

**IMPERIAL VALLEY TRANSIT  
ANNUAL PASSENGER MILE SAMPLING METHODOLOGY  
AND FINAL RESULTS  
JULY 1, 2016-JUNE 30, 2017**



**Prepared for:  
Imperial County Transportation Commission  
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**July, 2017**

**IMPERIAL VALLEY TRANSIT  
ANNUAL PASSENGER MILE SAMPLING METHODOLOGY  
AND FINAL RESULTS  
JULY 1, 2016-JUNE 30, 2017**

**Key Findings**

- **The 741,968 annual unlinked boardings for Imperial Valley Transit bus riders travel a total of 7,365,033 passenger miles.**
- **There are 25.25 unlinked passenger boardings per bus trip.**
  - **25.49 unlinked boardings on weekdays**
  - **22.93 unlinked boardings on Saturdays**
  - **23.00 unlinked boardings on Sundays**
- **These passengers traveled 250.19 passenger miles per bus trip.**
  - **250.52 miles on weekdays**
  - **248.51 miles on Saturdays**
  - **241.95 miles on Sundays**
- **The mean miles traveled per unlinked passenger bus trip is 9.91 miles.**
  - **9.83 miles on weekdays**
  - **10.84 miles on Saturdays**
  - **10.52 miles on Sundays**

**Introduction**

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 transit service is operated as a turnkey operation by First Transit, Inc. The service is administrated and funded by the Imperial County Transportation Commission (ICTC). The Commission members represent each City, the County and the Imperial Irrigation District.

Funding is provided annually through the ICTC adopted Overall Work Program Budget and Finance Plan. The source of the funding includes but is not limited to federal FTA 5307, 5311

and 5317 funds, State Transportation Development Act (TDA) including Local Transportation (LTF) and State Transit Assistance (STA), 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.

ICTC 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, 2016-to-June 30, 2017. Rea & Parker Research had conducted the most recent passenger mile sampling studies for Imperial Valley Transit in 2013-2014, 2010-2011, and 2008-2009.

### **Methodology**

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. Prior passenger mile samples (most recently July 1, 2013-to-June 30, 2014) performed for Imperial Valley Transit by Rea & Parker Research utilized the Federal Transportation Authority National Transit Database Circular 2710.1A to establish the requisite sample. On April 7, 2015, the FTA withdrew its sampling circulars and replaced them with a new NTD Sampling Manual.

Transit systems had been offered the opportunity to convert to the 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 challenging. All individual bus trip data was tracked and recorded electronically in 2010-2011 and in 2013-2014 so that the new methodology could be a reasonable alternative in the future, and when Circular 2710.1A was withdrawn, this change in sampling method (NTD Sampling Methodology) was adopted by Rea & Parker Research.

The option is also available to devise a statistically valid method that differs from the NTD methodology. However, Rea & Parker Research elected to utilize the NTD methodology because 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 approved methodology. These statistics would have been required to develop a method of sampling unique to Imperial Valley Transit. Richard A. Parker, Ph.D. and Louis M. Rea, Ph.D. have extensive experience in statistical sampling. 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., the principal investigators and analysts for this study.

Application of the data from prior years using the new methodology (NTD-provided template) produced the results shown in **Table 1**. The three methods (Base, APTL and PPMT) are shown to produce annual sample sizes of 410 (Base), 166 (APTL) and 554 (PPMT). The APTL (Average Passenger Trip Length) Option is available if the transit agency maintains a 100% count of unlinked passenger trips, estimates the average passenger trip length (APTL) through random sampling, and obtains annual PMT by multiplying the 100% UPT with the estimated APTL. Imperial Valley Transit meets all of these requirements. Rea & Parker Research selected the monthly sample of 14 randomly selected trips as the most efficient sampling method.

In prior years sample sizes were more in line with the Base or PPMT sample sizes. For example, 565 sample trips were counted in the 2013-2014 study. What allows the APTL study to be smaller is the availability of the 100 percent count of unlinked trips and the fact that the 2013-2014 study began maintaining the data needed for the 2016-2017 sample template during the 2013-2014 study. Rea & Parker Research contacted Matt Oliver, who oversees Imperial Valley Transit reporting to NTD to obtain his approval for using the APTL method. He confirmed that the agreement between our last sample and Imperial Valley Transit actual counts (only off 1.5% when the margin of error was set at 10%) confirms that the counts are good ones and that we can use the new sampling technique based upon having accurate 100% counts.

