

# Appendix L

## HCS Freeway Segment Worksheets

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-52 EB</i>													
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>Genesee Ave to I-805</i>													
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>													
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year	<i>2050</i>													
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data													
<b>Flow Inputs</b>																	
Volume, V	<i>4787</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>													
DDHV = AADT x K x D		veh/h	Grade % Length	<i>mi</i>													
			Up/Down %														
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>													
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>5.3</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>70.1</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>5.3</i>	mph	FFS	<i>70.1</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>5.3</i>	mph															
FFS	<i>70.1</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>3</i>																
Total Ramp Density, TRD	<i>1.82</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )	<i>1705</i>	pc/h/ln	Design LOS v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> ) pc/h/ln														
S	<i>67.0</i>	mph	S mph														
D = v <sub>p</sub> / S	<i>25.4</i>	pc/mi/ln	D = v <sub>p</sub> / S pc/mi/ln														
LOS	<i>C</i>		Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8												
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9												
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11												
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-52 WB</i>	
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>Genesee Ave to I-805</i>	
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>	
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year	<i>2050</i>	
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>					
<b>Flow Inputs</b>					
Volume, V	<i>3868</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>	
DDHV = AADT x K x D		veh/h	Grade % Length	<i>mi</i>	
			Up/Down %		
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>	
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft			
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub>	<i>0.0</i>	mph
Number of Lanes, N	<i>2</i>		f <sub>LC</sub>	<i>0.0</i>	mph
Total Ramp Density, TRD	<i>1.82</i>	ramps/mi	TRD Adjustment	<i>5.3</i>	mph
FFS (measured)			FFS	<i>70.1</i>	mph
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )			Design LOS		
v <sub>p</sub>	<i>2066</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )		
x f <sub>p</sub> )			x f <sub>p</sub> )	pc/h/ln	
S	<i>61.3</i>	mph	S	mph	
D = v <sub>p</sub> / S	<i>33.7</i>	pc/mi/ln	D = v <sub>p</sub> / S	pc/mi/ln	
LOS	<i>D</i>		Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8	
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9	
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11	
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-52 EB</i>													
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>I-805 to Convoy St</i>													
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>													
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year	<i>2050</i>													
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data													
<b>Flow Inputs</b>																	
Volume, V	<i>5799</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>													
DDHV = AADT x K x D		veh/h	Grade % Length	<i>mi</i>													
			Up/Down %														
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>													
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>5.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>70.4</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>5.0</i>	mph	FFS	<i>70.4</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>5.0</i>	mph															
FFS	<i>70.4</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>4</i>																
Total Ramp Density, TRD	<i>1.67</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )	<i>1549</i>	pc/h/ln	Design LOS														
S	<i>68.6</i>	mph	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )														
D = v <sub>p</sub> / S	<i>22.6</i>	pc/mi/ln	S														
LOS	<i>C</i>		D = v <sub>p</sub> / S														
			Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8													
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9													
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LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

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Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>I-805 to Convoy St</i>													
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>													
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year	<i>2050</i>													
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>																	
<b>Flow Inputs</b>																	
Volume, V	<i>4685</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>													
DDHV = AADT x K x D		veh/h	Grade % Length	<i>mi</i>													
			Up/Down %														
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>													
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>5.8</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>69.6</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>5.8</i>	mph	FFS	<i>69.6</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>5.8</i>	mph															
FFS	<i>69.6</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>3</i>																
Total Ramp Density, TRD	<i>2.00</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS														
S	<i>67.4</i>	mph	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )														
D = v <sub>p</sub> / S	<i>24.7</i>	pc/mi/ln	S														
LOS	<i>C</i>		D = v <sub>p</sub> / S														
			Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8													
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9													
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11													
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-52 EB</i>	
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>Convoy St to SR-163</i>	
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>	
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year	<i>2050</i>	
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>					
<b>Flow Inputs</b>					
Volume, V	<i>4991</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>	
DDHV = AADT x K x D		veh/h	Grade % Length	<i>mi</i>	
			Up/Down %		
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>	
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft			
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub>	<i>0.0</i>	mph
Number of Lanes, N	<i>4</i>		f <sub>LC</sub>	<i>0.0</i>	mph
Total Ramp Density, TRD	<i>1.67</i>	ramps/mi	TRD Adjustment	<i>5.0</i>	mph
FFS (measured)			FFS	<i>70.4</i>	mph
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS		
v <sub>p</sub>	<i>1333</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )		
S	<i>69.8</i>	mph	S		
D = v <sub>p</sub> / S	<i>19.1</i>	pc/mi/ln	D = v <sub>p</sub> / S		
LOS	<i>C</i>		Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8	
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9	
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11	
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

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Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>Convoy St to SR-163</i>	
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>	
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year	<i>2050</i>	
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>					
<b>Flow Inputs</b>					
Volume, V	<i>8436</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>	
DDHV = AADT x K x D		veh/h	Grade % Length	<i>mi</i>	
			Up/Down %		
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>	
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft			
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub>	<i>0.0</i>	mph
Number of Lanes, N	<i>3</i>		f <sub>LC</sub>	<i>0.0</i>	mph
Total Ramp Density, TRD	<i>1.83</i>	ramps/mi	TRD Adjustment	<i>5.3</i>	mph
FFS (measured)			FFS	<i>70.1</i>	mph
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )			Design LOS		
x f <sub>p</sub> )	<i>3004</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )	pc/h/ln	
S	<i>32.2</i> mph		x f <sub>p</sub> )		
D = v <sub>p</sub> / S	<i>93.2</i> pc/mi/ln		S	mph	
LOS	<i>F</i>		D = v <sub>p</sub> / S	pc/mi/ln	
			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8	
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9	
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11	
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-52 EB</i>	
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>SR-163 to Kearny Villa/Ruffin</i>	
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>	
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year	<i>2050</i>	
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
<b>Flow Inputs</b>					
Volume, V	<i>1685</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>	
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>
			Up/Down %		
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>	
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft			
Rt-Side Lat. Clearance	<i>6.0</i>	ft			
Number of Lanes, N	<i>4</i>				
Total Ramp Density, TRD	<i>1.83</i>	ramps/mi			
FFS (measured)					
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
			f <sub>LW</sub>	<i>0.0</i>	mph
			f <sub>LC</sub>	<i>0.0</i>	mph
			TRD Adjustment	<i>5.3</i>	mph
			FFS	<i>70.1</i>	mph
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )			Design LOS		
x f <sub>p</sub> )	<i>450</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )		
S	<i>70.0</i> mph		x f <sub>p</sub> )		
D = v <sub>p</sub> / S	<i>6.4</i> pc/mi/ln		S		
LOS	<i>A</i>		D = v <sub>p</sub> / S		
			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8	
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9	
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					



<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-52 WB</i>	
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>SR-163 to Kearny Villa/Ruffin</i>	
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>	
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year	<i>2050</i>	
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
<b>Flow Inputs</b>					
Volume, V	<i>2848</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>	
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>
			Up/Down %		
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>	
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft			
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub>	<i>0.0</i>	mph
Number of Lanes, N	<i>2</i>		f <sub>LC</sub>	<i>0.0</i> mph	
Total Ramp Density, TRD	<i>1.67</i>	ramps/mi	TRD Adjustment	<i>5.0</i> mph	
FFS (measured)			FFS	<i>70.4</i> mph	
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS		
v <sub>p</sub>	<i>1521</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )		
S	<i>68.8</i> mph		S		
D = v <sub>p</sub> / S	<i>22.1</i> pc/mi/ln		D = v <sub>p</sub> / S		
LOS	<i>C</i>		Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8	
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9	
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-52 EB</i>													
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>Kearny Villa/Ruffin to I-15</i>													
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>													
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year	<i>2050</i>													
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>																	
<b>Flow Inputs</b>																	
Volume, V	<i>2309</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>													
DDHV = AADT x K x D		veh/h	Grade % Length	<i>mi</i>													
			Up/Down %														
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>													
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>5.3</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>70.1</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>5.3</i>	mph	FFS	<i>70.1</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>5.3</i>	mph															
FFS	<i>70.1</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>4</i>																
Total Ramp Density, TRD	<i>1.83</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )	<i>617</i>	pc/h/ln	Design LOS														
S	<i>70.0</i>	mph	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )														
D = v <sub>p</sub> / S	<i>8.8</i>	pc/mi/ln	S														
LOS	<i>A</i>		D = v <sub>p</sub> / S														
			Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8													
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9													
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11													
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-52 WB</i>													
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>Kearny Villa/Ruffin to I-15</i>													
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>													
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year	<i>2050</i>													
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>																	
<b>Flow Inputs</b>																	
Volume, V	<i>3903</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>													
DDHV = AADT x K x D		veh/h	Grade % Length	<i>mi</i>													
			Up/Down %														
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>													
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>4.1</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>71.3</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>4.1</i>	mph	FFS	<i>71.3</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>4.1</i>	mph															
FFS	<i>71.3</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>3</i>																
Total Ramp Density, TRD	<i>1.33</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$			$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$														
S	<i>69.6</i>	mph	S	mph													
D = v <sub>p</sub> / S	<i>20.0</i>	pc/mi/ln	D = v <sub>p</sub> / S	pc/mi/ln													
LOS	<i>C</i>		Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8													
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9													
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11													
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-52 EB</i>													
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>I-15 to Santo Rd</i>													
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>													
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year	<i>2050</i>													
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>																	
<b>Flow Inputs</b>																	
Volume, V	<i>4029</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>													
DDHV = AADT x K x D		veh/h	Grade % Length	<i>mi</i>													
			Up/Down %														
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>													
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>5.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>70.4</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>5.0</i>	mph	FFS	<i>70.4</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>5.0</i>	mph															
FFS	<i>70.4</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>3</i>																
Total Ramp Density, TRD	<i>1.67</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )	<i>1435</i>	pc/h/ln	Design LOS														
S	<i>69.4</i>	mph	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )														
D = v <sub>p</sub> / S	<i>20.7</i>	pc/mi/ln	S														
LOS	<i>C</i>		D = v <sub>p</sub> / S														
			Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8													
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v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11													
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-52 WB</i>	
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>I-15 to Santo Rd</i>	
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>	
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year	<i>2050</i>	
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
<b>Flow Inputs</b>					
Volume, V	<i>6811</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>	
DDHV = AADT x K x D		veh/h	Grade % Length	<i>mi</i>	
			Up/Down %		
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>	
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft			
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub>	<i>0.0</i>	mph
Number of Lanes, N	<i>4</i>		f <sub>LC</sub>	<i>0.0</i>	mph
Total Ramp Density, TRD	<i>1.33</i>	ramps/mi	TRD Adjustment	<i>4.1</i>	mph
FFS (measured)			FFS	<i>71.3</i>	mph
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS		
v <sub>p</sub>	<i>1819</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )	pc/h/ln	
S	<i>65.6</i> mph		S	mph	
D = v <sub>p</sub> / S	<i>27.7</i> pc/mi/ln		D = v <sub>p</sub> / S	pc/mi/ln	
LOS	<i>D</i>		Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8	
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9	
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11	
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-805 NB</i>														
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>Governor Dr to SR-52</i>													
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>													
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year	<i>2050</i>													
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>																	
<b>Flow Inputs</b>																	
Volume, V	<i>13433</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>6</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>													
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>												
			Up/Down %														
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.971</i>														
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>1.8</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>73.6</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>1.8</i>	mph	FFS	<i>73.6</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>1.8</i>	mph															
FFS	<i>73.6</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>5</i>																
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS														
S	<i>34.5</i>	mph	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )														
D = v <sub>p</sub> / S	<i>84.5</i>	pc/mi/ln	S														
LOS	<i>F</i>		D = v <sub>p</sub> / S														
			Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8													
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9													
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11													
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-805 SB</i>														
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>Governor Dr to SR-52</i>													
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>													
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year	<i>2050</i>													
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>																	
<b>Flow Inputs</b>																	
Volume, V	<i>4275</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>6</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>													
DDHV = AADT x K x D		veh/h	Grade % Length	<i>mi</i>													
			Up/Down %														
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.971</i>													
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>1.8</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>73.6</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>1.8</i>	mph	FFS	<i>73.6</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>1.8</i>	mph															
FFS	<i>73.6</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>6</i>																
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )			Design LOS														
x f <sub>p</sub> )	<i>773</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )														
S	<i>75.0</i>	mph	x f <sub>p</sub> )														
D = v <sub>p</sub> / S	<i>10.3</i>	pc/mi/ln	S														
LOS	<i>A</i>		D = v <sub>p</sub> / S														
			pc/mi/ln														
			Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8												
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9												
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11												
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-805 NB</i>		
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>SR-52 to Clairemont Mesa Blvd</i>		
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>		
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year <i>2050</i>		
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
<b>Flow Inputs</b>					
Volume, V	<i>11128</i>	veh/h	Peak-Hour Factor, PHF		<i>0.95</i>
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>		<i>7</i>
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>		<i>0</i>
Peak-Hr Direction Prop, D			General Terrain:		<i>Level</i>
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>
			Up/Down %		
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>		<i>1.2</i>
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.966</i>		
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft			
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub>		<i>0.0</i> mph
Number of Lanes, N	<i>5</i>		f <sub>LC</sub>		<i>0.0</i> mph
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi	TRD Adjustment		<i>1.8</i> mph
FFS (measured)		mph	FFS		<i>73.6</i> mph
Base free-flow Speed, BFFS	<i>75.4</i> mph				
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )			Design LOS		
x f <sub>p</sub> )	<i>2425</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )		pc/h/ln
S	<i>52.5</i> mph		x f <sub>p</sub> )		mph
D = v <sub>p</sub> / S	<i>46.2</i> pc/mi/ln		S		pc/mi/ln
LOS <i>F</i>			D = v <sub>p</sub> / S		
			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes		S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	
V - Hourly volume		D - Density		f <sub>LW</sub> - Exhibit 11-8	
v <sub>p</sub> - Flow rate		FFS - Free-flow speed		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	
LOS - Level of service		BFFS - Base free-flow speed		f <sub>LC</sub> - Exhibit 11-9	
DDHV - Directional design hour volume				f <sub>p</sub> - Page 11-18	
				TRD - Page 11-11	
				LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3	



