.

- The shift in ridership from relatively short Zone A trips to trips in the outlying zones would increase annual vehicle-hours by 412 per year, or 3 percent over current levels, yielding an increase in annual operating costs of roughly $41,000.

- Overall impact on fare revenues would be minimal, calculated at only $216 per year. As a result, annual operating subsidy requirements would also be increase by approximately $41,000 per year.

This option would certainly make the DAR service easier for passengers to use and staff to administer. It would also make the system fully equitable, considering simply that all passengers would be charged the same fare. However, it would reduce equitability in that passengers making longer trips (and thus costing the service more to provide) would be paying a smaller proportion of the overall costs. Finally, while the elimination of the border charge would benefit some Zone A passengers, the large majority of Zone A passengers (approximately 70 percent) that travel wholly within Zone A would incur a 50 percent fare increase (from $2 to $3).

Elimination of Border Crossing Fares

Another way of simplifying the fare system, while also generating ridership in outlying zones, would be the elimination of the $0.50 border crossing fares (assuming no change in the existing base fares). This would not affect the fare for trips within a zone, but would reduce fares for longer trips and would make understanding and administering the system slightly easier.

TABLE 16: Alternative Analysis -- Flat Fare

Analysis Zone	Existing Ridership	Existing Fare[1]	New Fare	Projected Ridership	Change In Ridership #	Change In Ridership %	Annual Vehicle Trips	Annual Miles	Annual Hours	Total Operating Cost	Total Fare Revenue	Total Annual Subsidy
A	17,001	$2.49	$3.00	15,789	-1,212	-7%	15,084	148,284	7,410	$725,520	$47,366	$678,154
Ase	276	$3.50	$3.00	294	18	6%	294	3,043	152	$14,875	$882	$13,993
Bs	5,010	$3.66	$3.00	5,423	413	8%	4,942	70,360	3,507	$343,687	$16,270	$327,418
Bn	-	$3.48	$3.00	17	17	-	17	283	14	$1,386	$51	$1,335
C	415	$3.90	$3.00	461	46	11%	461	6,175	308	$30,184	$1,382	$28,802
D	-	$3.78	$3.00	23	23	-	23	403	20	$1,969	$69	$1,900
En	449	$3.78	$3.00	492	43	10%	492	9,357	467	$45,737	$1,477	$44,259
Es	35	$3.78	$3.00	38	3	10%	38	727	36	$3,556	$114	$3,442
F	-	$5.78	$3.00	89	89	-	89	1,976	99	$9,658	$266	$9,392
G	760	$5.50	$3.00	969	209	27%	918	14,685	654	$66,938	$2,906	$64,031
Gn	-	$5.58	$3.00	45	45	-	45	938	47	$4,588	$134	$4,454
Hw	-	$5.65	$3.00	19	19	-	19	384	19	$1,879	$58	$1,821
He	173	$5.67	$3.00	223	50	29%	223	3,702	185	$18,095	$668	$17,427
Iw	207	$5.88	$3.00	271	64	31%	271	4,960	248	$24,245	$814	$23,432
Ie	138	$5.88	$3.00	181	43	31%	181	4,963	248	$24,262	$543	$23,719
J	69	$6.18	$3.00	92	23	33%	92	1,397	70	$6,829	$277	$6,552
Kw	-	$6.18	$3.00	19	19	-	19	621	31	$3,034	$56	$2,978
Ke	138	$6.18	$3.00	184	46	33%	184	5,554	277	$27,150	$553	$26,597
L	35	$6.18	$3.00	46	12	33%	46	1,158	58	$5,662	$138	$5,523
Totals	24,706			24,675	-32	0%	23,437	278,971	13,849	$1,359,253	$74,024	$1,285,229
Change #									412	$41,055	$216	$40,839
Change %									3%	3%	0%	3%

Note 1: Average fare, including zone charges.

TABLE 17: Alternative Analysis - Eliminate Border Charge, No Change in Base Fares

Analysis Zone	Existing Ridership	Existing Fare[1]	New Fare	Projected Ridership	Change In Ridership #	Change In Ridership %	Annual Vehicle Trips	Annual Miles	Annual Hours	Total Operating Cost	Total Fare Revenue	Total Annual Subsidy
A	17,001	$2.49	$2.35	17,364	364	2%	16,589	163,084	8,150	$797,935	$40,757	$757,177
Ase	276	$3.50	$3.08	289	13	5%	289	2,993	149	$14,632	$890	$13,743
Bs	5,010	$3.66	$3.23	5,231	221	4%	4,767	67,870	3,383	$331,524	$16,911	$314,614
Bn	-	$3.48	$3.10	3	3	-	3	44	2	$214	$8	$206
C	415	$3.90	$3.18	445	31	7%	445	5,971	298	$29,189	$1,416	$27,773
D	-	$3.78	$3.10	4	4	-	4	62	3	$304	$11	$293
En	449	$3.78	$3.10	481	32	7%	481	9,144	456	$44,698	$1,492	$43,206
Es	35	$3.78	$3.10	37	2	7%	37	711	35	$3,475	$115	$3,360
F	-	$5.78	$5.00	14	14	-	14	305	15	$1,493	$69	$1,424
G	760	$5.50	$5.00	786	26	3%	745	11,914	531	$54,308	$3,930	$50,378
Gn	-	$5.58	$5.00	7	7	-	7	145	7	$709	$35	$675
Hw	-	$5.65	$5.00	3	3	-	3	59	3	$290	$15	$275
He	173	$5.67	$5.00	181	8	4%	181	2,999	150	$14,659	$903	$13,757
Iw	207	$5.88	$5.00	219	12	6%	219	4,011	200	$19,606	$1,097	$18,509
Ie	138	$5.88	$5.00	146	8	6%	146	4,014	200	$19,619	$731	$18,888
J	69	$6.18	$5.00	74	5	8%	74	1,127	56	$5,508	$372	$5,136
Kw	-	$6.18	$5.00	3	3	-	3	96	5	$469	$14	$455
Ke	138	$6.18	$5.00	149	11	8%	149	4,480	224	$21,900	$744	$21,156
L	35	$6.18	$5.00	37	3	8%	37	934	47	$4,567	$186	$4,381
Totals	24,706			25,474	767	3%	24,192	279,965	13,915	$1,365,101	$69,695	$1,295,407
Change #									478	$46,903	-$4,113	$51,016
Change %									4%	4%	-6%	4%

The analysis of this option is shown in Table 17. The average effective fare for passengers in all zones would decline, with the greatest reduction among the more remote zones where a higher proportion of existing riders cross multiple zone boundaries. Overall ridership would increase by 767 passenger-trips per year, or 3 percent, with the bulk of the ridership increase in Zones A and B.

All zones experienced an increase in annual ridership between 2 percent and 8 percent, with the larger increases occurring in outlying zones. The total annual subsidy increased by 4.1 percent. The additional ridership would increase vehicle-hours and annual costs by 4%. Addition the increased costs and loss of fare revenues, this option would increase overall subsidy requirements by roughly $51,000 per year.

Simplified Zone System

A potential "middle ground" regarding the current fare zone system would be to simplify the existing zone system into a smaller number of zones. To do this, the values for subsidy per passenger-trip shown in Table 11, above, were used to define three levels, as follows:

- Those existing zones or partial zones requiring less than $70 per passenger-trip (A, B_s, C, G, J)

- Those existing zones or partial zones requiring between $70 and $100 per passenger-trip ($B_N$, D, E, F, H I_W)

- Those existing zones or partial zones requiring more than $100 per passenger-trip ($I_E$, K, L)

Due to the geography of these individual zones, this results in a total of four larger zones. Fare levels were adjusted to result in roughly the same overall operating subsidies as at present. The resulting zones and fares are as follows, and as shown in Figure 8:

- The central zone would encompass all of Placerville, Diamond Springs, El Dorado, Shingle Springs, and Cameron, as well as the majority of El Dorado Hills (excluding the northernmost portion). The base fare for all travel within this zone would be $3.00 for seniors or persons with disabilities.

- A $4.00 base fare would be charged in the zone encompassing Camino, Coloma, Rescue and northernmost El Dorado Hills, along with a discontinuous area in the southwest portion of the county (along Latrobe Road).

- The most outlying portions of the service area, including Pollock Pines and Garden Valley, would make up the final zone, where a $5.00 fare would be charged.

Assuming Border Charges Remain

One option would be to continue to charge a $0.50 border charge for travel over the remaining zone boundaries. As shown in Table 18, this option would have the following impacts:

- Overall ridership would be reduced by 638 passenger-trips per year, or 2.6 percent. This would consist of a drop of 1,235 trips from Zone A (Placerville) and a smaller (27) drop in Zone E, offset in part by an increase in remaining zones.

