Phone: E-mail:		Fax:	
	Operational Analy	/sis	
Date Performed: Analysis Time Period:	I-75 NB Dearborn Exit/Spri	ngwells Exit	
Description: Detroit R		Crossing Project	
	Flow Inputs and A	Adjustments	
Volume, V Peak-hour factor, PHF		5141 0.95	veh/h
Peak 15-min volume, v15 Trucks and buses		1353 16	V %
Recreational vehicles Terrain type:		0 Level	8
Grade Segment length Trucks and buses PCE, E	Т	0.00 0.00 1.5	% mi
Recreational vehicle PC Heavy vehicle adjustmen	E, ER t, fHV	1.2 0.926	
Driver population factor Flow rate, vp	r, fp	1.00 1461	pc/h/ln
	Speed Inputs and	Adjustments	
Lane width Right-shoulder lateral Interchange density	clearance	12.0 6.0 1.00	ft ft interchange/mi
Number of lanes, N Free-flow speed: FFS or BFFS		4 Measured 55.0	mi/h
Lane width adjustment, Lateral clearance adjus		0.0	mi/h mi/h
Interchange density adj Number of lanes adjustm Free-flow speed, FFS		2.5 1.5 55.0 Urban Freeway	mi/h mi/h mi/h
LOS and Performance Measures			
Flow rate, vp Free-flow speed, FFS Average passenger-car s Number of lanes, N	peed, S	1461 55.0 55.0 4	pc/h/ln mi/h mi/h
Density, D		26.6	pc/mi/ln

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: Agency or Company: PARSONS
Date Performed: 8/22/2007 Analysis Time Period: AM Peak
Freeway/Direction: I-75 NB
From/To: Springwells Exit/Plaza Exit Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Flow Inputs and Adjustments_____ Volume, V 4739 veh/h Peak-hour factor, PHF 0.95 Peak 15-min volume, v15 1247 17 Trucks and buses Recreational vehicles Terrain type: Level 0.00 Grade Segment length 0.00 Мi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.922 Driver population factor, fp 1.00 pc/h/ln Flow rate, vp 1353 _____Speed Inputs and Adjustments_____ ft ft interchange/mi 12.0 Lane width Right-shoulder lateral clearance 6.0 Interchange density Number of lanes, N 1.00 4 Free-flow speed: Measured mi/h FFS or BFFS 55.0 mi/h mi/h mi/h mi/h Lane width adjustment, fLW 0.0 Lateral clearance adjustment, fLC
Interchange density adjustment, fID 0.0 2.5 Number of lanes adjustment, fN 1.5 55.0 mi/h Free-flow speed, FFS Urban Freeway LOS and Performance Measures_____ pc/h/ln Flow rate, vp 1353 Free-flow speed, FFS 55.0 mi/h mi/h Average passenger-car speed, S 55.0 Number of lanes, N 4 Density, D 24.6 pc/mi/ln

Phone: E-mail:		Fax:	
	Operational Anal	ysis	
Date Performed: Analysis Time Period:	CH PARSONS 8/22/2007 AM Peak I-75 NB Plaza Exit/Livern	ois Ent.	
Analysis Year: Description: Detroit F		Crossing Project	l
	Flow Inputs and		Ç
	rrow inpacts and	114) 45 cmc11c5	
Volume, V Peak-hour factor, PHF		4345 0.95	veh/h
Peak 15-min volume, v15		1143	V
Trucks and buses Recreational vehicles		11 0	90 a
Terrain type:		Level	0
Grade		0.00	96
Segment length		0.00	mi
Trucks and buses PCE, E	ST	1.5	211.00
Recreational vehicle PC		1.2	
Heavy vehicle adjustmer	it, fHV	0.948	
Driver population facto	or, fp	1.00	
Flow rate, vp		1206	pc/h/ln
····	Speed Inputs and	Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	6.0	ft
Interchange density		1.00	interchange/mi
Number of lanes, N		4	_
Free-flow speed:		Measured	
FFS or BFFS		55.0	mi/h
Lane width adjustment,		0.0	mi/h
Lateral clearance adjus		0.0	mi/h
Interchange density adj Number of lanes adjustm		2.5	mi/h
Free-flow speed, FFS	ient, in	1.5 55.0	mi/h
rice flow speed, frs		Urban Freeway	mi/h
LOS and Performance Measures			
Flow rate, vp		1206	pc/h/ln
Free-flow speed, FFS	rand C	55.0	mi/h
Average passenger-car s Number of lanes, N	peed, S	55.0 4	mi/h
Density, D		4 21.9	pc/mi/ln

Phone: E-mail:		Fax:	
	Operational Ana	lysis	
Analyst:	СН		
Agency or Company:	PARSONS		
Date Performed:	8/22/2007		
Analysis Time Period:			
Freeway/Direction:	I-75 NB		
From/To:	Livernois Ent./J	unction Exit	
Jurisdiction:			
Analysis Year:	2035 (PA02)		
Description: Detroit F	liver Internationa.	l Crossing Projec	t
	Flow Inputs and	Adjustments	
Volume, V		4652	veh/h
Peak-hour factor, PHF		0.95	·
Peak 15-min volume, v15		1224	V
Trucks and buses		11	9
Recreational vehicles		0	90
Terrain type:		Level	
Grade		0.00	ଚ୍ଚ
Segment length		0.00	mi
Trucks and buses PCE, E		1.5	
Recreational vehicle PC	•	1.2	
Heavy vehicle adjustmen		0.948	
Driver population facto	er, ip	1.00	4. 4-
Flow rate, vp		1033	pc/h/ln
	Speed Inputs and	d Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	6.0	ft
Interchange density		1.00	interchange/mi
Number of lanes, N		5	
Free-flow speed:		Measured	
FFS or BFFS	57.77	55.0	mi/h
Lane width adjustment,		0.0	mi/h
Lateral clearance adjus		0.0	mi/h
Interchange density adj Number of lanes adjustm		2.5	mi/h
Free-flow speed, FFS	ent, in	0.0	mi/h
rice from speed, fro		55.0 Urban Freeway	mi/h
	LOS and Performa	-	
	nos and retroima	ance measures	
Flow rate, vp		1033	pc/h/ln
Free-flow speed, FFS		55.0	mi/h
Average passenger-car s	peed, S	55.0	mi/h
Number of lanes, N		5	() (2
Density, D		18.8	pc/mi/ln

Phone: E-mail:		Fax:	
	Operational Ana	alysis	
_			
Analyst:	CH		
Agency or Company:	PARSONS		
Date Performed: Analysis Time Period:	8/22/2007		
Freeway/Direction:	I-75 NB		
From/To:	Junction Exit/Pl	laza Ent.	
Jurisdiction:	0411001011 111110711		
Analysis Year:	2035 (PA02)		
Description: Detroit		al Crossing Pro	ject
	Flow Inputs and	d Adjustments	
Volume, V		4510	veh/h
Peak-hour factor, PHF		0.95	012, 11
Peak 15-min volume, v1	5	1187	V
Trucks and buses		11	9
Recreational vehicles		0	9
Terrain type:		Level	
Grade		0.00	00
Segment length		0.00	mi
Trucks and buses PCE,		1.5	
Recreational vehicle P	-	1.2	
Heavy vehicle adjustme		0.948	
Driver population fact Flow rate, vp	or, ip	1.00 1252	pc/h/ln
riow race, vp		1232	pc/ II/ III
	Speed Inputs a	nd Adjustments_	
Lane width		12.0	ft
Right-shoulder lateral	clearance	6.0	ft
Interchange density		1.00	interchange/mi
Number of lanes, N		4	
Free-flow speed:		Measured	m i /la
FFS or BFFS Lane width adjustment,	FIM	55.0 0.0	mi/h mi/h
Lateral clearance adju		0.0	mi/h
Interchange density ad		2.5	mi/h
Number of lanes adjust		1.5	mi/h
Free-flow speed, FFS		55.0	mi/h
		Urban Free	
	LOS and Perform	mance Measures_	
Flow rate, vp		1252	pc/h/ln
Free-flow speed, FFS		55.0	mi/h
Average passenger-car	speed, S	55.0	mi/h
Number of lanes, N	± ,	4	·
Density, D		22.8	pc/mi/ln