<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-805 SB</i>														
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>SR-52 to Clairemont Mesa Blvd</i>														
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>														
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year <i>2050</i>														
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data													
<b>Flow Inputs</b>																	
Volume, V	<i>3541</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>7</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>														
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>												
Up/Down %																	
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.966</i>														
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>1.8</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>73.6</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>1.8</i>	mph	FFS	<i>73.6</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>1.8</i>	mph															
FFS	<i>73.6</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>4</i>																
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> ) <i>964</i>			Design LOS														
x f <sub>p</sub> )			v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )														
S <i>75.0</i> mph			x f <sub>p</sub> )														
D = v <sub>p</sub> / S <i>12.9</i> pc/mi/ln			S														
LOS <i>B</i>			D = v <sub>p</sub> / S														
			Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes			E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8												
V - Hourly volume			E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9												
v <sub>p</sub> - Flow rate			f <sub>p</sub> - Page 11-18		TRD - Page 11-11												
LOS - Level of service			LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	
S - Speed																	
D - Density																	
FFS - Free-flow speed																	
BFFS - Base free-flow speed																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-805 NB</i>		
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>Clairemont Mesa Blvd to Balboa</i>		
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>		
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year <i>2050</i>		
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
<b>Flow Inputs</b>					
Volume, V	<i>10966</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>7</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>	
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>
			Up/Down %		
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.966</i>		
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft			
Rt-Side Lat. Clearance	<i>6.0</i>	ft			
Number of Lanes, N	<i>4</i>				
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi			
FFS (measured)					
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
			f <sub>LW</sub>	<i>0.0</i>	mph
			f <sub>LC</sub>	<i>0.0</i>	mph
			TRD Adjustment	<i>1.8</i>	mph
			FFS	<i>73.6</i>	mph
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )			Design LOS		
x f <sub>p</sub> )	<i>2987</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )		
S	<i>31.3</i> mph		x f <sub>p</sub> )		
D = v <sub>p</sub> / S	<i>95.5</i> pc/mi/ln		S		
LOS	<i>F</i>		D = v <sub>p</sub> / S		
			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-805 SB</i>		
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>Clairemont Mesa Blvd to Balboa</i>		
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>		
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year <i>2050</i>		
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
<b>Flow Inputs</b>					
Volume, V	<i>3490</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>7</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>	
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>
			Up/Down %		
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.966</i>		
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft			
Rt-Side Lat. Clearance	<i>6.0</i>	ft			
Number of Lanes, N	<i>4</i>				
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi			
FFS (measured)					
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
			f <sub>LW</sub>	<i>0.0</i>	mph
			f <sub>LC</sub>	<i>0.0</i>	mph
			TRD Adjustment	<i>1.8</i>	mph
			FFS	<i>73.6</i>	mph
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> ) <i>951</i>			Design LOS		
x f <sub>p</sub> )			v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )		
S	<i>75.0</i>		x f <sub>p</sub> )		
D = v <sub>p</sub> / S	<i>12.7</i>		S	mph	
LOS	<i>B</i>		D = v <sub>p</sub> / S	pc/mi/ln	
			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8	
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9	
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-805 NB</i>														
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>Balboa Ave to SR-163</i>													
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>													
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year	<i>2050</i>													
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>																	
<b>Flow Inputs</b>																	
Volume, V	<i>11064</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>7</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>													
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>												
			Up/Down %														
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.966</i>													
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>1.8</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>73.6</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>1.8</i>	mph	FFS	<i>73.6</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>1.8</i>	mph															
FFS	<i>73.6</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>4</i>																
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )			Design LOS														
x f <sub>p</sub> )	<i>3013</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )														
S	<i>30.1</i>	mph	x f <sub>p</sub> )														
D = v <sub>p</sub> / S	<i>100.0</i>	pc/mi/ln	S														
LOS	<i>F</i>		D = v <sub>p</sub> / S														
			Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8													
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9													
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11													
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-805 SB</i>		
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>Balboa Ave to SR-163</i>		
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>		
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year <i>2050</i>		
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>					
<b>Flow Inputs</b>					
Volume, V	<i>3521</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>7</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>		
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>
Up/Down %					
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.966</i>		
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft	f <sub>LW</sub> <span style="float: right;"><i>0.0</i></span> <span style="float: right;">mph</span> f <sub>LC</sub> <span style="float: right;"><i>0.0</i></span> <span style="float: right;">mph</span> TRD Adjustment <span style="float: right;"><i>1.8</i></span> <span style="float: right;">mph</span> FFS <span style="float: right;"><i>73.6</i></span> <span style="float: right;">mph</span>		
Rt-Side Lat. Clearance	<i>6.0</i>	ft			
Number of Lanes, N	<i>5</i>				
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi			
FFS (measured)		mph			
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> ) <span style="float: right;"><i>767</i></span> <span style="float: right;">pc/h/ln</span>			Design LOS		
x f <sub>p</sub> )			v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> ) <span style="float: right;">pc/h/ln</span>		
S <span style="float: right;"><i>75.0</i></span> <span style="float: right;">mph</span>			x f <sub>p</sub> )		
D = v <sub>p</sub> / S <span style="float: right;"><i>10.2</i></span> <span style="float: right;">pc/mi/ln</span>			S <span style="float: right;">mph</span>		
LOS <span style="float: right;"><i>A</i></span>			D = v <sub>p</sub> / S <span style="float: right;">pc/mi/ln</span>		
			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes			E <sub>R</sub> - Exhibits 11-10, 11-12		
V - Hourly volume			E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		
v <sub>p</sub> - Flow rate			f <sub>p</sub> - Page 11-18		
LOS - Level of service			LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume			f <sub>LW</sub> - Exhibit 11-8		
			f <sub>LC</sub> - Exhibit 11-9		
			TRD - Page 11-11		

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-805 NB</i>		
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>SR-163 to Kearny Vill/Mesa Col</i>		
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>		
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year <i>2050</i>		
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
<b>Flow Inputs</b>					
Volume, V	<i>11123</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>7</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>		
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>
			Up/Down %		
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.966</i>		
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft			
Rt-Side Lat. Clearance	<i>6.0</i>	ft			
Number of Lanes, N	<i>5</i>				
Total Ramp Density, TRD	<i>2.00</i>	ramps/mi			
FFS (measured)					
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
			f <sub>LW</sub>	<i>0.0</i> mph	
			f <sub>LC</sub>	<i>0.0</i> mph	
			TRD Adjustment	<i>5.8</i> mph	
			FFS	<i>69.6</i> mph	
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )			Design LOS		
x f <sub>p</sub> )	<i>2424</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )		
S	<i>52.6</i> mph		x f <sub>p</sub> )		
D = v <sub>p</sub> / S	<i>46.1</i> pc/mi/ln		S		
LOS	<i>F</i>		D = v <sub>p</sub> / S		
			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>			
<b>General Information</b>		<b>Site Information</b>	
Analyst	<i>Chen Ryan Associates</i>	Highway/Direction of Travel	<i>I-805 SB</i>
Agency or Company	<i>Chen Ryan Associates</i>	From/To	<i>SR-163 to Kearny Vill/Mesa Col</i>
Date Performed	<i>2019</i>	Jurisdiction	<i>City of San Diego</i>
Analysis Time Period	<i>AM Peak Hour</i>	Analysis Year	<i>2050</i>
Project Description <i>Proposed</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
<b>Flow Inputs</b>			
Volume, V	<i>3540</i>	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			<i>Level</i>
			<i>mi</i>
<b>Calculate Flow Adjustments</b>			
f <sub>p</sub>	<i>1.00</i>	E <sub>R</sub>	<i>1.2</i>
E <sub>T</sub>	<i>1.5</i>	f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.966</i>
<b>Speed Inputs</b>		<b>Calc Speed Adj and FFS</b>	
Lane Width	<i>12.0</i>	ft	
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub>
Number of Lanes, N	<i>5</i>		<i>0.0</i>
Total Ramp Density, TRD	<i>2.00</i>	ramps/mi	mph
FFS (measured)		mph	f <sub>LC</sub>
Base free-flow Speed, BFFS	<i>75.4</i>	mph	<i>0.0</i>
			mph
			TRD Adjustment
			<i>5.8</i>
			mph
			FFS
			<i>69.6</i>
			mph
<b>LOS and Performance Measures</b>		<b>Design (N)</b>	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )	<i>771</i>	pc/h/ln	Design LOS
x f <sub>p</sub> )			v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )
S	<i>70.0</i>	mph	x f <sub>p</sub> )
D = v <sub>p</sub> / S	<i>11.0</i>	pc/mi/ln	S
LOS	<i>B</i>		mph
			D = v <sub>p</sub> / S
			pc/mi/ln
			Required Number of Lanes, N
<b>Glossary</b>		<b>Factor Location</b>	
N - Number of lanes	S - Speed	E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density	E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed	f <sub>p</sub> - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-805 NB</i>														
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>Kearny Vll/Mesa Col to Phyllis</i>														
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>														
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year <i>2050</i>														
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data													
<b>Flow Inputs</b>																	
Volume, V	<i>13015</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>6</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>														
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>												
			Up/Down %														
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.971</i>														
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>5.3</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>70.1</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>5.3</i>	mph	FFS	<i>70.1</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>5.3</i>	mph															
FFS	<i>70.1</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>5</i>																
Total Ramp Density, TRD	<i>1.83</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )			Design LOS														
x f <sub>p</sub> )	<i>2822</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )														
S	<i>39.5</i>	mph	x f <sub>p</sub> )														
D = v <sub>p</sub> / S	<i>71.5</i>	pc/mi/ln	S														
LOS	<i>F</i>		D = v <sub>p</sub> / S														
			Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8												
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9												
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11												
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	