<b>Table 1: Sample Size Options</b>			
		<b>Sample Size by Frequency</b>	<b>Annual Realized Sample Size</b>
<b>1. Annual Frequency</b>	1		
a) Base Option		410	410
b) APTL Option		166	166
c) PPMT Option		554	554
<b>2. Quarterly Frequency</b>	4		
a) Base Option		103	412
b) APTL Option		42	168
c) PPMT Option		139	556
<b>3. Monthly Frequency</b>	12		
a) Base Option		35	420
b) APTL Option		14	168
c) PPMT Option		47	564
<b>4. Weekly Frequency</b>	52		
a) Base Option		8	416
b) APTL Option		4	208
c) PPMT Option		11	572

In preparation for the commencement of the study and the sample selection, Rea & Parker Research entered each bus trip into an SPSS (Statistical Package for the Social Sciences) database as a code, indicating day of the week, week number in the period used for sampling, bus route number, and the number of the unique, unlinked trip on that day. After this was done, 14 trips were selected at random by SPSS for each month. The number of days upon which these 14 trips fell ranged from as low as 10 days to a maximum of 13 days in any given month. Over the course of the year, 168 trips were sampled on 114 days. The 2016-2017 sample proved to be an excellent subset of the total bus trip population (**Table 2**), where the only difference between the sample distribution and total bus trips that was of note was on Saturday.

<b>Table 2: Sample and Total Distribution of Bus Trips</b>		
<b>Time Period</b>	<b>Sample Distribution</b>	<b>Actual Bus Trips 7/1/16-6/30/17</b>
<b>Weekday AM (before 9am)</b>	<b>26.2%</b>	<b>25.3%</b>
<b>Weekday Midday (9am-3pm)</b>	<b>31.0%</b>	<b>33.6%</b>
<b>Weekday PM (3pm-7pm)</b>	<b>30.3%</b>	<b>29.3%</b>
<b>Weekday Night (after 7pm)</b>	<b>1.2%</b>	<b>2.3%</b>
<b>Saturday</b>	<b>8.9%</b>	<b>7.3%</b>
<b>Sunday</b>	<b>2.4%</b>	<b>2.2%</b>

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 succeeding 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 and alightings, with some on-board counts between stops, and to also record the vehicle ID number for determining capacity.

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. Math and logic checks by either Richard A. Parker, Ph.D. or Louis M. Rea, Ph.D. were also conducted. 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 sampled were 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 facilitated the new NTD sampling method.

## Imperial Valley Transit Passenger Sampling Assignment Log—EXHIBIT A

Assignment# <u>2-4/5</u>	Employee: _____
DATE: <u>August 12, 2016</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>
2n	2n-07	El Centro State & 7th	2:10p	Brawley E Street & Rio Vista	3:07p	<b>YES</b>	1+ hour break
2s		Brawley E Street & Rio Vista	4:19p	El Centro State & 7th	5:30p	<b>No</b>	
1s	1s-19	El Centro State & 7th	5:40p	Calexico Hacienda & Ollie	6:25p	<b>YES</b>	Stay on bus
1n		Calexico Hacienda & Ollie	6:35p	El Centro State & 7th	7:50p	<b>No</b>	

SURVEY TRIP SHEET—EXHIBIT B						# of Pages 1 of 2	
(1) Trip Serial No. _____		(2) Date _____		(3) Day of Week _____		(4) Time Period _____	
(5) Route No. 2 north _____		(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/7th				0		0
2	State/8th				0		0
3	State/14th				0		0
4	Imperial/Commercial				0		0
5	Imperial/Euclid				0		0
6	Bradshaw/Imperial				0		0
7	La Brucherie/Bradshaw				0		0
8	Aten / La Brucherie				0		0
9	Aten / Cross				0		0
10	Imperial Valley College				0		0
11	Barioni Ave./K St. (IID)				0		0
12	Imperial/9th				0		0
13	Pioneers Hospital--Brawley				0		0
14	Brawley--K St./ 2nd St.				0		0
15	Brawley--5th/G Street				0		0
16	Brawley--K St./S. 9th				0		0
0	(26) Capacity Miles (7) x (22)	Totals	0	0	0	0	0
0	(27) Seat Miles (8) x (22)						