Phone: E-mail:		Fax:	
	Operational Ana	alysis	
Analysis Time Period:	CH PARSONS 8/22/2007 AM Peak I-75 NB Plaza Ent./Clar	k Ent.	
Analysis Year: Description: Detroit F	2035 (PA02) River Internation	al Crossing Projec	ct
	Flow Inputs and	d Adjustments	
Volume, V Peak-hour factor, PHF		5203 0.95	veh/h
Peak 15-min volume, v15 Trucks and buses Recreational vehicles		1369 13 0	V % %
Terrain type: Grade Segment length		Grade 0.00 0.00	% mi
Trucks and buses PCE, E Recreational vehicle PC Heavy vehicle adjustment Driver population factor	EE, ER it, fHV	1.5 1.2 0.939 1.00	
Flow rate, vp	,	1458	pc/h/ln
	Speed Inputs a	nd Adjustments	
Lane width Right-shoulder lateral Interchange density Number of lanes, N	clearance	12.0 6.0 1.00 4	ft ft interchange/mi
Free-flow speed: FFS or BFFS Lane width adjustment,	fLW	Measured 55.0 0.0	mi/h mi/h
Lateral clearance adjust Interchange density adjustments of lanes adjustments of the control of	ustment, fID	0.0 2.5 1.5 55.0	mi/h mi/h mi/h mi/h
	LOS and Perform	Urban Freeway	Y
Flow rate, vp			ng/h/ln
Free-flow speed, FFS Average passenger-car s Number of lanes, N	speed, S	1458 55.0 55.0 4	pc/h/ln mi/h mi/h
Density, D		26.5	pc/mi/ln

Phone:

Fax:

Phone: E-mail:		rax;	
	Operational Ana	alysis	
Analyst:	СН		
Agency or Company:	PARSONS		
Date Performed:	11/26/2007		
Analysis Time Period:			
Freeway/Direction:	I-75 NB	3 m ' 1	
From/To:	Clark Ent./Grand	l Exit	
Jurisdiction:	2025 (DA02)		
Analysis Year: Description: Detroit	2035 (PA02) River Internationa	al Crossing Proje	ct
-	Flow Inputs and		
	.		
Volume, V		5532	veh/h
Peak-hour factor, PHF	_	0.95	
Peak 15-min volume, v1	5	1456 14	V १
Trucks and buses Recreational vehicles		0	9 9
Terrain type:		Level	O
Grade		0.00	ે
Segment length		0.00	mi
Trucks and buses PCE,	ET	1.5	
Recreational vehicle P		1.2	
Heavy vehicle adjustme		0.935	
Driver population fact		1.00	
Flow rate, vp		1246	pc/h/ln
	Speed Inputs an	nd Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	6.0	ft
Interchange density		1.00	interchange/mi
Number of lanes, N		5	
Free-flow speed:		Measured	
FFS or BFFS		55.0	mi/h
Lane width adjustment,		0.0	mi/h
Lateral clearance adju		0.0	mi/h
Interchange density ad		2.5	mi/h
Number of lanes adjust	ment, IN	0.0	mi/h
Free-flow speed, FFS		55.0 Urban Freewa	mi/h
	LOS and Perfor	mance Measures	_
			
Flow rate, vp		1246	pc/h/ln
Free-flow speed, FFS	arood C	55.0	mi/h
Average passenger-car Number of lanes, N	speed, S	55.0 5	mi/h
Density, D		22.7	pc/mi/ln

Phone:

Fax:

Phone: E-mail:		rax:	
	Operational Ana	alysis	
Analyst:	СН		
Agency or Company:	PARSONS		
Date Performed:	11/26/2007		
Analysis Time Period:	AM Peak		
Freeway/Direction:	I-75 NB		
From/To:	Grand Exit/I-96	WB Exit	
Jurisdiction:			
Analysis Year:	2035 (PA02)		
Description: Detroit	River Internation	al Crossing Projec	t.
	Flow Inputs and	d Adjustments	
Volume, V		5513	veh/h
Peak-hour factor, PHF		0.95	
Peak 15-min volume, v1	5	1451	V
Trucks and buses		14	8
Recreational vehicles		0	8
Terrain type:		Level	
Grade		0.00	8
Segment length	T.M.	0.00	mi
Trucks and buses PCE,		1.5	
Recreational vehicle F		1.2	
Heavy vehicle adjustme		0.935 1.00	
Driver population fact Flow rate, vp	or, rp	1242	pc/h/ln
	_		
	Speed Inputs an	nd Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	6.0	ft
Interchange density		1.00	interchange/mi
Number of lanes, N		5	
Free-flow speed:		Measured	1.7
FFS or BFFS	6.2.2.	55.0	mi/h
Lane width adjustment,		0.0	mi/h
Lateral clearance adju		0.0	mi/h
Interchange density ad		2.5 0.0	mi/h mi/h
Number of lanes adjust	menc, in	55.0	mi/h
Free-flow speed, FFS		Urban Freeway	•
	LOS and Perform	mance Measures	
Flow rate, vp		1242	pc/h/ln
Free-flow speed, FFS		55.0	mi/h
Average passenger-car	speed. S	55.0	mi/h
Number of lanes, N	-F	5	,
Density, D	•	22.6	pc/mi/ln
=			÷ ' '

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: CH Agency or Company: PARSONS
Date Performed: 8/22/200 8/22/2007 Analysis Time Period: Midday Peak
Freeway/Direction: I-75 NB
From/To: Dearborn Exit/Springwells Exit
Jurisdiction: Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Flow Inputs and Adjustments_____ Volume, V 2751 veh/h Peak-hour factor, PHF 0.95 Peak 15-min volume, v15 724 25 Trucks and buses Recreational vehicles 0 Terrain type: Level Grade 0.00 Segment length 0.00 mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.889 Driver population factor, fp 1.00 Flow rate, vp 814 pc/h/ln _____Speed Inputs and Adjustments_____ 12.0 ft Lane width ft ft interchange/mi Right-shoulder lateral clearance 6.0 Interchange density 1.00 Number of lanes, N 4 Free-flow speed: Measured mi/h FFS or BFFS 55.0 Lane width adjustment, fLW 0.0 mi/h Lateral clearance adjustment, fLC mi/h mi/h mi/h 0.0 Interchange density adjustment, fID 2.5 Number of lanes adjustment, fN 1.5 1.5 mi/n 55.0 mi/h Free-flow speed, FFS Urban Freeway LOS and Performance Measures_____ Flow rate, vp 814 pc/h/ln Free-flow speed, FFS 55.0 mi/h Average passenger-car speed, S 55.0 mi/h Number of lanes, N 4 Density, D 14.8 pc/mi/ln