<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>			
<b>General Information</b>		<b>Site Information</b>	
Analyst	<i>Chen Ryan Associates</i>	Highway/Direction of Travel <i>I-805 SB</i>	
Agency or Company	<i>Chen Ryan Associates</i>	From/To	<i>Kearny Vil/Mesa Col to Phyllis</i>
Date Performed	<i>2019</i>	Jurisdiction	<i>City of San Diego</i>
Analysis Time Period	<i>AM Peak Hour</i>	Analysis Year	<i>2050</i>
Project Description <i>Proposed</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
<b>Flow Inputs</b>			
Volume, V	<i>4142</i>	veh/h	Peak-Hour Factor, PHF <i>0.95</i>
AADT		veh/day	%Trucks and Buses, P <sub>T</sub> <i>6</i>
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub> <i>0</i>
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>
DDHV = AADT x K x D		veh/h	Grade % Length <i>mi</i> Up/Down %
<b>Calculate Flow Adjustments</b>			
f <sub>p</sub>	<i>1.00</i>	E <sub>R</sub>	<i>1.2</i>
E <sub>T</sub>	<i>1.5</i>	f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.971</i>	
<b>Speed Inputs</b>		<b>Calc Speed Adj and FFS</b>	
Lane Width	<i>12.0</i>	ft	
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub> <i>0.0</i> mph
Number of Lanes, N	<i>5</i>		f <sub>LC</sub> <i>0.0</i> mph
Total Ramp Density, TRD	<i>2.00</i>	ramps/mi	TRD Adjustment <i>5.8</i> mph
FFS (measured)		mph	FFS <i>69.6</i> mph
Base free-flow Speed, BFFS	<i>75.4</i>	mph	
<b>LOS and Performance Measures</b>		<b>Design (N)</b>	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )	<i>898</i>	pc/h/ln	Design LOS
x f <sub>p</sub> )			v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )
S	<i>70.0</i>	mph	x f <sub>p</sub> )
D = v <sub>p</sub> / S	<i>12.8</i>	pc/mi/ln	S
LOS	<i>B</i>		D = v <sub>p</sub> / S
			pc/mi/ln
			Required Number of Lanes, N
<b>Glossary</b>		<b>Factor Location</b>	
N - Number of lanes	S - Speed	E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density	E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed	f <sub>p</sub> - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-163 NB</i>													
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>Kearny Villa Rd to SR-52</i>													
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>													
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year	<i>2050</i>													
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>																	
<b>Flow Inputs</b>																	
Volume, V	<i>5873</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>													
DDHV = AADT x K x D		veh/h	Grade % Length	<i>mi</i>													
			Up/Down %														
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>													
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>5.8</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>69.6</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>5.8</i>	mph	FFS	<i>69.6</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>5.8</i>	mph															
FFS	<i>69.6</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>4</i>																
Total Ramp Density, TRD	<i>2.00</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS														
S	<i>68.4</i>	mph	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )														
D = v <sub>p</sub> / S	<i>22.9</i>	pc/mi/ln	S														
LOS	<i>C</i>		D = v <sub>p</sub> / S														
			Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8													
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9													
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11													
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-163 SB</i>													
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>Kearny Villa Rd to SR-52</i>													
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>													
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year	<i>2050</i>													
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>																	
<b>Flow Inputs</b>																	
Volume, V	<i>9101</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>													
DDHV = AADT x K x D		veh/h	Grade % Length	<i>mi</i>													
			Up/Down %														
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>													
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>1.8</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>73.6</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>1.8</i>	mph	FFS	<i>73.6</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>1.8</i>	mph															
FFS	<i>73.6</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>5</i>																
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )	<i>1945</i>	pc/h/ln	Design LOS														
S	<i>65.1</i>	mph	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )														
D = v <sub>p</sub> / S	<i>29.9</i>	pc/mi/ln	S														
LOS	<i>D</i>		D = v <sub>p</sub> / S														
			Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8													
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9													
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11													
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-163 NB</i>	
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>SR-52 to Kearny Villa (Monel)</i>	
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>	
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year	<i>2050</i>	
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
<b>Flow Inputs</b>					
Volume, V	<i>6282</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>	
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>
			Up/Down %		
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>	
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft			
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub>	<i>0.0</i>	mph
Number of Lanes, N	<i>5</i>		f <sub>LC</sub>	<i>0.0</i> mph	
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi	TRD Adjustment	<i>1.8</i> mph	
FFS (measured)			FFS	<i>73.6</i> mph	
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS		
	<i>1342</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )		
S	<i>73.7</i> mph		S		
D = v <sub>p</sub> / S	<i>18.2</i> pc/mi/ln		D = v <sub>p</sub> / S		
LOS	<i>C</i>		Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8	
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9	
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-163 SB</i>	
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>SR-52 to Kearny Villa (Monel)</i>	
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>	
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year	<i>2050</i>	
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
<b>Flow Inputs</b>					
Volume, V	<i>9735</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>	
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>
			Up/Down %		
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>	
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft			
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub>	<i>0.0</i>	mph
Number of Lanes, N	<i>4</i>		f <sub>LC</sub>	<i>0.0</i>	mph
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi	TRD Adjustment	<i>1.8</i>	mph
FFS (measured)			FFS	<i>73.6</i>	mph
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )			Design LOS		
x f <sub>p</sub> )	<i>2600</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )		
S	<i>46.7</i>	mph	x f <sub>p</sub> )		
D = v <sub>p</sub> / S	<i>55.7</i>	pc/mi/ln	S		
LOS	<i>F</i>		D = v <sub>p</sub> / S		
			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8	
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9	
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>			
<b>General Information</b>		<b>Site Information</b>	
Analyst	<i>Chen Ryan Associates</i>	Highway/Direction of Travel	<i>SR-163 NB</i>
Agency or Company	<i>Chen Ryan Associates</i>	From/To	<i>Krny Vil (Monel) to Clmnt Mes</i>
Date Performed	<i>2019</i>	Jurisdiction	<i>City of San Diego</i>
Analysis Time Period	<i>AM Peak Hour</i>	Analysis Year	<i>2050</i>
Project Description <i>Proposed</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
<b>Flow Inputs</b>			
Volume, V	<i>5432</i>	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	<i>0.95</i>
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P <sub>T</sub>
Peak-Hr Direction Prop, D			<i>3</i>
DDHV = AADT x K x D		veh/h	%RVs, P <sub>R</sub>
			<i>0</i>
			General Terrain:
			<i>Level</i>
			Grade % Length
			<i>mi</i>
			Up/Down %
<b>Calculate Flow Adjustments</b>			
f <sub>p</sub>	<i>1.00</i>	E <sub>R</sub>	<i>1.2</i>
E <sub>T</sub>	<i>1.5</i>	f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>
<b>Speed Inputs</b>		<b>Calc Speed Adj and FFS</b>	
Lane Width	<i>12.0</i>	ft	
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub>
Number of Lanes, N	<i>4</i>		<i>0.0</i>
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi	mph
FFS (measured)		mph	f <sub>LC</sub>
Base free-flow Speed, BFFS	<i>75.4</i>	mph	<i>0.0</i>
			mph
			TRD Adjustment
			<i>1.8</i>
			mph
			FFS
			<i>73.6</i>
			mph
<b>LOS and Performance Measures</b>		<b>Design (N)</b>	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )		Design LOS	
<i>1451</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )	
x f <sub>p</sub> )		pc/h/ln	
S	<i>72.7</i>	x f <sub>p</sub> )	
D = v <sub>p</sub> / S	<i>19.9</i>	S	
LOS	<i>C</i>	mph	
		D = v <sub>p</sub> / S	
		pc/mi/ln	
		Required Number of Lanes, N	
<b>Glossary</b>		<b>Factor Location</b>	
N - Number of lanes	S - Speed	E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density	E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed	f <sub>p</sub> - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	AM SR-163 Chen Ryan Associates		Highway/Direction of Travel SR-163 SB		
Agency or Company	Chen Ryan Associates		From/To	Krnv Vil (Monel) to Clmnt Mes	
Date Performed	2019		Jurisdiction	City of San Diego	
Analysis Time Period	AM Peak Hour		Analysis Year	2050	
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
<b>Flow Inputs</b>					
Volume, V	8418	veh/h	Peak-Hour Factor, PHF	0.95	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	3	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	0	
Peak-Hr Direction Prop, D			General Terrain:	Level	
DDHV = AADT x K x D		veh/h	Grade %	Length	mi
			Up/Down %		
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2	
E <sub>T</sub>	1.5		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] 0.985		
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f <sub>LW</sub>	0.0 mph	
Number of Lanes, N	4		f <sub>LC</sub>	0.0 mph	
Total Ramp Density, TRD	0.50	ramps/mi	TRD Adjustment	1.8 mph	
FFS (measured)			FFS	73.6 mph	
Base free-flow Speed, BFFS	75.4	mph			
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
Operational (LOS)			Design (N)		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS		
v <sub>p</sub>	2248	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )		
S	57.8	mph	S		
D = v <sub>p</sub> / S	38.9	pc/mi/ln	D = v <sub>p</sub> / S		
LOS	E		Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-163 NB</i>	
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>Clrmnt Mes to Bal/Krny Vil/Mer</i>	
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>	
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year	<i>2050</i>	
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
<b>Flow Inputs</b>					
Volume, V	<i>6996</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>	
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>
			Up/Down %		
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>	
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft			
Rt-Side Lat. Clearance	<i>6.0</i>	ft			
Number of Lanes, N	<i>4</i>				
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi			
FFS (measured)					
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
			f <sub>LW</sub>	<i>0.0</i>	mph
			f <sub>LC</sub>	<i>0.0</i>	mph
			TRD Adjustment	<i>1.8</i>	mph
			FFS	<i>73.6</i>	mph
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )			Design LOS		
x f <sub>p</sub> )	<i>1869</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )		
S	<i>66.6</i> mph		x f <sub>p</sub> )		
D = v <sub>p</sub> / S	<i>28.0</i> pc/mi/ln		S		
LOS	<i>D</i>		D = v <sub>p</sub> / S		
			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					



<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-163 SB</i>	
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>Clrmnt Mes to Bal/Krny Vil/Mer</i>	
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>	
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year	<i>2050</i>	
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
<b>Flow Inputs</b>					
Volume, V	<i>10842</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>	
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>
			Up/Down %		
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>	
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft			
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub>	<i>0.0</i>	mph
Number of Lanes, N	<i>4</i>		f <sub>LC</sub>	<i>0.0</i> mph	
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi	TRD Adjustment	<i>1.8</i> mph	
FFS (measured)			FFS	<i>73.6</i> mph	
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )			Design LOS		
x f <sub>p</sub> )	<i>2896</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )		
S	<i>35.2</i> mph		x f <sub>p</sub> )		
D = v <sub>p</sub> / S	<i>82.3</i> pc/mi/ln		S		
LOS	<i>F</i>		D = v <sub>p</sub> / S		
			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8	
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9	
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-163 NB</i>													
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>Bal/Krny Vil/Mer to I-805</i>													
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>													
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year	<i>2050</i>													
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>																	
<b>Flow Inputs</b>																	
Volume, V	<i>7097</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>5</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>													
DDHV = AADT x K x D		veh/h	Grade % Length	<i>mi</i>													
			Up/Down %														
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.976</i>													
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>1.8</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>73.6</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>1.8</i>	mph	FFS	<i>73.6</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>1.8</i>	mph															
FFS	<i>73.6</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>5</i>																
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )	<i>1531</i>	pc/h/ln	Design LOS														
S	<i>71.9</i>	mph	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )														
D = v <sub>p</sub> / S	<i>21.3</i>	pc/mi/ln	S														
LOS	<i>C</i>		D = v <sub>p</sub> / S														
			Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8													
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9													
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11													
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-163 SB</i>	
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>Bal/Krny Vil/Mer to I-805</i>	
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>	
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year	<i>2050</i>	
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>					
<b>Flow Inputs</b>					
Volume, V	<i>10999</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>5</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>	
DDHV = AADT x K x D		veh/h	Grade % Length	<i>mi</i>	
			Up/Down %		
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.976</i>	
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft			
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub>	<i>0.0</i>	mph
Number of Lanes, N	<i>5</i>		f <sub>LC</sub>	<i>0.0</i>	mph
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi	TRD Adjustment	<i>1.8</i>	mph
FFS (measured)			FFS	<i>73.6</i>	mph
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )			Design LOS		
x f <sub>p</sub> )	<i>2373</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )	pc/h/ln	
S	<i>54.1</i>	mph	x f <sub>p</sub> )		
D = v <sub>p</sub> / S	<i>43.8</i>	pc/mi/ln	S	mph	
LOS	<i>E</i>		D = v <sub>p</sub> / S	pc/mi/ln	
			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8	
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9	
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11	
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>SR-163 NB</i>		
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>I-805 to Mesa College Dr</i>		
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>		
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year <i>2050</i>		
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>					
<b>Flow Inputs</b>					
Volume, V	<i>9911</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>4</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>		
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>
Up/Down %					
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.980</i>		
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft	f <sub>LW</sub> <span style="float: right;"><i>0.0</i></span> <span style="float: right;">mph</span> f <sub>LC</sub> <span style="float: right;"><i>0.0</i></span> <span style="float: right;">mph</span> TRD Adjustment <span style="float: right;"><i>1.8</i></span> <span style="float: right;">mph</span> FFS <span style="float: right;"><i>73.6</i></span> <span style="float: right;">mph</span>		
Rt-Side Lat. Clearance	<i>6.0</i>	ft			
Number of Lanes, N	<i>6</i>				
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi			
FFS (measured)		mph			
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS		
<i>1774</i>	pc/h/ln		v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )		
<i>68.4</i>	mph		S		
<i>25.9</i>	pc/mi/ln		D = v <sub>p</sub> / S		
<i>C</i>			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8	
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9	
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-163 SB</i>	
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>I-805 to Mesa College Dr</i>	
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>	
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year	<i>2050</i>	
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>					
<b>Flow Inputs</b>					
Volume, V	<i>7696</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>6</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>	
DDHV = AADT x K x D		veh/h	Grade % Length	<i>mi</i>	
			Up/Down %		
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.971</i>	
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft			
Rt-Side Lat. Clearance	<i>6.0</i>	ft			
Number of Lanes, N	<i>5</i>				
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi			
FFS (measured)					
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
f <sub>LW</sub>			<i>0.0</i> mph		
f <sub>LC</sub>			<i>0.0</i> mph		
TRD Adjustment			<i>1.8</i> mph		
FFS			<i>73.6</i> mph		
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS		
<i>1669</i>	pc/h/ln		v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )		
S	<i>70.0</i>	mph	S		
D = v <sub>p</sub> / S	<i>23.8</i>	pc/mi/ln	D = v <sub>p</sub> / S		
LOS	<i>C</i>		Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8	
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9	
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11	
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-15 NB</i>														
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>SR-163 to SR-52</i>													
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>													
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year	<i>2050</i>													
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>																	
<b>Flow Inputs</b>																	
Volume, V	<i>6011</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>6</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>													
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>												
Up/Down %																	
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.971</i>													
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>1.8</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>73.6</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>1.8</i>	mph	FFS	<i>73.6</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>1.8</i>	mph															
FFS	<i>73.6</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>4</i>																
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS														
S	<i>70.6</i>	mph	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )														
D = v <sub>p</sub> / S	<i>23.1</i>	pc/mi/ln	S														
LOS	<i>C</i>		D = v <sub>p</sub> / S														
			Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8													
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9													
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11													
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-15 SB</i>														
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>SR-163 to SR-52</i>													
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>													
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year	<i>2050</i>													
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>																	
<b>Flow Inputs</b>																	
Volume, V	<i>13717</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>6</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>													
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>												
			Up/Down %														
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.971</i>													
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>1.8</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>73.6</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>1.8</i>	mph	FFS	<i>73.6</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>1.8</i>	mph															
FFS	<i>73.6</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>7</i>																
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )			Design LOS														
x f <sub>p</sub> )	<i>2125</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )														
S	<i>61.0</i>	mph	x f <sub>p</sub> )														
D = v <sub>p</sub> / S	<i>34.8</i>	pc/mi/ln	S														
LOS	<i>D</i>		D = v <sub>p</sub> / S														
			Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8													
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9													
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11													
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-15 NB</i>														
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>SR-52 to Clairemont Mesa Blvd</i>														
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>														
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year <i>2050</i>														
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data													
<b>Flow Inputs</b>																	
Volume, V	<i>6661</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>6</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>														
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>												
Up/Down %																	
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.971</i>														
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>1.8</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>73.6</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>1.8</i>	mph	FFS	<i>73.6</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>1.8</i>	mph															
FFS	<i>73.6</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>4</i>																
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )			Design LOS														
x f <sub>p</sub> )	<i>1805</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )														
S	<i>67.8</i>	mph	x f <sub>p</sub> )														
D = v <sub>p</sub> / S	<i>26.6</i>	pc/mi/ln	S														
LOS	<i>D</i>		D = v <sub>p</sub> / S														
			Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8												
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9												
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11												
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	



