

**IMPERIAL VALLEY TRANSIT
ANNUAL PASSENGER MILE SAMPLING METHODOLOGY
AND FINAL RESULTS
JULY 1, 2010-JUNE 30, 2011**



**Prepared for:
Imperial County Transportation Commission
1405 N. Imperial Ave. Suite 1
El Centro, CA 92243**

ICTC

**Prepared by:
Rea & Parker Research
P.O. Box 421079
San Diego, CA 92142
858-279-5070**



July, 2011

**IMPERIAL VALLEY TRANSIT
ANNUAL PASSENGER MILE SAMPLING METHODOLOGY
AND FINAL RESULTS
JULY 1, 2010-JUNE 30, 2011**

The County of Imperial provides fixed route bus service throughout the County through the services of Imperial Valley Transit, which was created in 1989. Imperial Valley Transit began as a 5 route system with 3 buses running Monday through Friday. The passenger ridership initially averaged approximately 3,000 passengers a month.

The service is operated by First Transit, Inc., administered by the Imperial County Department of Public Works, and funded by the Imperial Valley Association of Governments (IVAG). Funding is provided annually through the adopted IVAG Transit Finance Plan. The sources of the funding include, State Transit Assistance (STA), State Transportation Development Act (TDA), Federal 5311 and 5307 funds and local fare revenue.

The Federal Register of September 25, 1987, specifies that certain operating data must be collected from federally funded transit systems as part of the Section 15 Uniform System of Accounts and Records and Reporting System. One such required set of data that is required is an annual estimate of unlinked passenger trips and passenger miles that is reliable with 95 percent confidence to a margin of error of +/- 10 percent. The Urban Mass Transportation Administration and Federal Transit Administration (FTA) developed several suggested sampling techniques for collecting annual estimates of unlinked passenger trips and passenger miles. A transit agency may use a technique other than the UMTA recommended techniques as long as it meets the prescribed precision and confidence levels.

The County of Imperial contracted with Rea & Parker Research of San Diego, California to conduct the study that would require Rea & Parker Research personnel to ride randomly selected Imperial Valley Transit bus trips for a one year period that covered July 1, 2010-to-June 30, 2011. Rea & Parker Research had conducted the most recent passenger mile sampling for Imperial Valley Transit in 2008-2009.

Transit systems were now being offered the opportunity to convert to a new method of sampling supported by the National Transit Database (NTD). This new method would likely result in fewer samples required but in a highly irregular schedule that could make the securing and retention of employees to conduct the requisite counts to be problematic. Further, this new

sampling method required considerable trip-by-trip data from prior passenger mile estimates— records not required to be electronically maintained in order to compile the data for such prior estimates in order to complete the Daily Record Sheets that had been a part of the previous methodology. The decision was made to conduct this passenger mile estimate using the older, but still approved methodology, but to track and compile all individual bus trip data electronically so that the new methodology could be considered in the future.

The existing methodology indicated that for the 6 days per week that Imperial Valley Transit operated, two bus trips could be tallied every operating day for one year, or three trips every other day, 5 trips every third day, and so forth, as shown in the figure below.

**Sample Size
Table**

95 Percent Confidence Level @ Tolerance of 10 Percent

Number of Days Service Operated (m)

313
113

Number of One-Way Trips per Day (N)

	Sampling Interval (Every _ Day)					
	1	2	3	4	5	6
Trips/Day	2	3	5	8	12	19
Annual Trips	626	468	520	624	744	988

The option was also available to devise a statistically valid method that differed from both the new and the established NTD methodologies. Rea & Parker Research elected to utilize the NTD methodology inasmuch as it is specifically designed to address small transit systems. As such, no determination of variance, standard deviation, margin of error, confidence levels or intervals was undertaken by Rea & Parker research independent of this established methodology. These statistics would have been required to develop a method of sampling unique to Imperial Valley Transit. Attached as an appendix to this report are the academic and professional consultative experiences of Richard A. Parker, Ph.D. and Louis M. Rea, Ph.D., principals of Rea & Parker Research and also principal investigators and analysts for this study.

In preparation for the commencement of the study, Rea & Parker Research entered each bus trip into an SPSS (Statistical Package for the Social Sciences) database as a code, indicating weekday and Saturday, bus route number (each Imperial Valley Transit route runs in one direction only), and the number of the trip. For example, Route 50 on a weekday at 9:48am would have been

coded and entered as 50-04, the fourth Route 50 trip on weekdays and Saturday's 5:20pm Route 100 would have been coded 100s-05, the fifth Saturday Route 100 trip. Five trips were randomly selected by the SPSS program for counting every three days.

No buses run for Imperial Valley Transit on Sundays or on several holidays throughout the year. Other buses might alter their route somewhat on certain days or run only one day per week. Still others curtail their trips when Imperial Valley College is not in session. Random selection of any bus that was not running on a given day caused a randomly selected replacement to be chosen.

The method that was selected for implementation was for 5 bus trips to be sampled every third day. Most weeks were configured in one of three formats: Monday and Thursday, Tuesday and Friday, or Wednesday and Saturday. If a holiday occurred on a selected day during any week, these pairings were altered. For example, if Thanksgiving Day were the scheduled Thursday, that week may have been rearranged with the Wednesday and Saturday pairing so that for those two weeks only, buses were sampled on Monday and Wednesday one week and Thursday and Saturday in the previous or succeeding week. Missed trips, of which there were very few, were made up on the same day of the week as the missed trip during the succeeding week.

One other variable required attention for this year's study and that pertains to overflow buses. Imperial Valley Transit experiences considerable demand for boarding at the border in Calexico, and there are occasions when the existing Route 150 bus cannot accommodate that demand. At such times Imperial Valley Transit dispatches another bus to absorb this overflow demand. The overflow bus was added to the list of bus routes and selected for sampling similar to all other routes. Inasmuch as it was not known if the overflow bus was going to be needed on any particular day, a sixth trip was selected randomly for backup when the overflow was selected for sampling. On days when the overflow was not part of the sample but was needed, Imperial Valley Transit notified Rea & Parker research and that bus trip was added to the tally of trips run for that week.

On board personnel were given an assignment log (as depicted in the Exhibit A example) and trip sheets (Exhibit B example), as demonstrated on the next pages. The assignment log provided specific instructions about where to board each bus, where and when to exit, and if that trip was one that was selected for sampling. If the trip was selected, trip sheets were attached onto which

the Rea & Parker Research counting employee on board was to record boardings, alightings, and on-board counts between stops.

The Rea & Parker Research supervisor, who was based in the City of Imperial, collected and distributed these forms to the counting personnel and sent the manually completed forms twice per month to San Diego for data entry by Rea & Parker Research staff and math and logic checks by one of the principals of Rea & Parker Research—Richard A. Parker, Ph.D. or Louis M. Rea, Ph.D. At that point in time, the manual information was entered electronically, the distance between stops was added to the forms, and the total number of passenger miles could be determined. A completed trip sheet (Exhibit C) also follows in the next pages of this report for illustrative purposes. These completed forms were then compiled into an Excel file that maintained a running balance of counts and mileage. A sample of that Excel file also follows (Exhibit D), and it is this format that will facilitate consideration of NTD alternative sampling for future analyses.

Imperial Valley Transit Passenger Sampling Assignment Log (EXHIBIT A)

Assignment# <u>55B</u>	Employee: _____
DATE: <u>1-7-11</u>	Day of Week: <u>Fri</u>

SPECIAL INSTRUCTIONS FOR REPORTING/FINISHING IF OTHER THAN FIRST OR LAST STOP			
Reporting Time:		Reporting Place:	
Finishing Time:		Finishing Place:	

On-Board Bus Schedule

<u>Bus Route</u>	<u>Trip Serial #</u>	<u>Beginning Stop</u>	<u>Begin Stop Time</u>	<u>Last Stop</u>	<u>Last Stop Time</u>	<u>Bus Scheduled for Data Collection?</u>	<u>Special Instructions after Last Stop</u>
50		Brawley E St & Rio Vista	12:59P	El Centro State & 14 th	2:10P	No	Stay on bus
100	100-08	El Centro State & 14th	2:10P	Calexico Hacienda	2:56P	YES	Stay on bus and with driver
150		Calexico Hacienda	3:06P	El Centro State & 14 th	4:20P	No	
Blue	blu-10	El Centro State & 14th	4:35P	El Centro State & 14 th	5:33P	YES	
200	200-10	El Centro State & 14th	5:40P	Brawley E St & Rio Vista	6:37P	YES	

EXHIBIT B SURVEY TRIP SHEET

							# of Pages <u>1 of 1</u>	
(1) Trip Serial No. <u>100-08</u>			(2) Date <u>1-7-11</u>		(3) Day of Week <u>Fri</u>		(4) Time Period <u>Midday</u>	
(5) Route No. <u>100</u>			(6) Vehicle Inventory Number <u></u>		(7) Total Capacity _____		(8) Seated Capacity _____	
(9)	(10)	(12)	(13)	(14)	(15)	(16)	(17)	
Stop No.	Stop Description	Odometer Reading	Passengers Boarded	Passengers De-Boarded	Passengers On Board	Distance Between Stops	Passenger Miles (15) x (16)	
1	State St / 14th St.				0		0	
2	State St. / 8th St.				0		0	
3	State St. / 5th St.				0		0	
4	4th St. / Brighton				0		0	
5	4th St. / Wensley				0		0	
6	Ross St. / 10th St.				0		0	
7	Imperial Ave. / Pepper				0		0	
8	Aurora / 14th St.				0		0	
9	Aurora / 4th St.				0		0	
10	4th St. / Wake St.				0		0	
11	Imperial Valley Mall				0		0	
12	Heber Family Apts				0		0	
13	Dogwood/Hwy 86				0		0	
14	Heber Post Office				0		0	
15	Heber/Pitzer				0		0	
16	Scaroni/Cole				0		0	
17	Scaroni/Hacienda				0		0	
0	(26) Capacity Miles (7) x (22)	Totals	0	0	0	0	0	
			(20)		(21)	(22)	(23)	
0	(27) Seat Miles (8) x (22)			Mean On Board	0			