Phone: E-mail:		Fax:	
	Operational An	alysis	
Analyst: Agency or Company: Date Performed: Analysis Time Period: Freeway/Direction: From/To: Jurisdiction: Analysis Year: Description: Detroit F	I-75 NB Springwells Exi 2035 (PA02)		o a t
	Flow Inputs an		
Volume, V Peak-hour factor, PHF	-	2477 0.95	veh/h
Peak 15-min volume, v15 Trucks and buses Recreational vehicles		652 25 0	V % %
Terrain type: Grade Segment length		Level 0.00 0.00	% mi
Trucks and buses PCE, E Recreational vehicle PC Heavy vehicle adjustment Driver population factor	EE, ER it, fHV	1.5 1.2 0.889 1.00	
Flow rate, vp		733	pc/h/ln
	Speed Inputs a	nd Adjustments	
Lane width Right-shoulder lateral Interchange density Number of lanes, N	clearance	12.0 6.0 1.00	ft ft interchange/mi
Free-flow speed: FFS or BFFS Lane width adjustment,	fLW	Measured 55.0 0.0	mi/h mi/h
Lateral clearance adjust Interchange density adj Number of lanes adjustm	tment, fLC ustment, fID	0.0 2.5 1.5	mi/h mi/h mi/h
Free-flow speed, FFS		55.0 Urban Freewa	mi/h ay
	LOS and Perfor	mance Measures	
Flow rate, vp Free-flow speed, FFS Average passenger-car s Number of lanes, N	peed, S	733 55.0 55.0 4	pc/h/ln mi/h mi/h
Density, D		13.3	pc/mi/ln

Phone: E-mail:		Fax:	
,			
	Operational Ana	alysis	
Analyst:	СН		
Agency or Company:	PARSONS		
Date Performed:	8/22/2007		
Analysis Time Period:	Midday Peak		
Freeway/Direction:	I-75 NB		
From/To:	Plaza Exit/Live	rnois Ent.	
Jurisdiction:			
Analysis Year:	2035 (PA02)		
Description: Detroit F	River Internation	al Crossing Proje	ct
	Flow Inputs and	d Adjustments	
Volume, V		1769	veh/h
Peak-hour factor, PHF		0.95	V C11, 11
Peak 15-min volume, v15)	466	V
Trucks and buses		25	00
Recreational vehicles		0	90
Terrain type:		Level	
Grade		0.00	90
Segment length		0.00	mi
Trucks and buses PCE, E	ET	1.5	
Recreational vehicle PC	CE, ER	1.2	
Heavy vehicle adjustmer	nt, fHV	0.889	
Driver population facto	or, fp	1.00	
Flow rate, vp		524	pc/h/ln
	Speed Inputs ar	nd Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	6.0	ft
Interchange density		1.00	interchange/mi
Number of lanes, N		4	3 ·
Free-flow speed:		Measured	
FFS or BFFS		55.0	mi/h
Lane width adjustment,		0.0	mi/h
Lateral clearance adjus		0.0	mi/h
Interchange density adj	•	2.5	mi/h
Number of lanes adjustm	nent, fN	1.5	mi/h
Free-flow speed, FFS		55.0	mi/h
		Urban Freewa	У
	LOS and Perform	nance Measures	
Flow rate, vp		524	pc/h/ln
Free-flow speed, FFS		55.0	mi/h
Average passenger-car s	speed, S	55.0	mi/h
Number of lanes, N	<u>.</u> ,	4	_, _,
Density, D		9.5	pc/mi/ln

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: CH Agency or Company: PARSONS
Date Performed: 8/22/2007 Analysis Time Period: Midday Peak
Freeway/Direction: I-75 NB
From/To: Livernois Ent./Junction Exit Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project ______Flow Inputs and Adjustments_____ Volume, V 1880 veh/h 0.95 Peak-hour factor, PHF Peak 15-min volume, v15 495 V Trucks and buses 25 Recreational vehicles 0 용 Terrain type: Level 0.00 Grade Segment length 0.00 mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.889 Driver population factor, fp 1.00 Flow rate, vp 445 pc/h/ln _____Speed Inputs and Adjustments_____ 12.0 ft 6.0 ft 1.00 interchange/mi Lane width Right-shoulder lateral clearance 6.0 Interchange density 1.00 Number of lanes, N Free-flow speed: Measured mi/h 55.0 FFS or BFFS Lane width adjustment, fLW 0.0 mi/h Lateral clearance adjustment, fLC mi/h 0.0 2.5 0.0 Interchange density adjustment, fID mi/h 0.0 mi/h 55.0 mi/h Number of lanes adjustment, fN Free-flow speed, FFS Urban Freeway LOS and Performance Measures_____ 445 Flow rate, vp pc/h/ln 55.0 mi/h Free-flow speed, FFS Average passenger-car speed, S 55.0 mi/h Number of lanes, N

8.1

pc/mi/ln

Density, D

Phone: Fax: E-mail: ______Operational Analysis_____ Analyst: Agency or Company: PARSONS
Date Performed: 8/22/200 8/22/2007 Analysis Time Period: Midday Peak
Freeway/Direction: I-75 NB
From/To: Junction Exit/Plaza Ent. Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Flow Inputs and Adjustments_____ Volume, V 1830 veh/h Peak-hour factor, PHF 0.95 Peak 15-min volume, v15 482 V 25 Trucks and buses 용 Recreational vehicles Terrain type: Level Grade 0.00 Segment length 0.00 Мi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.889 Driver population factor, fp 1.00 Flow rate, vp 542 pc/h/ln ______Speed Inputs and Adjustments_____ Lane width 12.0 ft 6.0 ft 1.00 interchange/mi 12.0 ft Right-shoulder lateral clearance 6.0 Interchange density
Number of lanes, N 4 Free-flow speed: Measured FFS or BFFS mi/h 55.0 Lane width adjustment, fLW 0.0 mi/h Lateral clearance adjustment, fLC 0.0 mi/h mi/h 0.0 mi/h 2.5 mi/h 1.5 mi/h 55.0 mi/h Interchange density adjustment, fID 2.5 Number of lanes adjustment, fN 1.5 Free-flow speed, FFS Urban Freeway _____LOS and Performance Measures_____ Flow rate, vp 542 pc/h/ln Free-flow speed, FFS 55.0 mi/h mi/h Average passenger-car speed, S 55.0 Number of lanes, N 4 Density, D 9.9 pc/mi/ln

Phone: Fax: E-mail: _____Operational Analysis_____ Agency or Company: PARSONS
Date Performed: 8/22/200 8/22/2007 Analysis Time Period: Midday Peak
Freeway/Direction: I-75 NB
From/To: Plaza Ent./Clark Ent. Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Flow Inputs and Adjustments_____ 1984 veh/h Volume, V 0.95 Peak-hour factor, PHF Peak 15-min volume, v15 522 V Trucks and buses 25 % 0 Recreational vehicles Terrain type: Level 0.00 용 Grade 0.00 Segment length тi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.889 Driver population factor, fp 1.00 pc/h/ln 587 Flow rate, vp _____Speed Inputs and Adjustments_____ 12.0 ft ft interchange/mi Lane width ft Right-shoulder lateral clearance 6.0 1.00 Interchange density Number of lanes, N Free-flow speed: Measured mi/h 55.0 FFS or BFFS mi/h Lane width adjustment, fLW 0.0 0.0 mi/h
0.0 mi/h
2.5 mi/h
1.5 mi/h
55.0 mi/h Lateral clearance adjustment, fLC 0.0 Interchange density adjustment, fID 2.5 1.5 Number of lanes adjustment, fN Free-flow speed, FFS Urban Freeway LOS and Performance Measures_____ 587 pc/h/ln Flow rate, vp 55.0 Free-flow speed, FFS mi/h Average passenger-car speed, S 55.0 mi/h Number of lanes, N