Figure 8: Simplified Dial-A-Ride Zone Alternative
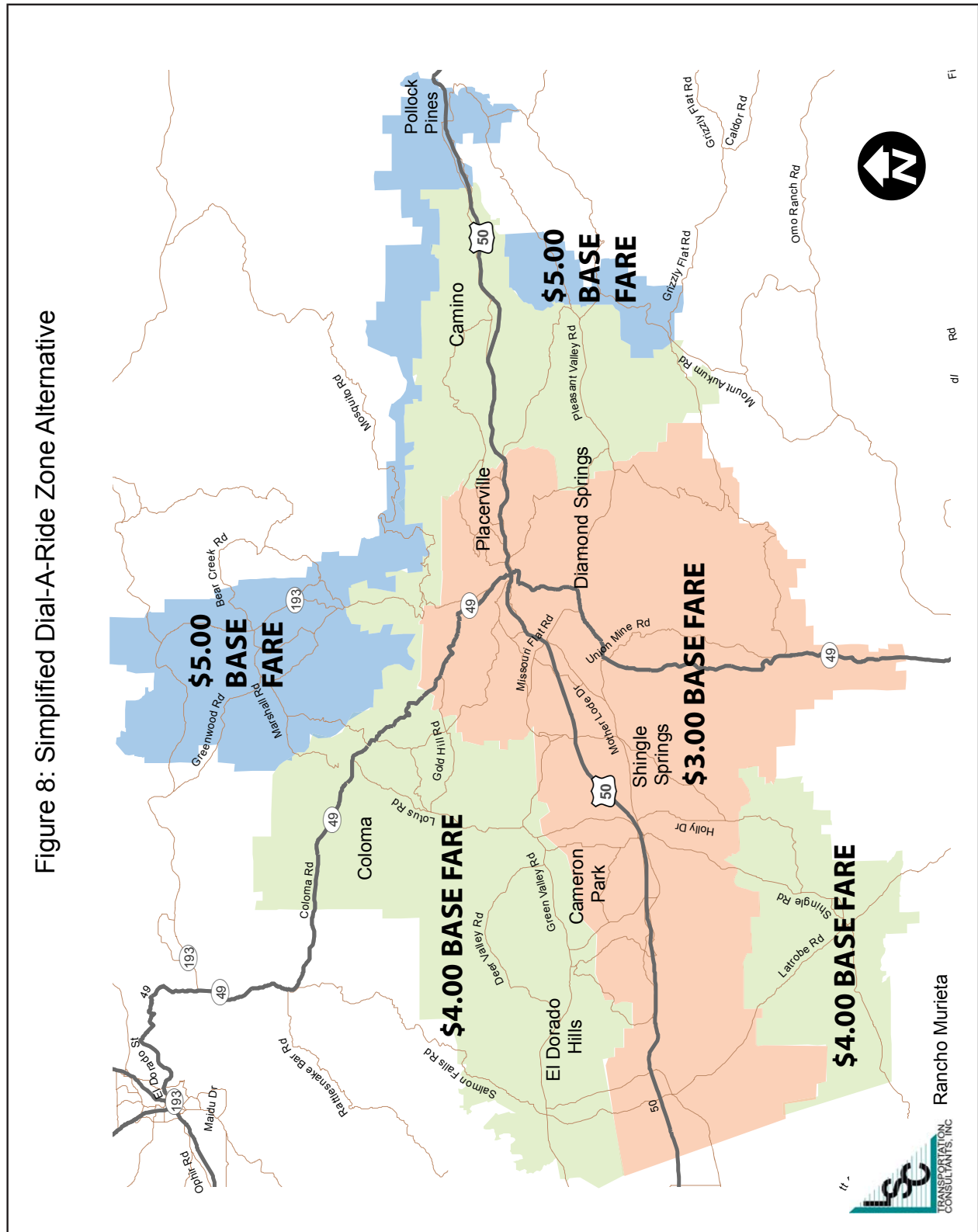
TABLE 18: Simplified Zones With Border Crossing Charges

Analysis Zone	Existing Ridership	Base Fare Existing	Base Fare With Alternative	Average Fare(1) Existing	Average Fare(1) With Alternative	Annual Ridership	Change in Ridership #	Change in Ridership %	Annual Vehicle Trips	Annual Miles	Annual Hours	Operating Cost	Fare Revenue	Total Annual Subsidy
1	**23,532**	**-**	**$3.00**	**-**	**$3.10**	**22,817**	**(715)**	**-3.0%**	**21,730**	**241,252**	**11,971**	**$1,175,076**	**$70,732**	**$1,104,344**
A	17,001	$2.00	$3.00	$2.49	$3.10	15,753	(1,247)	-7.3%	15,003	147,954	7,394			
Ase	276	$2.00	$3.00	$3.50	$3.10	288	12	4.3%	275	2,985	149			
Bs	5,010	$3.00	$3.00	$3.66	$3.10	5,309	298	6.0%	5,056	68,872	3,433			
C	415	$3.00	$3.00	$3.90	$3.10	449	35	8.4%	428	6,025	301			
G	760	$5.00	$3.00	$5.50	$3.10	929	169	22.2%	885	14,084	628			
J	69	$5.00	$3.00	$6.18	$3.10	88	19	27.3%	84	1,332	66			
2	**864**	**-**	**$4.00**	**-**	**$4.45**	**932**	**68**	**7.9%**	**932**	**10,539**	**526**	**$51,527**	**$4,147**	**$47,380**
F	-	$5.00	$4.00	$5.78	$4.45	27	27	-	27	602	30			
Gn	-	$5.00	$4.00	$5.58	$4.45	14	14	-	14	286	14			
Hw	-	$5.00	$4.00	$5.65	$4.45	6	6	-	6	117	6			
He	173	$5.00	$4.00	$5.67	$4.45	188	15	8.8%	188	253	13			
Bn	-	$3.00	$4.00	$3.48	$4.45	5	5	-	5	86	4			
Iw	207	$5.00	$4.00	$5.88	$4.45	228	21	10.2%	228	387	19			
D	-	$3.00	$4.00	$3.78	$4.45	7	7	-	7	123	6			
En	449	$3.00	$4.00	$3.78	$4.45	424	(25)	-5.6%	424	8,057	402			
Es	35	$3.00	$4.00	$3.78	$4.45	33	(2)	-5.6%	33	626	31			
3	**311**	**-**	**$5.00**	**-**	**$5.90**	**319**	**8**	**2.7%**	**319**	**9,087**	**453**	**$44,417**	**$1,884**	**$42,534**
Ie	138	$5.00	$5.00	$5.88	$5.90	138	(0)	-0.1%	138	3,788	189			
Kw	-	$5.00	$5.00	$6.18	$5.90	6	6	-	6	189	9			
Ke	138	$5.00	$5.00	$6.18	$5.90	140	2	1.6%	140	4,228	211			
L	35	$5.00	$5.00	$6.18	$5.90	35	1	1.6%	35	882	44			
Total	**24,706**				**$3.19**	**24,068**	**(638)**	**-2.6%**	**22,981**	**260,877**	**12,950**	**$1,271,020**	**$76,763**	**$1,194,257**

Change		Annual Hours	Operating Cost	Fare Revenue	Total Annual Subsidy
	#	-487	-$47,178	$2,955	-$50,133
	%	-4%	-4%	4%	-4%

Note 1: Includes border crossing charges.

- Operating vehicle-hours and costs would drop by 4 percent, or approximately $47,200 per year.

- Including the additional $3,000 in additional fare revenue, overall subsidy requirements would drop by an estimated $50,200 per year.

<u>Assuming Elimination of Border Charges</u>

Alternatively, the zone system could be simplified and the border charges dropped at the same time, reducing the effective fares, particularly for the outlying areas. As shown in Table 19, the impacts would be as follows:

- Overall ridership would be reduced by 293 passenger-trips per year, or 1 percent per year. The loss in Zone A would be less than in the previous option (1,065).

- Operating costs would increase slightly ($7,700 per year), but would be largely offset by additional fare revenue ($4,200), yielding a net increase in subsidy requirements of $3,500 per year.

Barring fares that result in a large increase in subsidy needs[2], a simplified zone system results in a benefit to the outlying areas (in particular, Cameron Park and El Dorado Hills), but at a cost to the Placerville and Camino areas. It could be considered more equitable as a greater proportion of residents[3] pay the same fare. However, it could also be considered less equitable in that the proportion of total costs paid by the passenger would differ between communities. For example, residents of Placerville would pay fares that cover approximately 7 percent of the operating costs, while residents of El Dorado Hill would pay 4 percent.

Elimination of Service to Low Ridership Zones

One potential means of reducing costs, simplifying the program and improving efficiency would be to stop offering service to areas with low ridership. A standard of less than 1 one-way passenger-trip per week (or 52 per year) was applied, and resulted in the following list of five zones:

1. The southern portion of Zone E (Pleasant Valley)
2. Zone L (Starks Grade Road area)
3. Zone F (Along Green Valley Road west of Cameron Park)
4. The western portion of Zone H (Latrobe area)
5. The western portion of Zone K (far northern portion of Camino)

As indicated in Table 20, the first two of these zones only generated 35 trips per year apiece, while the latter three generated no ridership. Eliminating service to these areas would reduce operating costs by $7,400 per year, and reduce operating subsidy by $7,100 per year.

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[2] Evaluating this alternative assuming that no zones would incur a fare increase ($2.00 base fare in the central zone, $3.00 in the second zone and $5.00 in the outlying zone) results in an increase in subsidy requirements of approximately $154,000 per year.

[3] The central zone would encompass 65 percent of the total population within the DAR service area.