SURVEY TRIP SHEET

# of Pages <u>1 of 2</u>							
(1) Trip Serial No. <u>blu-10</u>		(2) Date <u>1-7-11</u>		(3) Day of Week <u>Fri</u>		(4) Time Period <u>PM Peak</u>	
(5) Route No. <u>BLUE</u>		(6) Vehicle Inventory Number _____		(7) Total Capacity _____		(8) Seated Capacity _____	
(9)	(10)	(12)	(13)	(14)	(15)	(16)	(17)
Stop No.	Stop Description	Odometer Reading	Passengers Boarded	Passengers De-Boarded	Passengers On Board	Distance Between Stops	Passenger Miles (15) x (16)
1	State St. / 14th St.				0		0
2	Waterman / Main				0		0
3	La Brucherie/Orange				0		0
4	La Brucherie/Ross				0		0
5	Imperial/Pepper				0		0
6	Ross/10 th				0		0
7	Clark Road/S. Loop Rd				0		0
8	Social Services Buildings				0		0
9	Wake Ave				0		0
10	4th St./Driftwood				0		0
11	4th St./Wensley				0		0
12	3rd/Brighton				0		0
13	1st/Brighton				0		0
14	Hope/Brighton				0		0
15	Dogwood/Orange				0		0
16	Dogwood/Evan Hewes				0		0
0	(26) Capacity Miles (7) x (22)	Totals	0	0	0	0	0
			(20)		(21)	(22)	(23)
0	(27) Seat Miles (8) x (22)						

SURVEY TRIP SHEET

							# of Pages <u>2 of 2</u>
(1) Trip Serial No. <u>blu-10</u>		(2) Date <u>1-7-11</u>		(3) Day of Week <u>Weds</u>		(4) Time Period <u>PM Peak</u>	
(5) Route No. <u>BLU</u>		(6) Vehicle Inventory Number _____		(7) Total Capacity _____		(8) Seated Capacity _____	
(9)	(10)	(12)	(13)	(14)	(15)	(16)	(17)
Stop No.	Stop Description	Odometer Reading	Passengers Boarded	Passengers De-Boarded	Passengers On Board	Distance Between Stops	Passenger Miles (15) x (16)
17	Park/5th St.				0		0
18	State St./5th				0		0
19	State St./8th				0		0
20	State St. / 14th St.				0		0
0	(26) Capacity Miles (7) x (22)	Totals	0	0	0	0	0
			(20)		(21)	(22)	(23)
0	(27) Seat Miles (8) x (22)			Mean On Board	0		

SURVEY TRIP SHEET

							# of Pages <u>1 of 2</u>	
(1) Trip Serial No. <u>200-10</u>		(2) Date <u>1-7-11</u>		(3) Day of Week <u>Fri</u>		(4) Time Period <u>PM Peak</u>		
(5) Route No. <u>200</u>		(6) Vehicle Inventory Number		(7) Total Capacity _____		(8) Seated Capacity _____		
(9)	(10)	(12)	(13)	(14)	(15)	(16)	(17)	
Stop No.	Stop Description	Odometer Reading	Passengers Boarded	Passengers De-Boarded	Passengers On Board	Distance Between Stops	Passenger Miles (15) x (16)	
1	State/14th				0		0	
2	Imperial/Commercial				0		0	
3	Imperial/Euclid				0		0	
4	Bradshaw/86 (Costco)				0		0	
5	La Brucherie/Bradshaw -WalM				0		0	
6	Aten / La Brucherie				0		0	
7	Aten/Myrtle				0		0	
8	Aten / Cross				0		0	
9	Imperial Valley College				0		0	
10	Barioni Ave./K St. (IID)				0		0	
11	Imperial Post Office				0		0	
12	15th & Imperial				0		0	
13	Legion Rd. / Hwy 86 (Hospital)				0		0	
14	Brawley--K St./ 2nd St.				0		0	
15	Brawley--K St/Imperial Ave				0		0	
16	Brawley--K St./S. 9th				0		0	
0	(26) Capacity Miles (7) x (22)	Totals	0	0	0	0	0	
			(20)		(21)	(22)	(23)	
0	(27) Seat Miles (8) x (22)							

SURVEY TRIP SHEET

							# of Pages <u>2 of 2</u>	
(1) Trip Serial No. <u>200-10</u>		(2) Date <u>1-7-11</u>		(3) Day of Week <u>Fri</u>		(4) Time Period <u>PM Peak</u>		
(5) Route No. <u>200</u>		(6) Vehicle Inventory Number _____		(7) Total Capacity _____		(8) Seated Capacity _____		
(9)	(10)	(12)	(13)	(14)	(15)	(16)	(17)	
Stop No.	Stop Description	Odometer Reading	Passengers Boarded	Passengers De-Boarded	Passengers On Board	Distance Between Stops	Passenger Miles (15) x (16)	
17	Brawley--K St./S. Palm St.				0		0	
18	Brawley--Palm St. / J St.				0		0	
19	Brawley--S. Main St. / Palm				0		0	
20	Brawley--Main St. / 10th St.				0		0	
21	Brawley--Main/North Plaza				0		0	
22	Brawley--Main/3rd St.				0		0	
23	Brawley--E St./Rio Vista				0		0	
24	Westmorland--Center/Main				0		0	
25	Westmorland--Center/6th				0		0	
26	Calipatria--Main St. / Park				0		0	
27	Calipatria--111/Main				0		0	
28	Niland--111/Main				0		0	
29	Brawley--K St./S. Palm St.				0		0	
							0	
							0	
							0	
0	(26) Capacity Miles (7) x (22)	Totals	0	0	0	0	0	
			(20)		(21)	(22)	(23)	
0	(27) Seat Miles (8) x (22)			Mean On Board	0			

EXHIBIT C SURVEY TRIP SHEET

							# of Pages <u>1 of 1</u>	
(1) Trip Serial No. <u>100-11</u>			(2) Date <u>11-19-10</u>		(3) Day of Week <u>Fri</u>		(4) Time Period <u>PM Peak</u>	
(5) Route No. <u>100</u>		(6) Vehicle Inventory Number <u>105</u>		(7) Total Capacity <u>64</u>		(8) Seated Capacity <u>43</u>		
(9)	(10)	(12)	(13)	(14)	(15)	(16)	(17)	
Stop No.	Stop Description	Odometer Reading	Passengers Boarded	Passengers De-Boarded	Passengers On Board	Distance Between Stops	Passenger Miles (15) x (16)	
1	State St / 14th St.	60084.1	14		14	0.4	5.6	
2	State St. / 8th St.	60084.5	2		16	0.3	4.8	
3	State St. / 5th St.	60084.8	1	1	16	0.3	4.8	
4	4th St. / Brighton	60085.1	1		17	0.3	5.1	
5	4th St. / Wensley	60085.4	1		18	0.8	14.4	
6	Ross St. / 10th St.	60086.2	2		20	1.5	30	
7	Imperial Ave. / Pepper	60087.7	5	1	24	0.5	12	
8	Aurora / 14th St.				24		0	
9	Aurora / 4th St.				24		0	
10	4th St. / Wake St.	60088.2		2	22	1.9	41.8	
11	Imperial Valley Mall	60090.1	6	1	27	2.4	64.8	
12	Heber Family Apts	60092.5	5		32	0.5	16	
13	Dogwood/Hwy 86	60093	3		35	4.8	168	
14	Heber Post Office				35		0	
15	Heber/Pitzer				35		0	
16	Scaroni/Cole				35		0	
17	Scaroni/Hacienda	60097.8		3	32		0	
876.8	(26) Capacity Miles (7) x (22)	Totals	40	8	391	13.7	367.3	
			(20)		(21)	(22)	(23)	
589.1	(27) Seat Miles (8) x (22)			Mean On Board	23.9333333			

EXHIBIT D
EXCEL COMPUTERIZD TRIP-BY-TRIP DATA ENTRY
(EXAMPLE: WEEK 1 INPUT)

Date	Day of Week	Week #	Route	Time Period	Boarded-UPT	Sum of Boardings	On-Board	Sum of On-Board	Bus Trip Distance
7/1/2010	Thurs	1	IVCNIL	1	6	6	10	10	40.3
7/1/2010	Thurs	1	Blue	1	7	13	45	55	13.9
7/1/2010	Thurs	1	100	2	47	60	418	473	13.8
7/1/2010	Thurs	1	100	3	54	114	506	979	13.9
7/1/2010	Thurs	1	100	2	57	171	552	1531	13.9
7/6/2010	Tues	1	50	2	35	206	472	2003	50.5
7/6/2010	Tues	1	450	3	0	206	0	2003	7.8
7/6/2010	Tues	1	150	4	48	254	490	2493	19.8
7/6/2010	Tues	1	100	4	6	260	65	2558	13.9
7/6/2010	Tues	1	150	4	4	264	28	2586	6.4

Passenger Miles=PMT	Sum of PMT	Capacity Miles	Sum of Capacity Miles	Seat Miles	Sum of Seat Miles
74.4	74.4	1249.3	1249.3	1088.1	1088.1
34.9	109.3	319.7	1569	319.7	1407.8
366.5	475.8	897	2466	607.2	2015
439.2	915	903.5	3369.5	611.6	2626.6
479.6	1394.6	861.8	4231.3	569.9	3196.5
594.7	1989.3	3282.6	7513.9	2222	5418.5
0	1989.3	132.6	7646.5	132.6	5551.1
290.2	2279.5	1287	8933.5	871.2	6422.3
63.1	2342.6	291.9	9225.4	291.9	6714.2
11.6	2354.2	134.4	9359.8	134.4	6848.6

FTA Form 406A was used to compile the Daily Trip-by-Trip Excel file totals for the year and to display the final results for the yearlong study.¹ Form 406A shows (on Lines 1, 7, and 10) that a total of 16,785 unlinked boardings were counted for the year on the 520 sampled bus trips (32.28 boardings per bus trip). In 2008-2009 there were 33.18 boardings per sampled trip.