<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>			
<b>General Information</b>		<b>Site Information</b>	
Analyst	<i>Chen Ryan Associates</i>	Highway/Direction of Travel	<i>I-15 SB</i>
Agency or Company	<i>Chen Ryan Associates</i>	From/To	<i>SR-52 to Clairemont Mesa Blvd</i>
Date Performed	<i>2019</i>	Jurisdiction	<i>City of San Diego</i>
Analysis Time Period	<i>AM Peak Hour</i>	Analysis Year	<i>2050</i>
Project Description <i>Proposed</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
<b>Flow Inputs</b>			
Volume, V	<i>4782</i>	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			<i>0.95</i>
			<i>6</i>
			<i>0</i>
			<i>Level</i>
			<i>mi</i>
<b>Calculate Flow Adjustments</b>			
f <sub>p</sub>	<i>1.00</i>	E <sub>R</sub>	<i>1.2</i>
E <sub>T</sub>	<i>1.5</i>	f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.971</i>
<b>Speed Inputs</b>		<b>Calc Speed Adj and FFS</b>	
Lane Width	<i>12.0</i>	ft	
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub>
Number of Lanes, N	<i>4</i>		<i>0.0</i>
Total Ramp Density, TRD	<i>2.00</i>	ramps/mi	mph
FFS (measured)		mph	f <sub>LC</sub>
Base free-flow Speed, BFFS	<i>75.4</i>	mph	<i>0.0</i>
			mph
			TRD Adjustment
			<i>5.8</i>
			mph
			FFS
			<i>69.6</i>
			mph
<b>LOS and Performance Measures</b>		<b>Design (N)</b>	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )		Design LOS	
<i>1296</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )	
x f <sub>p</sub> )		pc/h/ln	
S	<i>69.9</i>	x f <sub>p</sub> )	
D = v <sub>p</sub> / S	<i>18.5</i>	S	
LOS	<i>C</i>	mph	
		D = v <sub>p</sub> / S	
		pc/mi/ln	
		Required Number of Lanes, N	
<b>Glossary</b>		<b>Factor Location</b>	
N - Number of lanes	S - Speed	E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density	E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed	f <sub>p</sub> - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-15 NB</i>		
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>Climnt Mesa to Balboa/Tierra</i>		
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>		
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year <i>2050</i>		
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
<b>Flow Inputs</b>					
Volume, V	<i>9355</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>6</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>	
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>
			Up/Down %		
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.971</i>		
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft			
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub>	<i>0.0</i>	mph
Number of Lanes, N	<i>4</i>		f <sub>LC</sub>	<i>0.0</i>	mph
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi	TRD Adjustment	<i>1.8</i>	mph
FFS (measured)			FFS	<i>73.6</i>	mph
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )			Design LOS		
x f <sub>p</sub> )	<i>2536</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )		
S	<i>48.9</i> mph		x f <sub>p</sub> )		
D = v <sub>p</sub> / S	<i>51.9</i> pc/mi/ln		S		
LOS	<i>F</i>		D = v <sub>p</sub> / S		
			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-15 SB</i>		
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>Climnt Mesa to Balboa/Tierra</i>		
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>		
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year <i>2050</i>		
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
<b>Flow Inputs</b>					
Volume, V	<i>6716</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>6</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>		
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>
Up/Down %					
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.971</i>		
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft			
Rt-Side Lat. Clearance	<i>6.0</i>	ft			
Number of Lanes, N	<i>4</i>				
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi			
FFS (measured) mph					
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
f <sub>LW</sub>			<i>0.0</i>	mph	
f <sub>LC</sub>			<i>0.0</i>	mph	
TRD Adjustment			<i>1.8</i>	mph	
FFS			<i>73.6</i>	mph	
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )			Design LOS		
x f <sub>p</sub> )	<i>1820</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )		
S	<i>67.6</i> mph		x f <sub>p</sub> )		
D = v <sub>p</sub> / S	<i>26.9</i> pc/mi/ln		S		
LOS <i>D</i>			D = v <sub>p</sub> / S		
			pc/mi/ln		
			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-15 NB</i>														
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>Balboa/Tierrasanta to Aero Dr</i>														
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>														
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year <i>2050</i>														
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data													
<b>Flow Inputs</b>																	
Volume, V	<i>10449</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>5</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>														
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>												
			Up/Down %														
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.976</i>														
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>1.8</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>73.6</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>1.8</i>	mph	FFS	<i>73.6</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>1.8</i>	mph															
FFS	<i>73.6</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>5</i>																
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS														
2255	pc/h/ln		v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )														
S	<i>57.6</i>	mph	S														
D = v <sub>p</sub> / S	<i>39.2</i>	pc/mi/ln	D = v <sub>p</sub> / S														
LOS	<i>E</i>		Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8												
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9												
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11												
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-15 SB</i>														
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>Balboa/Tierrasanta to Aero Dr</i>														
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>														
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year <i>2050</i>														
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data													
<b>Flow Inputs</b>																	
Volume, V	<i>7502</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>5</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>														
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>												
Up/Down %																	
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.976</i>														
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>1.8</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>73.6</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>1.8</i>	mph	FFS	<i>73.6</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>1.8</i>	mph															
FFS	<i>73.6</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>4</i>																
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )			Design LOS														
x f <sub>p</sub> )	<i>2024</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )														
S	<i>63.4</i>	mph	x f <sub>p</sub> )														
D = v <sub>p</sub> / S	<i>31.9</i>	pc/mi/ln	S														
LOS	<i>D</i>		D = v <sub>p</sub> / S														
			Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8												
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9												
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11												
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>			
<b>General Information</b>		<b>Site Information</b>	
Analyst	<i>Chen Ryan Associates</i>	Highway/Direction of Travel <i>I-15 NB</i>	
Agency or Company	<i>Chen Ryan Associates</i>	From/To	<i>Aero Dr to Murphy Canyon</i>
Date Performed	<i>2019</i>	Jurisdiction	<i>City of San Diego</i>
Analysis Time Period	<i>AM Peak Hour</i>	Analysis Year	<i>2050</i>
Project Description <i>Proposed</i>			
<input checked="" type="checkbox"/> Oper.(LOS) <input type="checkbox"/> Des.(N) <input type="checkbox"/> Planning Data			
<b>Flow Inputs</b>			
Volume, V	<i>11177</i>	veh/h	Peak-Hour Factor, PHF <i>0.95</i>
AADT		veh/day	%Trucks and Buses, P <sub>T</sub> <i>5</i>
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub> <i>0</i>
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>
DDHV = AADT x K x D		veh/h	Grade % Length <i>mi</i> Up/Down %
<b>Calculate Flow Adjustments</b>			
f <sub>p</sub>	<i>1.00</i>	E <sub>R</sub>	<i>1.2</i>
E <sub>T</sub>	<i>1.5</i>	f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.976</i>	
<b>Speed Inputs</b>		<b>Calc Speed Adj and FFS</b>	
Lane Width	<i>12.0</i>	ft	
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub> <i>0.0</i> mph
Number of Lanes, N	<i>4</i>		f <sub>LC</sub> <i>0.0</i> mph
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi	TRD Adjustment <i>1.8</i> mph
FFS (measured)		mph	FFS <i>73.6</i> mph
Base free-flow Speed, BFFS	<i>75.4</i>	mph	
<b>LOS and Performance Measures</b>		<b>Design (N)</b>	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )	<i>3015</i>	pc/h/ln	Design LOS
S	<i>30.1</i>	mph	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )
D = v <sub>p</sub> / S	<i>100.3</i>	pc/mi/ln	S
LOS	<i>F</i>		D = v <sub>p</sub> / S
			Required Number of Lanes, N
<b>Glossary</b>		<b>Factor Location</b>	
N - Number of lanes	S - Speed	E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density	E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed	f <sub>p</sub> - Page 11-18	TRD - Page 11-11
LOS - Level of service speed	BFFS - Base free-flow speed	LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-15 SB</i>		
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>Aero Dr to Murphy Canyon Rd</i>		
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>		
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year <i>2050</i>		
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
<b>Flow Inputs</b>					
Volume, V	<i>8024</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>5</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>		
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>
			Up/Down %		
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.976</i>		
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft			
Rt-Side Lat. Clearance	<i>6.0</i>	ft			
Number of Lanes, N	<i>5</i>				
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi			
FFS (measured)					
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
f <sub>LW</sub>			<i>0.0</i> mph		
f <sub>LC</sub>			<i>0.0</i> mph		
TRD Adjustment			<i>1.8</i> mph		
FFS			<i>73.6</i> mph		
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )			Design LOS		
x f <sub>p</sub> )	<i>1731</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )		
S	<i>69.1</i> mph		x f <sub>p</sub> )		
D = v <sub>p</sub> / S	<i>25.1</i> pc/mi/ln		S		
LOS <i>C</i>			D = v <sub>p</sub> / S		
			pc/mi/ln		
			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-15 NB</i>														
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>Murphy Canyon Rd to Friars Rd</i>														
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>														
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year <i>2050</i>														
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data													
<b>Flow Inputs</b>																	
Volume, V	<i>11563</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>5</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>														
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>												
Up/Down %																	
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.976</i>														
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>1.8</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>73.6</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>1.8</i>	mph	FFS	<i>73.6</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>1.8</i>	mph															
FFS	<i>73.6</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>4</i>																
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )			Design LOS														
3119	pc/h/ln		v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )														
x f <sub>p</sub> )			pc/h/ln														
S	<i>25.3</i>	mph	S														
D = v <sub>p</sub> / S	<i>123.3</i>	pc/mi/ln	D = v <sub>p</sub> / S														
LOS	<i>F</i>		Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8												
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9												
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11												
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	



<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-15 SB</i>														
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>Murphy Canyon Rd to Friars Rd</i>														
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>														
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year <i>2050</i>														
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data													
<b>Flow Inputs</b>																	
Volume, V	<i>8302</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>5</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>													
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>												
			Up/Down %														
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.976</i>														
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>1.8</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>73.6</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>1.8</i>	mph	FFS	<i>73.6</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>1.8</i>	mph															
FFS	<i>73.6</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>6</i>																
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> ) <i>1493</i>			Design LOS														
x f <sub>p</sub> )			v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )														
S <i>72.3</i> mph			x f <sub>p</sub> )														
D = v <sub>p</sub> / S <i>20.6</i> pc/mi/ln			S														
LOS <i>C</i>			D = v <sub>p</sub> / S														
			Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes		S - Speed	E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8												
V - Hourly volume		D - Density	E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9												
v <sub>p</sub> - Flow rate		FFS - Free-flow speed	f <sub>p</sub> - Page 11-18		TRD - Page 11-11												
LOS - Level of service		BFFS - Base free-flow speed	LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-15 NB</i>		
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>Friars Rd to I-8</i>		
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>		
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year <i>2050</i>		
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>					
<b>Flow Inputs</b>					
Volume, V	<i>12065</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>5</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>		
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>
Up/Down %					
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.976</i>		
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft	f <sub>LW</sub> <span style="float: right;"><i>0.0</i></span> <span style="float: right;">mph</span> f <sub>LC</sub> <span style="float: right;"><i>0.0</i></span> <span style="float: right;">mph</span> TRD Adjustment <span style="float: right;"><i>1.8</i></span> <span style="float: right;">mph</span> FFS <span style="float: right;"><i>73.6</i></span> <span style="float: right;">mph</span>		
Rt-Side Lat. Clearance	<i>6.0</i>	ft			
Number of Lanes, N	<i>6</i>				
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi			
FFS (measured)		mph			
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS		
S	<i>59.8</i>	mph	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )		
D = v <sub>p</sub> / S	<i>36.3</i>	pc/mi/ln	S		
LOS	<i>E</i>		D = v <sub>p</sub> / S		
			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-15 SB</i>		
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>Friars Rd to I-8</i>		
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>		
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year <i>2050</i>		
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>					
<b>Flow Inputs</b>					
Volume, V	<i>8661</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>5</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>		
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>
Up/Down %					
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.976</i>		
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft	f <sub>LW</sub> <span style="float: right;"><i>0.0</i></span> <span style="float: right;">mph</span> f <sub>LC</sub> <span style="float: right;"><i>0.0</i></span> <span style="float: right;">mph</span> TRD Adjustment <span style="float: right;"><i>1.8</i></span> <span style="float: right;">mph</span> FFS <span style="float: right;"><i>73.6</i></span> <span style="float: right;">mph</span>		
Rt-Side Lat. Clearance	<i>6.0</i>	ft			
Number of Lanes, N	<i>6</i>				
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi			
FFS (measured)		mph			
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS		
S	<i>71.6</i>	mph	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )		
D = v <sub>p</sub> / S	<i>21.8</i>	pc/mi/ln	S		
LOS	<i>C</i>		D = v <sub>p</sub> / S		
			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-52 EB</i>													
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>Genesee Avenue to I-805</i>													
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>													
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year	<i>2050</i>													
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>																	
<b>Flow Inputs</b>																	
Volume, V	<i>5496</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>													
DDHV = AADT x K x D		veh/h	Grade % Length	<i>mi</i>													
			Up/Down %														
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>													
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border: none;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>5.3</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>70.1</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>5.3</i>	mph	FFS	<i>70.1</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>5.3</i>	mph															
FFS	<i>70.1</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>3</i>																
Total Ramp Density, TRD	<i>1.82</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )			Design LOS														
v <sub>p</sub>	<i>1957</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )														
x f <sub>p</sub> )			x f <sub>p</sub> )														
S	<i>63.4</i>	mph	S														
D = v <sub>p</sub> / S	<i>30.9</i>	pc/mi/ln	D = v <sub>p</sub> / S														
LOS	<i>D</i>		Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8													
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9													
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11													
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-52 WB</i>	
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>Genesee Avenue to I-805</i>	
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>	
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year	<i>2050</i>	
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
<b>Flow Inputs</b>					
Volume, V	<i>3758</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>	
DDHV = AADT x K x D		veh/h	Grade % Length	<i>mi</i>	
			Up/Down %		
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>	
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft			
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub>	<i>0.0</i>	mph
Number of Lanes, N	<i>2</i>		f <sub>LC</sub>	<i>0.0</i>	mph
Total Ramp Density, TRD	<i>1.82</i>	ramps/mi	TRD Adjustment	<i>5.3</i>	mph
FFS (measured)			FFS	<i>70.1</i>	mph
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )			Design LOS		
x f <sub>p</sub> )	<i>2008</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )	pc/h/ln	
S	<i>62.4</i>	mph	x f <sub>p</sub> )		
D = v <sub>p</sub> / S	<i>32.2</i>	pc/mi/ln	S	mph	
LOS	<i>D</i>		D = v <sub>p</sub> / S	pc/mi/ln	
			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8	
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9	
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11	
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-52 EB</i>	
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>I-805 to Convoy St</i>	
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>	
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year	<i>2050</i>	
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>					
<b>Flow Inputs</b>					
Volume, V	<i>6657</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>	
DDHV = AADT x K x D		veh/h	Grade % Length	<i>mi</i>	
			Up/Down %		
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>	
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft			
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub>	<i>0.0</i>	mph
Number of Lanes, N	<i>4</i>		f <sub>LC</sub>	<i>0.0</i>	mph
Total Ramp Density, TRD	<i>1.67</i>	ramps/mi	TRD Adjustment	<i>5.0</i>	mph
FFS (measured)			FFS	<i>70.4</i>	mph
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )			Design LOS		
x f <sub>p</sub> )	<i>1778</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )	pc/h/ln	
S	<i>66.1</i>	mph	x f <sub>p</sub> )		
D = v <sub>p</sub> / S	<i>26.9</i>	pc/mi/ln	S	mph	
LOS	<i>D</i>		D = v <sub>p</sub> / S	pc/mi/ln	
			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8	
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9	
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11	
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>SR-52 WB</i>														
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>I-805 to Convoy St</i>														
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>														
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year <i>2050</i>														
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>																	
<b>Flow Inputs</b>																	
Volume, V	<i>4552</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>														
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>												
Up/Down %																	
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.985</i>														
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>5.8</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>69.6</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>5.8</i>	mph	FFS	<i>69.6</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>5.8</i>	mph															
FFS	<i>69.6</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>3</i>																
Total Ramp Density, TRD	<i>2.00</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS														
S	<i>67.9</i>	mph	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )														
D = v <sub>p</sub> / S	<i>23.9</i>	pc/mi/ln	S														
LOS	<i>C</i>		D = v <sub>p</sub> / S														
			Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8												
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9												
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11												
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-52 EB</i>													
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>Convoy Street to SR-163</i>													
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>													
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year	<i>2050</i>													
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data													
<b>Flow Inputs</b>																	
Volume, V	<i>8324</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>													
DDHV = AADT x K x D		veh/h	Grade % Length	<i>mi</i>													
			Up/Down %														
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>													
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>5.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>70.4</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>5.0</i>	mph	FFS	<i>70.4</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>5.0</i>	mph															
FFS	<i>70.4</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>4</i>																
Total Ramp Density, TRD	<i>1.67</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )	<i>2223</i>	pc/h/ln	Design LOS v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> ) pc/h/ln														
S	<i>57.9</i>	mph	S mph														
D = v <sub>p</sub> / S	<i>38.4</i>	pc/mi/ln	D = v <sub>p</sub> / S pc/mi/ln														
LOS	<i>E</i>		Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8												
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9												
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11												
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	