TABLE 19: Simplified Zones Without Border Crossing Charge

Analysis Zone	Existing Ridership	Base Fare Existing	Base Fare With Alternative	Average Fare Existing	Average Fare With Alternative	Annual Ridership	Change in Ridership #	Change in Ridership %	Annual Vehicle Trips	Annual Miles	Annual Hours	Operating Cost	Fare Revenue	Total Annual Subsidy
1	23,532	-	**$3.00**	-	**$3.00**	23,080	(451)	-2%	21,981	244,036	12,109	$1,188,639	$71,549	$1,117,091
A	17,001	$2.00	$3.00	$2.49	$3.00	15,935	(1,065)	-6%	15,176	149,662	7,479			
Ase	276	$2.00	$3.00	$3.50	$3.00	292	15	6%	278	3,020	151			
Bs	5,010	$3.00	$3.00	$3.66	$3.00	5,370	359	7%	5,114	69,667	3,473			
C	415	$3.00	$3.00	$3.90	$3.00	455	40	10%	433	6,094	304			
G	760	$5.00	$3.00	$5.50	$3.00	940	180	24%	895	14,246	635			
J	69	$5.00	$3.00	$6.18	$3.00	89	20	29%	85	1,348	67			
2	864	-	**$4.00**	-	**$4.00**	993	129	15%	993	18,377	917	$89,828	$4,417	$85,411
F	-	$5.00	$4.00	$5.78	$4.00	40	40	-	40	884	44			
Gn	-	$5.00	$4.00	$5.58	$4.00	20	20	-	20	420	21			
Hw	-	$5.00	$4.00	$5.65	$4.00	9	9	-	9	172	9			
He	173	$5.00	$4.00	$5.67	$4.00	195	22	13%	195	3,243	162			
Bn	-	$3.00	$4.00	$3.48	$4.00	8	8	-	8	127	6			
Iw	207	$5.00	$4.00	$5.88	$4.00	237	30	14%	237	4,337	216			
D	-	$3.00	$4.00	$3.78	$4.00	10	10	-	10	180	9			
En	449	$3.00	$4.00	$3.78	$4.00	440	(9)	-2%	440	8,364	417			
Es	35	$3.00	$4.00	$3.78	$4.00	34	(1)	-2%	34	650	32			
3	311	-	**$5.00**	-	**$5.00**	341	30	10%	341	9,706	484	$47,444	$2,010	$45,435
Ie	138	$5.00	$5.00	$5.88	$5.00	146	8	6%	146	4,014	200			
Kw	-	$5.00	$5.00	$6.18	$5.00	8	8	-	8	278	14			
Ke	138	$5.00	$5.00	$6.18	$5.00	149	11	8%	149	4,480	224			
L	35	$5.00	$5.00	$6.18	$5.00	37	3	8%	37	934	47			
Total	24,706				$3.19	24,413	(293)	-1%	23,314	272,119	13,510	$1,325,912	$77,975	$1,247,937
Change #											73	$7,714	$4,168	$3,546
Change %											1%	1%	6%	0%

TABLE 20: Analysis of Low-Ridership Zone Removal

Zone	Annual Ridership	Vehicle-miles	Vehicle-hours	Daily Fare Revenue	Total Fare Revenue	Operating Cost	Operating Subsidy
E_S	35	664	33	$0.37	$100	$3,200	$3,100
L	35	868	43	$0.60	$200	$4,200	$4,000
F	0	-	-	-	-	-	-
H_W	0	-	-	-	-	-	-
K_W	0	-	-	-	-	-	-
Totals:	69	1,531	76	$0.97	$300	$7,400	$7,100

Note: Zones listed experienced the lowest level of ridership and are not encompassed by other zones

Elimination of Service to Zones with High Subsidy Per Trip

A straightforward way of improving the effectiveness of the DAR service would be to eliminate service to those areas that require a high subsidy per passenger-trip. In the 2001 Dial-A-Ride Study, a criteria of $60.00 in subsidy per passenger-trip was used to define the service area. Considering the impacts of inflation, the equivalent figure in 2015 dollars is just over $100 per passenger-trip. Applying this criteria, Table 21 presents those zones that result in a subsidy per passenger-trip exceeding $100. For those zones without current ridership, the marginal operating cost was calculated based upon the miles/hours required to serve each zone, and average fare per passenger-trip estimated based upon the current fare schedule.

TABLE 21: Elimination of Service to High Subsidy per Passenger Zones

Analysis Zone	Annual					Psgr - Trip per Veh - Hour	Marginal Cost per Psgr Trip	Avg. Fare per Psgr Trip	Marginal Subsidy per Psgr Trip
	Vehicle Hours	Operating Cost	Ridership	Fare Revenue	Operating Subsidy				
F	0	$0	0	$0	$0	0.90	$108.89	$5.78	$103.12
I_E	189	$18,542	138	$812	$17,730	0.73	$134.15	$5.88	$128.28
K_W	0	$0	0	$0	$0	0.60	$162.42	$6.18	$156.25
K_E	208	$20,341	138	$853	$19,487	0.67	$147.17	$6.18	$140.99
L	43	$4,242	35	$213	$4,028	0.80	$122.76	$6.18	$116.58
Total	440	$43,125	311	$1,879	$41,246	0.71	$138.67	$6.04	$132.63

As shown, there are a total of five existing zones (or portions of zones) that exceed this criteria, ranging from Zone F (a subsidy of $103 per passenger-trip) up to Zone K_W (a subsidy of $156). These zones include the Garden Valley area, Pollock Pines area, and the area bordering Folsom Lake. If service to all zones were to be eliminated, there would be the following impacts:

- Ridership would be reduced by 311 passenger-trips per year, or roughly 6 per week.

- Operating costs would be reduced by $43,100 per year. Subtracting the $1,900 in lost fare revenue, operating subsidy would be reduced by $41,320 per year.

Service to Additional Zones

A final alternative considered was the expansion of DAR service to new areas. Based upon public input, the five area shown in Table 22 were evaluated, including Somerset, Georgetown, Cool, Pilot Hill and Mosquito Flat. Ridership potential was based upon the demand analysis, discussed above. Operating parameters and costs were based upon mileage and typical operating speeds.

Ridership would range from 85 trips per year generated in Pilot Hill up to 307 per year generated in Cool. Costs would range from $8,300 per year to $30,000 per year by area, totaling $76,400 per year for the total of all five areas. Subtracting $2,800 in fare revenues, the total increase in annual subsidy of serving all five would be $73,600.

The performance evaluation of these options is shown in the right-most columns of Table 22. As indicated, the passenger-trips served per vehicle-hour ranges from 0.49 (for Cool) up to 0.76 (for Somerset). The operating subsidy per passenger-trip ranges from a low of $122 (Somerset) up to $193 (Cool).

TABLE 22: Analysis of Service to Additional Zones

Zone Name	Assumed Fare Base	Assumed Fare Average(2)	Zone Population	Annual Ridership	Vehicle Miles	Vehicle Hours	Total Fare Revenue	Operating Cost	Operating Subsidy	Psgr-Trips per Veh-Hr	Subsidy per Psgr-Trip
Somerset	$5.00	$6.18	1748	65	1726	86	$400	$8,400	$8,000	0.76	$122
Georgetown	$5.00	$6.18	2794	122	4220	211	$800	$20,600	$19,800	0.58	$162
Cool	$5.00	$6.25	4230	151	6143	307	$900	$30,000	$29,100	0.49	$193
Pilot Hill	$5.00	$6.33	1532	53	1694	85	$300	$8,300	$8,000	0.62	$152
Mosquito Flat	$5.00	$6.18	1320	61	1869	93	$400	$9,100	$8,700	0.65	$144
Total				451	15653	781	$2,800	$76,400	$73,600	0.58	$163
% Change				2%	6%	6%	4%	6%	6%		

Note 1: Ridership is estimated based on actual ridership in similar outlying zones
Note 2: Includes border crossing fares

Summary of Alternatives and Performance Analysis

Table 23 presents a summary of the various alternatives discussed above, as well as an analysis of their performance with regards to two key measures: the marginal passenger-trips carried per marginal hour of service (i.e., the change in ridership divided by the change in vehicle-hours), and the marginal subsidy per marginal passenger-trip (the change in subsidy needs divided by the change in ridership). In considering these performance measures, we can apply El Dorado Transit's standards, as summarized in the 2014 *Long Range and Short Range Transit Plan*. The specific pertinent standard regarding DAR services is the minimum of 2.0 passenger-trips per vehicle-hour of service. In addition, the *2001 Dial-A-Ride Zone Assessment Study for El Dorado County* applied a standard of a maximum subsidy of $60 per passenger-trip. Reviewing the impacts of inflation between 2001 and 2015, this is equivalent to approximately $100 in 2015 dollars.[4]

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[4] It is worth noting that this figure is almost exactly double the Dial-A-Ride service's existing average of $50.37.