# of Pages 2 of 2



**SURVEY TRIP SHEET—EXHIBIT B**

<b>(1) Trip Serial No.</b> _____		<b>(2) Date</b> _____		<b>(3) Day of Week</b> _____		<b>(4) Time Period</b> _____	
<b>(5) Route No.</b> 2 north		<b>(6) Vehicle Inventory Number</b> _____		<b>(7) Total Capacity</b> _____		<b>(8) Seated Capacity</b> _____	
<b>(9)</b>	<b>(10)</b>	<b>(12)</b>	<b>(13)</b>	<b>(14)</b>	<b>(15)</b>	<b>(16)</b>	<b>(17)</b>
<b>Stop No.</b>	<b>Stop Description</b>	<b>Odometer Reading</b>	<b>Passengers Boarded</b>	<b>Passengers De-Boarded</b>	<b>Passengers On Board</b>	<b>Distance Between Stops</b>	<b>Passenger Miles (15) x (16)</b>
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/Cesar Chavez				0		0
21	Brawley--Main/3rd St.				0		0
22	Brawley--E St./Rio Vista				0		0
23	Westmorland--Center/Main				0		0
24	Westmorland--Center/6th				0		0
25	Calipatria--Main St. / Park				0		0
26	Calipatria--111/Main				0		0
27	Niland--111/Main				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—EXHIBIT C

<b>(1) Trip Serial No.</b> 2n07				<b>(2) Date</b> 8-12-16		<b>(3) Day of Week</b> FRI		<b>(4) Time Period</b> MID	
<b>(5) Route No.</b> 2 north			<b>(6) Vehicle Inventory Number</b> 1215		<b>(7) Total Capacity</b> 80		<b>(8) Seated Capacity</b> 40		
(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/7th	81951.7	16		16	0.5	8		
2	State/8th				16		0		
3	State/14th	81952.2	1		17	0.3	5.1		
4	Imperial/Commercial	81952.5	1	2	16	1	16		
5	Imperial/Euclid				16		0		
6	Bradshaw/Imperial	81953.5	2	2	16	0.3	4.8		
7	La Brucherie/Bradshaw	81953.8	1	2	15	9	135		
8	Aten / La Brucherie				15		0		
9	Aten / Cross				15		0		
10	Imperial Valley College	81962.8	6	2	19	4.8	91.2		
11	Barioni Ave./K St. (IID)				19		0		
12	Imperial/9th	81967.6	1	1	19	8.6	163.4		
13	Pioneers Hospital--Brawley	81976.2	1	1	19	1.3	24.7		
14	Brawley--K St./ 2nd St.	81977.5		1	18	1.2	21.6		
15	Brawley--5th/G Street				18		0		
16	Brawley--K St./S. 9th				18		0		
2160	(26) Capacity Miles (7) x (22)	Totals	29	11	272	27	469.8		
1080	(27) Seat Miles (8) x (22)								

## SURVEY TRIP SHEET—EXHIBIT C

						# of Pages <u>2 of 2</u>	
(1) Trip Serial No. <u>n07</u>		(2) Date <u>8-12-16</u>		(3) Day of Week <u>FRI</u>		(4) Time Period <u>MID</u>	
(5) Route No. <u>2 north</u>		(6) Vehicle Inventory umber <u>1215</u>		(7) Total Capacity <u>80</u>		(8) Seated Capacity <u>40</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)
17	Brawley--K St./S. Palm St.	81978.7		1	17	0.4	6.8
18	Brawley--Palm St. / J St.				17		0
19	Brawley--S. Main St. / Palm	81979.1	3	2	18	1	18
20	Brawley-Main St/Cesar Chavez				18		0
21	Brawley--Main/3rd St.	81980.1	2		20	0.6	12
22	Brawley--E St./Rio Vista	81980.7		20	0		0
23	Westmorland--Center/Main				0		0
24	Westmorland--Center/6th				0		0
25	Calipatria--Main St. / Park				0		0
26	Calipatria--111/Main				0		0
27	Niland--111/Main				0		0
2320	(26) Capacity Miles (7) x (22)	Totals	34	34	362	29	506.6
			(20)		(21)	(22)	(23)
1160	(27) Seat Miles (8) x (22)			Mean On Board	24.62068966		