<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-52 WB</i>													
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>Convoy Street to SR-163</i>													
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>													
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year	<i>2050</i>													
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data													
<b>Flow Inputs</b>																	
Volume, V	<i>5134</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>													
DDHV = AADT x K x D		veh/h	Grade % Length	<i>mi</i>													
			Up/Down %														
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>													
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>5.3</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>70.1</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>5.3</i>	mph	FFS	<i>70.1</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>5.3</i>	mph															
FFS	<i>70.1</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>3</i>																
Total Ramp Density, TRD	<i>1.83</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS														
S	<i>65.4</i>	mph	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )														
D = v <sub>p</sub> / S	<i>27.9</i>	pc/mi/ln	S														
LOS	<i>D</i>		D = v <sub>p</sub> / S														
			Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8													
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9													
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11													
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-52 EB</i>	
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>SR-163 to Kearny Villa Road</i>	
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>	
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year	<i>2050</i>	
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
<b>Flow Inputs</b>					
Volume, V	<i>2810</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>	
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>
			Up/Down %		
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>	
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft			
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub>	<i>0.0</i>	mph
Number of Lanes, N	<i>4</i>		f <sub>LC</sub>	<i>0.0</i> mph	
Total Ramp Density, TRD	<i>1.83</i>	ramps/mi	TRD Adjustment	<i>5.3</i> mph	
FFS (measured)			FFS	<i>70.1</i> mph	
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )	<i>751</i> pc/h/ln		Design LOS		
x f <sub>p</sub> )			v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )		
S	<i>70.0</i> mph		x f <sub>p</sub> )		
D = v <sub>p</sub> / S	<i>10.7</i> pc/mi/ln		S		
LOS	<i>A</i>		D = v <sub>p</sub> / S		
			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-52 WB</i>	
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>SR-163 to Kearny Villa Road</i>	
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>	
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year	<i>2050</i>	
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
<b>Flow Inputs</b>					
Volume, V	<i>1733</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>	
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>
			Up/Down %		
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>	
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft			
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub>	<i>0.0</i>	mph
Number of Lanes, N	<i>2</i>		f <sub>LC</sub>	<i>0.0</i> mph	
Total Ramp Density, TRD	<i>1.67</i>	ramps/mi	TRD Adjustment	<i>5.0</i> mph	
FFS (measured)			FFS	<i>70.4</i> mph	
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )			Design LOS		
926	pc/h/ln		v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )		
x f <sub>p</sub> )			pc/h/ln		
S	<i>70.0</i>	mph	S		
D = v <sub>p</sub> / S	<i>13.2</i>	pc/mi/ln	D = v <sub>p</sub> / S		
LOS	<i>B</i>		Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8	
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9	
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-52 EB</i>													
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>Kearny Villa Road to I-15</i>													
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>													
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year	<i>2050</i>													
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>																	
<b>Flow Inputs</b>																	
Volume, V	<i>3851</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>													
DDHV = AADT x K x D		veh/h	Grade % Length	<i>mi</i>													
			Up/Down %														
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>													
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>5.3</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>70.1</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>5.3</i>	mph	FFS	<i>70.1</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>5.3</i>	mph															
FFS	<i>70.1</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>4</i>																
Total Ramp Density, TRD	<i>1.83</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS														
S	<i>70.0</i>	mph	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )														
D = v <sub>p</sub> / S	<i>14.7</i>	pc/mi/ln	S														
LOS	<i>B</i>		D = v <sub>p</sub> / S														
			Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8													
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9													
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11													
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-52 WB</i>													
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>Kearny Villa Road to I-15</i>													
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>													
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year	<i>2050</i>													
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>																	
<b>Flow Inputs</b>																	
Volume, V	<i>2375</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>													
DDHV = AADT x K x D		veh/h	Grade % Length	<i>mi</i>													
			Up/Down %														
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>													
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>4.1</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>71.3</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>4.1</i>	mph	FFS	<i>71.3</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>4.1</i>	mph															
FFS	<i>71.3</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>3</i>																
Total Ramp Density, TRD	<i>1.33</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS														
S	<i>70.0</i>	mph	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )														
D = v <sub>p</sub> / S	<i>12.1</i>	pc/mi/ln	S														
LOS	<i>B</i>		D = v <sub>p</sub> / S														
			Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8													
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9													
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11													
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-52 EB</i>	
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>I-15 Interchange to Santo Road</i>	
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>	
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year	<i>2050</i>	
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
<b>Flow Inputs</b>					
Volume, V	<i>6721</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>	
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>
			Up/Down %		
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>	
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft			
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub>	<i>0.0</i>	mph
Number of Lanes, N	<i>3</i>		f <sub>LC</sub>	<i>0.0</i> mph	
Total Ramp Density, TRD	<i>1.67</i>	ramps/mi	TRD Adjustment	<i>5.0</i> mph	
FFS (measured)			FFS	<i>70.4</i> mph	
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )			Design LOS		
x f <sub>p</sub> )	<i>2394</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )		
S	<i>53.5</i> mph		x f <sub>p</sub> )		
D = v <sub>p</sub> / S	<i>44.8</i>	pc/mi/ln	S		
LOS	<i>E</i>		D = v <sub>p</sub> / S		
			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8	
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9	
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-52 WB</i>	
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>I-15 Interchange to Santo Road</i>	
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>	
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year	<i>2050</i>	
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
<b>Flow Inputs</b>					
Volume, V	<i>4145</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>	
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>
			Up/Down %		
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>	
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft			
Rt-Side Lat. Clearance	<i>6.0</i>	ft			
Number of Lanes, N	<i>4</i>				
Total Ramp Density, TRD	<i>1.33</i>	ramps/mi			
FFS (measured)					
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
			f <sub>LW</sub>	<i>0.0</i>	mph
			f <sub>LC</sub>	<i>0.0</i>	mph
			TRD Adjustment	<i>4.1</i>	mph
			FFS	<i>71.3</i>	mph
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS		
	<i>1107</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )		
S	<i>70.0</i> mph		S		
D = v <sub>p</sub> / S	<i>15.8</i> pc/mi/ln		D = v <sub>p</sub> / S		
LOS	<i>B</i>		Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8	
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9	
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-805 NB</i>														
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>Governor Drive to SR-52</i>													
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>													
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year	<i>2050</i>													
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>																	
<b>Flow Inputs</b>																	
Volume, V	<i>6171</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>6</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>													
DDHV = AADT x K x D		veh/h	Grade % Length	<i>mi</i>													
			Up/Down %														
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.971</i>													
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>1.8</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>73.6</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>1.8</i>	mph	FFS	<i>73.6</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>1.8</i>	mph															
FFS	<i>73.6</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>5</i>																
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS														
S	<i>73.7</i>	mph	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )														
D = v <sub>p</sub> / S	<i>18.1</i>	pc/mi/ln	S														
LOS	<i>C</i>		D = v <sub>p</sub> / S														
			Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8													
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9													
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11													
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	



<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-805 SB</i>														
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>Governor Drive to SR-52</i>													
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>													
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year	<i>2050</i>													
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>																	
<b>Flow Inputs</b>																	
Volume, V	<i>13012</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>6</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>													
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>												
			Up/Down %														
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.971</i>														
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>1.8</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>73.6</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>1.8</i>	mph	FFS	<i>73.6</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>1.8</i>	mph															
FFS	<i>73.6</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>6</i>																
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS														
v <sub>p</sub>	<i>2351</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )														
S	<i>54.8</i>	mph	S														
D = v <sub>p</sub> / S	<i>42.9</i>	pc/mi/ln	D = v <sub>p</sub> / S														
LOS	<i>E</i>		Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8												
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9												
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11												
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-805 NB</i>														
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>SR-52 to Clairemont Mesa Blvd</i>														
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>														
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year <i>2050</i>														
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data													
<b>Flow Inputs</b>																	
Volume, V	<i>5112</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>7</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>														
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>												
			Up/Down %														
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.966</i>														
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>1.8</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>73.6</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>1.8</i>	mph	FFS	<i>73.6</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>1.8</i>	mph															
FFS	<i>73.6</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>5</i>																
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS														
<i>1114</i>	pc/h/ln		v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )														
<i>74.9</i>	mph		S														
<i>14.9</i>	pc/mi/ln		D = v <sub>p</sub> / S														
<i>B</i>			Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8												
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9												
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11												
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>			
<b>General Information</b>		<b>Site Information</b>	
Analyst	<i>Chen Ryan Associates</i>	Highway/Direction of Travel	<i>I-805 SB</i>
Agency or Company	<i>Chen Ryan Associates</i>	From/To	<i>SR-52 to Clairemont Mesa Blvd</i>
Date Performed	<i>2019</i>	Jurisdiction	<i>City of San Diego</i>
Analysis Time Period	<i>PM Peak Hour</i>	Analysis Year	<i>2050</i>
Project Description <i>Proposed</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
<b>Flow Inputs</b>			
Volume, V	<i>10779</i>	veh/h	Peak-Hour Factor, PHF <i>0.95</i>
AADT		veh/day	%Trucks and Buses, P <sub>T</sub> <i>7</i>
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub> <i>0</i>
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>
DDHV = AADT x K x D		veh/h	Grade % Length <i>mi</i> Up/Down %
<b>Calculate Flow Adjustments</b>			
f <sub>p</sub>	<i>1.00</i>	E <sub>R</sub>	<i>1.2</i>
E <sub>T</sub>	<i>1.5</i>	f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.966</i>
<b>Speed Inputs</b>		<b>Calc Speed Adj and FFS</b>	
Lane Width	<i>12.0</i>	ft	
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub> <i>0.0</i> mph
Number of Lanes, N	<i>4</i>		f <sub>LC</sub> <i>0.0</i> mph
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi	TRD Adjustment <i>1.8</i> mph
FFS (measured)		mph	FFS <i>73.6</i> mph
Base free-flow Speed, BFFS	<i>75.4</i>	mph	
<b>LOS and Performance Measures</b>		<b>Design (N)</b>	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )	<i>2936</i>	pc/h/ln	Design LOS
x f <sub>p</sub> )			v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )
S	<i>33.5</i>	mph	x f <sub>p</sub> )
D = v <sub>p</sub> / S	<i>87.6</i>	pc/mi/ln	S
LOS	<i>F</i>		D = v <sub>p</sub> / S
			pc/mi/ln
			Required Number of Lanes, N
<b>Glossary</b>		<b>Factor Location</b>	
N - Number of lanes	S - Speed	E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density	E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed	f <sub>p</sub> - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-805 NB</i>														
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>Clairemont Mesa Blvd to Balboa</i>														
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>														
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year <i>2050</i>														
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data													
<b>Flow Inputs</b>																	
Volume, V	<i>5038</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>7</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>														
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>												
Up/Down %																	
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.966</i>														
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>1.8</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>73.6</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>1.8</i>	mph	FFS	<i>73.6</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>1.8</i>	mph															
FFS	<i>73.6</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>4</i>																
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )	<i>1372</i>	pc/h/ln	Design LOS														
S	<i>73.5</i>	mph	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )														
D = v <sub>p</sub> / S	<i>18.7</i>	pc/mi/ln	S														
LOS	<i>C</i>		D = v <sub>p</sub> / S														
			Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8												
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9												
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11												
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-805 SB</i>														
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>Clairemont Mesa Blvd to Balboa</i>														
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>														
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year <i>2050</i>														
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data													
<b>Flow Inputs</b>																	
Volume, V	<i>10623</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>7</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>														
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>												
Up/Down %																	
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.966</i>														
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border: none;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>1.8</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>73.6</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>1.8</i>	mph	FFS	<i>73.6</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>1.8</i>	mph															
FFS	<i>73.6</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>4</i>																
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )	<i>2893</i>	pc/h/ln	Design LOS														
S	<i>35.3</i>	mph	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )														
D = v <sub>p</sub> / S	<i>81.9</i>	pc/mi/ln	S														
LOS	<i>F</i>		D = v <sub>p</sub> / S														
			Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8												
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9												
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11												
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-805 NB</i>														
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>Balboa Avenue to SR-163</i>													
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>													
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year	<i>2050</i>													
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>																	
<b>Flow Inputs</b>																	
Volume, V	<i>5083</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>7</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>													
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>												
			Up/Down %														
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.966</i>														
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>1.8</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>73.6</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>1.8</i>	mph	FFS	<i>73.6</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>1.8</i>	mph															
FFS	<i>73.6</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>4</i>																
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> ) <i>1384</i>			Design LOS														
x f <sub>p</sub> )		pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )														
S	<i>73.4</i>	mph	x f <sub>p</sub> )														
D = v <sub>p</sub> / S	<i>18.9</i>	pc/mi/ln	S														
LOS	<i>C</i>		D = v <sub>p</sub> / S														
			pc/mi/ln														
			Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8													
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9													
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11													
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-805 SB</i>		
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>Balboa Avenue to SR-163</i>		
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>		
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year <i>2050</i>		
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS) <input type="checkbox"/> Des.(N) <input type="checkbox"/> Planning Data					
<b>Flow Inputs</b>					
Volume, V	<i>10717</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>7</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>		
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>
Up/Down %					
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.966</i>		
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft	f <sub>LW</sub> <i>0.0</i> mph f <sub>LC</sub> <i>0.0</i> mph TRD Adjustment <i>1.8</i> mph FFS <i>73.6</i> mph		
Rt-Side Lat. Clearance	<i>6.0</i>	ft			
Number of Lanes, N	<i>5</i>				
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi			
FFS (measured)					
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS		
S	<i>55.3</i>	mph	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )		
D = v <sub>p</sub> / S	<i>42.2</i>	pc/mi/ln	S		
LOS	<i>E</i>		D = v <sub>p</sub> / S		
			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>			
<b>General Information</b>		<b>Site Information</b>	
Analyst	<i>Chen Ryan Associates</i>	Highway/Direction of Travel	<i>I-805 NB</i>
Agency or Company	<i>Chen Ryan Associates</i>	From/To	<i>SR-163 to Kearny Villa Road</i>
Date Performed	<i>2019</i>	Jurisdiction	<i>City of San Diego</i>
Analysis Time Period	<i>PM Peak Hour</i>	Analysis Year	<i>2050</i>
Project Description <i>Proposed</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
<b>Flow Inputs</b>			
Volume, V	<i>5110</i>	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.95
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P <sub>T</sub>
Peak-Hr Direction Prop, D			7
DDHV = AADT x K x D		veh/h	%RVs, P <sub>R</sub>
			0
			General Terrain:
			<i>Level</i>
			Grade % Length
			<i>mi</i>
			Up/Down %
<b>Calculate Flow Adjustments</b>			
f <sub>p</sub>	<i>1.00</i>	E <sub>R</sub>	<i>1.2</i>
E <sub>T</sub>	<i>1.5</i>	f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.966</i>
<b>Speed Inputs</b>		<b>Calc Speed Adj and FFS</b>	
Lane Width	<i>12.0</i>	ft	
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub>
Number of Lanes, N	<i>5</i>		<i>0.0</i>
Total Ramp Density, TRD	<i>2.00</i>	ramps/mi	mph
FFS (measured)		mph	f <sub>LC</sub>
Base free-flow Speed, BFFS	<i>75.4</i>	mph	<i>0.0</i>
			mph
			TRD Adjustment
			<i>5.8</i>
			mph
			FFS
			<i>69.6</i>
			mph
<b>LOS and Performance Measures</b>		<b>Design (N)</b>	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )		Design LOS	
<i>1113</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )	
x f <sub>p</sub> )		pc/h/ln	
S	<i>70.0</i>	x f <sub>p</sub> )	
	mph	S	
D = v <sub>p</sub> / S	<i>15.9</i>	mph	
	pc/mi/ln	D = v <sub>p</sub> / S	
LOS	<i>B</i>	pc/mi/ln	
		Required Number of Lanes, N	
<b>Glossary</b>		<b>Factor Location</b>	
N - Number of lanes	S - Speed	E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density	E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed	f <sub>p</sub> - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			