- 27.89 passengers on 93 sampled weekday a.m. peak hour bus trips (prior to 9:00 a.m.)—2008-2009 = 25.51 boardings per sampled trip.
- 38.54 boardings on 177 sampled midday weekday trips (9:00 a.m.—3:00 p.m.)—2008-2009 = 41.03 boardings per sampled trip.
- 26.16 boardings on 146 weekday p.m. peak bus trips (3:00 p.m. –7:00 p.m.)—2008-2009 = 25.71 boardings per sampled trip.
- and 19.89 on 19 nighttime trips (after 7:00 p.m.)—2008-2009 = 16.83 boardings per sampled trip.
- Saturdays, with fewer buses that run on the busier routes, typically, averaged 37.32 boardings per trip—2008-2009 = 40.62 boardings per sampled trip.

Inasmuch as Saturdays were oversampled relative to weekday trips, with 85 out of 520 sampled trips (16.3 percent of all sampled trips) in contrast to the actual weekly bus trips of 556 scheduled weekday trips and 31 scheduled Saturday trips (5.3 percent of all trips), the overall 32.28 boarding average is disproportionately high because of the higher boardings per trip on Saturdays. When weights are applied², the mean number of boardings per trip system wide is reduced slightly to 31.20 (2008-2009 = 31.30 boardings per trip).

All of ridership averages presented above are very close to those from the 2008-2009 sampling, thereby strongly confirming both their validity and the methodological reliability of the study.

¹ The original Form 406A was modified from its published version to accommodate the requisite weighting and to correct some errors in the form. The original Form 406A follows on the next page, with errors noted by yellow highlight. These errors were as follows:

- 1) Lines 11-12 on the original were repeats of lines 9-10 rather than the data shown on the modified Form 406A on lines 12-13, which was the clear intent, and
- 2) Line 10 on the original is shown as being calculated by dividing line 1 by line 7; whereas, the correct determination is line 4 divided by line 7

² Inasmuch as the sample distribution does not precisely mirror the actual distribution of trips weighting was appropriate for Form 406A. Weights are equal to the total trips in the sample (Line 7—Sample Total column) divided by total number of bus trips sampled (Line 8—Sample Total column). Then, for each time period, that result is divided by the total number of trips in the sample by time period (7) divided by the total number of bus trips sampled by time period (8). These weights are then multiplied by sample totals to obtain sample data that is weighted to reflect the actual distribution of bus trips.

Form 406A (Modified)
ANNUAL DATA TO FTA: IMPERIAL
VALLEY TRANSIT

July 1, 2010-June 30, 2011

Line No.	ITEM	WEEKDAYS				SATURDAY	SAMPLE	WEIGHTED**
		AM PEAK	MIDDAY	PM PEAK	NIGHT		TOTAL	TOTAL
	Accumulations from Trip by Trip Record							
1	(20) Passengers Boarded	2594	6822	3819	378	3172	16785	16221
2	(21) Passengers on Board	26724	74710	39702	3831	38030	182997	173666
3	(22) Bus Trip Distance	2108.1	3562.4	2930.8	328.5	2729.5	11659.3	11064.8
4	(23) Passenger Miles	31963.8	66364	41333.8	2666.9	41300	183628.5	174314.1
5	(26) Capacity Miles	108355.3	174150.8	141207	13484.6	159246.2	596443.9	551895.4
6	(27) Seat Miles	77569.9	128447.7	102716.5	10532	109689.6	428555.7	400220.8
7	(28) Trips in Sample	93	177	146	19	85	520	
8	(29) Total Number of Bus Trips	7495	10119	9081	1155	1581	29447	
9	WEIGHTS**	1.423150979	1.009547173	1.09835595	1.073471875	0.328454511		
	Sample Averages							
10	Unlinked Passengers (Boardings) per Trip (1/7)	27.89	38.54	26.16	19.89	37.32	32.28	31.2
11	Passenger Miles per Trip (4/7)	343.70	374.94	283.11	140.36	485.88	353.13	335.2
12	Capacity Miles per Trip (5/7)	1165.11	983.90	967.17	709.72	1873.48	1147.01	1061.3
13	Seat Miles per Trip (6/7)	834.08	725.69	703.54	554.32	1290.47	824.15	769.7
14	% Passenger Miles to Seat Miles per Trip (11/13)	0.412	0.517	0.402	0.253	0.377	0.428	0.436
15	% Passenger Miles to Capacity Miles per Trip (11/12)	0.295	0.381	0.293	0.198	0.259	0.308	0.316
	Annual Totals (weighted by number of trips)							
16	Annual Unlinked Passenger Trips (10*8)	209054	390010	237537	22978	58999	950515	918578
17	Annual Total Passenger Miles (11*8)	2576007.32	3793996.14	2570905.74	162119.45	768180.00	10398670.08	9871208.65

Applying these mean numbers of unlinked boardings and correspondingly determined passenger miles (based on number of passengers on-board and distance between stops) reveals the final estimates required for the federal database. **Form 406A shows that the annual estimated unlinked passenger boardings and mileage is determined (with a margin of error of +/- 10 percent at 95 percent confidence) to be 918,578 riders who traveled 9,871,209 passenger miles during the year (Lines 16 and 17).** In 2008-2009, the corresponding estimates were 894,537 passengers and 9,602,013 passenger miles, indicating a great deal of consistency between the two periods, with 2010-2011 showing an increase of approximately 24,000 unlinked passenger trips and 269,000 passenger miles.

Form 406A also breaks down the total ridership and mileage by time of day (Lines 16 and 17).

- There are 209,054 unlinked boardings annually during weekday a.m. peak periods, traveling 2,576,007 miles. Corresponding totals from 2008-2009 were 190,077 unlinked boardings and 2,543,680 passenger miles.
- Midday riders on weekdays total 390,010 per year and 3,793,996 miles. In 2008-2009, ridership showed 396,254 unlinked boardings and 3,753,544 miles.
- Peak riders during the weekday p.m. periods total 237,537 and 2,570,906 miles (2008-2009 = 232,032 boardings and 2,436,605 miles).
- Weekday nights have 22,978 riders traveling 162,119 miles (an increase from 2008-2009 when there were 17,028 boardings and 119,020 miles), whereas all others listed herein are very similar (within the 10 percent margin of error) to 2008-2009.
- Saturdays have 58,999 riders and 768,180 miles (2008-2009 = 59,146 boardings and 749,164 miles).

Imperial Valley Transit vehicles experience their highest percentage occupancy (Line 14) during midday on weekdays, with 51.7% of seat miles occupied (2008-2009 = 44.4%), followed by the weekday morning peak period (41.2 percent—2008-2009 = 37.1%), and, as would be expected, night times have the lightest occupancy (25.3 percent—2008-2009 = 23.5%). In 2008-2009, Saturdays carried the second highest load (41.3%) instead of weekday morning peak. Overall, for all buses, 43.6 percent of seats are occupied with 31.6 percent of the combined seated and

standing capacity occupied, and in 2008-2009, the corresponding occupancies were 39.7% of seats and 26.6% of seated and standing capacity³.

³ There was a redetermination downward of some standing capacities that were used in 2008-2009, and the increase in combined seated and standing occupancy is partially impacted by this change. As such the increased seated and standing occupancy in 2010-2011 overstates the difference between the years

ANNUAL DATA TO FTA

Transit ID _____

Level _____

Fiscal Year End _____

Type of Service _____

Mode _____

Line No.	ITEM	WEEKDAYS				SATURDAY	TOTAL
		AM PEAK	MIDDAY	PM PEAK	OTHER		
	Accumulations from Daily Record Sheet						
1	(20) Passengers Boarded						
2	(21) Passengers on Board						
3	(22) Bus Trip Distance						
4	(23) Passenger Miles						
5	(26) Capacity Miles						
6	(27) Seat Miles						
7	(28) Trips in Sample						
8	(29) Total Number of Bus Trips						
9	Unlinked Passengers per Trip (1/7)						
10	Passenger Miles per Trip (1/7)						
11	Unlinked Passengers per Trip (1/7)						
12	Passenger Miles per Trip (4/7)						

*DO = Directly Operated PT = Purchased Transportation

Sample Plan Used _____

Date Prepared _____

Date Updated _____

APPENDIX: Qualifications of Rea & Parker Research

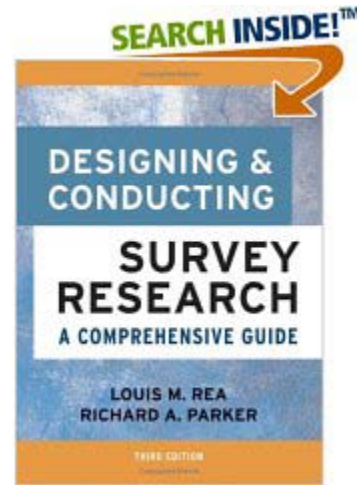
Richard A. Parker, Ph.D.