**EXHIBIT D  
EXCEL COMPUTERIZED TRIP-BY-TRIP DATA ENTRY  
(EXAMPLE: JULY, 2016 INPUT)**

**Data Input from Survey Trip Sheets highlighted in Blue—Balance of Columns are Running Calculations by Excel**

Date	Day of Week	Month #	Route	Time Period	Boarded-UPT	Sum of Boardings	On-Board	Sum of On-Board
				1=am peak--2=midday--3=pm peak--4=night--5=Saturday --6=Sunday				
7/5/2016	Tues	1	1s	2	26	26	204	204
7/6/2016	Weds	1	1s	2	34	60	309	513
7/6/2016	Weds	1	Green	3	9	69	110	623
7/7/2016	Thurs	1	21n-IVC	1	15	84	124	747
7/11/2016	Mon	1	2n	2	55	139	618	1365
7/15/2016	Fri	1	1n	3	40	179	464	1829
7/21/2016	Thurs	1	2n	2	41	220	326	2155
7/22/2016	Fri	1	Green	3	3	223	16	2171
7/22/2016	Fri	1	2s	3	24	247	328	2499
7/23/2016	Sat	1	1n	5	47	294	545	3044
7/24/2016	Sun	1	1n	6	41	335	627	3671
7/28/2016	Thurs	1	21n-IVC	1	34	369	274	3945
7/28/2016	Thurs	1	Blue	2	3	372	21	3966
7/29/2016	Fri	1	41n	3	2	374	5	3971

Bus Trip Distance	Sum of Distance	Passenger Miles=PMT	Sum of PMT	Capacity Miles	Sum of Capacity Miles	Seat Miles
14.4	14.4	219.8	219.8	1152	1152	576
14.4	28.8	311.5	531.3	1152	2304	576
16.6	45.4	67	598.3	332	2636	332
15.3	60.7	187.6	785.9	1224	3860	612
25.7	86.4	796.9	1582.8	2056	5916	1028
19.8	106.2	313.9	1896.7	1584	7500	792
26.5	132.7	399.2	2295.9	2120	9620	1060
16.5	149.2	9.8	2305.7	330	9950	330
52.3	201.5	437.6	2743.3	4184	14134	2092
19.9	221.4	360.1	3103.4	1592	15726	796
18.3	239.7	405.9	3509.3	1454	17180	732
15.6	255.3	429.9	3939.2	1248	18428	624

Sum of Seat Miles	Avg. Route Length	PPMT	AUPTL	PMT/PPMT
	22.28988095			
576	22.28988095	579.5369048	8.453846154	0.044863407
1152	22.28988095	1337.392857	8.855	0.044863407
1484	22.28988095	1538.001786	8.671014493	0.044863407
2096	22.28988095	1872.35	9.355952381	0.044863407
3124	22.28988095	3098.293452	11.38705036	0.044863407
3916	22.28988095	3989.88869	10.59608939	0.044863407
4976	22.28988095	4903.77381	10.43590909	0.044863407
5306	22.28988095	4970.643452	10.33946188	0.044863407
7398	22.28988095	5505.600595	11.10647773	0.044863407
8194	22.28988095	6553.225	10.55578231	0.044863407
8926	22.28988095	7467.110119	10.47552239	0.044863407
9550	22.28988095	8224.966071	10.67533875	0.044863407

## Determining Average Daily Passenger Miles Traveled

According to the National Transit Base Sampling Manual:<sup>1</sup>

- (a) You must determine the sample APTL (Average Passenger Trip Length) for a given sample as the ratio of sample total PMT (Passenger Miles Traveled) over sample total UPT (Unlinked Passenger Trips) for the following cases: (1) for the entire sample, (2) by type of service days<sup>2</sup>, or (3) by service group.
- (b) To determine the weighted sample APTL for an entire sample you should follow these steps:
  - i. Determine each service day's size in the number of service units actually operated.
  - ii. Compute each service day's share of the number of service units actually operated. These shares must sum to 1.
  - iii. Determine each service day's sample size in the number of service units in the sample.
  - iv. Determine each service day's sample total UPT.
  - v. Determine each service day's sample total PMT.
  - vi. Compute each service day's sample average for UPT.
  - vii. Compute each service's sample average for PMT.
  - viii. Sum the product of each service day's share of the number of service units actually operated and its sample average UPT
  - ix. Sum the product of each service day's share of the number of service units actually operated and its sample average PMT
  - x. Compute the ratio of the result from (9) to the result from (8). This ratio gives the weighted sample APTL.
  - xi. Multiply your sample average APTL for each type of service day with the corresponding 100% count of UPT to get the annual total PMT for each type of service day.
  - xii. Sum the above products across all types of service days to get your annual total PMT.