Density, D

10.7 pc/mi/ln

Phone:

Fax:

E-mail:			
	Operational Ana	alysis	
Analyst:	СН		
Agency or Company:	PARSONS		
Date Performed:	11/26/2007		
Analysis Time Period:	Midday Peak		
Freeway/Direction:	I-75 NB		
From/To:	Clark Ent./Grand	l Evit	
Jurisdiction:	Clark Enc./Grane	EXIC	
Analysis Year:	2035 (PA02)		
Description: Detroit		al Crossing Project	_
_			
	Flow Inputs and	d Adjustments	
Volume, V		2379	veh/h
Peak-hour factor, PHF		0.95	
Peak 15-min volume, v1	5	626	V
Trucks and buses		25	8
Recreational vehicles		0	8
Terrain type:		Level	
Grade		0.00	8
Segment length		0.00	mi
Trucks and buses PCE,	ET	1.5	
Recreational vehicle Po		1.2	
Heavy vehicle adjustmen		0.889	
Driver population fact	or, fp	1.00	
Flow rate, vp		563	pc/h/ln
	Speed Inputs ar	nd Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	6.0	ft
Interchange density	or car arrec	1.00	interchange/mi
Number of lanes, N		5	riider eiidiig e/ mis
Free-flow speed:		Measured	
FFS or BFFS		55.0	mi/h
Lane width adjustment,	fLW	0.0	mi/h
Lateral clearance adju		0.0	mi/h
Interchange density ad		2.5	mi/h
Number of lanes adjust		0.0	mi/h
Free-flow speed, FFS	, · · · · · · · · · · · · · · · · ·	55.0	mi/h
ilos ilos apresa, a s		Urban Freeway	
	LOS and Perform	mance Measures	
77		5.63	ng/h/ln
Flow rate, vp		563 55.0	pc/h/ln
Free-flow speed, FFS	anood C	55.0	mi/h mi/h
Average passenger-car	speed, S	55.0 5	mi/h
Number of lanes, N			nc/mi/ln
Density, D		10.2	pc/mi/ln

Phone: E-mail:		Fax:	
	Operational Ar	alvsis	
	Operational		
Analyst:	CH		
Agency or Company:	PARSONS		
Date Performed:	11/26/2007		
Analysis Time Period:			
Freeway/Direction:	I-75 NB	tup maile	
From/To:	Grand Exit/I-96	WB EXIC	
Jurisdiction:	0025 (D702)		
Analysis Year:	2035 (PA02)	and Creating Dro	icat
Description: Detroit	River Internation	ial Crossing Pro	Jecc
	Flow Inputs ar	nd Adjustments	
Volume, V		2135	veh/h
Peak-hour factor, PHF		0.95	
Peak 15-min volume, v1	5	562	V
Trucks and buses		25	8
Recreational vehicles		0	8
Terrain type:		Level	
Grade		0.00	%
Segment length		0.00	mi
Trucks and buses PCE,	ET	1.5	
Recreational vehicle P		1.2	
Heavy vehicle adjustme		0.889	
Driver population fact		1.00	
Flow rate, vp		506	pc/h/ln
	Speed Inputs	and Adjustments_	
T		12.0	ft
Lane width Right-shoulder lateral	cloarance	6.0	ft
	Clearance	1.00	interchange/mi
Interchange density Number of lanes, N		5	
Free-flow speed:		Measured	
FFS or BFFS		55.0	mi/h
Lane width adjustment,	f T.M	0.0	mi/h
Lateral clearance adju	stment. fLC	0.0	mi/h
Interchange density ad		2.5	mi/h
Number of lanes adjust		0.0	mi/h
Free-flow speed, FFS	1110110 / 211	55.0	mi/h
riee riow speed, ris		Urban Free	
	LOS and Perfo	rmance Measures_	
-		F.O.C	ng/h/1n
Flow rate, vp		506	pc/h/ln mi/h
Free-flow speed, FFS	. 1 . 0	55.0	mi/h mi/h
Average passenger-car	speed, S	55.0	mi/h
Number of lanes, N		5 9 2	pc/mi/ln
Density, D		9.2	bc/mt/m

Phone: Fax: E-mail: _____Operational Analysis______ Analyst: CHAgency or Company: PARSONS
Date Performed: 8/22/2007 Analysis Time Period: PM Peak Freeway/Direction: I-75 NB From/To: Dearborn Exit/Springwells Exit Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Flow Inputs and Adjustments_____ Volume, V 3391 veh/h Peak-hour factor, PHF 0.95 Peak 15-min volume, v15 892 25 Trucks and buses Recreational vehicles 0 Level Terrain type: Grade 0.00 Segment length 0.00 mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.889 Driver population factor, fp 1.00 Flow rate, vp 1004 pc/h/ln ______Speed Inputs and Adjustments_____ ft Lane width 12.0 Right-shoulder lateral clearance 6.0 ft Interchange density 1.00 interchange/mi Number of lanes, N 4 Free-flow speed: Measured Measured
55.0 mi/h
0.0 mi/h
0.0 mi/h
2.5 mi/h
1.5 mi/h
55.0 mi/h FFS or BFFS 55.0 0.0 Lane width adjustment, fLW Lateral clearance adjustment, fLC 0.0 Interchange density adjustment, fID 2.5 Number of lanes adjustment, fN 1.5 Free-flow speed, FFS. Urban Freeway _____LOS and Performance Measures_____ 1004 Flow rate, vp pc/h/ln Free-flow speed, FFS 55.0 mi/h mi/h Average passenger-car speed, S 55.0 Number of lanes, N 4 Density, D 18.3 pc/mi/ln

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: Agency or Company: PARSONS
Date Performed: 8/22/2007 Analysis Time Period: PM Peak Freeway/Direction: I-75 NB From/To: Springwells Exit/Plaza Exit Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Flow Inputs and Adjustments____ Volume, V 3116 veh/h Peak-hour factor, PHF 0.95 820 Peak 15-min volume, v15 v 25 Trucks and buses Recreational vehicles Level Terrain type: Grade 0.00 응 Segment length 0.00 Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.889 Driver population factor, fp 1.00 923 Flow rate, vp pc/h/ln _____Speed Inputs and Adjustments_____ 12.0 ft 6.0 ft 1.00 interchange/mi Lane width 12.0 Right-shoulder lateral clearance Interchange density Number of lanes, N 4 Free-flow speed: Measured mi/h mi/h mi/h mi/h 55.0 FFS or BFFS Lane width adjustment, fLW 0.0 Lateral clearance adjustment, fLC 0.0 Interchange density adjustment, fID 2.5 1.5 Number of lanes adjustment, fN 1.5 mi/h 55.0 mi/h Free-flow speed, FFS Urban Freeway LOS and Performance Measures_____ 923 pc/h/ln 55.0 mi/h 55.0 mi/h Flow rate, vp Free-flow speed, FFS Average passenger-car speed, S Number of lanes, N