<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-805 SB</i>		
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>SR-163 to Kearny Villa Road</i>		
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>		
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year <i>2050</i>		
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
<b>Flow Inputs</b>					
Volume, V	<i>10775</i>	veh/h	Peak-Hour Factor, PHF		<i>0.95</i>
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>		<i>7</i>
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>		<i>0</i>
Peak-Hr Direction Prop, D			General Terrain:		<i>Level</i>
DDHV = AADT x K x D		veh/h	Grade % Length		<i>mi</i>
			Up/Down %		
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>		<i>1.2</i>
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.966</i>		
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft			
Rt-Side Lat. Clearance	<i>6.0</i>	ft			
Number of Lanes, N	<i>5</i>				
Total Ramp Density, TRD	<i>2.00</i>	ramps/mi			
FFS (measured)					
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
			f <sub>LW</sub>	<i>0.0</i>	mph
			f <sub>LC</sub>	<i>0.0</i>	mph
			TRD Adjustment		<i>5.8</i> mph
			FFS		<i>69.6</i> mph
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS		
<i>2348</i>	pc/h/ln		v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )		
<i>54.7</i>	mph		S		
<i>42.9</i>	pc/mi/ln		D = v <sub>p</sub> / S		
LOS <i>E</i>			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes		S - Speed	E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume		D - Density	E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate		FFS - Free-flow speed	f <sub>p</sub> - Page 11-18		TRD - Page 11-11
LOS - Level of service		BFFS - Base free-flow speed	LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-805 NB</i>														
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>Kearny Villa Rd to Phyllis Pl</i>														
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>														
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year <i>2050</i>														
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data													
<b>Flow Inputs</b>																	
Volume, V	<i>5979</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>6</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>														
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>												
Up/Down %																	
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.971</i>														
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>5.3</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>70.1</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>5.3</i>	mph	FFS	<i>70.1</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>5.3</i>	mph															
FFS	<i>70.1</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>5</i>																
Total Ramp Density, TRD	<i>1.83</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )			Design LOS														
x f <sub>p</sub> )	<i>1296</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )														
S	<i>69.9</i>	mph	x f <sub>p</sub> )														
D = v <sub>p</sub> / S	<i>18.5</i>	pc/mi/ln	S														
LOS	<i>C</i>		D = v <sub>p</sub> / S														
			Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8												
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9												
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11												
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-805 SB</i>														
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>Kearny Villa Rd to Phyllis Pl</i>														
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>														
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year <i>2050</i>														
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data													
<b>Flow Inputs</b>																	
Volume, V	<i>12607</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>6</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>														
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>												
Up/Down %																	
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.971</i>														
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>5.8</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>69.6</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>5.8</i>	mph	FFS	<i>69.6</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>5.8</i>	mph															
FFS	<i>69.6</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>5</i>																
Total Ramp Density, TRD	<i>2.00</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )			Design LOS														
x f <sub>p</sub> )	<i>2734</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )														
S	<i>42.7</i>	mph	x f <sub>p</sub> )														
D = v <sub>p</sub> / S	<i>64.0</i>	pc/mi/ln	S														
LOS	<i>F</i>		D = v <sub>p</sub> / S														
			Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8												
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9												
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11												
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-163 NB</i>													
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>Kearny Villa Rd to SR-52</i>													
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>													
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year	<i>2050</i>													
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>																	
<b>Flow Inputs</b>																	
Volume, V	<i>7062</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>													
DDHV = AADT x K x D		veh/h	Grade % Length	<i>mi</i>													
			Up/Down %														
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>													
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>5.8</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>69.6</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>5.8</i>	mph	FFS	<i>69.6</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>5.8</i>	mph															
FFS	<i>69.6</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>4</i>																
Total Ramp Density, TRD	<i>2.00</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS														
<i>1886</i>	pc/h/ln		v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )														
<i>64.5</i>	mph		S														
<i>29.2</i>	pc/mi/ln		D = v <sub>p</sub> / S														
<i>D</i>			Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8													
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9													
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11													
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-163 SB</i>													
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>Kearny Villa Rd to SR-52</i>													
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>													
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year	<i>2050</i>													
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>																	
<b>Flow Inputs</b>																	
Volume, V	<i>8922</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>													
DDHV = AADT x K x D		veh/h	Grade % Length	<i>mi</i>													
			Up/Down %														
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>													
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>1.8</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>73.6</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>1.8</i>	mph	FFS	<i>73.6</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>1.8</i>	mph															
FFS	<i>73.6</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>5</i>																
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS														
S	<i>65.9</i>	mph	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )														
D = v <sub>p</sub> / S	<i>28.9</i>	pc/mi/ln	S														
LOS	<i>D</i>		D = v <sub>p</sub> / S														
			Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8													
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9													
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11													
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-163 NB</i>	
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>SR-52 to Kearny Villa (Monel)</i>	
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>	
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year	<i>2050</i>	
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
<b>Flow Inputs</b>					
Volume, V	<i>7553</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>	
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>
			Up/Down %		
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>	
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft			
Rt-Side Lat. Clearance	<i>6.0</i>	ft			
Number of Lanes, N	<i>5</i>				
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi			
FFS (measured)					
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
			f <sub>LW</sub>	<i>0.0</i>	mph
			f <sub>LC</sub>	<i>0.0</i>	mph
			TRD Adjustment	<i>1.8</i>	mph
			FFS	<i>73.6</i>	mph
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )			Design LOS		
x f <sub>p</sub> )	<i>1614</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )		
S	<i>70.8</i> mph		x f <sub>p</sub> )		
D = v <sub>p</sub> / S	<i>22.8</i> pc/mi/ln		S		
LOS	<i>C</i>		D = v <sub>p</sub> / S		
			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8	
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9	
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-163 SB</i>	
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>SR-52 to Kearny Villa (Monel)</i>	
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>	
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year	<i>2050</i>	
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
<b>Flow Inputs</b>					
Volume, V	<i>9544</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>	
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>
			Up/Down %		
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>	
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft			
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub>	<i>0.0</i>	mph
Number of Lanes, N	<i>4</i>		f <sub>LC</sub>	<i>0.0</i>	mph
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi	TRD Adjustment	<i>1.8</i>	mph
FFS (measured)			FFS	<i>73.6</i>	mph
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )			Design LOS		
x f <sub>p</sub> )	<i>2549</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )		pc/h/ln
S	<i>48.4</i> mph		x f <sub>p</sub> )		
D = v <sub>p</sub> / S	<i>52.6</i> pc/mi/ln		S		mph
LOS	<i>F</i>		D = v <sub>p</sub> / S		pc/mi/ln
			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>			
<b>General Information</b>		<b>Site Information</b>	
Analyst	<i>Chen Ryan Associates</i>	Highway/Direction of Travel	<i>SR-163 NB</i>
Agency or Company	<i>Chen Ryan Associates</i>	From/To	<i>Krny Vil (Monel) to Clmnt Mes</i>
Date Performed	<i>2019</i>	Jurisdiction	<i>City of San Diego</i>
Analysis Time Period	<i>PM Peak Hour</i>	Analysis Year	<i>2050</i>
Project Description <i>Proposed</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
<b>Flow Inputs</b>			
Volume, V	<i>6532</i>	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	<i>0.95</i>
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P <sub>T</sub>
Peak-Hr Direction Prop, D			<i>3</i>
DDHV = AADT x K x D		veh/h	%RVs, P <sub>R</sub>
			<i>0</i>
			General Terrain:
			<i>Level</i>
			Grade % Length
			<i>mi</i>
			Up/Down %
<b>Calculate Flow Adjustments</b>			
f <sub>p</sub>	<i>1.00</i>	E <sub>R</sub>	<i>1.2</i>
E <sub>T</sub>	<i>1.5</i>	f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>
<b>Speed Inputs</b>		<b>Calc Speed Adj and FFS</b>	
Lane Width	<i>12.0</i>	ft	
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub>
Number of Lanes, N	<i>4</i>		<i>0.0</i>
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi	mph
FFS (measured)		mph	f <sub>LC</sub>
Base free-flow Speed, BFFS	<i>75.4</i>	mph	<i>0.0</i>
			mph
			TRD Adjustment
			<i>1.8</i>
			mph
			FFS
			<i>73.6</i>
			mph
<b>LOS and Performance Measures</b>		<b>Design (N)</b>	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )		Design LOS	
<i>1745</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )	
x f <sub>p</sub> )		pc/h/ln	
S	<i>68.9</i>	x f <sub>p</sub> )	
D = v <sub>p</sub> / S	<i>25.3</i>	S	
LOS	<i>C</i>	mph	
		D = v <sub>p</sub> / S	
		pc/mi/ln	
		Required Number of Lanes, N	
<b>Glossary</b>		<b>Factor Location</b>	
N - Number of lanes	S - Speed	E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density	E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed	f <sub>p</sub> - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			