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<sup>1</sup> Section 83 (subsection 83.05), pp. 42-43

<sup>2</sup> Service Days will be used for Imperial Valley Transit. Types of service days are defined in the manual (p. 52) as Weekdays, Saturdays and Sundays  
*Annual Passenger Mile Sampling (2016-2017)*  
*Imperial Valley Transit*



This method is applied in **Table 3**.

<b>Table 3</b>			
<b>Passenger Mile Sample: Annual Passenger Count and Miles</b>			
<b>Imperial Valley Transit</b>			
<b>July 1, 2016-June 30, 2017</b>			
<b>Description</b>	<b>Type of Service Day</b>		
	<b>Weekdays</b>	<b>Saturdays</b>	<b>Sundays</b>
<b>Service Day Annual Trips</b>	<b>37,529</b>	<b>3,016</b>	<b>900</b>
<b>Proportion of Total Trips</b>	<b>.9055</b>	<b>.0728</b>	<b>.0217</b>
<b>Sample Size</b>	<b>149</b>	<b>15</b>	<b>4</b>
<b>Sample Total Unlinked Passenger Trips (UPT)</b>	<b>3,798</b>	<b>344</b>	<b>92</b>
<b>Sample Total PMT (Passenger Miles Traveled)</b>	<b>37,328.1</b>	<b>3727.7</b>	<b>967.8</b>
<b>Sample Average UPT</b>	<b>25.49</b>	<b>22.93</b>	<b>23.00</b>
<b>Sample Average PMT</b>	<b>250.52</b>	<b>248.51</b>	<b>241.95</b>
<b>Sample Average APTL</b>	<b>9.83</b>	<b>10.84</b>	<b>10.52</b>
<b>Weighted Sample Average UPT</b>	<b>25.25</b>		
<b>Weighted Sample Average PMT</b>	<b>250.19</b>		
<b>Weighted Sample APTL</b>	<b>9.91</b>		
<b>100% UPT Counts<sup>3</sup></b>	<b>664,755</b>	<b>56,908</b>	<b>20,305</b>
<b>Sum of 100% UPT Counts</b>	<b>741,968</b>		
<b>Sample APTL * 100% UPT Count</b>	<b>6,534,541.65</b>	<b>616,882.72</b>	<b>213,608.60</b>
<b>Sum of Sample APTL * 100% UPT Counts = Total PMT</b>	<b>7,365,032.97</b>		

**Table 3 shows that the 741,968 annual unlinked boardings for Imperial Valley Transit bus riders travel a total of 7,365,033 passenger miles, including:**

- 25.25 unlinked passenger boardings per bus trip
  - 25.49 on weekdays
  - 22.93 on Saturdays
  - 23.00 on Sundays
- 250.19 passenger miles traveled per bus trip

<sup>3</sup> 100% count supplied by Imperial Valley Transit  
*Annual Passenger Mile Sampling (2016-2017)*  
*Imperial Valley Transit*

- 250.52 on weekdays
- 248.51 on Saturdays
- 241.95 on Sundays
- 9.91 average miles traveled per passenger per bus trip
  - 9.83 on weekdays
  - 10.84 on Saturdays
  - 10.52 on Sundays

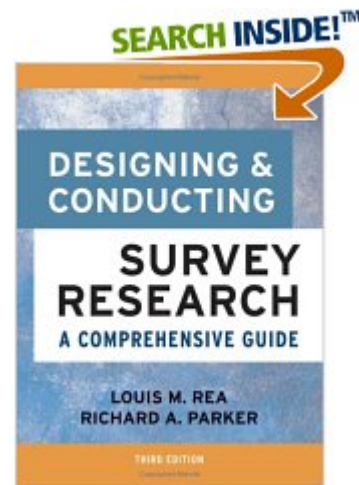
**APPENDIX: Qualifications of Rea & Parker Research**

**Richard A. Parker, Ph.D.**

**Louis M. Rea, Ph.D.**

Rea & Parker Research is a statistical sample survey and market research and economic consulting firm based in San Diego, California, with facilities in Los Angeles and Orange County. It was founded by Louis M. Rea, Ph.D. and Richard A. Parker, Ph.D. in 1984 and 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. Rea & Parker Research is a certified Small Business Enterprise by the State of California.

With particular reference to the current project, the references below will indicate a wealth of experience in on-board bus and rail projects for several entities in Southern California, transportation research including intercept surveys, focus group analysis, and telephone surveys. Rea & Parker Research has extensive experience working with major public agencies in Southern California and the State of California. Rea & Parker Research has 30 years of experience in transportation related surveys for both the public and private sectors.