| Alternate Scenario | Annual Ridership | | | Total Annual Subsidy | | | Annual Vehicle Hours | | | PERFORMANCE ANALYSIS | |
	#	# Change	% Change	#	# Change	% Change	#	# Change	% Change	Marginal Passenger-Trips per Vehicle Hour	Marginal Subsidy per Psgr Trip
Existing	*24,706*	*-*	*-*	*$1,244,390*	*-*	*-*	*13,437*	*-*	*-*	*1.84*	*$50.37*
ALTERNATIVES THAT INCREASE RIDERSHIP AND INCREASE SUBSIDY											
No Border Fare	25,474	767	3.1%	$1,295,407	$51,016	4.1%	13,915	478	3.6%	1.61	$66.47
New Zones	25,158	451	1.8%	$1,317,990	$73,600	5.9%	14,218	781	5.8%	0.58	$163.11
Somerset	--	65	0.3%	--	$8,400	0.7%	--	86	0.6%	0.76	$128.56
Georgetown	--	122	0.5%	--	$20,600	1.7%	--	211	1.6%	0.58	$168.90
Cool	--	151	0.6%	--	$30,000	2.4%	--	307	2.3%	0.49	$199.04
Pilot Hill	--	53	0.2%	--	$8,300	0.7%	--	85	0.6%	0.62	$157.84
Mosquito Flat	--	61	0.2%	--	$9,100	0.7%	--	93	0.7%	0.65	$150.13
ALTERNATIVES THAT DECREASE RIDERSHIP AND DECREASE SUBSIDY											
Simplified Zones - With Border Charge	24,068	(638)	-2.6%	$1,194,257	-$50,133	-4.0%	12,950	(487)	-3.6%	1.31	$78.53
$0.50 Fare Increase	23,339	(1,368)	-5.5%	$1,166,752	-$77,638	-6.2%	12,725	(712)	-5.3%	1.92	$56.77
Elimination of Low Use Zones	--	(69)	-0.3%	$1,237,290	-$7,100	-0.6%	13,361	(76)	-0.6%	0.90	$102.74
E_S	--	(35)	-0.1%	--	-$3,100	-0.2%	--	(33)	-0.2%	1.04	$89.71
L	--	(35)	-0.1%	--	-$4,000	-0.3%	--	(43)	-0.3%	0.80	$115.76
F	--	-	0.0%	--	$0	0.0%	--	0	0.0%	-	-
H_W	--	-	0.0%	--	$0	0.0%	--	0	0.0%	-	-
K_W	--	-	0.0%	--	$0	0.0%	--	0	0.0%	-	-
Elimination of High Subsidy per Psgr Zones	--	(311)	-1.3%	--	-$41,246	-3.3%	--	(440)	-3.3%	0.71	$132.63
F	--	-	0.0%	--	$0	0.0%	--	0	0.0%	0.90	$103.12
IE	--	(138)	-0.6%	--	-$17,730	-1.4%	--	(189)	-1.4%	0.73	$128.28
KW	--	-	0.0%	--	$0	0.0%	--	0	0.0%	0.60	$156.25
KE	--	(138)	-0.6%	--	-$19,487	-1.6%	--	(208)	-1.5%	0.67	$140.99
L	--	(35)	-0.1%	--	-$4,028	-0.3%	--	(43)	-0.3%	0.80	$116.58
ALTERNATIVES THAT DECREASE RIDERSHIP AND INCREASE SUBSIDY											
Simplified Zones - Without Border Charge	24,413	(293)	-1.2%	$1,247,937	$3,546	0.3%	13,510	73	0.5%	(4.01)	-$12.11
Flat Fare	24,675	(32)	-0.1%	$1,285,229	$40,839	3.3%	13,849	412	3.1%	(0.08)	-$1,283.03

The table presents three categories of alternatives:

- The alternatives that **increase ridership while increasing subsidy requirements** consist of the elimination of the border fare, as well as the provision of service to additional areas. As indicated, the elimination of border fares attains the standard for marginal subsidy per passenger-trip, but is slightly below the standard for passenger-trips per vehicle-hour. The expansion of service areas does not attain either of these standards for any of the areas, by a substantial margin.

- Next, the table presents the alternatives that **decrease ridership while decreasing subsidy requirements**. These consist of the simplified zone system (retaining the border charges), the across-the-board fare increase, and the elimination of service to low use or high subsidy zones. In this case, the standards can be considered in the opposite direction – those alternatives with ridership per hour that are below the 2.0 standard are valid candidates for implementation (consistent with the standard), as are those that have a subsidy per passenger-trip exceeding $100. By the passenger-trip per vehicle-hour measure, all alternatives are viable candidates for implementation.
  By the subsidy per passenger-trip measure, the elimination of service to all zones considered would be viable, with the exception of the E_S zone. Neither the simplified zone with border charges nor the fare increase would be viable by this measure.

- Finally, there are two alternatives that would **decrease ridership while increasing subsidy requirements**: the flat fare option, and the simplified zones with elimination of border charges. Neither of these alternatives are viable, by either performance measure.

The alternatives that modify the fare system can also be evaluated with regards to the impact on the equity of the fare system. This was done in the following steps, for each option (including the current fare system):

1. For each zone, the variance in fare from the average fare (difference in the fare charged in each zone with the average fare paid by all passengers) was calculated.

2. The absolute variance was then factored by the proportion of passenger-trips generated by each zone.

3. Summing over all zones yields the average variance from the average fare that individual passengers pay.

The larger the resulting figure, the greater the overall inequity in the fare structure. The results of this evaluation were as follows:

- Existing fare structure – Average variance of $0.68

- Elimination of border charges – Average variance of $0.59

- Simplified zones with border charges – Average variance of $0.16

- Simplified zones without border charges – Average variance of $0.11

- Flat Fares – Average variance of $0.00

This indicates that eliminating border charges improves the overall equity of the fare structure slightly, but the simplified zones are substantially more equitable. The flat fare option, of course, is wholly equitable with regards to fares.

The following plan has been developed based upon the overall goals of the Dial-A-Ride program, the needs of the community, and the results of the analyses presented in previous chapters.

As a preamble, it is important to note that the Dial-A-Ride program is *not* required under the Americans with Disabilities Act (ADA). El Dorado Transit meets the ADA requirements through other programs and strategies, notable the Complementary Paratransit service. It should also be noted that the Dial-A-Ride service is unusual in comparison with other similar California rural and semi-rural areas with regards to large extent (both geographically and in terms of capacity) of its Dial-A-Ride program. Overall, this indicates that El Dorado Transit has wide discretion to tailor the Dial-A-Ride program for local needs.

Eliminate General Public Service

A review of a full week of service indicated zero ridership other than elderly or disabled persons. Transit staff confirms anecdotally that general public riders are very infrequent. It is recommended that service no longer be offered to the general public. While it could be argued that there is effectively no cost to continuing to offer general public service, there is also benefit of simplifying the service. In particular, area residents sometimes see the availability of this service to the general public and call for immediate service, which the Dial-A-Ride program is unable to accommodate due to capacity constraints, leading to frustrations. It is preferable to focus the program on doing a good job for seniors and persons with disabilities, by eliminating the option of service to the general public.

Eliminate Service to High Subsidy Zones

Service should be eliminated to the eastern portion of Zone I (Garden Valley area), to Zone L (Starks Grade Road area), to Zone F (near Folsom Lake) and to the western portion of Zone K (north of Camino), due to high subsidy per passenger levels that exceed standards. These zones require between $103 and $156 in subsidy for every passenger-trip served (or between $206 and $312 for a single round-trip), which exceeds recommended standards. On average, service to these zones requires $125 in subsidy per passenger-trip. Elimination of service to these areas will reduce operating subsidy requirements by an estimated $22,000 per year.

These zones generate only an estimated 173 passenger-trips per year (or less than a single one-way passenger-trip per day). Service to these areas is an inefficient use of limited operating dollars – comparing the cost efficiency with the average subsidy per trip for the system as a whole ($51) indicates that El Dorado Transit could provide 2.5 trips in the remainder of the system for every 1 trip in these outlying areas. While eliminating existing service is always a difficult decision, in this case it is recommended to enhance the overall benefits provided by the Dial-A-Ride program to the region as a whole.

While the eastern portion of Zone K (Pollock Pines) also has high subsidy requirements, this area has a concentration of residents with high potential need for transit services. It is therefore recommended that service continue to be provided to this relatively limited area.

Eliminate Individual Zones and Adopt a Flat Fare

It is recommended that the existing 12 zone system be eliminated, and a single flat fare be applied across the recommended service area, as shown in Figure 9. This will greatly simplify the service, aiding passenger's ability to use the system as well as making it easier for dispatchers, drivers and management staff to market, explain and monitor.

The recommended flat fare is $3.00 per trip. Table 24 presents a summary of the existing and recommended fares for each of the zones. Note that this includes both the base fare (for a rider that does not cross a zone boundary), as well as the average fare (reflecting the typical fare paid by residents of a zone, including boundary fares). For instance, including the zone boundary fares, the average fare paid by a Zone A resident is currently $2.49. Shifting to a flat $3.00 fare therefore reflects an effective $0.51 fare increase for the average Zone A rider, or a 20 percent fare increase.

| | | Fare | | | Change in Fare | | | |
| | | Existing | | | Excluding Boundary Fare | | Including Boundary Fare | |
Existing Zone		Excluding Boundary Fare	Including Boundary Fare	Plan	$	%	$	%
A	Placerville	$2.00	$2.49	$3.00	$1.00	50%	$0.51	20%
B (Southern Portion)	Cameron Park	$3.00	$3.66	$3.00	$0.00	0%	-$0.66	-18%
B (Northern Portion)	Rescue	$3.00	$3.48	$3.00	$0.00	0%	-$0.48	-14%
C	El Dorado	$3.00	$3.90	$3.00	$0.00	0%	-$0.90	-23%
D	N. of Placerville	$3.00	$3.78	$3.00	$0.00	0%	-$0.78	-21%
E	Pleasant Valley	$3.00	$3.78	$3.00	$0.00	0%	-$0.78	-21%
G	El Dorado Hills	$5.00	$5.50	$3.00	-$2.00	-40%	-$2.50	-45%
H	Latrobe	$5.00	$5.67	$3.00	-$2.00	-40%	-$2.67	-47%
I (Western Portion)	Coloma	$5.00	$5.88	$3.00	-$2.00	-40%	-$2.88	-49%
J	S. 49 Area	$5.00	$6.18	$3.00	-$2.00	-40%	-$3.18	-51%
K (Eastern Portion)	Pollock Pines	$5.00	$6.18	$3.00	-$2.00	-40%	-$3.18	-51%

TABLE 24: Summary of Recommended Zone and Fare Changes

The ridership, service and costs associated with this recommended plan are shown in Table 25. As indicated:

- Overall ridership is forecast to decrease slightly by approximately 200 passenger-trips per year, or 0.8 percent. There would be a 1,212 or 7 percent reduction in ridership in existing Zone A (Placerville). The largest ridership gains are in Zone B (Cameron Park) of 440 passenger-trips, and a 254 increase in Zone G (El Dorado Hills). It should be noted that these estimates do not include the potential long-term ridership benefit associated with the much simpler fare structure, which can be expected to remove an existing barrier to rider's understanding of and use of the service.