Louis M. Rea, Ph.D.

Rea & Parker Research is a survey and market research and economic consulting firm based in San Diego, California. Rea & Parker Research also has facilities in Los Angeles. Rea & Parker Research is a division of Rea & Parker, Incorporated, a California corporation—incorporated in 1985 (Fed ID: 33-0156230). Its home office in San Diego is located at 4875 Casals Place, San Diego, CA 92124 (mailing address: P.O. Box 421079, San Diego, CA 92142-1079). Telephone numbers for Rea & Parker Research are 858-279-5070 and 858-279-1170 (fax). The website is www.rea-parker.com.

It was founded by its present owners, Louis M. Rea, Ph.D., and Richard A. Parker, Ph.D., in 1984 and was incorporated in 1985. Rea & Parker Research has grown into a well-respected, financially stable, and substantial research organization with clients throughout the State of California and the Southwest who will attest to the firm's ability to deliver a quality product within the originally designated budget and in accordance with the contracted time schedule.

Dr. Parker is the firm's President and Dr. Rea its Vice-President. Dr. Rea and Dr. Parker are also professors in the School of Public Affairs at San Diego State University. Dr. Parker and Dr. Rea are co-authors of a highly successful book, *Designing and Conducting Survey Research: A Comprehensive Guide*, published by Jossey-Bass Publishers in 1992, with a second edition published in 1997, and a third edition in 2005.



Rea & Parker Research utilizes the university offices and state-of-the-art computer facilities, along with access to renowned scholars and reference material when necessary. There are four regularly employed members of the staff: Richard A. Parker, Ph.D., Louis M. Rea, Ph.D., Sherry Ryan, Ph.D., and Sharon Gomez, with part-time research assistant help from graduate and undergraduate student assistants.

Drs. Parker and Rea have extensive experience in public and urban affairs regarding the collection of primary demographic, attitudinal, and market-related data through survey research and focus group analysis. Rea & Parker Research has a significant history of success in deriving marketing data from ethnic minority groups. Further, they are highly regarded economic consultants, particularly in the areas of fiscal impact analysis, urban economic development, and site specific commercial, retail, and residential evaluation.

Rea & Parker Research has designed and conducted surveys and market research for a significant list of clients, including:

- State of California--Senate Rules Committee
- State of California--Senate Special Committee on Border Issues
- State of California--Office of the Auditor General
- State of California--Office of the Attorney General
- California Department of Transportation (CALTRANS)
- San Diego County Sheriffs' Department
- San Diego County Water Authority
- San Diego Unified School District
- Imperial Irrigation District

- Otay Water District
- San Diego Gas & Electric
- County of San Diego
- County of Orange
- City of San Diego
- City of San Diego Housing Commission
- City of Escondido
- City of Carlsbad
- City of Oceanside
- City of Poway
- City of Davis
- City of St. Helena
- City of Dana Point
- City of Holtville
- Los Angeles County Metropolitan Transportation Authority
- Southern California Regional Rail Authority (Metrolink)
- Orange County Transportation Authority
- Bay Area Rapid Transit
- San Diego Metropolitan Transit System
- Riverside Transit Agency
- Imperial Valley Transit
- Southern California Association of Governments
- Imperial Valley Association of Governments
- San Diego Association of Governments
- Santa Clarita Transit
- Sweetwater Authority
- San Diego County Taxpayers Association
- San Diego County Law Library
- California Center for Sustainable Energy
- City Heights Community Development Corporation (City of San Diego)
- Centre City Development Corporation (City of San Diego)
- North Park Main Street Association (San Diego)
- San Luis Rey Indian Water Authority
- La Jolla Band of Mission Indians
- Viejas Enterprises
- Foxwoods Development
- Wallace, Roberts and Todd--Planners and Architects (San Francisco)
- Westec Services, Inc. (Salt Lake City)
- Joint Labor/Management Committee-Retail Food Industry
- San Diego/Imperial Counties Labor Council AFL-CIO
- PRC Engineering
- RECON, Incorporated
- Christiansen and Wallace
- Stevens Planning Group
- IBI Group
- Brian Mooney and Associates--Urban Planners
- MNA Consulting Services
- Stoorza, Ziegau, & Metzger--Public Relations
- Southwest Strategies, LLC
- Stirling Enterprises
- Pardee Construction Company

- San Diego Aircraft Carrier Museum Foundation
- Pacifica Companies
- Westbrook Development
- Genstar Development
- Laing Urban
- Pacific Century Development
- Subway, Inc.
- Westfield Shopping Centers
- Shea Properties
- Pacific Beachfront Resort
- Housing Solutions Alliance
- Smart Growth Coalition—National City
- SORE
- Rodney Company/Rancho Guejito
- Seyfarth Shaw LLP—Attorneys at Law
- Sheppard, Mullin, Richter & Hampton, LLP—Attorneys-at-Law
- Akins, Gump, Strauss, Hauer & Feld—Attorneys-at-Law
- Paul, Plevin, Sullivan & Connaughton LLP—Attorneys-at-Law
- Ault, Deuprey, Jones, Danielsen, & Gorman--Attorneys at Law
- Higgs, Fletcher & Mack--Attorneys at Law
- O'Neill, Huxtable & Abelson--Attorneys at Law

Richard A. Parker, Ph.D. is a Professor of Practice in the School of Public Affairs at San Diego State University where he teaches graduate and undergraduate courses in statistics, survey research, urban economic development, finance, and real estate. Dr. Parker possesses extensive analytical experience in statistical survey research, market analysis, land use, real estate development and valuation, and transportation issues. He will serve as the co-Project Director.

Dr. Parker has been a consultant to both the public and private sectors for almost 30 years. He has specialized in sample survey research for various governmental agencies and market research for retail, commercial, residential, and recreational development. Particular emphasis has been placed upon market research conducted in the field of transportation, with a myriad of rider/on-board surveys, intercept surveys, telephone surveys, and focus group projects having been performed for several transportation agencies. Dr. Parker has further established his reputation with regard to fiscal impact studies, urban redevelopment, and environmental impact/socioeconomic and demographic analyses. Dr. Parker has also been involved on a consultative basis with a number of issues concerning economic and population growth impacts in Southern California and has published a variety of articles, monographs, and books on these subjects. He has further participated in various panel discussions, delivered expert testimony to legislatures and courts, and appeared on several radio and television programs on behalf of his clients.

Dr. Parker is a graduate of Brown University, the University of California at Berkeley, and UCLA. He possesses degrees in Business Administration from those institutions (B.S., MBA, and Ph.D.) plus a further graduate degree in City Planning (MCP) from San Diego State University.

Louis M. Rea, Ph.D. is Vice-President of Rea & Parker Research and professor of City Planning in the School of Public Affairs at San Diego State University. Dr. Rea teaches graduate courses in statistical analysis, transportation planning, survey research, and urban/fiscal problems. He has published a variety of articles, participated in panel discussions, and delivered numerous papers at professional conferences throughout the United States. He has extensive experience as a researcher and consultant in California and particularly in San Diego and the Los Angeles area for the past 30 years. Dr. Rea will be Co-Project Director for this study.

Dr. Rea has conducted and supervised numerous projects in the areas of transportation research and transit planning, including on-board bus/train surveys, ride checks, intercept surveys, and focus groups. He has also conducted Internet and telephone surveys in numerous consulting and research assignments for municipal jurisdictions and private businesses throughout Southern California. Dr. Rea has prepared environmental impact reports and market analyses for various commercial/recreational developments and has analyzed the feasibility of assessment districts and direct benefit financing. Dr. Rea has also prepared demographic and economic profiles and projections for various projects.

Dr. Rea is a graduate of Colgate University in New York, where he earned a BA. He received a Master of Regional Planning (MRP) and Ph.D. in Social Science. from Syracuse University in Regional Planning.

Complete resumes are attached.

Survey Research Consultative Projects

San Diego County Water Authority Public Opinion Surveys

Prepared, implemented, and analyzed 2003, 2004, and 2005, 2006, 2008, 2009 and 2011 (in progress) Public Awareness Survey of telephone respondents (600 in 2003, 710 in 2004, 725 in 2005, and 700 in 2006, 2008 and 2009) concerning behavior, opinion, rate tolerance, future needs assessment issues, desalination, water reclamation, conservation practices.

