

## APPENDIX D

### TRIP GENERATION INTERNAL CAPTURE CALCULATION WORKSHEETS

NCHRP 684 Internal Trip Capture Estimation Tool			
<b>Project Name:</b>	River Street Development, San Juan Capistrano	<b>Organization:</b>	LLG Engineers
<b>Project Location:</b>	San Juan Capistrano	<b>Performed By:</b>	JM
<b>Scenario Description:</b>	Existing	<b>Date:</b>	1/18/2018
<b>Analysis Year:</b>	2017	<b>Checked By:</b>	0
<b>Analysis Period:</b>	Daily	<b>Date:</b>	1/18/2018

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips <sup>3</sup>		
	ITE LUCs <sup>1</sup>	Quantity	Units	Total	Entering	Exiting
Office	710	8	TSF	78	39	39
Retail	492/820/850	25	TSF	1,353	676	677
Restaurant	931/932	28	TSF	2,697	1,348	1,349
Cinema/Entertainment	--	--	--	0	0	0
Residential	--	--	--	0	0	0
Hotel	--	--	--	0	0	0
All Other Land Uses <sup>2</sup>	--	--	--	0	0	0
				4,128	2,063	2,065

Table 2-P: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. <sup>4</sup>	% Transit	% Non-Motorized	Veh. Occ. <sup>4</sup>	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses <sup>2</sup>						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		8	2	0	0	0
Retail	12		196	0	0	0
Restaurant	12	338		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	4,128	2,063	2,065
Internal Capture Percentage	28%	28%	28%
External Vehicle-Trips <sup>5</sup>	2,992	1,495	1,497
External Transit-Trips <sup>6</sup>	0	0	0
External Non-Motorized Trips <sup>6</sup>	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	62%	26%
Retail	51%	31%
Restaurant	15%	26%
Cinema/Entertainment	N/A	N/A
Residential	N/A	N/A
Hotel	N/A	N/A

<sup>1</sup>Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

<sup>2</sup>Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

<sup>3</sup>Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

<sup>4</sup>Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made.

<sup>5</sup>Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.

<sup>6</sup>Person-Trips

\*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

<b>Project Name:</b>	River Street Development, San Juan Capistrano
<b>Analysis Period:</b>	Daily

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends						
Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	39	39	1.00	39	39
Retail	1.00	676	676	1.00	677	677
Restaurant	1.00	1348	1348	1.00	1349	1349
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	0	0	1.00	0	0
Hotel	1.00	0	0	1.00	0	0

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		8	2	0	1	0
Retail	14		196	27	176	34
Restaurant	40	553		108	243	94
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	0	0	0	0	0	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		54	27	0	0	0
Retail	12		391	0	0	0
Restaurant	12	338		0	0	0
Cinema/Entertainment	2	27	40		0	0
Residential	22	68	189	0		0
Hotel	0	14	67	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)						
Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles <sup>1</sup>	Transit <sup>2</sup>	Non-Motorized <sup>2</sup>
Office	24	15	39	15	0	0
Retail	346	330	676	330	0	0
Restaurant	198	1150	1348	1150	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	0	0	0	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses <sup>3</sup>	0	0	0	0	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)						
Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles <sup>1</sup>	Transit <sup>2</sup>	Non-Motorized <sup>2</sup>
Office	10	29	39	29	0	0
Retail	208	469	677	469	0	0
Restaurant	350	999	1349	999	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	0	0	0	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses <sup>3</sup>	0	0	0	0	0	0

<sup>1</sup>Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

<sup>2</sup>Person-Trips

<sup>3</sup>Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator

\*Indicates computation that has been rounded to the nearest whole number.

NCHRP 684 Internal Trip Capture Estimation Tool					
<b>Project Name:</b>	River Street Development, San Juan Capistrano	<b>Organization:</b>	LLG Engineers		
<b>Project Location:</b>	San Juan Capistrano	<b>Performed By:</b>	AB		
<b>Scenario Description:</b>	Existing	<b>Date:</b>	1/18/2018		
<b>Analysis Year:</b>	2017	<b>Checked By:</b>	0		
<b>Analysis Period:</b>	AM Street Peak Hour	<b>Date:</b>	1/18/2018		

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips <sup>3</sup>		
	ITE LUCs <sup>1</sup>	Quantity	Units	Total	Entering	Exiting
Office	710	8	TSF	9	8	1
Retail	492/820/850	25	TSF	43	25	18
Restaurant	931/932	28	TSF	124	73	51
Cinema/Entertainment	--	--	--	0	0	0
Residential	--	--	--	0	0	0
Hotel	--	--	--	0	0	0
All Other Land Uses <sup>2</sup>	--	--	--	0	0	0
				176	106	70

Table 2-A: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. <sup>4</sup>	% Transit	% Non-Motorized	Veh. Occ. <sup>4</sup>	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses <sup>2</sup>						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		2	0	0	0
Restaurant	1	2		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	176	106	70
Internal Capture Percentage	6%	5%	7%
External Vehicle-Trips <sup>5</sup>	166	101	65
External Transit-Trips <sup>6</sup>	0	0	0
External Non-Motorized Trips <sup>6</sup>	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	13%	0%
Retail	8%	11%
Restaurant	3%	6%
Cinema/Entertainment	N/A	N/A
Residential	N/A	N/A
Hotel	N/A	N/A

<sup>1</sup>Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

<sup>2</sup>Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

<sup>3</sup>Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

<sup>4</sup>Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

<sup>5</sup>Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.