<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>			
<b>General Information</b>		<b>Site Information</b>	
Analyst	<i>Chen Ryan Associates</i>	Highway/Direction of Travel	<i>SR-163 SB</i>
Agency or Company	<i>Chen Ryan Associates</i>	From/To	<i>Krny Vil (Monel) to Clmnt Mes</i>
Date Performed	<i>2019</i>	Jurisdiction	<i>City of San Diego</i>
Analysis Time Period	<i>PM Peak Hour</i>	Analysis Year	<i>2050</i>
Project Description <i>Proposed</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
<b>Flow Inputs</b>			
Volume, V	<i>8253</i>	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	<i>0.95</i>
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P <sub>T</sub>
Peak-Hr Direction Prop, D			<i>3</i>
DDHV = AADT x K x D		veh/h	%RVs, P <sub>R</sub>
			<i>0</i>
			General Terrain:
			<i>Level</i>
			Grade % Length
			<i>mi</i>
			Up/Down %
<b>Calculate Flow Adjustments</b>			
f <sub>p</sub>	<i>1.00</i>	E <sub>R</sub>	<i>1.2</i>
E <sub>T</sub>	<i>1.5</i>	f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>
<b>Speed Inputs</b>		<b>Calc Speed Adj and FFS</b>	
Lane Width	<i>12.0</i>	ft	
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub>
Number of Lanes, N	<i>4</i>		<i>0.0</i>
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi	mph
FFS (measured)		mph	f <sub>LC</sub>
Base free-flow Speed, BFFS	<i>75.4</i>	mph	<i>0.0</i>
			mph
			TRD Adjustment
			<i>1.8</i>
			mph
			FFS
			<i>73.6</i>
			mph
<b>LOS and Performance Measures</b>		<b>Design (N)</b>	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )		Design LOS	
<i>2204</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )	
x f <sub>p</sub> )		pc/h/ln	
S	<i>59.0</i>	x f <sub>p</sub> )	
D = v <sub>p</sub> / S	<i>37.4</i>	S	
LOS	<i>E</i>	mph	
		D = v <sub>p</sub> / S	
		pc/mi/ln	
		Required Number of Lanes, N	
<b>Glossary</b>		<b>Factor Location</b>	
N - Number of lanes	S - Speed	E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density	E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed	f <sub>p</sub> - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-163 NB</i>	
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>Clrmnt Mes to Bal/Krny Vil/Mer</i>	
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>	
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year	<i>2050</i>	
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
<b>Flow Inputs</b>					
Volume, V	<i>8413</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>3</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>	
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>
			Up/Down %		
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>	
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft			
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub>	<i>0.0</i>	mph
Number of Lanes, N	<i>4</i>		f <sub>LC</sub>	<i>0.0</i>	mph
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi	TRD Adjustment	<i>1.8</i>	mph
FFS (measured)			FFS	<i>73.6</i>	mph
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS		
	<i>2247</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )		
S	<i>57.8</i> mph		S		
D = v <sub>p</sub> / S	<i>38.9</i> pc/mi/ln		D = v <sub>p</sub> / S		
LOS	<i>E</i>		Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8	
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9	
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>			
<b>General Information</b>		<b>Site Information</b>	
Analyst	<i>Chen Ryan Associates</i>	Highway/Direction of Travel	<i>SR-163 SB</i>
Agency or Company	<i>Chen Ryan Associates</i>	From/To	<i>Clrmnt Mes to Bal/Krny Vil/Mer</i>
Date Performed	<i>2019</i>	Jurisdiction	<i>City of San Diego</i>
Analysis Time Period	<i>PM Peak Hour</i>	Analysis Year	<i>2050</i>
Project Description <i>Proposed</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
<b>Flow Inputs</b>			
Volume, V	<i>10629</i>	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			<i>0.95</i>
			<i>3</i>
			<i>0</i>
			<i>Level</i>
			<i>mi</i>
<b>Calculate Flow Adjustments</b>			
f <sub>p</sub>	<i>1.00</i>	E <sub>R</sub>	<i>1.2</i>
E <sub>T</sub>	<i>1.5</i>	f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.985</i>
<b>Speed Inputs</b>		<b>Calc Speed Adj and FFS</b>	
Lane Width	<i>12.0</i>	ft	
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub>
Number of Lanes, N	<i>4</i>		<i>0.0</i>
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi	mph
FFS (measured)		mph	f <sub>LC</sub>
Base free-flow Speed, BFFS	<i>75.4</i>	mph	<i>0.0</i>
			mph
			TRD Adjustment
			<i>1.8</i>
			mph
			FFS
			<i>73.6</i>
			mph
<b>LOS and Performance Measures</b>		<b>Design (N)</b>	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )		Design LOS	
<i>2839</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )	
x f <sub>p</sub> )		pc/h/ln	
S	<i>37.6</i>	x f <sub>p</sub> )	
D = v <sub>p</sub> / S	<i>75.6</i>	S	
LOS	<i>F</i>	mph	
		D = v <sub>p</sub> / S	
		pc/mi/ln	
		Required Number of Lanes, N	
<b>Glossary</b>		<b>Factor Location</b>	
N - Number of lanes	S - Speed	E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density	E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed	f <sub>p</sub> - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-163 NB</i>	
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>Bal/Krny Vil/Mer to I-805</i>	
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>	
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year	<i>2050</i>	
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>					
<b>Flow Inputs</b>					
Volume, V	<i>8534</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>5</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>	
DDHV = AADT x K x D		veh/h	Grade % Length	<i>mi</i>	
			Up/Down %		
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.976</i>	
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft	f <sub>LW</sub> <span style="float: right;"><i>0.0</i></span> <span style="float: right;">mph</span> f <sub>LC</sub> <span style="float: right;"><i>0.0</i></span> <span style="float: right;">mph</span> TRD Adjustment <span style="float: right;"><i>1.8</i></span> <span style="float: right;">mph</span> FFS <span style="float: right;"><i>73.6</i></span> <span style="float: right;">mph</span>		
Rt-Side Lat. Clearance	<i>6.0</i>	ft			
Number of Lanes, N	<i>5</i>				
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi			
FFS (measured)		mph			
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )	<i>1842</i>	pc/h/ln	Design LOS		
S	<i>67.2</i>	mph	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )		
D = v <sub>p</sub> / S	<i>27.4</i>	pc/mi/ln	S		
LOS	<i>D</i>		D = v <sub>p</sub> / S		
			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8	
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9	
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11	
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-163 SB</i>													
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>Bal/Krny Vil/Mer to I-805</i>													
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>													
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year	<i>2050</i>													
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>																	
<b>Flow Inputs</b>																	
Volume, V	<i>10783</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>5</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>													
DDHV = AADT x K x D		veh/h	Grade % Length	<i>mi</i>													
			Up/Down %														
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.976</i>													
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>1.8</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>73.6</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>1.8</i>	mph	FFS	<i>73.6</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>1.8</i>	mph															
FFS	<i>73.6</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>5</i>																
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )	<i>2327</i>	pc/h/ln	Design LOS														
S	<i>55.5</i>	mph	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )														
D = v <sub>p</sub> / S	<i>41.9</i>	pc/mi/ln	S														
LOS	<i>E</i>		D = v <sub>p</sub> / S														
			Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8													
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9													
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11													
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>SR-163 NB</i>		
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>I-805 to Mesa College Dr</i>		
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>		
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year <i>2050</i>		
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>					
<b>Flow Inputs</b>					
Volume, V	<i>7774</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>4</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>		
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>
Up/Down %					
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.980</i>		
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft	f <sub>LW</sub> <span style="float: right;"><i>0.0</i></span> <span style="float: right;">mph</span> f <sub>LC</sub> <span style="float: right;"><i>0.0</i></span> <span style="float: right;">mph</span> TRD Adjustment <span style="float: right;"><i>1.8</i></span> <span style="float: right;">mph</span> FFS <span style="float: right;"><i>73.6</i></span> <span style="float: right;">mph</span>		
Rt-Side Lat. Clearance	<i>6.0</i>	ft			
Number of Lanes, N	<i>6</i>				
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi			
FFS (measured)		mph			
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS		
S	<i>73.3</i>	mph	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )		
D = v <sub>p</sub> / S	<i>19.0</i>	pc/mi/ln	S		
LOS	<i>C</i>		D = v <sub>p</sub> / S		
			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel	<i>SR-163 SB</i>	
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>I-805 to Mesa College Dr</i>	
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>	
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year	<i>2050</i>	
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>					
<b>Flow Inputs</b>					
Volume, V	<i>8249</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>4</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>	
DDHV = AADT x K x D		veh/h	Grade % Length	<i>mi</i>	
			Up/Down %		
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.980</i>	
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft			
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub>	<i>0.0</i>	mph
Number of Lanes, N	<i>5</i>		f <sub>LC</sub>	<i>0.0</i>	mph
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi	TRD Adjustment	<i>1.8</i>	mph
FFS (measured)			FFS	<i>73.6</i>	mph
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS		
S	<i>68.4</i>	mph	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )	pc/h/ln	
D = v <sub>p</sub> / S	<i>25.9</i>	pc/mi/ln	S	mph	
LOS	<i>C</i>		D = v <sub>p</sub> / S	pc/mi/ln	
			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8	
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9	
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11	
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-15 NB</i>														
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>SR-163 to SR-52</i>													
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>													
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year	<i>2050</i>													
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data													
<b>Flow Inputs</b>																	
Volume, V	<i>6908</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>6</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>													
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>												
			Up/Down %														
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.971</i>														
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>1.8</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>73.6</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>1.8</i>	mph	FFS	<i>73.6</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>1.8</i>	mph															
FFS	<i>73.6</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>4</i>																
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi															
FFS (measured)																	
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> ) <i>1872</i>			Design LOS														
x f <sub>p</sub> )	<i>66.6</i>		v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )														
S	<i>28.1</i>		x f <sub>p</sub> )														
D = v <sub>p</sub> / S	<i>D</i>		S														
LOS			D = v <sub>p</sub> / S														
			Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8												
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9												
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11												
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	