*Richard A. Parker* is the president of Rea & Parker Research and a professor emeritus in the School of Public Affairs at San Diego State University. Dr. Parker is a co-author (with Louis M. Rea) of a highly successful book, *Designing and Conducting Survey Research: A Comprehensive Guide*, published by Jossey-Bass/Wiley Publishers (division of Simon & Schuster) in 1992, with a second edition published in 1997, a third edition published in 2005, and a fourth edition in 2014.

*Louis M. Rea* is an emeritus professor of city planning in the School of Public Affairs at San Diego State University where he served as school director for nearly twenty-five years. He teaches graduate courses in statistical analysis, transportation planning, survey research, program design and evaluation, and urban/fiscal problems, as well as undergraduate courses in introductory public administration and policy and evaluation in Criminal Justice.

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.

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](http://www.rea-parker.com).

Rea & Parker Research has conducted transportation related research as well as research associated with water issues, immigration, and energy for over 30 years.

Survey Research Clients:

- 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
- Los Angeles County Metropolitan Transportation Authority
- Southern California Regional Rail Authority (Metrolink)
- Orange County Transportation Authority
- California Department of Transportation (CALTRANS)
- Bay Area Rapid Transit
- Metropolitan Transit System (San Diego Transit)
- North County Transit District
- Fresno Area Express
- Gold Line Authority (Los Angeles MTA)
- Southern California Association of Governments (SCAG)
- San Diego Association of Governments (SANDAG)
- San Diego Gas & Electric
- San Diego County Sheriff's Department
- San Diego County Water Authority
- San Diego Unified School District
- Poway Unified School District
- Imperial Irrigation District
- Otay Water District
- Vallecitos Water District
- University of California-Berkeley
- University of California-Los Angeles
- University of California-Davis
- County of Orange
- County of San Diego
- City of San Diego
- City of San Diego Housing Commission
- City of Escondido
- City of Carlsbad
- City of Poway
- City of Davis
- City of St. Helena
- City of Dana Point

- City of Oceanside
- Imperial Valley Association of Governments
- Imperial County Transportation Commission
- Imperial Valley Transit
- Santa Clarita Transit
- Santa Monica Municipal Bus Lines
- Culver CityBus
- Foothill Transit
- El Monte Transit
- Torrance Transit
- Cerritos on Wheels
- Commerce Transit
- Los Angeles Commuter Express
- Pasadena ARTS
- Carson Circuit
- Alhambra Transit
- Clovis Stageline
- Riverside Transit Agency
- San Diego County Law Library
- 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
- California Center for Sustainable Energy

Economic Research Clients:

- 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)
- Southern California Gas Company
- San Diego County Sheriff's Department
- San Diego Unified School District
- San Diego Gas & Electric
- Southern California Gas Company
- Pardee Construction Company
- San Diego Aircraft Carrier Museum Foundation
- Westbrook Development
- Genstar Development
- Laing Urban
- Pacific Century Development
- Subway, Inc.
- Westfield Shopping Centers
- Shea Properties
- City of San Diego
- City of San Diego Housing Commission
- City of Carlsbad
- City of Poway
- City of Holtville

- Southern California Association of Governments
- Imperial Valley Association of Governments
- San Diego County Taxpayers Association
- California Center for Sustainable Energy
- City Heights Community Development Corporation (City of San Diego)
- Centre City Development Corporation (City of San Diego)
- La Jolla Band of Mission Indians
- Viejas Enterprises
- Foxwoods Development
- Big Pine Paiute Economic Development Corporation
- Joint Labor/Management Committee-Retail Food Industry
- San Diego/Imperial Counties Labor Council AFL-CIO
- Southwest Strategies, LLC
- Stirling Enterprises
- Ivey Ranch Development Company
- Pacifica Companies
- Pacific Beachfront Resort
- Housing Solutions Alliance
- Smart Growth Coalition—National City
- Rancho Guejito Corporation
- Seacoast Inn
- Shopoff Group
- Mercado Barrio Logan
- DTOM Sports Apparel
- Accretive Investments
- Mortgage Electronic Registration System, Inc. (MERS)
- Chelsea Investment Corp.
- Border Communities Capital Corp.
- Cox Communications
- Regency Shopping Centers
- Clinicas de Salud del Pueblo
- Three Rivers CDE (Mississippi)

**Richard A. Parker, Ph.D. is Professor Emeritus 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 Professor Emeritus 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.