Density, D

pc/mi/ln

16.8

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: CH Agency or Company: PARSONS
Date Performed: 8/22/2007 Analysis Time Period: PM Peak Freeway/Direction: I-75 NB From/To: Plaza Exit/Livernois Ent. Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Flow Inputs and Adjustments____ Volume, V 2147 veh/h Peak-hour factor, PHF 0.95 Peak 15-min volume, v15 565 18 Trucks and buses Recreational vehicles 0 Terrain type: Level Grade 0.00 Segment length 0.00 тi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.917 1.00 Driver population factor, fp Flow rate, vp 616 pc/h/ln _____Speed Inputs and Adjustments_____ ft Lane width 12.0 Right-shoulder lateral clearance 6.0 ft Interchange density 1.00 interchange/mi Number of lanes, N 4 Free-flow speed: Measured Measured
55.0 mi/h
0.0 mi/h
0.0 mi/h
2.5 mi/h
1.5 mi/h
55.0 mi/h FFS or BFFS 55.0 Lane width adjustment, fLW 0.0 Lateral clearance adjustment, fLC 0.0 Interchange density adjustment, fID 2.5 Number of lanes adjustment, fN 1.5 Free-flow speed, FFS Urban Freeway LOS and Performance Measures_____ Flow rate, vp 616 pc/h/ln mi/h mi/h Free-flow speed, FFS 55.0 55.0 Average passenger-car speed, S Number of lanes, N 4

11.2

pc/mi/ln

Phone: E-mail:		Fax:				
Operational Analysis						
Analyst:	CH					
Agency or Company: Date Performed:	8/22/2007					
Analysis Time Period:	0/22/2007 DM Daak					
Analysis Time Period: Freeway/Direction:	T-75 NB					
From/To:	Livernois Ent./Junction Exit					
Jurisdiction:	ELVOINOID ENGLY VALUE ELVI					
Analysis Year:	2035 (PA02)					
Description: Detroit F	iver Internationa	l Crossing Project				
	Flow Inputs and	Adjustments				
Volume, V		2280	veh/h			
Peak-hour factor, PHF		0.95				
Peak 15-min volume, v15		600	V			
Trucks and buses		17	0			
Recreational vehicles		0	00			
Terrain type:		Level				
Grade		0.00	o			
Segment length	· m	0.00	mi			
Trucks and buses PCE, E		1.5				
Recreational vehicle PCE, ER		1.2 0.922				
Heavy vehicle adjustment, fHV Driver population factor, fp		1.00				
Flow rate, vp		521	pc/h/ln			
Speed Inputs and Adjustments						
T and width						
Lane width Right-shoulder lateral	alaaranaa	12.0 6.0	ft ft			
Interchange density	Clealance	1.00	interchange/mi			
Number of lanes, N		5	interchange/mi			
Free-flow speed:		Measured				
FFS or BFFS		55.0	mi/h			
Lane width adjustment,	fLW	0.0	mi/h			
Lateral clearance adjus		0.0	mi/h			
Interchange density adjustment, fID		2.5	mi/h			
Number of lanes adjustment, fN		0.0	mi/h			
Free-flow speed, FFS		55.0	mi/h			
		Urban Freeway				
LOS and Performance Measures						
Flow rate, vp		521	pc/h/ln			
Free-flow speed, FFS		55.0	mi/h			
Average passenger-car speed, S		55.0	mi/h			
Number of lanes, N		5				
Density, D		9.5	pc/mi/ln			

Phone: E-mail:		Fax:						
	Operational Analysis							
Analyst:	СН							
Agency or Company:	PARSONS							
Date Performed:	8/22/2007							
Analysis Time Period:	PM Peak							
Freeway/Direction:	I-75 NB							
From/To:	Junction Exit/Plaza Ent.							
Jurisdiction:								
Analysis Year:								
Description: Detroit B	River Internation	al Crossing Proje	ect					
	Flow Inputs and	d Adjustments						
Volume, V		2218	veh/h					
Peak-hour factor, PHF		0.95	,					
Peak 15-min volume, v15	5	584	V					
Trucks and buses		18	8					
Recreational vehicles		0	ଚ					
Terrain type:		Level						
Grade		0.00	96					
Segment length		0.00	mi					
Trucks and buses PCE, I	ET	1.5						
Recreational vehicle Po	•	1.2						
Heavy vehicle adjustment, fHV		0.917						
Driver population factor, fp		1.00						
Flow rate, vp		636	pc/h/ln					
	Speed Inputs ar	nd Adjustments						
Lane width		12.0	ft					
Right-shoulder lateral	clearance	6.0	ft					
Interchange density		1.00	interchange/mi					
Number of lanes, N		4	· · · · · · · · · · · · · · · · · · ·					
Free-flow speed:		Measured						
FFS or BFFS		55.0	mi/h					
Lane width adjustment,	fLW	0.0	mi/h					
Lateral clearance adjus		0.0	mi/h					
Interchange density adj		2.5	mi/h					
Number of lanes adjustr	nent, fN	1.5	mi/h					
Free-flow speed, FFS		55.0	mi/h					
		Urban Freewa	ау					
LOS and Performance Measures								
Flow rate, vp		636	pc/h/ln					
Free-flow speed, FFS		55.0	mi/h					
Average passenger-car s	speed, S	55.0	mi/h					
Number of lanes, N		4	• "					
Density, D		11.6	pc/mi/ln					

Phone: Fax: E-mail: Operational Analysis______ Analyst: CH Agency or Company: PARSONS
Date Performed: 8/22/2007 Analysis Time Period: PM Peak Freeway/Direction: I-75 NB From/To: Plaza Ent./Clark Ent. Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Flow Inputs and Adjustments_____ Volume, V 2340 veh/h Peak-hour factor, PHF 0.95 Peak 15-min volume, v15 616 V 21 Trucks and buses Recreational vehicles Level Terrain type: Grade 0.00 0.00 Segment length mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.905 Driver population factor, fp 1.00 pc/h/ln 680 Flow rate, vp _____Speed Inputs and Adjustments_____ ft 12.0 ft 6.0 ft 1.00 interchange/mi Lane width 12.0 Right-shoulder lateral clearance 6.0 Interchange density 4 Number of lanes, N Free-flow speed: Measured 55.0 mi/h
0.0 mi/h
0.0 mi/h
2.5 mi/h
1.5 mi/h
55.0 mi/h FFS or BFFS 55.0 0.0 Lane width adjustment, fLW Lateral clearance adjustment, fLC 0.0 Interchange density adjustment, fID 2.5 Number of lanes adjustment, fN 1.5 Free-flow speed, FFS Urban Freeway _____LOS and Performance Measures_____ 680 pc/h/ln Flow rate, vp mi/h mi/h Free-flow speed, FFS 55.0 55.0 Average passenger-car speed, S Number of lanes, N 4

Density, D

12.4 pc/mi/ln

Phone: E-mail:		Fax:				
II Marri						
Operational Analysis						
Analyst.	СН					
Analyst: Agency or Company:	PARSONS					
Date Performed:	11/26/2007					
Analysis Time Period:	PM Peak					
Freeway/Direction:	I-75 NB					
From/To:	Clark Ent./Grand Exit					
Jurisdiction:	02027 2201/ 02020 22020					
Analysis Year:	2035 (PA02)					
Description: Detroit R		l Crossing Project				
	Flow Inputs and	Adjustments				
-		2040	lo / lo			
Volume, V		3049	veh/h			
Peak-hour factor, PHF		0.95 802	77			
Peak 15-min volume, v15		80 <i>2</i> 19	V %			
Trucks and buses		0	% %			
Recreational vehicles		Level	-0			
Terrain type:		0.00	90			
Grade		0.00	mi			
Segment length Trucks and buses PCE, F	יידי	1.5	111.1			
Recreational vehicle PC		1.2				
Heavy vehicle adjustment, fHV		0.913				
Driver population factor, fp		1.00				
Flow rate, vp		703	pc/h/ln			
	Speed Inputs an	d Adjustments				
Lane width		12.0	ft			
Right-shoulder lateral	clearance	6.0	ft			
Interchange density		1.00	interchange/mi			
Number of lanes, N		5				
Free-flow speed:		Measured	/1-			
FFS or BFFS		55.0	mi/h mi/h			
Lane width adjustment, fLW		0.0	mi/h			
Lateral clearance adjus		0.0 2.5	mi/h			
Interchange density adjustment, fID		0.0	mi/h			
Number of lanes adjustment, fN		55.0	mi/h			
Free-flow speed, FFS		Urban Freeway	шт/п			
		orban rrooma,				
LOS and Performance Measures						
Flow rate, vp		703	pc/h/ln			
Free-flow speed, FFS		55.0	mi/h			
Average passenger-car speed, S		55.0	mi/h			
Number of lanes, N		5				
Density, D		12.8	pc/mi/ln			