<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-15 SB</i>														
Agency or Company	<i>Chen Ryan Associates</i>		From/To	<i>SR-163 to SR-52</i>													
Date Performed	<i>2019</i>		Jurisdiction	<i>City of San Diego</i>													
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year	<i>2050</i>													
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>																	
<b>Flow Inputs</b>																	
Volume, V	<i>10015</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>6</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>													
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>												
			Up/Down %														
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.971</i>														
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>1.8</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>73.6</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>1.8</i>	mph	FFS	<i>73.6</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>1.8</i>	mph															
FFS	<i>73.6</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>7</i>																
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS														
v <sub>p</sub>	<i>1551</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )														
S	<i>71.6</i>	mph	S														
D = v <sub>p</sub> / S	<i>21.7</i>	pc/mi/ln	D = v <sub>p</sub> / S														
LOS	<i>C</i>		Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8													
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9													
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18	TRD - Page 11-11													
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>			
<b>General Information</b>		<b>Site Information</b>	
Analyst	<i>Chen Ryan Associates</i>	Highway/Direction of Travel	<i>I-15 NB</i>
Agency or Company	<i>Chen Ryan Associates</i>	From/To	<i>SR-52 to Clairemont Mesa Blvd</i>
Date Performed	<i>2019</i>	Jurisdiction	<i>City of San Diego</i>
Analysis Time Period	<i>PM Peak Hour</i>	Analysis Year	<i>2050</i>
Project Description <i>Proposed</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
<b>Flow Inputs</b>			
Volume, V	<i>4817</i>	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			<i>0.95</i>
			<i>6</i>
			<i>0</i>
			<i>Level</i>
			<i>mi</i>
<b>Calculate Flow Adjustments</b>			
f <sub>p</sub>	<i>1.00</i>	E <sub>R</sub>	<i>1.2</i>
E <sub>T</sub>	<i>1.5</i>	f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	<i>0.971</i>
<b>Speed Inputs</b>		<b>Calc Speed Adj and FFS</b>	
Lane Width	<i>12.0</i>	ft	
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub>
Number of Lanes, N	<i>4</i>		<i>0.0</i>
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi	mph
FFS (measured)		mph	f <sub>LC</sub>
Base free-flow Speed, BFFS	<i>75.4</i>	mph	<i>0.0</i>
			mph
			TRD Adjustment
			<i>1.8</i>
			mph
			FFS
			<i>73.6</i>
			mph
<b>LOS and Performance Measures</b>		<b>Design (N)</b>	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )		Design LOS	
<i>1306</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )	
x f <sub>p</sub> )		pc/h/ln	
S	<i>74.0</i>	mph	x f <sub>p</sub> )
D = v <sub>p</sub> / S	<i>17.7</i>	pc/mi/ln	S
LOS	<i>B</i>		mph
			pc/mi/ln
			D = v <sub>p</sub> / S
			Required Number of Lanes, N
<b>Glossary</b>		<b>Factor Location</b>	
N - Number of lanes	S - Speed	E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density	E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed	f <sub>p</sub> - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
<b>General Information</b>		<b>Site Information</b>	
Analyst	Chen Ryan Associates	Highway/Direction of Travel	I-15 SB
Agency or Company	Chen Ryan Associates	From/To	SR-52 to Clairemont Mesa Blvd
Date Performed	2019	Jurisdiction	City of San Diego
Analysis Time Period	PM Peak Hour	Analysis Year	2050
Project Description <i>Proposed</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
<b>Flow Inputs</b>			
Volume, V	6984	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.95
			6
			0
			Level
			mi
<b>Calculate Flow Adjustments</b>			
f <sub>p</sub>	1.00	E <sub>R</sub>	1.2
E <sub>T</sub>	1.5	f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	0.971
<b>Speed Inputs</b>		<b>Calc Speed Adj and FFS</b>	
Lane Width	12.0	ft	
Rt-Side Lat. Clearance	6.0	ft	f <sub>LW</sub>
Number of Lanes, N	4		f <sub>LC</sub>
Total Ramp Density, TRD	2.00	ramps/mi	TRD Adjustment
FFS (measured)		mph	FFS
Base free-flow Speed, BFFS	75.4	mph	
			0.0
			0.0
			5.8
			69.6
<b>LOS and Performance Measures</b>		<b>Design (N)</b>	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )		Design LOS	
x f <sub>p</sub> )	1893	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )
S	64.4	mph	x f <sub>p</sub> )
D = v <sub>p</sub> / S	29.4	pc/mi/ln	S
LOS	D		D = v <sub>p</sub> / S
			Required Number of Lanes, N
<b>Glossary</b>		<b>Factor Location</b>	
N - Number of lanes	S - Speed	E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density	E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed	f <sub>p</sub> - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-15 NB</i>		
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>Clairemont Mesa Blvd to Balboa</i>		
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>		
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year <i>2050</i>		
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
<b>Flow Inputs</b>					
Volume, V	<i>6766</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>6</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>	
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>
			Up/Down %		
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.971</i>		
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft			
Rt-Side Lat. Clearance	<i>6.0</i>	ft			
Number of Lanes, N	<i>4</i>				
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi			
FFS (measured)		mph			
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
			f <sub>LW</sub>	<i>0.0</i>	mph
			f <sub>LC</sub>	<i>0.0</i>	mph
			TRD Adjustment	<i>1.8</i>	mph
			FFS	<i>73.6</i>	mph
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )			Design LOS		
x f <sub>p</sub> )	<i>1834</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )		
S	<i>67.3</i>	mph	x f <sub>p</sub> )		
D = v <sub>p</sub> / S	<i>27.3</i>	pc/mi/ln	S		
LOS	<i>D</i>		D = v <sub>p</sub> / S		
			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>			
<b>General Information</b>		<b>Site Information</b>	
Analyst	<i>Chen Ryan Associates</i>	Highway/Direction of Travel <i>I-15 SB</i>	
Agency or Company	<i>Chen Ryan Associates</i>	From/To	<i>Clairemont Mesa Blvd to Balboa</i>
Date Performed	<i>2019</i>	Jurisdiction	<i>City of San Diego</i>
Analysis Time Period	<i>PM Peak Hour</i>	Analysis Year	<i>2050</i>
Project Description <i>Proposed</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
<b>Flow Inputs</b>			
Volume, V	<i>9809</i>	veh/h	Peak-Hour Factor, PHF <i>0.95</i>
AADT		veh/day	%Trucks and Buses, P <sub>T</sub> <i>6</i>
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub> <i>0</i>
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>
DDHV = AADT x K x D		veh/h	Grade % Length <i>mi</i> Up/Down %
<b>Calculate Flow Adjustments</b>			
f <sub>p</sub>	<i>1.00</i>	E <sub>R</sub>	<i>1.2</i>
E <sub>T</sub>	<i>1.5</i>	f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.971</i>	
<b>Speed Inputs</b>		<b>Calc Speed Adj and FFS</b>	
Lane Width	<i>12.0</i>	ft	
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub> <i>0.0</i> mph
Number of Lanes, N	<i>4</i>		f <sub>LC</sub> <i>0.0</i> mph
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi	TRD Adjustment <i>1.8</i> mph
FFS (measured)		mph	FFS <i>73.6</i> mph
Base free-flow Speed, BFFS	<i>75.4</i>	mph	
<b>LOS and Performance Measures</b>		<b>Design (N)</b>	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )	<i>2659</i>	pc/h/ln	Design LOS
S	<i>44.5</i>	mph	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )
D = v <sub>p</sub> / S	<i>59.7</i>	pc/mi/ln	S
LOS	<i>F</i>		D = v <sub>p</sub> / S
			Required Number of Lanes, N
<b>Glossary</b>		<b>Factor Location</b>	
N - Number of lanes	S - Speed	E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density	E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed	f <sub>p</sub> - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-15 NB</i>		
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>Balboa Ave to Aero Dr</i>		
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>		
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year <i>2050</i>		
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>					
<b>Flow Inputs</b>					
Volume, V	<i>7557</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>5</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>		
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>
Up/Down %					
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.976</i>		
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft	f <sub>LW</sub> <span style="float: right;"><i>0.0</i></span> <span style="float: right;">mph</span> f <sub>LC</sub> <span style="float: right;"><i>0.0</i></span> <span style="float: right;">mph</span> TRD Adjustment <span style="float: right;"><i>1.8</i></span> <span style="float: right;">mph</span> FFS <span style="float: right;"><i>73.6</i></span> <span style="float: right;">mph</span>		
Rt-Side Lat. Clearance	<i>6.0</i>	ft			
Number of Lanes, N	<i>5</i>				
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi			
FFS (measured)		mph			
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS		
S	<i>70.6</i>	mph	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )		
D = v <sub>p</sub> / S	<i>23.1</i>	pc/mi/ln	S		
LOS	<i>C</i>		D = v <sub>p</sub> / S		
			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-15 SB</i>		
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>Balboa Ave to Aero Dr</i>		
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>		
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year <i>2050</i>		
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>					
<b>Flow Inputs</b>					
Volume, V	<i>10956</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>5</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>		
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>
Up/Down %					
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.976</i>		
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft	f <sub>LW</sub> <span style="float: right;"><i>0.0</i></span> <span style="float: right;">mph</span> f <sub>LC</sub> <span style="float: right;"><i>0.0</i></span> <span style="float: right;">mph</span> TRD Adjustment <span style="float: right;"><i>1.8</i></span> <span style="float: right;">mph</span> FFS <span style="float: right;"><i>73.6</i></span> <span style="float: right;">mph</span>		
Rt-Side Lat. Clearance	<i>6.0</i>	ft			
Number of Lanes, N	<i>4</i>				
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi			
FFS (measured)		mph			
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS		
S	<i>32.7</i>	mph	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )		
D = v <sub>p</sub> / S	<i>90.4</i>	pc/mi/ln	S		
LOS	<i>F</i>		D = v <sub>p</sub> / S		
			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>			
<b>General Information</b>		<b>Site Information</b>	
Analyst	<i>Chen Ryan Associates</i>	Highway/Direction of Travel <i>I-15 NB</i>	
Agency or Company	<i>Chen Ryan Associates</i>	From/To	<i>Aero Drive to Murphy Canyon Rd</i>
Date Performed	<i>2019</i>	Jurisdiction	<i>City of San Diego</i>
Analysis Time Period	<i>PM Peak Hour</i>	Analysis Year	<i>2050</i>
Project Description <i>Proposed</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
<b>Flow Inputs</b>			
Volume, V	<i>8083</i>	veh/h	Peak-Hour Factor, PHF <i>0.95</i>
AADT		veh/day	%Trucks and Buses, P <sub>T</sub> <i>5</i>
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub> <i>0</i>
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>
DDHV = AADT x K x D		veh/h	Grade % Length <i>mi</i> Up/Down %
<b>Calculate Flow Adjustments</b>			
f <sub>p</sub>	<i>1.00</i>	E <sub>R</sub>	<i>1.2</i>
E <sub>T</sub>	<i>1.5</i>	f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.976</i>	
<b>Speed Inputs</b>		<b>Calc Speed Adj and FFS</b>	
Lane Width	<i>12.0</i>	ft	
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub> <i>0.0</i> mph
Number of Lanes, N	<i>4</i>		f <sub>LC</sub> <i>0.0</i> mph
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi	TRD Adjustment <i>1.8</i> mph
FFS (measured)		mph	FFS <i>73.6</i> mph
Base free-flow Speed, BFFS	<i>75.4</i>	mph	
<b>LOS and Performance Measures</b>		<b>Design (N)</b>	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )	<i>2180</i>	pc/h/ln	Design LOS
S	<i>59.6</i>	mph	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )
D = v <sub>p</sub> / S	<i>36.6</i>	pc/mi/ln	S
LOS	<i>E</i>		D = v <sub>p</sub> / S
			Required Number of Lanes, N
<b>Glossary</b>		<b>Factor Location</b>	
N - Number of lanes	S - Speed	E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density	E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed	f <sub>p</sub> - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			



<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-15 SB</i>		
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>Aero Drive to Murphy Canyon Rd</i>		
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>		
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year <i>2050</i>		
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
<b>Flow Inputs</b>					
Volume, V	<i>11719</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>5</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>		
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>
			Up/Down %		
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.976</i>		
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft			
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub>	<i>0.0</i>	mph
Number of Lanes, N	<i>5</i>		f <sub>LC</sub>	<i>0.0</i> mph	
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi	TRD Adjustment <i>1.8</i> mph		
FFS (measured) mph			FFS <i>73.6</i> mph		
Base free-flow Speed, BFFS	<i>75.4</i> mph				
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )			Design LOS		
x f <sub>p</sub> )	<i>2529</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )		
S	<i>49.1</i> mph		x f <sub>p</sub> )		
D = v <sub>p</sub> / S	<i>51.5</i> pc/mi/ln		S		
LOS <i>F</i>			D = v <sub>p</sub> / S		
			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>																	
<b>General Information</b>			<b>Site Information</b>														
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-15 NB</i>														
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>Murphy Canyon Rd to Friars Rd</i>														
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>														
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year <i>2050</i>														
Project Description <i>Proposed</i>																	
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data													
<b>Flow Inputs</b>																	
Volume, V	<i>8363</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>													
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>5</i>													
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>													
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>														
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>												
			Up/Down %														
<b>Calculate Flow Adjustments</b>																	
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>													
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.976</i>														
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>														
Lane Width	<i>12.0</i>	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f<sub>LW</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f<sub>LC</sub></td> <td style="padding: 5px;"><i>0.0</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"><i>1.8</i></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;"><i>73.6</i></td> <td style="padding: 5px;">mph</td> </tr> </table>			f <sub>LW</sub>	<i>0.0</i>	mph	f <sub>LC</sub>	<i>0.0</i>	mph	TRD Adjustment	<i>1.8</i>	mph	FFS	<i>73.6</i>	mph
f <sub>LW</sub>	<i>0.0</i>	mph															
f <sub>LC</sub>	<i>0.0</i>	mph															
TRD Adjustment	<i>1.8</i>	mph															
FFS	<i>73.6</i>	mph															
Rt-Side Lat. Clearance	<i>6.0</i>	ft															
Number of Lanes, N	<i>4</i>																
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi															
FFS (measured)		mph															
Base free-flow Speed, BFFS	<i>75.4</i>	mph															
<b>LOS and Performance Measures</b>			<b>Design (N)</b>														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS														
2256	pc/h/ln		v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )														
S	<i>57.5</i>	mph	S														
D = v <sub>p</sub> / S	<i>39.2</i>	pc/mi/ln	D = v <sub>p</sub> / S														
LOS	<i>E</i>		Required Number of Lanes, N														
<b>Glossary</b>			<b>Factor Location</b>														
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8												
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9												
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11												
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-15 SB</i>		
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>Murphy Canyon Rd to Friars Rd</i>		
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>		
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year <i>2050</i>		
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
<b>Flow Inputs</b>					
Volume, V	<i>12124</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>5</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>		
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>
Up/Down %					
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.976</i>		
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft			
Rt-Side Lat. Clearance	<i>6.0</i>	ft	f <sub>LW</sub>	<i>0.0</i>	mph
Number of Lanes, N	<i>6</i>		f <sub>LC</sub>	<i>0.0</i> mph	
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi	TRD Adjustment <i>1.8</i> mph		
FFS (measured) mph			FFS <i>73.6</i> mph		
Base free-flow Speed, BFFS	<i>75.4</i> mph				
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS		
	<i>2180</i>	pc/h/ln	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )		
S	<i>59.6</i> mph		S		
D = v <sub>p</sub> / S	<i>36.6</i> pc/mi/ln		D = v <sub>p</sub> / S		
LOS <i>E</i>			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes			E <sub>R</sub> - Exhibits 11-10, 11-12		
V - Hourly volume			E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		
v <sub>p</sub> - Flow rate			f <sub>p</sub> - Page 11-18		
LOS - Level of service			LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume			f <sub>LW</sub> - Exhibit 11-8		
S - Speed			f <sub>LC</sub> - Exhibit 11-9		
D - Density			TRD - Page 11-11		
FFS - Free-flow speed					
BFFS - Base free-flow speed					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-15 NB</i>		
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>Friars Road to I-8</i>		
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>		
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year <i>2050</i>		
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>					
<b>Flow Inputs</b>					
Volume, V	<i>8725</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>5</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>		
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>
Up/Down %					
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.976</i>		
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft	f <sub>LW</sub> <span style="float: right;"><i>0.0</i></span> <span style="float: right;">mph</span> f <sub>LC</sub> <span style="float: right;"><i>0.0</i></span> <span style="float: right;">mph</span> TRD Adjustment <span style="float: right;"><i>1.8</i></span> <span style="float: right;">mph</span> FFS <span style="float: right;"><i>73.6</i></span> <span style="float: right;">mph</span>		
Rt-Side Lat. Clearance	<i>6.0</i>	ft			
Number of Lanes, N	<i>6</i>				
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi			
FFS (measured)		mph			
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS		
S	<i>71.4</i>	mph	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )		
D = v <sub>p</sub> / S	<i>22.0</i>	pc/mi/ln	S		
LOS	<i>C</i>		D = v <sub>p</sub> / S		
			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

<b>BASIC FREEWAY SEGMENTS WORKSHEET</b>					
<b>General Information</b>			<b>Site Information</b>		
Analyst	<i>Chen Ryan Associates</i>		Highway/Direction of Travel <i>I-15 SB</i>		
Agency or Company	<i>Chen Ryan Associates</i>		From/To <i>Friars Road to I-8</i>		
Date Performed	<i>2019</i>		Jurisdiction <i>City of San Diego</i>		
Analysis Time Period	<i>PM Peak Hour</i>		Analysis Year <i>2050</i>		
Project Description <i>Proposed</i>					
<input checked="" type="checkbox"/> Oper.(LOS) <span style="margin-left: 150px;"><input type="checkbox"/> Des.(N)</span> <span style="margin-left: 150px;"><input type="checkbox"/> Planning Data</span>					
<b>Flow Inputs</b>					
Volume, V	<i>12650</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>5</i>	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	<i>0</i>	
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>		
DDHV = AADT x K x D		veh/h	Grade %	Length	<i>mi</i>
Up/Down %					
<b>Calculate Flow Adjustments</b>					
f <sub>p</sub>	<i>1.00</i>		E <sub>R</sub>	<i>1.2</i>	
E <sub>T</sub>	<i>1.5</i>		f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)] <i>0.976</i>		
<b>Speed Inputs</b>			<b>Calc Speed Adj and FFS</b>		
Lane Width	<i>12.0</i>	ft	f <sub>LW</sub> <span style="float: right;"><i>0.0</i></span> <span style="float: right;">mph</span> f <sub>LC</sub> <span style="float: right;"><i>0.0</i></span> <span style="float: right;">mph</span> TRD Adjustment <span style="float: right;"><i>1.8</i></span> <span style="float: right;">mph</span> FFS <span style="float: right;"><i>73.6</i></span> <span style="float: right;">mph</span>		
Rt-Side Lat. Clearance	<i>6.0</i>	ft			
Number of Lanes, N	<i>6</i>				
Total Ramp Density, TRD	<i>0.50</i>	ramps/mi			
FFS (measured)		mph			
Base free-flow Speed, BFFS	<i>75.4</i>	mph			
<b>LOS and Performance Measures</b>			<b>Design (N)</b>		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )			Design LOS		
S	<i>57.0</i>	mph	v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )		
D = v <sub>p</sub> / S	<i>39.9</i>	pc/mi/ln	S		
LOS	<i>E</i>		D = v <sub>p</sub> / S		
			Required Number of Lanes, N		
<b>Glossary</b>			<b>Factor Location</b>		
N - Number of lanes	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13		f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed		f <sub>p</sub> - Page 11-18		TRD - Page 11-11
LOS - Level of service speed	BFFS - Base free-flow speed		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					