Short-form resumes are attached.

## **Survey Research Consultative Projects**

### **Imperial Valley Transit/Imperial County Transportation Commission**

- Year long sample survey in process (2016-2017) 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 (2013-2014) 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 (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

### **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 with follow-up surveys also conducted on-board the following year.
    - 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. The analysis consisted of detailed crosstabulations, correlations, and analyses of variance in order to assess market segmentation strategies.
- 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, with follow-up surveys also conducted on-board the following year.
  - 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. 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.
- 600-person telephone survey in San Gabriel Valley concerning expansion of Gold Line and Measure R

**Orange County Transportation Authority (OCTA):**

- Intercept survey of 1,950 bus riders in Orange County regarding origin-destination, customer satisfaction, and messaging.
- 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.
- 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).
- 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
- 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.
- Conducted focus groups among public outreach firms to determine opinions concerning consulting for OCTA—contact administration, pricing, clarity of tasks, and so forth’

**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.

**San Diego County Water Authority Public Opinion Surveys**

- Prepared, implemented, and analyzed 2003, 2004, and 2005, 2006, 2008, 2009, 2011, and 2012 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.
- 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.

### **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—2004, 2011m and 2012.

### **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**

- 2015 Customer Awareness and Satisfaction Survey (n =400)
- 2013 Customer Awareness and Satisfaction Survey (n =350)
- 2012 Customer Awareness and Satisfaction Survey (n = 550)
- 2012 Call Center Customer Service Survey (n = 300)

- 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

### **San Diego Unified School District**

- Survey of building contractors concerning economic impacts of Project Stabilization Agreement with local trade unions regarding school construction projects.

#### **Poway Unified School District**

- Telephone survey of 400 district residents pertaining to satisfaction with existing bond program and potential for future borrowing.

#### **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

#### **San Diego Metropolitan Transit System**

- Survey of passengers at trolley stations
- 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.
- Intercept surveys of 500 passengers at two rail stations concerning moving transit center.

#### **San Diego Association of Governments**

- Focus groups concerning carpool, vanpool, transit alternative commute options.
- Survey of 400 San Diego County businesses (plus focus groups) regarding telework policies, opportunities and challenges.
- 400-person intercept survey at International Border concerning parking costs, availability and other issues.

#### **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.

#### **North County Transit District**

- Online survey of commuters and residents of Camp Pendleton regarding transportation needs.

#### **Fresno Area Express**

- On-board bus survey (n =3,700) regarding origins, destinations, modes of access and egress, demographics
- Intercept bus stop survey re: rider satisfaction (n =1,500)

- Telephone satisfaction survey of para-transit customers (n = 400)

### **Vallecitos Water District**

- Telephone survey (n=300) regarding conservation, awareness of district activities and communications

### **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 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, South Orange County Reliability Project, among others).. Model recalibrated and used continuously for new projects.
- Economic impact analysis for L-3602 pipeline project

**Southern California Gas Company**

- Development of economic impact and fiscal model applicable to System Reliability Project and Pipeline Safety Enhancement Plan affecting 12 counties in California. Model recalibrated and used continuously for new projects.
- Economic impact analysis for North-South pipeline project in Riverside, San Bernardino, Orange and Los Angeles Counties.
- Economic impact analysis for System Reliability Project.

**San Diego Unified School District**

- Economic analysis of bidding, construction costs , delays, labor compliance and others pertaining to construction projects for San Diego Unified School District.

**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

- Economic and fiscal impact of expansion of Costa Verde Shopping Center, La Jolla, CA

### **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
- Fiscal and economic impact of shopping center/hotel development in Cypress, CA

### **Pacifica Companies**

- Fiscal and economic impact of oceanfront resort in San Diego County
- Fiscal and economic impact of converting Oxnard, CA suites hotel into senior living accommodations

### **One World Beef**

- Fiscal, economic and community impact consultant for acquisition and rehabilitation of large meat packing facility in order to obtain New Market Tax Credits.

### **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.

### **Border Communities Credit Corp/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.
- Analysis of job creation for 6 development proposals—San Diego, CA, Chula Vista, CA Brawley, CA, Imperial, CA, Yuma, AZ, El Paso, TX
- Analysis of job creation for 4 development proposals—San Diego, CA (2), Huron, CA, and Las Cruces, New Mexico

### **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

### **Big Pine Paiute Economic Development Corporation**

- Economic/Fiscal impact analysis of proposed Indian Travel Plaza/Casino on US 395 near Big Pine and Bishop, California.