Phone: E-mail:		Fax:				
E-Mari.						
	Operational Ana	lysis				
Analyst:	СН					
Agency or Company:	PARSONS					
Date Performed:	11/26/2007					
Analysis Time Period:						
Freeway/Direction:	I-75 NB					
From/To:	Grand Exit/I-96 WB Exit					
Jurisdiction:						
Analysis Year:	2035 (PA02)					
Description: Detroit	River Internationa	al Crossing Project	t			
	Flow Inputs and	l Adjustments				
Volume, V		2845	veh/h			
Peak-hour factor, PHF		0.95				
Peak 15-min volume, v1	5	749	V			
Trucks and buses	_	17	8			
Recreational vehicles		0	8			
Terrain type:		Level				
Grade		0.00	8			
Segment length		0.00	mi			
Trucks and buses PCE,	ET	1.5				
Recreational vehicle P		1.2				
Heavy vehicle adjustme		0.922				
Driver population fact		1.00				
Flow rate, vp		650	pc/h/ln			
	Speed Inputs ar	nd Adjustments				
Lane width		12.0	ft			
Right-shoulder lateral	clearance	6.0	ft			
Interchange density		1.00	interchange/mi			
Number of lanes, N		5	_			
Free-flow speed:		Measured				
FFS or BFFS		55.0	mi/h			
Lane width adjustment, fLW		0.0	mi/h			
Lateral clearance adju		0.0	mi/h			
Interchange density ad		2.5	mi/h			
Number of lanes adjust		0.0	mi/h			
Free-flow speed, FFS		55.0	mi/h			
		Urban Freeway				
LOS and Performance Measures						
Flow rate, vp		650	pc/h/ln			
Free-flow speed, FFS		55.0	mi/h			
Average passenger-car speed, S		55.0	mi/h			
Number of lanes, N	<u>, -</u>	5				
Density, D		11.8	pc/mi/ln			
· · <u>-</u> / -						

HCS+: Basic Freeway Segments Release 5.2

Fax: Phone: E-mail: _____Operational Analysis_____ Analyst: CH Agency or Company: PARSONS
Date Performed: 8/22/2007 Analysis Time Period: AM Peak Freeway/Direction: I-75 SB From/To: Ambassador Ent./Grand Ent. Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Flow Inputs and Adjustments____ 3386 veh/h Volume, V Peak-hour factor, PHF 0.95 891 Peak 15-min volume, v15 v 14 Trucks and buses Recreational vehicles Level Terrain type: 용 0.00 Grade 0.00 Segment length Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.935 1.00 Driver population factor, fp 763 pc/h/ln Flow rate, vp _____Speed Inputs and Adjustments_____ ft 12.0 Lane width 6.0 ft Right-shoulder lateral clearance 1.00 interchange/mi Interchange density Number of lanes, N 5 Free-flow speed: Measured mi/h mi/h mi/h mi/h 55.0 FFS or BFFS Lane width adjustment, fLW 0.0 Lateral clearance adjustment, fLC 0.0 Interchange density adjustment, fID 2.5 0.0 0.0 mi/h 55.0 mi/h Number of lanes adjustment, fN Free-flow speed, FFS Urban Freeway LOS and Performance Measures______ 763 pc/n/ mi/h mi/h pc/h/ln Flow rate, vp Free-flow speed, FFS 55.0 55.0 Average passenger-car speed, S Number of lanes, N 5

pc/mi/ln

13.9

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: Agency or Company: PARSONS
Date Performed: 8/22/2007 Analysis Time Period: AM Peak Freeway/Direction: I-75 SB From/To: Grand Ent./Clark Exit Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Flow Inputs and Adjustments_____ 3414 veh/h Volume, V Peak-hour factor, PHF 0.95 898 Peak 15-min volume, v15 V 14 Trucks and buses Recreational vehicles Terrain type: Level Grade 0.00 왕 Segment length 0.00 Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.935 Driver population factor, fp 1.00 Flow rate, vp 641 pc/h/ln _____Speed Inputs and Adjustments_____ ft Lane width 12.0 Right-shoulder lateral clearance 6.0 ft 1.00 interchange/mi Interchange density Number of lanes, N 6 Free-flow speed: Measured

 Measured

 55.0
 mi/h

 0.0
 mi/h

 0.0
 mi/h

 2.5
 mi/h

 0.0
 mi/h

 55.0
 mi/h

 55.0 FFS or BFFS Lane width adjustment, fLW 0.0 Lateral clearance adjustment, fLC 0.0 Interchange density adjustment, fID 2.5 Number of lanes adjustment, fN Free-flow speed, FFS Urban Freeway LOS and Performance Measures_____ 641 pc/h/ln 55.0 mi/h 55.0 mi/h Flow rate, vp Free-flow speed, FFS Average passenger-car speed, S Number of lanes, N 6

Density, D

pc/mi/ln

11.7

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: CH Agency or Company: PARSONS
Date Performed: 8/22/2007 Analysis Time Period: AM Peak Freeway/Direction: I-75 SB From/To: Clark Exit/Plaza Exit Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Flow Inputs and Adjustments_____ Volume, V veh/h 2812 Peak-hour factor, PHF 0.95 Peak 15-min volume, v15 740 V 17 Trucks and buses Recreational vehicles 읒 Level Terrain type: Grade 0.00 양 Segment length 0.00 тi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.922 Driver population factor, fp 1.00 Flow rate, vp 642 pc/h/ln _____Speed Inputs and Adjustments_____ ft 12.0 Lane width ft Right-shoulder lateral clearance 6.0 interchange/mi Interchange density 1.00 Number of lanes, N Free-flow speed: Measured mi/h mi/h FFS or BFFS 55.0 Lane width adjustment, fLW 0.0 mi/h mi/h Lateral clearance adjustment, fLC 0.0 Interchange density adjustment, fID 2.5 0.0 Number of lanes adjustment, fN 0.0 mi/h 55.0 mi/h Free-flow speed, FFS Urban Freeway _____LOS and Performance Measures_____ Flow rate, vp 642 pc/h/ln pc/h/ mi/h mi/h Free-flow speed, FFS 55.0 mi/h Average passenger-car speed, S 55.0 Number of lanes, N 5

11.7

pc/mi/ln

Fax: Phone: E-mail: _____Operational Analysis_____ Analyst: СН Agency or Company: PARSONS
Date Performed: 8/22/2007
Analysis Time Period: AM Peak
Freeway/Direction: I-75 SB
From/To: Plaza Exit/Junction Ent. Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Flow Inputs and Adjustments_____ 2596 veh/h Volume, V 0.95 Peak-hour factor, PHF Peak 15-min volume, v15 683 V 14 Trucks and buses Recreational vehicles Level Terrain type: 0.00 Grade 0.00 mi Segment length Trucks and buses PCE, ET Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.935 Driver population factor, fp 1.00 731 pc/h/ln Flow rate, vp _____Speed Inputs and Adjustments_____ 12.0 ft 6.0 ft 1.00 interchange/mi Lane width 12.0 Right-shoulder lateral clearance 6.0 Interchange density Number of lanes, N Measured Free-flow speed: mi/h FFS or BFFS 55.0 mi/h mi/h 0.0 Lane width adjustment, fLW Lateral clearance adjustment, fLC 0.0 2.5 mi/h 1.5 mi/h 55.0 mi/h mi/h Interchange density adjustment, fID 2.5 Number of lanes adjustment, fN 1.5 Free-flow speed, FFS Urban Freeway LOS and Performance Measures_____ 731 pc/h/ln Flow rate, vp mi/h mi/h 55.0 Free-flow speed, FFS 55.0 Average passenger-car speed, S Number of lanes, N 4