Also for the **San Diego County Water Authority:**

- Prepared, implemented, and analyzed survey of General Managers and Department Heads of 23 member agencies about satisfaction, effectiveness, usefulness of services and programs provided by Water Authority in 2003 and 2005
- Prepared, implemented, and analyzed employee satisfaction survey of Engineering Department.
- Prepared, implemented, and analyzed 400 respondent survey among San Diego County contractors regarding project labor agreements and public works contracting.
- 2008—two 600 person telephone surveys tracking before and after impacts of public awareness campaign concerning water conservation.

Los Angeles County Metropolitan Transportation Authority:

On-Board and Telephone Bus Surveys

- On-Board bus survey for MTA, Foothill Transit, and Duarte Transit concerning expansion of Gold Line—800 respondents
- Conducted the On-Board Bus Survey for **Los Angeles County Metropolitan Transportation Authority**, including 40,000 rider/on-board surveys, 2,500 follow-up telephone interviews, and 10 focus groups.
 - Final deliverables include/included 4 reports:
 - Satisfaction, travel patterns, fare media, and demographics of 31,000 weekday bus riders on LACMTA buses and those of 12 municipal transit operators within Los Angeles County (**Alhambra Community Transit, Culver City Bus Lines, Commerce Transit, Pasadena ARTS, Cerritos-On-Wheels (COW), Santa Monica Big Blue Bus, Los Angeles Commuter Express, Santa Clarita Transit, Torrance Transit, Carson Circuit, El Monte Trolley, and Foothill Transit**).
 - Satisfaction, travel patterns, fare media, and demographics of 3,500 weekend bus riders on LACMTA buses.
 - Detailed follow-up telephone survey of 2,500 weekday riders of MTA and 12 municipal operators expanding upon demographics, satisfaction, problem occurrence, importance/concern, travel behavior, use of MTA website, customer service, and marketing media and messages.
 - Geocoded home, origin (production), boarding, alighting, and destination (attraction) data is presented in color graphics by line, service sector, and planning area.
 - Prepared the on-board survey instrument for LACMTA and each of the 12 municipal operators and had its surveyors ride the buses of randomly selected bus runs from June, 2001 to December, 2001, with follow-up surveys also conducted on-board during March, 2002.
 - Prepared and tested the survey instrument in 10 focus group sessions conducted in Los Angeles County and in two extensive on-board pretests involving almost 1,000 respondents. Focus groups were conducted in different geographical areas of the County, among different age and ethnic groups, and in both Spanish and English.

- The telephone survey consisted of 39 questions, including 110 individual variables. The mean survey time was 13.09 minutes, administered in both English and Spanish. Media information concerning messages communicated on television was added to more typical transportation-based questions. It was conducted from late January to early March, 2002. The analysis consisted of detailed crosstabulations, correlations, and analyses of variance in order to assess market segmentation strategies.

On-Board and Telephone Rail Surveys

- On-Board survey of Gold Line riders concerning expansion plans—800 respondents
- Conducted the On-Board Rail Survey for **Los Angeles County Metropolitan Transportation Authority**, including 15,000 rider/on-board surveys, 1,000 follow-up telephone interviews, and 3 focus groups.
 - Final deliverables include/included 4 reports:
 - Satisfaction, travel patterns, fare media, and demographics of 12,000 weekday riders on LACMTA Metro Rail—Blue, Green, and Red Lines.
 - Satisfaction, travel patterns, fare media, and demographics of 3,000 weekend bus riders on LACMTA Metro Rail—Blue, Green, and Red Lines.
 - Detailed follow-up telephone survey of 1,000 weekday and weekend riders of Metro Rail expanding upon demographics, satisfaction, problem occurrence, importance/concern, travel behavior, use of MTA website, customer service, and marketing media and messages.
 - Geocoded home, origin (production), and destination (attraction) data is presented in color graphics by line.
 - Prepared the on-board survey instrument for LACMTA and had its surveyors ride the trains on randomly selected runs from August, 2001 to October, 2001, with follow-up surveys also conducted on-board during February, 2002.
 - Prepared and tested the survey instrument in 3 focus group sessions conducted in Los Angeles County and in two extensive on-board pretests involving almost 500 respondents. Focus groups were conducted in different geographical areas of the County, among different age and ethnic groups, and in both Spanish and English.

- The telephone survey consisted of 42 questions, including 103 individual variables. The mean survey time was 12.29 minutes, administered in both English and Spanish. It was conducted from late January to early March, 2002. Media information concerning messages communicated on television was added to more typical transportation-based questions. The analysis consisted of detailed crosstabulations, correlations, and analyses of variance in order to assess market segmentation strategies.

Telephone Survey

- 600-person telephone survey in San Gabriel Valley concerning expansion of Gold Line and Measure R

Orange County Transportation Authority (OCTA):

Market Program Consultant—Seniors, Pre-Seniors, and Hispanics

Marketing program consultant in OCTA's effort to attract and retain more riders, particularly from Hispanic and senior citizen groups. Sixteen focus groups were scheduled and twelve conducted (four having been deferred at OCTA's request to July, 2002).

Focus groups were held among riders and non-riders in Hispanic and senior citizen population enclaves. Further focus groups were held among pre-seniors (age 55-64) in order to ascertain information about their willingness to ride the buses as they grow older and what they would require in order to do so with much satisfaction.

Marketing messages were tested, including a new logo, new bus schedules, and OCTA publications. Intensive examination of media usage, including radio stations preferred, television channels watched, and newspapers read, was undertaken. Advertisements that are successful among these groups were explored.

Also conducted were two 600-person telephone surveys among Latino and senior residents of Orange County. These surveys pursued much the same information as the focus groups, including media usage, television programs watched, community cable programming information, and so forth in a quantitative mode that permits tracking and trend analysis over time. Detailed analysis using crosstabulations, analyses of variance, correlations, and regression, and factor analysis were undertaken as a part of the segmentation effort.

CenterLine Customer Profile

Conducted the CenterLine Customer Profile for the **Orange County Transportation Authority** involving intercept surveys of 8,800 potential urban light rail users, 1,500 telephone survey interviews, and 12 focus group/roundtables. Final analysis assessed likely ridership, preferred destinations, trip purposes, public support, demographic and psychographic profiles of potential light rail ridership

Twenty-one sites were selected in Orange County that were to be likely destinations for a proposed light rail system. Randomly selected individuals at sites including Disneyland, John Wayne Airport, University of California-Irvine, California State University-Fullerton, Main Street Santa Ana, Civic Center, UCI Medical Center, South Coast Plaza, and others were surveyed in person to determine their interest in using the proposed light rail system, their current transportation behavior, and design/marketing themes. This intercept survey was a short 4-minute interview to determine how far people would walk, how often they would ride, for what purpose (employment/recreation), among others.

These intercept interviews were followed-up by detailed 18-minute telephone interviews of randomly selected residents of central Orange County and western Riverside and San Bernardino Counties. These surveys were to establish greater depth of understanding of the potential market, including demographics and transportation needs/desires. Detailed analysis using crosstabulations, analyses of variance, correlations, and regression, and factor analysis were undertaken as a part of the segmentation effort.

At the same time as the surveys were being conducted, 12 focus groups throughout the County (Fullerton, Santa Ana, Costa Mesa, Irvine, Orange, and Anaheim) involving mayors, city council persons, business leaders, local merchants, tourism officials, and the general public were being held to uncover the qualitative richness behind the quantitative intercept and telephone survey data pertaining to public perceptions of the system, public fears of disruption, desired routes, and local needs.

Additional research projects for the Orange County Transportation Authority

- Prepared, conducted and analyzed 2,000 person rider/on-board bus survey for the **Orange County Transportation Authority** regarding monthly, weekly, and daily bus pass sales. Prepared questionnaire, administered survey, analyzed data in order to assess potential for expanding bus pass sales.
- Prepared Multi-Cultural Market Assessment Study for transportation services in Orange County. Formulated baseline data and marketing strategies for long- and short-term transportation related issues facing Orange County's diverse multi-cultural communities, with particular emphasis upon Hispanic and Vietnamese communities. Administered three different statistical surveys including intercept and rider/on-board formats, each in English, Spanish, and Vietnamese.
- Prepared, conducted and analyzed Vietnamese ridership study, including in-person intercept survey, telephone sample survey, and focus group among Vietnamese community leaders regarding current bus service and future transit needs in the Vietnamese areas of Orange County.
- 2007--Analyzed 2,000 person ACCESS (disabled paratransit) customer service satisfaction survey.
- 2007—conducted and analyzed counts of passengers on Amtrak and Metrolink trains at every Orange County station plus Oceanside, Norwalk, and Commerce.