- Annual vehicle-hours of service would remain essentially unchanged (a calculated decrease of 23 vehicle-hours per year).

- Operating costs would decrease by an estimated $1,600 per year, which rounds to a 0.1 percent increase.

Figure 9: Dial-A-Ride Revised Service Area

Table 25: Recommended Dial-A-Ride Plan Impacts

Analysis Zone	Existing Ridership	Existing Fare[1]	New Fare	Projected Ridership	Change In Ridership #	Change In Ridership %	Annual Vehicle Trips	Annual Miles	Annual Hours	Total Operating Cost	Total Fare Revenue	Total Annual Subsidy
A	17,001	$2.49	$3.00	15,789	-1,212	-7%	15,084	148,284	7,410	$725,520	$47,366	$678,154
Ase	276	$3.50	$3.00	294	18	6%	294	3,043	152	$14,875	$882	$13,993
Bs	5,010	$3.66	$3.00	5,423	413	8%	4,942	70,360	3,507	$343,687	$16,270	$327,418
Bn	-	$3.48	$3.00	17	17	-	17	283	14	$1,386	$51	$1,335
C	415	$3.90	$3.00	461	46	11%	461	6,175	308	$30,184	$1,382	$28,802
D	-	$3.78	$3.00	23	23	-	23	403	20	$1,969	$69	$1,900
En	449	$3.78	$3.00	492	43	10%	492	9,357	467	$45,737	$1,477	$44,259
Es	35	$3.78	$3.00	38	3	10%	38	727	36	$3,556	$114	$3,442
G	760	$5.50	$3.00	969	209	27%	918	14,685	654	$66,938	$2,906	$64,031
Gn	-	$5.58	$3.00	45	45	-	45	938	47	$4,588	$134	$4,454
Hw	-	$5.65	$3.00	19	19	-	19	384	19	$1,879	$58	$1,821
He	173	$5.67	$3.00	223	50	29%	223	3,702	185	$18,095	$668	$17,427
Iw	207	$5.88	$3.00	271	64	31%	271	4,960	248	$24,245	$814	$23,432
J	69	$6.18	$3.00	92	23	33%	92	1,397	70	$6,829	$277	$6,552
Ke	138	$6.18	$3.00	184	46	33%	184	5,554	277	$27,150	$553	$26,597
Totals	24,534			24,340	-193	-0.8%	23,103	270,253	13,414	$1,316,637	$73,021	$1,243,616
Change #									-23	-$1,561	-$787	-$774
Change %									-0.2%	-0.1%	-1.1%	-0.1%

Note 1: Average fare, including zone charges.

- Fare revenues would be reduced by an estimate $800 per year.

- Overall operating subsidy requirements would be increased by approximately $800, or 0.1 percent.

The impact on fare equity is one of the strong benefits of this plan: as all passengers would pay the same fare, this plan eliminates all of the existing fare inequity.

OPTION – 4 Zone System

If the impacts of the individual fare changes under the recommended flat fare system are a concern, another feasible option would be to simplify to a 4 zone system, as shown in Figure 10, with only two fare levels rather than the current three fare levels. These zones were determined based upon the relative operating subsidy of providing service to each area. Under this option, the fare for the Central Zone is $2.50 per one-way passenger-trip, while the fare for the South, North and East Zones would be $4.00. Note that the reduction in the number of zone boundaries would reduce the number of boundary crossing charges paid, reducing the impact of any increases in base fares. The current $0.50 boundary crossing charge would remain.

Table 26 presents the overall impacts of this option (including the same reduction in overall service area). Overall ridership is forecast to increase by approximately 800 passenger-trips per year, or 3.2 percent. There would be a slight (220 or 1.2 percent) reduction in ridership in existing Zone A (Placerville). The largest ridership gains are in Zone B (Cameron Park) of 640 passenger-trips, and a 228 increase in Zone G (El Dorado Hills). Operating costs would increase by only an estimated $3,000 per year, which rounds to a 0.2 percent increase. Fare revenues would be reduced by an estimate $6,000 per year, and overall operating subsidy requirements would be increased by approximately $9,000, or 1 percent. Table 27 presents a side-by-side comparison of the impacts of the recommended plan versus this option.

Alternatives Considered but Not Recommended

Service expansion to any of the five areas evaluated is not recommended. The subsidy per passenger ranges from $129 to $199 while the passenger per vehicle-hour ranges from 0.58 to 0.76, indicating that none are remotely close to either of the standards.

Title VI Considerations

As a smaller transit service (less than 50 buses in operation at peak), El Dorado Transit is not required to conduct service equity analyses (comparing the transit service area with the demographics of persons served and not served). El Dorado Transit is currently in compliance with applicable Title VI requirements, and the changes in DAR service would not change this status of compliance.

To assess the relative impact of the recommended plan on minority population, the population characteristics of areas currently served and proposed to be eliminated from service were reviewed. US Census 2009-2013 American Community Survey data was evaluated by census tract, in order to identify the number of residents that are White and non-Hispanic compared with the number that are not in this category (considered for purposes of this evaluated to be Minority). As shown in Table 28, the area currently served by Dial-A-Ride is estimated to have a total population of 138,328, of which 25,189 or 18.2 percent are Minority. Those areas where

Figure 10: Optional 4-Zone System
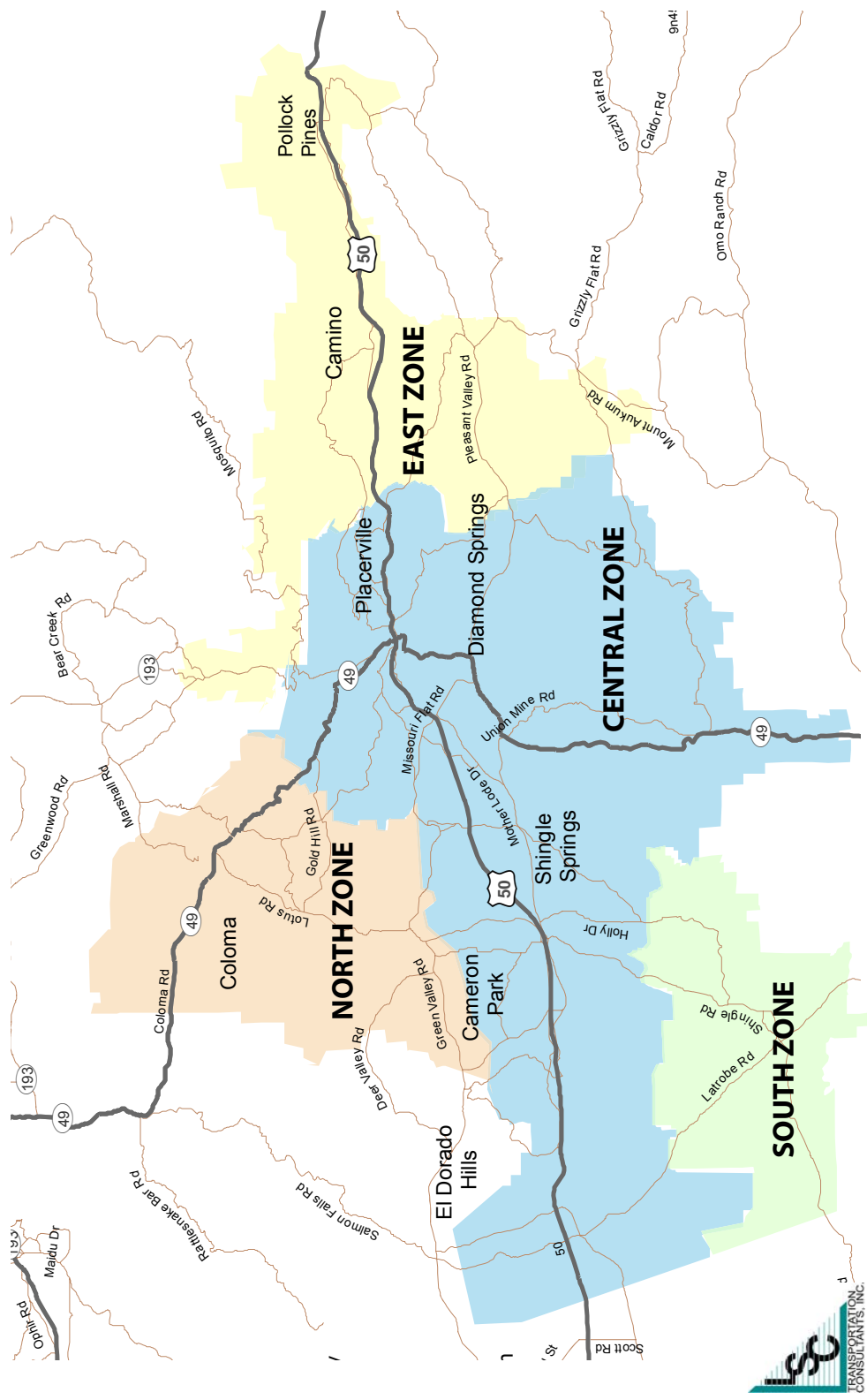
Table 26: Dial-A-Ride Four Zone Option