Density, D

pc/mi/ln

13.3

Fax: Phone: E-mail: Operational Analysis______ Analyst: СН Agency or Company: PARSONS
Date Performed: 8/22/2007 Analysis Time Period: AM Peak Freeway/Direction: I-75 SB
From/To: Junction Ent./Livernois Exit Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Flow Inputs and Adjustments_____ 2630 veh/h Volume, V Peak-hour factor, PHF 0.95 692 V Peak 15-min volume, v15 14 Trucks and buses Recreational vehicles Level Terrain type: % Grade 0.00 0.00 Segment length Мi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.935 1.00 Driver population factor, fp 592 pc/h/ln Flow rate, vp _____Speed Inputs and Adjustments_____ ft 12.0 12.0 ft 6.0 ft 1.00 interchange/mi Lane width Right-shoulder lateral clearance Interchange density Number of lanes, N 5 Free-flow speed: Measured mi/h mi/h mi/h mi/h 55.0 FFS or BFFS Lane width adjustment, fLW 0.0 Lateral clearance adjustment, fLC 0.0 Interchange density adjustment, fID 2.5 0.0 0.0 mi/h 55.0 mi/h Number of lanes adjustment, fN Free-flow speed, FFS Urban Freeway LOS and Performance Measures_____ 592 pc/h/ln Flow rate, vp 592 pc/h/ 55.0 mi/h 55.0 mi/h Free-flow speed, FFS Average passenger-car speed, S Number of lanes, N 5

pc/mi/ln

10.8

Fax:

Phone:

E-mail: Operational Analysis_____ Analyst: Agency or Company: PARSONS
Date Performed: 8/22/2007 Analysis Time Period: AM Peak Freeway/Direction: I-75 SB From/To: Livernois Exit/Plaza Ent. Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Flow Inputs and Adjustments_____ 2252 veh/h Volume, V Peak-hour factor, PHF 0.95 593 Peak 15-min volume, v15 v 17 Trucks and buses Recreational vehicles Level Terrain type: Grade 0.00 0.00 Segment length Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER Heavy vehicle adjustment, fHV 0.922 Driver population factor, fp 1.00 643 pc/h/ln Flow rate, vp _____Speed Inputs and Adjustments_____ ft f+ Lane width 12.0 6.0 ft 1.00 interchange/mi Right-shoulder lateral clearance Interchange density 4 Number of lanes, N Free-flow speed: Measured Measured
55.0 mi/h
0.0 mi/h
0.0 mi/h
2.5 mi/h
1.5 mi/h
55.0 mi/h 55.0 FFS or BFFS 0.0 Lane width adjustment, fLW Lateral clearance adjustment, fLC Interchange density adjustment, fID 0.0 2.5 1.5 Number of lanes adjustment, fN Free-flow speed, FFS Urban Freeway LOS and Performance Measures_____ pc/h/ln mi/h mi/h 643 Flow rate, vp Free-flow speed, FFS 55.0 Average passenger-car speed, S 55.0 Number of lanes, N 4 pc/mi/ln Density, D 11.7

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: Analyst:
Agency or Company:
Date Performed:
Analysis Time Period:
Freeway/Direction:
From/To:

Analysis Ent./Springwells Ent. Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Flow Inputs and Adjustments_____ Volume, V 3020 veh/h Peak-hour factor, PHF 0.95 795 V Peak 15-min volume, v15 24 Trucks and buses 응 Recreational vehicles Level Terrain type: 0.00 Grade Segment length 0.00 mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.893 Driver population factor, fp 1.00 890 Flow rate, vp pc/h/ln _____Speed Inputs and Adjustments_____ 12.0 ft 6.0 ft 1.00 interchange/mi Lane width Right-shoulder lateral clearance Interchange density Number of lanes, N Free-flow speed: Measured

 Measured

 55.0
 mi/h

 0.0
 mi/h

 0.0
 mi/h

 2.5
 mi/h

 1.5
 mi/h

 55.0
 mi/h

 FFS or BFFS Lane width adjustment, fLW 0.0 Lateral clearance adjustment, fLC Interchange density adjustment, fID 0.0 2.5 Number of lanes adjustment, fN Free-flow speed, FFS Urban Freeway LOS and Performance Measures_____ Flow rate, vp 890 pc/h/ln pe/h/ mi/h mi/h Free-flow speed, FFS 55.0 55.0 Average passenger-car speed, S Number of lanes, N 4

Density, D

pc/mi/ln

16.2

HCS+: Basic Freeway Segments Release 5.2

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: Agency or Company: PARSONS
Date Performed: 8/22/2007
Analysis Time Period: AM Peak Freeway/Direction: I-75 SB From/To: Springwells Ent./Dearborn Ent. Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project ______Flow Inputs and Adjustments_____ veh/h Volume, V 3153 Peak-hour factor, PHF 0.95 Peak 15-min volume, v15 830 v 24 용 Trucks and buses Recreational vehicles Level Terrain type: 0.00 Grade 왕 Segment length 0.00 Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.893 Driver population factor, fp 1.00 Flow rate, vp 929 pc/h/ln _____Speed Inputs and Adjustments____ 12.0 ft Lane width 6.0 ft 1.00 interchange/mi Right-shoulder lateral clearance Interchange density Number of lanes, N Free-flow speed: Measured mi/h mi/h 55.0 FFS or BFFS 0.0 mi/h
0.0 mi/h
2.5 mi/h
1.5 mi/h
55.0 mi/h Lane width adjustment, fLW 0.0 Lateral clearance adjustment, fLC Interchange density adjustment, fID 0.0 2.5 Number of lanes adjustment, fN Free-flow speed, FFS Urban Freeway LOS and Performance Measures Flow rate, vp 929 pc/h/ln mi/h mi/h Free-flow speed, FFS 55.0 55.0 Average passenger-car speed, S Number of lanes, N

4

16.9

Density, D

pc/mi/ln

Fax: Phone: E-mail: _____Operational Analysis______ Analyst: CH Agency or Company: PARSONS
Date Performed: 8/22/2007
Analysis Time Period: Midday Peak
Freeway/Direction: I-75 SB
From/To: Ambassador Ent./Grand Ent. Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Flow Inputs and Adjustments____ 3048 veh/h Volume, V Peak-hour factor, PHF 0.95 802 Peak 15-min volume, v15 V 25 Trucks and buses 응 Recreational vehicles Level Terrain type: Grade 0.00 양 Segment length 0.00 Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER Heavy vehicle adjustment, fHV 0.889 Driver population factor, fp 1.00 722 pc/h/ln Flow rate, vp _____Speed Inputs and Adjustments_____ ft Lane width 12.0 6.0 ft 1.00 interchange/mi Right-shoulder lateral clearance Interchange density Number of lanes, N 5 Free-flow speed: Measured mi/h mi/h FFS or BFFS 55.0 0.0 Lane width adjustment, fLW 0.0 mi/h
2.5 mi/h
0.0 mi/h
55.0 mi/h Lateral clearance adjustment, fLC 0.0 Interchange density adjustment, fID 2.5 Number of lanes adjustment, fN Free-flow speed, FFS Urban Freeway LOS and Performance Measures_____ pc/h/ln mi/h mi/h 722 Flow rate, vp Free-flow speed, FFS 55.0 55.0 Average passenger-car speed, S