<sup>6</sup>Person-Trips

\*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

<b>Project Name:</b>	River Street Development, San Juan Capistrano
<b>Analysis Period:</b>	AM Street Peak Hour

Land Use	Table 7-A (D): Entering Trips			Table 7-A (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	8	8	1.00	1	1
Retail	1.00	25	25	1.00	18	18
Restaurant	1.00	73	73	1.00	51	51
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	0	0	1.00	0	0
Hotel	1.00	0	0	1.00	0	0

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	1	0	0	0
Retail	5		2	0	3	0
Restaurant	16	7		0	2	2
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	0	0	0	0	0	

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		8	17	0	0	0
Retail	0		37	0	0	0
Restaurant	1	2		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	4	15	0		0
Hotel	0	1	4	0	0	

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles <sup>1</sup>	Transit <sup>2</sup>	Non-Motorized <sup>2</sup>
Office	1	7	8	7	0	0
Retail	2	23	25	23	0	0
Restaurant	2	71	73	71	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	0	0	0	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses <sup>3</sup>	0	0	0	0	0	0

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles <sup>1</sup>	Transit <sup>2</sup>	Non-Motorized <sup>2</sup>
Office	0	1	1	1	0	0
Retail	2	16	18	16	0	0
Restaurant	3	48	51	48	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	0	0	0	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses <sup>3</sup>	0	0	0	0	0	0

<sup>1</sup>Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A  
<sup>2</sup>Person-Trips  
<sup>3</sup>Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator  
\*Indicates computation that has been rounded to the nearest whole number.

NCHRP 684 Internal Trip Capture Estimation Tool			
<b>Project Name:</b>	River Street Development, San Juan Capistrano	<b>Organization:</b>	LLG Engineers
<b>Project Location:</b>	San Juan Capistrano	<b>Performed By:</b>	AB
<b>Scenario Description:</b>	Existing	<b>Date:</b>	1/18/2018
<b>Analysis Year:</b>	2017	<b>Checked By:</b>	0
<b>Analysis Period:</b>	PM Street Peak Hour	<b>Date:</b>	1/18/2018

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips <sup>3</sup>		
	ITE LUCs <sup>1</sup>	Quantity	Units	Total	Entering	Exiting
Office	710	8	TSF	9	1	8
Retail	492/820/850	25	TSF	128	65	63
Restaurant	931/932	28	TSF	245	158	87
Cinema/Entertainment	--	--	--	0	0	0
Residential	--	--	--	0	0	0
Hotel	--	--	--	0	0	0
All Other Land Uses <sup>2</sup>	--	--	--	0	0	0
				382	224	158

Table 2-P: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. <sup>4</sup>	% Transit	% Non-Motorized	Veh. Occ. <sup>4</sup>	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses <sup>2</sup>						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0		0	
Retail					0	
Restaurant					0	
Cinema/Entertainment					0	
Residential		0	0			
Hotel					0	

Table 4-P: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		2	0	0	0	0
Retail	0		18	0	0	0
Restaurant	0	33		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	382	224	158
Internal Capture Percentage	28%	24%	34%
External Vehicle-Trips <sup>5</sup>	276	171	105
External Transit-Trips <sup>6</sup>	0	0	0
External Non-Motorized Trips <sup>6</sup>	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	0%	25%
Retail	54%	29%
Restaurant	11%	38%
Cinema/Entertainment	N/A	N/A
Residential	N/A	N/A
Hotel	N/A	N/A

<sup>1</sup>Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

<sup>2</sup>Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

<sup>3</sup>Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

<sup>4</sup>Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made.

<sup>5</sup>Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.

<sup>6</sup>Person-Trips

\*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

<b>Project Name:</b>	River Street Development, San Juan Capistrano
<b>Analysis Period:</b>	PM Street Peak Hour

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends						
Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	1	1	1.00	8	8
Retail	1.00	65	65	1.00	63	63
Restaurant	1.00	158	158	1.00	87	87
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	0	0	1.00	0	0
Hotel	1.00	0	0	1.00	0	0

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		2	0	0	0	0
Retail	1		18	3	16	3
Restaurant	3	36		7	16	6
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	0	0	0	0	0	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		5	3	0	0	0
Retail	0		46	0	0	0
Restaurant	0	33		0	0	0
Cinema/Entertainment	0	3	5		0	0
Residential	1	7	22	0		0
Hotel	0	1	8	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)						
Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles <sup>1</sup>	Transit <sup>2</sup>	Non-Motorized <sup>2</sup>
Office	0	1	1	1	0	0
Retail	35	30	65	30	0	0
Restaurant	18	140	158	140	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	0	0	0	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses <sup>3</sup>	0	0	0	0	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)						
Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles <sup>1</sup>	Transit <sup>2</sup>	Non-Motorized <sup>2</sup>
Office	2	6	8	6	0	0
Retail	18	45	63	45	0	0
Restaurant	33	54	87	54	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	0	0	0	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses <sup>3</sup>	0	0	0	0	0	0

<sup>1</sup>Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

<sup>2</sup>Person-Trips

<sup>3</sup>Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator

\*Indicates computation that has been rounded to the nearest whole number.