Analysis Zone	Existing Ridership	Base Fare Existing	Base Fare With Alternative	Average Fare(1) Existing	Average Fare(1) With Alternative	Annual Ridership	Change in Ridership #	Change in Ridership %	Annual Vehicle	Annual Miles	Annual Hours	Operating Cost	Fare Revenue	Total Annual
1	23,532	-	$2.50	-	$2.60	24,279	748	3.2%	23,124	256,856	12,745	$1,251,087	$63,126	$1,187,926
A	17,001	$2.00	$2.50	$2.49	$2.60	16,754	(247)	-1.5%	15,956	157,348	7,863			
Ase	276	$2.00	$2.50	$3.50	$2.60	307	30	11.0%	292	3,175	158			
Bs	5,010	$3.00	$2.50	$3.66	$2.60	5,646	635	12.7%	5,377	73,245	3,651			
C	415	$3.00	$2.50	$3.90	$2.60	478	63	15.2%	455	6,407	320			
G	760	$5.00	$2.50	$5.50	$2.60	988	228	30.0%	941	14,978	667			
Gn	-	$5.00	$4.00	$5.58	$4.45	14	14	-	14	286	14			
J	69	$5.00	$2.50	$6.18	$2.60	94	24	35.4%	89	1,417	71			
2	1,002	-	$4.00	-	$4.45	1,046	44	4.4%	1,046	14,318	715	$69,998	$4,656	$65,342
Hw	-	$5.00	$4.00	$5.65	$4.45	6	6	-	6	117	6			
He	173	$5.00	$4.00	$5.67	$4.45	188	15	8.8%	188	253	13			
Bn	-	$3.00	$4.00	$3.48	$4.45	5	5	-	5	86	4			
Iw	207	$5.00	$4.00	$5.88	$4.45	228	21	10.2%	228	387	19			
Ke	138	$5.00	$4.00	$6.18	$4.45	155	17	12.1%	155	4,667	233			
D	-	$3.00	$4.00	$3.78	$4.45	7	7	-	7	123	6			
En	449	$3.00	$4.00	$3.78	$4.45	424	(25)	-5.6%	424	8,057	402			
Es	35	$3.00	$4.00	$3.78	$4.45	33	(2)	-5.6%	33	626	31			
Total	24,534				$2.68	25,326	792	3.2%	24,170	271,174	13,460	$1,321,084	$67,782	$1,253,267

Change	#	%	Annual Hours	Operating Cost	Fare Revenue	Total Annual
#			22	$2,887	-$6,026	$8,877
%			0.2%	0.2%	-8%	1%

Note 1: Includes border crossing charges.

TABLE 27: Comparison of Recommended Plan and Option

		Impact	
		Recommended	
	Existing	Plan	Option
Number of Zones	12	1	4
Boundary Charges?	Yes	No	Yes
Annual Ridership	24,706	-193	792
	--	-0.8%	3.2%
Annual Operating Subsidy	$1,244,390	-$774	$8,877
		-0.1%	0.7%
% of Riders With Increase in Fares	--	69.3%	70.2%
Maximum % Fare Increase (Including Boundary Fares)	--	20%	15%

TABLE 28: Relative Impact of Plan on Service to Minority Populations

	Population			% of Population	
Area	Non-Minority	Minority	Total	Non-Minority	Minority
Current Served by DAR	113,139	25,189	138,328	81.8%	18.2%
Service Eliminated Under Plan	15,823	2,365	18,188	87.0%	13.0%
Served With Plan	97,316	22,825	120,141	81.0%	19.0%

SOURCE: U.S. Census Bureau, 2009-2013 5-Year American Community Survey

service will be eliminated have a total population of 18,188, of which 13.0 percent are Minority. As a result of this plan, therefore, the proportion of population within the DAR service area that are Minority will increase from 18.2 percent to 19.0 percent. In sum, the plan will not have an undue impact on Minority population.

Americans with Disabilities Act Considerations

As discussed previously, El Dorado County is not required under the ADA to operate the Dial-A-Ride service. Rather, the requirements regarding ADA service supporting the El Dorado Transit fixed-route and separately-managed Complementary Paratransit Service. The ADA does impose requirements on the Dial-A-Ride service in order to ensure that persons with disabilities are not discriminated against in the operation and management of the program. Section 7.4.2 of

the US Department of Transportation's Circular FTA C 4710.1 *Americans With Disabilities Act (ADA): Guidance* document (dated November 4, 2015) lays out seven service characteristics that need to be considered in ensuring equivalency of service for persons with disabilities:

1. Response time
2. Fares
3. Geographic area of service
4. Hours and days of service
5. Restriction or priorities based on trip purpose
6. Availability of information and reservations capability
7. Constr55aints on capacity or service availability

The Dial-A-Ride program currently meets the requirements for each of these factors, and there is nothing in the recommended plan that would change this condition.

As an additional mobility option, it is worth considering how changes under this plan may affect ADA considerations for the fixed route and Complementary Paratransit services. Of importance, none of the areas for elimination of Dial-A-Ride service are currently served by either fixed route or paratransit services, indicating that this change in service area would not increase demand for these services. The forecast increase in Dial-A-Ride ridership within the remaining service area generated by the overall reduction in fares could well include ADA eligible persons that otherwise would use the Complementary Paratransit service. This indicates that, if anything, the Dial-A-Ride plan would reduce ridership demand on the Complementary Paratransit service to a small degree.

Coordination with Taxi Voucher Program

El Dorado Transit recently initiated a Taxi Voucher program serving the El Dorado Hills area. This program is the result of a previous study that found that fixed route service is not feasible in El Dorado Hills (unlike the other urbanized portions of western El Dorado County) and identified the Taxi Voucher program as an alternate means of improving mobility. Rides within El Dorado Hills are available for seniors or persons with a disability for $3.00 (using a pre-purchased voucher). Fixed rate fares to other destinations outside of El Dorado Hills are also available. For instance, a one-way rider to Kaiser Hospital in Folsom requires one voucher plus $9.00 in fare, paid to the driver. The contracted taxi firm (Gold Rush Taxi) is paid $12 per passenger-trip. As the current contract has a billing maximum of $43,500 for the first year of service, the Taxi Voucher program could serve up to 3,583 one-way trips per year.

Under the recommended Dial-A-Ride program, the Dial-A-Ride program would continue, with fares dropping from $5.00 to $3.00. This would result in a modest increase in DAR ridership generated in El Dorado Hills (on the order of one daily one-way passenger-trip). However, total ridership would still remain at roughly 1,000 rides per year.

These two programs largely serve two different but complementary roles. The Dial-A-Ride program serves very few (on the average of 1.3 per day) passenger-trips wholly within El Dorado Hills. Instead, 79 percent of the trips made for El Dorado Hills residents are for travel to and from Cameron Park or Placerville. The Taxi Voucher program, on the other hand, is intended to serve local trips within El Dorado Hills, providing a high degree of "real time" availability than is possible under the Dial-A-Ride program. In addition, the Taxi Voucher program provides partially subsidized trips to areas west of El Dorado Hills (particularly in Folsom), unlike the Dial-A-Ride service.

A comparison of the subsidy requirements for the Taxi Voucher program ($12.00 per trip) with those of the Dial-A-Ride program (averaging $51.00) per trip indicates that a successful Taxi Voucher has the potential for reducing overall costs for short local trips, particularly in those areas far from El Dorado Transit's operating base in Diamond Springs. There would be a number of importance factors that would need to be considered before new or expanded Taxi Voucher programs are implemented:

- Expanding Taxi Voucher programs in a way that reduces Dial-A-Ride staffing levels would need to address Mass Transit Employee Protection requirements (49 USC 5333(b), formerly Section 13(c) of the Urban Mass Transportation Act), as implemented by the United States Department of Labor. These require that existing public transit employees covered under a collective bargaining agreement have their rights and benefits preserved when new services are implemented. This could result in additional costs accompanying a new Taxi Voucher program.

- The relatively low subsidy costs of the El Dorado Hills Taxi Voucher are in part a function of the relatively small and compact service area. Costs and subsidy levels could increase substantially with an expanded service area.

- Other urbanized portions of western El Dorado County are also served by local fixed route services. New Taxi Voucher programs could therefore result in two publicly funded programs that effectively compete against each other, unless carefully designed.

At present, it is prudent to monitor the implementation and effectiveness of the initial Taxi Voucher program (as called for in the service agreement) and see the actual results in El Dorado Hills. This useful, locally-based information will greatly benefit future decision making regarding Taxi Voucher options.

Monitoring Plan

El Dorado Transit already tracks key performance measures for the Dial-A-Ride program:

– Operating cost per passenger
– Operating cost per hour
– Passenger-trips per revenue hour
– Average fare per passenger
– Road Calls
– Fare box recovery ratio
– No-shows (including late cancellation within 24 hours of pick-up time)

The *2014 Short- and Long-Range Transit Plan* identifies the following monitoring elements and standards:

- On-time performance – 95 percent of all scheduled pick-ups should be provided on-time, defined as not more than 10 minutes late.

- In-vehicle travel time – 100 percent of passengers should reach their destinations within 2 hours.

In addition to these already-adopted measures, it is recommended that El Dorado Transit monitor the following:

- Trip denials should be tracked. While the Dial-A-Ride service is not required to adhere to the strict standards of ADA complementary paratransit service, it is still good management practice to understand the overall ability of the program to meet potential passengers' mobility needs. For trips that cannot be accommodated, a log should be kept of desired trip origin, trip destination, day of week and desired trip time. This can be periodically reviewed to identify if shifts in driver hours are needed, or if additional capacity is warranted.