### **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.

#### **Rancho Guejito Corporation**

- 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.

#### **Mortgage Electronic Registration Systems, Inc. (MERS)**

- Costs and benefits to consumers and taxpayers of electronic registration system for mortgages throughout United States. MERS is service owned by Fannie Mae, Ginnie Mae, Bank of America, Chase, Wells Fargo and all other major banks in U.S.

#### **Ivey Ranch Development Company**

- Fiscal and economic impact analysis of three development alternatives for 10 acre site in Oceanside California

#### **Shopoff Group**

- Fiscal and economic impact analysis of two development alternatives for 4.5 acre site in Oceanside, California
- Fiscal and jobs impact for proposed residential development in Vista, California
- Fiscal analysis of 70 unit condominium project in San Diego County.

#### **Accretive Investments**

- Fiscal Impact analysis of 600 acre, 1,800 housing unit and retail development in unincorporated area of northern San Diego County.

#### **Cox Communications**

- Fiscal and economic impact analysis of Cox Communications California operations.

#### **Regency Shopping Centers**

- Fiscal and economic impact analysis of revitalization of Costa Verde Shopping Center, La Jolla, California

#### **Clinica de Salud del Pueblo**

- Community impact analysis for medical center in El Centro, California

### **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 (3 cases) – pharmacy managers and all employees overtime
  - Bank of America—employee overtime
  - Safeway, Inc.—customer service issues

**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 (Wet Seal)
- Expert witness: Loan Depot

**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.).

## 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, Magna Cum Laude, Dean's List)

### Selected Professional Experience

#### **1985-present Professor (Emeritus since 2013), School of Public Affairs, San Diego State University**

Courses taught: Seminar in Urban Planning Methodologies (upper division 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 (upper division undergraduate and graduate)

#### **1984-present President, Rea & Parker Research/California 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, San Diego MTS, Orange County Transportation Authority, Los Angeles County MTA, Southern California Regional Rail Authority (Metrolink), Fresno Area Express, Bay Area Rapid Transit, Imperial Valley Transportation Commission, CALTRANS, San Diego County Water Authority, Otay Water District, Vallecitos Water District, San Diego Housing Commission, 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, Kelly Services. Loan Depot.**

**Economic consultant to Westfield Shopping Centers, San Diego Gas & Electric, Southern California Gas Company, 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., Wet Seal, Inc., Housing Solutions Alliance, San Diego County Taxpayers Association, Shopoff Land Fund, Rancho Guejito Corporation, Ivey Ranch Development, among others.**

### Selected Publications/Awards:

- Designing and Conducting Survey Research: A Comprehensive Guide (with Louis M. Rea, Ph.D., 1992 (2<sup>nd</sup> edition 1997—3<sup>rd</sup> edition 2005—4<sup>th</sup> edition 2014). Jossey-Bass, Inc., Publishers, San Francisco.
- The Economics of Environmental Restrictions on the Use of Urban Land, Institute of Urban and Regional Development, University of California, Berkeley, California (with Leonard Merewitz, Ph.D.).
- "Water Supply for Urban Southern California: An Historical and Legal Perspective," Glendale University Law Review
- "The Retail Commercial Strip in Transition: A Case Study in San Diego," The Western Governmental Researcher
- Bernays Mark of Merit—Special Purpose Communications, 2008

## 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 (Emeritus since 2012)**

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.

**Principal Consultant: Rea and Parker Research, 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 Transportation Survey Research Clients include North County Transit District, Southern California Regional Rail Authority (Metrolink), Coaster, State of California Department of Transportation, SANDAG, San Diego MTS, Orange County Transportation Authority, Los Angeles County MTA, Riverside Transit Agency, Fresno Area Express, Imperial Valley Transportation Commission, Los Angeles Department of Transportation, Santa Clarita Transit, Foothill Transit, Torrance Transit, Santa Monica Big Blue Bus, Culver Citybus, Cerritos on Wheels, Commerce Transit, El Monte Transit, Alhambra Community Transit, Duarte Transit, Pasadena ARTS, Carson Circuit, Montebello Bus Lines.**

**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 -- 2<sup>nd</sup> edition, 1997; 3<sup>rd</sup> edition, 2005, 4<sup>th</sup> edition --2014 (with Richard A. Parker).