- 2008—Focus groups (4) concerning integration and improvements to service (Metrolink, Amtrak, Coaster) along Los Angeles-San Diego (LOSSAN South) corridor
- 2008/2009—Rail safety study including observations at each of 54 at-grade rail crossings in Orange County, interviews with 60 local decision makers and other community leaders, and 600 person residential telephonic survey.
- Conducted focus groups among senior/disabled bus riders and full fare bus riders concerning proposed restructuring of bus fares. Also conducted roundtable meetings with coach operators and social service agency representatives.
- Conducted public participation portion of Orange County Bus Improvement Project (BUSLINK). Prepared report based upon focus group discussions with bus users and non-users, employee transportation coordinators, real estate developers, senior citizens, students, transportation advocates, Orange County employers, and members of ethnic minority communities throughout the County. Final report summarized the perceptions of focus group participants concerning potential improvements to the bus system.
- Conducted focus group discussions with Metrolink commuter rail users and non-users within Orange County for purposes of identifying service and marketing issues and opportunities. Prepared final report summarizing findings from these focus group discussions.
- Conducted focus group discussions with clients of ACCESS paratransit service for purposes of identifying the viability of alternative transportation options.
- Conducted focus groups among users of ACCESS for purposes of refining six strategies for providing a financially viable service to ACCESS customers and prepared formal final report.
- Conducted a series of roundtable discussions concerning the implementation of changes in the ACCESS system pertaining to reservations, eligibility, schedule, rates, pick-up and delivery policy, etc., and prepared formal final report.
- Conducted focus group discussions concerning Master Plan of Countywide Commuter Bikeways and prepared final report.
- Prepared Multi-Cultural Market Assessment update, including focus groups within the Hispanic community concerning the marketing of transportation services. Evaluated the success of programs commenced following the initial Multi-Cultural Market Assessment.
- Conducted focus group and roundtable discussions with community leaders, general public, and representatives of goods movement/freight industry regarding long-range transportation planning in Orange County.
- Conducted focus groups among businesses and residents of Orange County concerning recommended Corridor (Fullerton-Irvine) Transportation Strategy.

- Conducted focus groups among residents of northern, central, and southern Orange County regarding the FastForward long-range transportation.
- Conducted roundtables and focus groups concerning routing issues and public support for the CenterLine urban light rail system proposed for Orange County.

State of California (Senate Rules Committee, Senate Select Committee on Border Issues, and Office of the Auditor General)

- Analysis of fiscal impact of undocumented immigrants on public services in San Diego County and California, including criminal justice system, education, and public health. Further identified estimated number of undocumented residents and their contributions to State and local tax revenues. Also included in the analysis were federal revenues, false documentation issues, and macro-economic impacts. Study included substantial primary data gathering techniques, including direct interviews with undocumented immigrant workers and INS returnees. Prepared, administered, and analyzed sample surveys of undocumented immigrants in San Diego County for purposes of determining employment characteristics, revenue generation, demographics, and migration patterns. Research included extensive face-to-face interviews and structured roundtable discussions.

City of Oceanside

- Prepared, implemented, and analyzed telephonic survey of 803 residents of Northern San Diego County concerning awareness, behavior, and opinions about water runoff pollution.

San Diego County

- Prepared, implemented, and analyzed 1,305 person telephonic survey of unincorporated area residents concerning awareness, behavior, and opinions about water runoff pollution.
- Conducted, analyzed and reported upon two 600-person telephonic public opinion and awareness surveys before and after public awareness campaign to inform county residents about emergency preparedness.
- Prepared, implemented, and analyzed 8 intercept surveys of law library users concerning classes offered, benefits, opportunities for improvement.
- Evaluated the San Diego Community Planning Process as viewed by planning group participants and informed parties (developed questionnaire, analyzed data, and prepared a final report).

City of Coronado

- Prepared, implemented, and analyzed 600 respondent in-person intercept survey of visitors to identify places of staying, recreational activities, modes of transportation.

City of Carlsbad

- Prepared, implemented, and analyzed citywide sample telephone survey of 600 respondents concerning future urban commercial development in this fast growing Northern San Diego County city. Extensive analysis of underlying values through various development scenarios and conjoint analytical techniques was featured.

City of San Diego

- Prepared, implemented, and analyzed 400 person telephone survey of residents of three low income San Diego communities concerning issues such as crime, economic development, city services, and the success of the City's "Weed and Seed Program."
- Prepared, administered, and analyzed sample survey of San Diego County residents for purposes of assessing utilization and demand factors for Mission Bay Park in San Diego. This survey of 850 persons served to inform the revision of the Park's Master Plan.
- Analysis of market for existing condominium developments in downtown San Diego. Detailed analysis included extensive survey and corresponding statistical and qualitative analysis including recommendations for future market composition.
- Consultant for the revitalization of an older commercial retail area in mid-city San Diego seeking to rejuvenate its retail base. Three surveys and a series of key participant discussions were performed in conjunction with this effort--existing retailers, potential retailers, and residents of the area--plus corresponding statistical and qualitative analysis. Final report included a recommended retail structure for the community that would be realistic, implementable, and sensitive to the diversity of ethnicity in this community.
- Prepared, conducted, and analyzed 600 person telephone survey in mid-city for purposes of establishing need for community court in the area populated by myriad low-income minority and immigrant groups. Also in-person interviews/surveys of 100 local business owners.
- Prepared, implemented and analyzed 400 person survey of City residents concerning water supply awareness, conservation attitudes and behaviors, and opinions about water recycling.

San Diego Unified School District

- Survey of 400 San Diego County building contractors concerning advantages and disadvantages of performing construction tasks for the San Diego Unified School District.

County of Orange

- Prepared, implemented, and analyzed 1,040 person telephone survey of unincorporated area (North Tustin) in order to assess level of service satisfaction issues and potential annexation/sphere of influence adjustments

County of San Diego

- Prepared, implemented and analyzed two 600 person surveys of County residents concerning emergency preparedness before and after public information campaign

Otay Water District

- 2011 Customer Awareness and Satisfaction Survey (n = 300)
- 2010 Desalination Survey—400 respondents and 2 focus groups
- 2010 Employee Satisfaction online survey
- 2009 Customer Awareness and Satisfaction Survey of 300 customers of the District
- 2009 Large Users Drought Telephone Survey
- 2008 Customer Service telephone survey of 300 participants prepared, conducted, and analyzed.
- 2008 Customer Awareness and Satisfaction telephone survey of 300 participants prepared, conducted, and analyzed
- 2008 Employee Satisfaction survey prepared conducted and analyzed using web-based instrument.
- 2007 residential customer satisfaction/awareness (n=300) telephone survey prepared, implemented and analyzed. Emphasis upon customer satisfaction and conservation measures.
- 2007 Call Center customer service telephone survey (n = 200) focused upon satisfaction with customer service and communications.
- 2005 customer satisfaction survey of 350 residential customers concerning behavior, opinion, customer service, desalination, water reclamation, and conservation practices.

Imperial Irrigation District

- Instruction to energy traders in use of mathematical and statistical tools to aid in their requisite analyses.
- Developed statistical models that predict energy consumption based upon various climactic conditions to within 1-3% of actual.

San Luis Rey Indian Water Authority

- Prepared and supervised administration of detailed census and opinion survey of 2,500 members of five Indian tribes. Particular emphasis was given to issues of importance to the tribes' members such as job opportunities, education, cultural issues, economic development opportunities and transportation access issues. Focus group sessions with each tribe were utilized to complement the survey findings. Final report included both census data and fully tabulated and statistically analyzed summary of the opinions of reservation residents.

City of Poway, California

- Prepared, administered, and statistically analyzed a mail survey of 800 Poway businesses regarding their needs and opinions concerning Poway's business climate and future opportunities. Final report included detailed analysis and exposition, including recommendations where appropriate.
- Prepared, administered, and statistically analyzed a mail survey of 6,000 Poway households concerning their opinions regarding a variety of issues of importance to the City for future planning. Final report included fully tabulated results with accompanying statistical reports

North Park Main Street Association

- Conducted two intercept surveys--business owners and shoppers in San Diego Main Street National Historic Preservation Area in order to determine shopping needs and level of improvement or decline in area since the implementation of the Main Street program.

City of Dana Point, California

- Prepared recreation and parks needs assessment survey for administration to general public.

City of Davis

- Prepared, administered, and analyzed sample survey of 833 residents of Davis, California for purposes of assessing utilization, demand, and tax allocation factors for City of Davis Department of Parks and Recreation in concert with the preparation of the Master Plan.

City of St. Helena

- Prepared, administered, and analyzed 400 respondent sample survey of City of St. Helena, California residents for purposes of General Plan revisions.

Santa Clarita Transit

- Three focus groups among Latinos, commuters, and local bus riders to identify service and marketing-related issues and policies for rider attraction and retention.

Southern California Regional Rail Authority (Metrolink)

- Determined the requisite two-stage sample for Federal Transportation Agency requirements for annual passenger and mileage calculations.
- Conducted a 3,500 person rider/on-board sample survey on 7 Metrolink lines regarding customer satisfaction, importance, problem occurrences, travel behavior, marketing strategies, and demographics. Also undertaken were precise counts of passenger boardings and alightings at each station for each train in the Metrolink train system.
- Conducted a 6,000 person rider/on-board sample survey on 6 Metrolink lines regarding customer satisfaction, importance, problem occurrences, travel behavior, marketing strategies, and demographics.
- Conducted focus groups with student riders and potential riders of Metrolink.
- Conducted Riverside County rider focus groups for Metrolink regarding use of new stop and need for reverse commute trains.

California Department of Transportation

- Prepared growth inducement study for State Route 56 through the northern portion of the City of San Diego. Study included fiscal impacts as well as housing, employment, and income forecasts; also included were planning implications of possible growth inducing factors associated with the construction of the highway.
- Conducted focus groups and web-based survey of CALTRANS engineers regarding job satisfaction and staff morale.
- Eight surveys among pilot study riders of combined commuter train/rental car system of commuting.

San Diego County Sheriff's Department

- Established analysis by station (11) of workload and availability for calls for service among Sheriff's patrol deputies. Over 3,000 samples drawn and analyzed to establish manpower needs.