- Trip origin and destination should be tracked and summarized. One of the benefits of the current zone system is that it generates good data on the overall trip patterns of Dial-A-Ride passengers. For at least the first full year after implementation of this plan, trips should continue to be tracked by the origin and destination using the existing zone system. This will allow management to review any unexpected responses to the change in the Dial-A-Ride program, and consider modifications based upon a quantitative understanding. This will also allow a better understanding of how the new El Dorado taxi voucher program is interacting with the Dial-A-Ride program.

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Dial-A-Ride Routematch Data
April 6, 2015 through April 10, 2015

Date	Vehicle #	Pick-Up Time	Previous Zone	Pick-Up Zone	Drop-Off Zone	Next Zone	Fare	
4/7/2015	1010	8:20	A	A	A	A	$	2.00
		8:52	A	A	A	A	$	2.00
		9:09	A	A	A	A	$	2.00
		9:29	A	A	A	A	$	3.00
		10:20	A	A	A	A	$	2.00
		10:42	A	A	A	A	$	2.00
		11:00	A	A	A	A	$	3.00
		11:30	A	A	A	A	$	2.00
		11:47	A	A	Bs	Bs	$	3.50
		12:18	Bs	Bs	A	Bs	$	3.50
		13:00	A	Bs	G	A	$	5.50
	1101	7:30	A	Bs	Bs	Iw	$	3.00
		8:16	Bs	Iw	A	A	$	6.00
		9:00	A	A	A	Bs	$	2.00
		10:00	A	Bs	A	A	$	3.50
		10:48	A	A	A	A	$	2.00
		11:04	A	A	A	A	$	2.00
		11:10	break					
		12:15	A	A	A	Bs	$	2.00
		12:40	A	Bs	A	A	$	3.50
		13:37	A	A	A	A	$	2.00
		14:31	A	A	A	A	$	2.00
		14:44	A	A	A	A	$	2.00
		15:13	A	A	A	A	$	2.00
		15:30	A	A	A	A	$	2.00
	1301	7:15	A	C	Bs	Ase	$	4.00
		7:24	C	Ase	Bs	Bs	$	3.50
		8:00	Bs	Bs	A	Bs	$	3.50
		8:38	A	Bs	A	A	$	3.50
		9:36	A	A	A	A	$	2.00
		10:06	A	A	A	A	$	2.00
		10:29	break					
		13:37	A	A	A	A	$	2.00
		14:00	A	A	Iw	A	$	-
		15:15	Iw	A	A	A	$	2.00
	1302	8:28	A	A	A	Bs	$	2.00
		8:55	A	Bs	Bs	A	$	3.00
		9:37	Bs	A	A	A	$	2.00
		9:55	A	A	A	A	$	2.00
		10:10	A	A	Bs	A	$	3.50
		11:01	Bs	A	G	G	$	6.00
		11:30	G	G	G	Bs	$	5.00
		11:46	G	Bs	Bs	Bs	$	3.00
		12:15	break					
		13:15	Bs	Bs	Bs	Bs	$	3.00
		14:00	Bs	Bs	Ke	Bs	$	3.00
		14:08	Bs	Bs	Bs	A	$	3.00
		15:15	Ke	A	Bs	Bs	$	3.50
		16:20	Bs	Bs	C	A	$	4.00

	1303	7:30	A	A	A	Ke	$	2.00
		8:05	A	Ke	Bs	A	$	3.00
		8:25	Ke	A	Bs	A	$	3.50
		9:06	Bs	A	A	He	$	2.00
		9:59	A	He	Bs	Bs	$	5.50
		10:31	Bs	Bs	A	Bs	$	3.50
		11:30	A	Bs	He	G	$	5.50
		11:48	break					
		13:29	He	G	G	G	$	5.00
		13:37	G	G	G	Bs	$	5.00
		14:00	G	Bs	A	A	$	3.50
		15:00	A	A	A	A	$	2.00
		15:30	A	A	Bs	A	$	3.50
	1304	8:38	A	A	A	A	$	2.00
		8:55	A	A	A	A	$	2.00
		9:08	A	A	A	A	$	2.00
		9:41	A	A	A	A	$	2.00
		10:03	A	A	A	A	$	2.00
		10:30	A	A	A	A	$	2.00
		10:45	A	A	A	A	$	2.00
		10:50	A	A	A	A	$	2.00
		11:08	A	A	A	A	$	2.00
		11:30	A	A	A	A	$	2.00
		12:00	A	A	A	Iw	$	2.00
		12:30	break					
		13:42	A	Iw	A	A	$	6.00
		14:40	A	A	A	A	$	2.00
		15:00	A	A	A	A	$	2.00
		15:20	A	A	Iw	A	$	6.00
		16:30	Iw	A	A	A	$	2.00
4/8/2015	1010	7:50	A	A	A	A	$	2.00
		8:15	A	A	Bs	A	$	-
		9:00	Bs	A	A	A	$	3.00
		10:41	A	A	Bs	A	$	3.50
		11:30	Bs	A	A	A	$	3.00
		12:00	break					
		13:02	A	A	Ie	A	$	6.00
	1101	7:30	A	Bs	Bs	G	$	3.00
		8:10	Bs	G	Bs	A	$	5.50
		8:50	Bs	A	A	A	$	2.00
		9:15	A	A	A	A	$	2.00
		9:32	A	A	A	A	$	2.00
		9:55	A	A	A	Bs	$	2.00
		10:27	A	Bs	A	A	$	3.50
		11:00	A	A	G	Bs	$	6.00
		11:28	break					
		13:00	G	Bs	G	G	$	5.50
		13:11	Bs	G	G	Bs	$	5.00
		13:37	G	Bs	Bs	G	$	3.00
		14:11	Bs	G	Bs	A	$	5.50
		14:51	Bs	A	Bs	Bs	$	3.50
		15:12	Bs	Bs	Bs	A	$	3.00

1301	7:30	A	A	A	A	$	2.00
	7:44	A	A	A	A	$	2.00
	8:02	A	A	Bs	A	$	3.50
	8:15	A	A	Bs	Bs	$	3.50
	8:55	Bs	Bs	A	A	$	3.50
	9:38	A	A	Bs	Bs	$	3.50
	10:01	break					
	11:10	Bs	Bs	A	A	$	3.50
	11:51	A	A	Bs	Bs	$	3.50
	12:35	Bs	Bs	Bs	A	$	3.00
	13:00	Bs	A	Iw	A	$	6.00
	15:10	Iw	A	A	A	$	2.00
1302	8:33	A	En	A	A	$	3.50
	8:52	A	A	A	A	$	2.00
	9:30	A	A	Bs	A	$	3.50
	10:07	Bs	A	A	C	$	2.00
	11:06	A	C	A	A	$	3.50
	11:45	A	A	A	A	$	2.00
	12:15	A	A	A	A	$	2.00
	12:40	A	A	C	A	$	3.50
	12:58	break					
	14:56	C	A	A	A	$	2.00
	15:30	A	A	A	A	$	2.00
	16:15	A	A	A	Bs	$	2.00
	16:40	A	Bs	G	A	$	5.50
1303	7:15	A	C	Bs	Ase	$	4.00
	7:20	C	Ase	Bs	Bs	$	3.50
	8:00	Bs	Bs	A	Ie	$	3.50
	9:00	A	Ie	A	Bs	$	6.00
	9:47	A	Bs	A	A	$	-
	10:15	A	A	A	Iw	$	2.00
	11:17	A	Iw	A	A	$	6.00
	11:55	break					
	13:30	A	A	A	A	$	2.00
	13:40	A	A	A	A	$	2.00
	14:24	A	A	A	A	$	2.00
	14:40	A	A	A	A	$	2.00
	14:55	A	A	A	A	$	2.00
	15:10	A	A	Bs	A	$	3.50
1304	9:00	A	A	Bs	A	$	3.50
	9:45	Bs	A	A	A	$	2.00
	10:09	A	A	A	A	$	2.00
	10:30	A	A	A	Ie	$	2.00
	11:14	A	Ie	A	A	$	6.00
	12:06	A	A	A	A	$	2.00
	12:30	break					
	13:38	A	A	Ie	A	$	6.00
	15:09	Ie	A	En	A	$	3.50
	15:41	En	A	A	A	$	2.00
	16:04	A	A	A	Bs	$	2.00
	16:31	A	Bs	Ase	Bs	$	3.50
	16:31	A	Bs	C	A	$	4.00