- Utilized scientific sample to analyzed time savings applicable to the conversion of arrest data to laptop computers from manual entry. Final report included specific determination of manpower hours saved and recommendations for software and operational policy changes in order to maximize technological advantages.
- Workload analysis based upon sample of time logs from Sheriffs Communication Center and Monte Carlo simulations in order to identify necessary staffing levels for 9-1-1, radio, and administrative communications throughout San Diego County

Bay Area Rapid Transit

- Market analysis and ridership projection for two stations located on East Bay line of BART.

Southern California Association of Governments

- 800 person survey and 6 focus groups to determine desired route for high-speed rail from Northern California between Los Angeles and San Diego.
- 5200 person survey of pedestrian, passenger vehicle, and commercial truck border crossers at Calexico and Algodones/Yuma pertaining to trip purpose, frequency, origin/destination, and other factors.

Riverside Transit Agency

- On-board survey of 8000 riders of Riverside bus system regarding satisfaction, frequency, demographics
- On-board survey and count of RTA bus lines that intersect with Downtown Riverside Transit Terminal in order to identify magnitude and nature of travel disruptions that will occur when terminal is relocated
- On-Board survey of commuter bus lines
- Intercept of 1000 passengers transferring and/or ending trip at Downtown Terminal

San Diego Metropolitan Transit System

- On-board counts of weekend contract service
- Conducted focus groups concerning routing/scheduling and planning/marketing issues for the expansion of the San Diego Trolley.

San Diego Association of Governments

- Focus groups concerning carpool, vanpool, transit alternative commute options.

Imperial Valley Transit

- Year long sample survey (2010-2011) and count of passengers on-board buses in order to meet Federal Transportation Agency requirements for statistically reliable estimate of annual passenger miles traveled.
- Year long sample survey (2008-2009) and count of passengers on-board buses in order to meet Federal Transportation Agency requirements for statistically reliable estimate of annual passenger miles traveled

University of California PATH/SANDAG

- Six Month panel for focus groups and surveys at start and end concerning new transit plan that utilizes rental cars at either end of transit trip.

University of California, Davis

- Web-based survey of all identifiable San Francisco Bay Area water management professionals concerning water conservation policies and practices, including follow-up telephone interviews.

City of Escondido

- Prepared, administered, and statistically analyzed telephone survey of 425 residents concerning library facilities.

California Center for Sustainable Energy

- Focus groups concerning the use of solar energy for residential power users – both contractors and residents participated.
- Focus groups among homeowners with photovoltaic systems, real estate professionals, and city/county permitting and inspection officials concerning barriers to and solutions pertaining to photovoltaic system installation and ownership.

Expert Witness: Survey Research and Statistical Analysis

Seyfarth Shaw, LLP

- Analyzed and testified as expert witness
 - Ikon Office Solutions regarding overtime and meal break survey
 - Orange County Register regarding adequacy of statistical survey sampling of and statistical conclusions drawn from employees
 - Kaiser Permanente (2 cases) – pharmacy managers
 - Bank of America—employee overtime

Sheppard, Mullin, Richter & Hampton, LLP

- Expert witness regarding statistical surveys and labor-hour issues in class action litigation (Bank of America).
- Expert Witness regarding employee claims for clothing expense reimbursement

Higgs, Fletcher & Mack, LLP

- Analyzed and testified (deposition) as expert witness regarding statistical survey concerning appraisal of commercial real estate subject to condemnation.

Paul, Plevin, Sullivan & Connaughton, LLP

- Contracted as expert witness regarding adequacy of statistical survey sampling of and statistical conclusions drawn from employees—2 cases (Kelly Services, Inc. –declaration--and one other settled prior to any declaration being filed that cannot, therefore, be disclosed)

Akins, Gump, Strauss, Hauer & Feld

- Contracted as expert witness regarding adequacy of statistical survey sampling and conclusions drawn from employees in labor-hour class action (CVS Pharmacy, Inc.).

Economic, Financial, and Fiscal Impact Analyses

State of California (Senate Rules Committee, Senate Select Committee on Border Issues, and Office of the Auditor General)

- Analysis of fiscal impact of undocumented immigrants on public services in San Diego County, including criminal justice system, education, and public health. Further identified estimated number of undocumented residents and their contributions to State and local tax revenues. Included in the analysis were federal revenues, false documentation issues, and macro-economic impacts. Study included substantial primary data gathering techniques, including direct interviews with undocumented immigrant workers and INS returnees for purposes of determining employment characteristics, revenue generation, demographics, and migration patterns.

California Department of Transportation

- Prepared growth inducement study for State Route 56 through the northern portion of the City of San Diego. Study included fiscal impacts as well as housing, employment, and income forecasts; also included were planning

implications of possible growth inducing factors associated with the construction of the highway.

San Diego Unified School District

- Economic analysis of impacts on project cost and employment associated with using Project Stabilization Agreements for construction projects.

San Diego County Taxpayers' Association

- Prepared economic and financial analysis of San Diego County Multiple Species Conservation Program for presentation to Planning Commission, City Council, and Board of Supervisors, including imposition of fee required to assemble the land.
- Prepared analysis of economic effects of proposed San Diego development impact fee program. Study included both academic, theoretical analysis and practical fiscal impact considerations.
- Written analysis and critique of Planned Growth and Taxpayer Relief Initiative – Development Impact Fee proposal for consideration before San Diego City Council.
- Fiscal Impact Analysis of Olivenhein Dam project of San Diego County Water Authority
- Prepared general fiscal impact analysis of mobile home rent control ordinances in State of California.

Westfield Shopping Centers

- Analysis of proposed City of San Diego Affordable Housing Impact Fee, including recalculation and allocation among land uses
- Analysis of potential sales and fiscal impact due to expansion of University Town Center, La Jolla, CA

San Diego Aircraft Carrier Museum Foundation

- Prepared fiscal impact analysis regarding the establishment of the USS Midway aircraft carrier museum on San Diego Bay.

Pardee Construction Company

- Prepared Economic Impact Analysis of proposed all-cargo airport at Brown Field, including job creation and related industrial/commercial/visitor development

- Prepared Economic/Fiscal Impact Analysis of 2,650 acre “high-end” Pacific Highlands Ranch residential development in Carmel Valley area of San Diego. Included determination of impact fees.

Westbrook Development

- Economic/Fiscal Impact Analysis of 2,550 acre residential/ commercial/resort development at Fanita Ranch in Santee. Included determination of impact fees for the development and alternative use as open space.

Genstar Development

- Economic/Fiscal Impact Analysis of 3,000 acre 4S Ranch residential/commercial development in San Diego County. Included determination of development impact fees.

San Diego Gas & Electric

- Analysis of feasibility and fiscal impact of City of San Marcos proposal to form and operationalize its own municipal utility—Discovery Valley Utility
- Environmental/Fiscal analysis of San Diego Gas & Electric’s 2004 Energy Resource Plan.
- Economic analysis of Sunrise PowerLink to Imperial County
- Analysis of fiscal impact of Carlsbad agricultural protection measures proposed on 2006 ballot
- Development of economic impact and fiscal model applicable to Sunrise PowerLink, smart meters, ECO substation, South Bay Substation, Dynamic pricing, and renewable energy development)

Southwest Strategies, LLC

- Fiscal Impact analysis for potential rezoning of industrial land to residential in Oceanside, California—determined and compared impact fees for industrial and residential use, including transportation impact fees.
- Analysis of proposed City of San Diego Affordable Housing Impact Fee, including recalculation and allocation among land uses.
- Socio-economic profile of residents of 5 affordable housing developments in the City of Poway, including demographics, spending, impacts on crime, schools, property values
- Examination of financial implications of rezoning Old Town National City to remove non-conforming industrial uses

Shea Properties

- Fiscal impact of proposed redevelopment of Barrio Logan with Mercado and affordable housing in San Diego.
- Fiscal impact of second project planned for Barrio Logan

Pacifica Companies

- Community impact analysis of proposed coastal hotel/resort in San Diego County. Included fiscal impact, economic impact, new market tax credit analysis and employment generation.

Laing Urban

- Fiscal Impact analysis for potential rezoning of industrial land to residential in Culver City, California-- determined and compared impact fees for industrial and residential use, including transportation impact fees

San Diego-Imperial Counties Labor Council AFL-CIO

- Analysis of San Diego County Water Authority-Imperial Irrigation District water transfer in terms of environmental and economic obstacles faced and economic development opportunities to be derived from funds to be available within the Imperial Valley.

WESTEC Services, Inc.

- Prepared socioeconomic present condition, impact, and mitigation sections of Environmental Impact Report for California State Prison and San Diego County jail and honor camp at Otay Mesa. Also prepared project description and statement of needs chapter, crime rate and socioeconomic hazards sections.

Mooney & Associates

- Prepared socioeconomic present condition, impact, and mitigation sections of economic impact report for expansion of San Diego County jail in Santee. Also prepared project description and statement of needs chapter, crime rate and socioeconomic hazards sections.

Joint Labor Management Committee of the Retail Food Industry

- Analysis of impacts of large “big box” retailers upon existing merchants. Particular emphasis upon downtown impacts and planning consequences in light of movement toward smart growth. San Diego’s City of Villages strategy was assessed in this regard.
- Economic Impact of supercenter retail development upon California jobs, health and welfare expenditures, and general economic conditions.