4/6/2015	1101	8:07	A	G	Bs	Bs	$	5.50
		9:04	Bs	Bs	A	A	$	3.50
		10:02	A	A	A	Bs	$	2.00
		11:00	A	Bs	G	A	$	5.50
		11:12	break					
		12:39	G	A	A	Ie	$	2.00
		13:31	A	Ie	A	A	$	6.00
		15:38	A	A	Bs	A	$	3.50
	1301	8:00	A	A	A	A	$	2.00
		8:17	A	A	Bs	A	$	-
		8:20	A	A	Bs	A	$	3.50
		9:30	Bs	A	A	A	$	2.00
		10:01	A	A	A	A	$	2.00
		10:15	break					
		11:17	A	A	A	Bs	$	2.00
		12:00	A	Bs	A	Bs	$	3.50
		13:00	A	Bs	G	Bs	$	5.50
		14:00	G	Bs	A	A	$	3.50
		15:00	A	A	Bs	A	$	3.50
		15:45	Bs	A	Ie	A	$	6.00
	1302	8:45	A	En	A	A	$	3.50
		9:11	A	A	A	A	$	2.00
		9:30	A	A	Bs	Bs	$	3.50
		10:02	Bs	Bs	G	A	$	5.50
		10:53	G	A	A	A	$	2.00
		11:02	A	A	A	A	$	2.00
		11:08	A	A	A	A	$	2.00
		11:45	A	A	A	A	$	2.00
		12:02	A	A	A	A	$	2.00
		12:20	break					
		13:42	A	A	A	A	$	2.00
		15:00	A	A	En	A	$	3.50
		15:27	En	A	A	A	$	2.00
		15:30	A	A	A	A	$	2.00
		16:15	A	A	A	A	$	2.00
		16:36	A	A	A	A	$	2.00
	1303	7:15	A	C	Bs	Ase	$	4.00
		7:20	C	Ase	Bs	Bs	$	3.50
		8:11	Bs	Bs	A	A	$	3.50
		8:45	A	A	A	A	$	2.00
		9:08	A	A	A	A	$	2.00
		9:30	A	A	A	A	$	2.00
		10:30	A	A	A	A	$	2.00
		10:40	A	A	Bs	Bs	$	3.50
		11:09	break					
		12:13	Bs	Bs	BS	Bs	$	3.00
		12:35	Bs	Bs	A	A	$	3.50
		13:15	A	A	En	A	$	3.50
		15:03	En	A	A	A	$	2.00
		15:20	A	A	A	A	$	2.00

Page 5 of 7	4/9/2015	1010	8:51	A	A	A	A	$	2.00
			9:15	A	A	A	A	$	2.00
			11:33	Sac	A	Bs	A	$	3.50
			14:03	Sac	A	A	A	$	2.00
		1101	7:30	A	A	Bs	A	$	3.00
			8:00	Bs	A	A	A	$	2.00
			8:24	A	A	A	A	$	2.00
			9:05	A	A	A	A	$	2.00
			9:33	A	A	A	Bs	$	2.00
			10:09	A	Bs	A	A	$	3.50
			10:40	A	A	A	A	$	2.00
			10:45	A	A	A	A	$	2.00
			11:00	break					
			12:05	A	A	A	A	$	2.00
			12:20	A	A	A	A	$	2.00
			12:25	A	A	A	Bs	$	2.00
			13:00	A	Bs	Bs	Bs	$	3.00
			13:19	Bs	Bs	A	Bs	$	3.50
			14:01	A	Bs	Bs	A	$	3.00
			15:05	Bs	A	A	A	$	2.00
		1301	7:20	A	Ase	Bs	Bs	$	3.50
			8:00	Bs	Bs	A	A	$	3.50
			8:27	A	A	A	A	$	2.00
			8:48	A	A	A	A	$	2.00
			9:00	A	A	A	A	$	2.00
			9:40	A	A	A	A	$	2.00
			9:51	A	A	Folsom	Folsom	$	10.00
			10:30	break					
			11:30	Folsom	Folsom	A	A	$	10.00
			12:09	A	A	A	A	$	2.00
			12:35	A	A	A	A	$	2.00
			13:15	A	A	A	A	$	2.00
			14:10	A	A	A	A	$	2.00
			14:45	A	A	A	A	$	2.00
		1302	8:55	A	Bs	Bs	Bs	$	3.00
			9:27	Bs	Bs	A	A	$	3.50
			10:27	A	A	A	Bs	$	2.00
			11:00	A	Bs	Bs	Bs	$	3.00
			11:30	Bs	Bs	He	A	$	5.50
			12:16	He	A	Bs	Bs	$	3.50
			12:47	break					
			14:00	Bs	Bs	Ke	A	$	3.00
			15:11	Ke	A	Bs	A	$	3.50
			15:20	A	A	Iw	Bs	$	6.00
			16:20	Iw	Bs	Ase	A	$	3.50
			17:00	Ase	A	A	A	$	2.00
		1303	7:30	A	A	A	Ke	$	2.00
			8:05	A	Ke	Bs	A	$	2.00
			8:25	Ke	A	Bs	He		
			9:40	Bs	He	Bs	G	$	5.50
			10:14	Bs	G	Bs	Bs	$	5.50
			10:44	Bs	Bs	Bs	Bs	$	3.00
			11:00	Bs	Bs	G	Bs	$	5.50
			11:25	break					
			12:31	G	Bs	A	Iw	$	3.50
			13:40	A	Iw	A	A	$	6.00
			14:15	A	A	A	A	$	2.00
			14:45	A	A	A	A	$	2.00
			15:10	A	A	Bs	A	$	3.50

	1304	9:00	A	A	A	A	$	2.00
		9:15	A	A	A	A	$	2.00
		10:00	A	A	A	A	$	2.00
		10:30	A	A	A	A	$	2.00
		10:39	A	A	A	A	$	2.00
		10:39	A	A	A	A	$	2.00
		11:08	A	A	G	Bs	$	6.00
		12:15	G	Bs	A	A	$	3.50
		12:40	A	A	A	A	$	2.00
		13:11	A	A	A	A	$	2.00
		13:25	break					
		14:30	A	A	A	A	$	2.00
		15:30	A	A	A	A	$	2.00
		16:00	A	A	A	A	$	2.00
		16:10	A	A	A	A	$	2.00
4/10/2015	1010	8:50	A	Bs	A	A	$	3.50
		9:35	A	A	A	C	$	2.00
		10:00	A	C	Bs	A	$	4.00
		10:30	A	A	A	A	$	2.00
		11:00	A	A	A	A	$	2.00
		11:18	A	A	Bs	Bs	$	3.50
		11:49	Bs	Bs	C	A	$	4.00
		12:08	C	A	A	A	$	2.00
		12:37	A	A	A	A	$	3.00
		13:13	A	A	A	A	$	3.00
	1101	7:49	A	G	Bs	A	$	5.50
		8:30	Bs	A	Bs	A	$	3.50
		9:11	Bs	A	A	A	$	2.00
		9:40	A	A	A	En	$	2.00
		10:15	A	En	A	A	$	3.50
		10:45	break					
		11:45	A	A	A	A	$	2.00
		12:00	A	A	A	A	$	2.00
		12:30	A	A	A	A	$	2.00
		12:48	A	A	A	A	$	2.00
		13:00	A	A	A	A	$	2.00
		13:35	A	A	A	Bs	$	2.00
		14:05	A	Bs	Bs	A	$	3.00
		14:37	Bs	A	A	A	$	2.00
		15:10	A	A	Bs	A	$	3.50
	1301	7:30	A	A	A	A	$	3.50
		8:00	A	A	A	A	$	2.00
		8:17	A	A	Bs	A	$	3.50
		8:25	A	A	Bs	Bs	$	3.50
		9:31	Bs	Bs	Bs	A	$	3.00
		10:00	Bs	A	A	Bs	$	2.00
		10:31	A	Bs	A	A	$	2.00
		11:00	A	A	A	He	$	3.00
		11:08	break					
		13:00	A	He	A	Bs	$	6.00
		14:00	A	Bs	A	A	$	3.50
		15:00	A	A	A	En	$	3.00

1302	8:40	A	En	A	A	$	3.50
	9:00	A	A	A	A	$	3.00
	9:09	A	A	A	A	$	2.00
	9:33	A	A	Bs	Bs	$	3.50
	10:05	Bs	Bs	G	Bs	$	5.50
	10:31	G	Bs	Bs	Bs	$	3.00
	11:00	Bs	Bs	J	A	$	6.50
	11:40	J	A	A	A	$	2.00
	12:43	A	A	A	A	$	2.00
	13:02	break					
	14:10	A	A	A	A	$	2.00
	14:30	A	A	A	A	$	2.00
	14:45	A	A	He	A	$	6.00
	16:00	He	A	A	A	$	2.00
	16:13	A	A	Bs	A	$	3.50
1303	8:00	A	A	A	A	$	2.00
	8:45	A	A	A	A	$	2.00
	8:55	A	A	A	J	$	2.00
	9:30	A	J	Bs	Bs	$	6.50
	10:10	Bs	Bs	A	A	$	3.50
	10:35	A	A	Bs	Bs	$	3.50
	12:20	Bs	Bs	Bs	Bs	$	3.00
	12:39	Bs	Bs	Bs	Bs	$	3.00
	13:00	Bs	Bs	G	G	$	5.50
	13:14	Bs	G	G	A	$	5.00
	14:15	G	A	F	A	$	6.00
	15:10	F	A	A	A	$	2.00
1304	8:38	A	A	A	A	$	2.00
	9:00	A	A	Bs	A	$	3.50
	9:48	A	A	A	A	$	2.00
	10:00	A	A	A	A	$	2.00
	10:31	A	A	A	Bs	$	2.00
	11:01	A	Bs	A	A	$	3.50
	11:30	A	A	A	A	$	2.00
	11:39	A	A	A	A	$	2.00
	11:58	A	A	A	A	$	2.00
	12:16	A	A	En	A	$	3.50
	12:42	break					
	14:09	En	A	A	A	$	2.00
	14:30	A	A	A	A	$	2.00
	15:00	A	A	A	A	$	2.00
	15:10	A	A	A	A	$	3.00
	15:30	A	A	A	A	$	2.00
	16:15	A	A	A	A	$	2.00
	16:35	A	A	A	A	$	2.00
	17:00	A	A	A	A	$	2.00