City of San Diego

- Determined shopping needs and level of improvement or decline in North Park community since the implementation of the Main Street Historic Preservation Program.
 - Analysis of market for existing condominium developments in downtown San Diego. Detailed analysis included extensive survey and corresponding statistical and qualitative analysis including recommendations for future market composition.
 - Consultant for the revitalization of an older commercial retail area in mid-city San Diego seeking to rejuvenate its retail base. Final report included a recommended retail structure for the community that would be realistic, implementable, and sensitive to the diversity of ethnicity in this community.

La Jolla Band of Mission Indians

- Marketing and management consultants for Sengme Oaks Water Park, a water theme amusement park in Northern San Diego County. Prepared formal marketing and management plans for the Park.

Merrill Lynch Commercial Real Estate

- Provided a variety of on-going property valuation and real estate consultative services including improved and unimproved real property appraisals and land use feasibility planning for large acreage.

City of Carlsbad

- Analyzed future urban commercial development in fast growing Northern San Diego County city.

Chelsea Investments, Inc.

- Analysis of job creation for three development proposals: Children's Village in San Diego, child care facilities and four-story offices in San Diego, and residential/commercial development in San Luis Rio Colorado, AZ.

Stirling Enterprises

- Fiscal Impact analysis of proposal to rezone parcel of industrial land into multiple residential in Oceanside, California--determined and compared impact fees for industrial and residential use, including transportation impact fees
- Projected Jobs-Housing equilibrium point for City of Oceanside

Viejas Enterprises

- Socio-economic analysis of proposal to locate Indian casino in City of Calexico, California
- Socio-economic/fiscal impact analysis of tribal casino in Alpine, California

Foxwoods/Pauma Development

- Multiplier, Housing Needs, Employment, Crime, Pathological Gambling analyses for casino development in northern San Diego County

County of Orange

- Prepared, implemented, and analyzed study of unincorporated area (North Tustin) in order to assess level of service satisfaction issues and potential annexation/sphere of influence and fee adjustments.

Housing Solutions

- Socio-economic profile of residents of 5 affordable housing developments in the City of Poway, including demographics, spending, impacts on crime, schools, property values

National City Smart Growth Coalition

- Planning and economic consultant to business owners in National City Westside regarding new land use plan for community.

City of Davis

- Prepared, administered, and analyzed study of Davis, California for purposes of assessing utilization, demand, and tax allocation factors for City of Davis Department of Parks and Recreation in concert with the preparation of the Master Plan.

Subway, Inc. and Pacific Century Development

- Analysis of two sites in Blythe, CA to determine market absorption potential for new hotel/motel developments.

City of Holtville

- Economic consultant to City in process of dissolving Joint Powers Authority in order to secure fair share of proceeds.

San Diego Housing Commission

- In accordance with the City of San Diego SRO Preservation Ordinance, an inventory of all existing guest rooms in the City of San Diego was performed in order to retroactively identify rooms that qualified as single room occupancy hotel rooms as of December 1985, December 1987 and May 1988. The purpose

of this survey was to identify a baseline number of such units for presentation purposes. Prepared SRO identification methodologies, computerization formats, statistical analyses, and final report with room-by-room breakdown.

Rodney Company/Rancho Guejito

- Fiscal impact and economic analysis of proposed Multiple Species Conservation Program—North County.
- Fiscal impact and economic analysis of proposed General Plan Update for San Diego County
- Analysis of impact of San Diego County General Plan upon transportation, education, and public safety services in rural San Diego County.
- Economic analysis of impact of protection of arroyo toad from Santa Barbara County to San Diego County

Richard A. Parker, Ph.D.

Education

Ph.D.	University of California, Los Angeles (Los Angeles, California) Pacific Western University (Los Angeles, California) Doctor of Philosophy (Business Administration)
M.B.A.	University of California, Berkeley (Berkeley, California) Master of Business Administration
M.C.P.	San Diego State University (San Diego, California) Master of City Planning
B.S.	Brown University (Providence, Rhode Island) University of California, Berkeley (Berkeley, California) Bachelor of Science — Business Administration (Phi Beta Kappa)

Selected Professional Experience

1985-present Professor of Practice, School of Public Affairs, San Diego State University

Courses taught: Seminar in Urban Planning Methodologies (undergraduate and graduate), Financing Urban Development (graduate), Quantitative Methods (Statistics) (graduate), Seminar in Quantitative Approaches to Public Administration (graduate), Quantitative Techniques in Urban Planning (graduate), Contemporary Urban Issues (upper division undergraduate), Public Finance (graduate and upper division undergraduate), Seminar in Economics of Urban and Regional Planning (graduate), Public Policy (undergraduate and graduate)

1984-present President, Rea & Parker Research/Economic Solutions

President/Project Director of survey and market research and economic consulting firm based in San Diego, California, with facilities in Los Angeles and Orange County. Extensive experience in public and urban affairs regarding the collection of primary demographic, attitudinal, and market-related data through survey research and focus group analysis. Highly regarded economic consultant, particularly in the areas of fiscal impact analysis, urban economic development, and site specific commercial, retail, and residential evaluation.

Selected Survey Research Clients include State of California, San Diego County, Orange County, Imperial County, Cities of San Diego, Escondido, Carlsbad, Oceanside, Poway, Davis, Holtville, and Dana Point, SANDAG, SCAG, IVAG, San Diego MTS, Orange County Transportation Authority, Los Angeles County MTA, Southern California Regional Rail Authority (Metrolink), Bay Area Rapid Transit, Imperial Valley Transit, Santa Clarita Transit, CALTRANS, San Diego County Water Authority, Otay Water District, San Diego Housing Commission, San Diego Unified School District, California Center for Sustainable Energy.

Expert witness regarding survey research and statistical analysis for Bank of America, Kaiser Permanente, NASSCO/General Dynamics, Ikon Office Equipment, Orange County Register/Freedom Communications, CVS Pharmacies, Wet Seal.

Economic consultant to Westfield Shopping Centers, San Diego Gas & Electric, Imperial Irrigation District, Viejas Enterprises, Foxwoods Casinos, Retail Food Industry Council, Pardee Homes, Shea Communities, San Diego Aircraft Carrier Museum Foundation, Stirling Cargo Airports, Subway, Inc., Housing Solutions Alliance, San Diego County Taxpayers Association, among others.

Selected Publications:

Designing and Conducting Survey Research: A Comprehensive Guide (with Louis M. Rea, Ph.D., 1992 (2nd edition 1997—3rd edition 2005). Jossey-Bass, Inc., Publishers, San Francisco.

Awards: Bernays Award of Merit—Specialty Publication—Westfield University Town Center Expansion

LOUIS M. REA, Ph.D.

EDUCATION

- Ph.D. Economics, Public Management (Social Science), The Maxwell School, Syracuse University, 1975
- M.R.P. Master of Regional Planning, The Maxwell School, Syracuse University, 1973
- B.A. Economics, Colgate University, Hamilton, New York 1971
(Phi Beta Kappa, Cum Laude, Honors in Economics)

PROFESSIONAL EMPLOYMENT

Professor: *School of Public Affairs, San Diego State University, 1975-present*

Graduate Courses Taught: Seminar in Urban and Regional Planning Analysis, Seminar in Urban Transportation Planning, Quantitative Techniques in Urban Planning, Methods of Analysis in Public and Urban Affairs, Seminar in Urban and Fiscal Issues, Principles of Survey Research, and Program Design and Evaluation. Undergraduate Courses Taught: Introduction to Urban Planning, Applied Planning Research and Program Evaluation in Criminal Justice Administration, and Management of Urban Governments.

Director: *School of Public Administration and Urban Studies, 1983-2006.*

Responsible for the management and direction of the School of Public Administration and Urban Studies, consisting of 40 employees, including 30 full time and part time faculty, and 10 support and research staff; responsible for managing the School's resources valued at approximately \$4.0 million, consisting of funds in the areas of personnel, supplies and services, computer hardware, scholarships, endowments, and SDSU Foundation accounts; provide supervision of all personnel matters, including recruitment and hiring of full and part-time faculty as well as staff positions; oversee reappointment, tenure, and promotion process; schedule classes; prepare and implement school's academic strategic plan, business plan, student learning goals and objectives, and faculty hiring practices; responsible for fund raising and development.

Vice President and Principal Consultant: *Rea and Parker Research/Economic Solutions, 1984-present*

Provide professional consulting services to client agencies (both public and private) seeking research data and studies for executive decision making. Provide services in the areas of transportation research including on-board bus and rail surveys, survey research associated with customer satisfaction and market feasibility analysis, economic and fiscal impact analysis, program evaluation, and public policy analysis including land use, housing, immigration, and tourism.

Selected clients include State of California, San Diego County, Orange County, and Imperial County; cities of San Diego, Escondido, Carlsbad, Poway, and Davis; authorities including SANDAG, SCAG, San Diego MTS, Orange County Transportation Authority, Los Angeles County MTA, Southern California Regional Rail Authority, San Diego County Water Authority, Otay Water District and CALTRANS.

Visiting Professor: *University of California, San Diego, Graduate School of International Relations and Pacific Studies, 2006-present.*

Teach a required graduate course in program design and evaluation to students pursuing a Master's Degree in International Relations.

PUBLICATION

Designing and Conducting Survey Research: A Comprehensive Guide. Jossey-Bass, Inc., San Francisco, 1992 -- 2nd edition, 1997; 3rd edition, 2005 (with Richard A. Parker).