5 13.1

pc/mi/ln

Number of lanes, N

HCS+: Basic Freeway Segments Release 5.2

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: CH Analyst:
Agency or Company:
Date Performed:
Analysis Time Period:
Freeway/Direction:
From/To:

Ch
PARSONS
8/22/2007
Midday Peak
I-75 SB
Grand Ent./Clark Exit Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Flow Inputs and Adjustments_____ veh/h 3089 Volume, V 0.95 Peak-hour factor, PHF Peak 15-min volume, v15 813 v 25 Trucks and buses Recreational vehicles Level Terrain type: 0.00 왕 Grade 0.00 Segment length тi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.889 Driver population factor, fp 1.00 610 pc/h/ln Flow rate, vp _____Speed Inputs and Adjustments_____ ft 12.0 Lane width ft 6.0 Right-shoulder lateral clearance 1.00 interchange/mi Interchange density Number of lanes, N Measured Free-flow speed: mi/h mi/h FFS or BFFS 55.0 Lane width adjustment, fLW 0.0 Lateral clearance adjustment, fLC Interchange density adjustment, fID mi/h mi/h 0.0 2.5 0.0 0.0 mi/h 55.0 mi/h Number of lanes adjustment, fN Free-flow speed, FFS Urban Freeway LOS and Performance Measures_____ 610 pc/h/ 55.0 mi/h 55.0 mi/h 610 pc/h/ln Flow rate, vp Free-flow speed, FFS Average passenger-car speed, S

6 11.1

pc/mi/ln

Number of lanes, N

Phone: Fax: E-mail: Operational Analysis_____ СН Analyst: Agency or Company: PARSONS
Date Performed: 8/22/2007 Analysis Time Period: Midday Peak
Freeway/Direction: I-75 SB
From/To: Clark Exit/Plaza Exit Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Flow Inputs and Adjustments_____ veh/h 2791 Volume, V Peak-hour factor, PHF 0.95 Peak 15-min volume, v15 734 V 25 0 Trucks and buses Recreational vehicles Level Terrain type: 0.00 응 Grade Segment length 0.00 mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.889 Driver population factor, fp 1.00 pc/h/ln Flow rate, vp 661 _____Speed Inputs and Adjustments_____ ft Lane width 12.0 6.0 £t Right-shoulder lateral clearance interchange/mi 1.00 Interchange density Number of lanes, N Measured Free-flow speed: mi/h mi/h 55.0 FFS or BFFS 0.0 Lane width adjustment, fLW Lateral clearance adjustment, fLC mi/h 0.0 Interchange density adjustment, fID 2.5 mi/h mi/h 55.0 mi/h Number of lanes adjustment, fN Free-flow speed, FFS Urban Freeway LOS and Performance Measures_____ 661 pc/h/ln Flow rate, vp 55.0 mi/h Free-flow speed, FFS mi/h 55.0 Average passenger-car speed, S Number of lanes, N

12.0

Density, D

pc/mi/ln

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: СН Agency or Company: PARSONS
Date Performed: 8/22/2007
Analysis Time Period: Midday Peak Freeway/Direction: I-75 SB From/To: Plaza Exit/Junction Ent. Jurisdiction: 2035 (PA02) Analysis Year: Description: Detroit River International Crossing Project _____Flow Inputs and Adjustments____ Volume, V 2396 veh/h Peak-hour factor, PHF 0.95 Peak 15-min volume, v15 631 V Trucks and buses 25 Recreational vehicles Terrain type: Level Grade 0.00 용 Segment length 0.00 Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER Heavy vehicle adjustment, fHV 0.889 Driver population factor, fp 1.00 Flow rate, vp 709 pc/h/ln _____Speed Inputs and Adjustments_____ ft Lane width 12.0 6.0 ft 1.00 interchange/mi Right-shoulder lateral clearance Interchange density Number of lanes, N 4 Free-flow speed: Measured FFS or BFFS 55.0 mi/h Lane width adjustment, fLW 0.0 mi/h 0.0 mi/h 2.5 mi/h 1.5 mi/h 55.0 mi/h Lateral clearance adjustment, fLC 0.0 Interchange density adjustment, fID 2.5 Number of lanes adjustment, fN 1.5 Free-flow speed, FFS Urban Freeway _____LOS and Performance Measures_____ Flow rate, vp 709 pc/h/ln Free-flow speed, FFS 55.0 mi/h mi/h Average passenger-car speed, S 55.0 Number of lanes, N 4

pc/mi/ln

12.9

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: Agency or Company: PARSONS
Date Performed: 8/22/2007
Analysis Time Period: Midday Peak Freeway/Direction: I-75 SB From/To: Junction Ent./Livernois Exit Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Flow Inputs and Adjustments____ Volume, V 2443 veh/h Peak-hour factor, PHF 0.95 643 Peak 15-min volume, v15 V 25 Trucks and buses Recreational vehicles Terrain type: Level Grade 0.00 Segment length 0.00 Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER Heavy vehicle adjustment, fHV 0.889 Driver population factor, fp 1.00 Flow rate, vp 579 pc/h/ln _____Speed Inputs and Adjustments_____ ft Lane width 12.0 6.0 ft 1.00 interchange/mi Right-shoulder lateral clearance Interchange density Number of lanes, N Free-flow speed: Measured

 measured

 55.0
 mi/h

 0.0
 mi/h

 0.0
 mi/h

 2.5
 mi/h

 0.0
 mi/h

 55.0
 mi/h

 FFS or BFFS 55.0 0.0 Lane width adjustment, fLW Lateral clearance adjustment, fLC
Interchange density adjustment, fID 0.0 2.5 Number of lanes adjustment, fN Free-flow speed, FFS Urban Freeway LOS and Performance Measures_____ Flow rate, vp 579 pc/h/ mi/h mi/h pc/h/ln Free-flow speed, FFS 55.0 55.0 Average passenger-car speed, S Number of lanes, N 5

10.5

pc/mi/ln

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: Analyst:
Agency or Company: PARSONS
Date Performed: 8/22/2007
Analysis Time Period: Midday Peak
Freeway/Direction: I-75 SB
From/To: Livernois Exit/Plaza Ent. Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Flow Inputs and Adjustments_____ Volume, V 2273 veh/h Peak-hour factor, PHF 0.95 Peak 15-min volume, v15 598 v 25 Trucks and buses Recreational vehicles Level Terrain type: Grade 0.00 왕 Segment length 0.00 Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.889 Driver population factor, fp 1.00 Flow rate, vp 673 pc/h/ln ______Speed Inputs and Adjustments_____ 12.0 ft 6.0 ft 1.00 interchange/mi Lane width Right-shoulder lateral clearance Interchange density Number of lanes, N Free-flow speed: Measured 55.0 FFS or BFFS mi/h 0.0 Lane width adjustment, fLW mi/h 0.0 mi/h
2.5 mi/h
1.5 mi/h
55.0 mi/h Lateral clearance adjustment, fLC 0.0 2.5 Interchange density adjustment, fID Number of lanes adjustment, fN Free-flow speed, FFS Urban Freeway LOS and Performance Measures_____ pc/h/ln mi/h

673

55.0

55.0

12.2

4

mi/h

pc/mi/ln

Flow rate, vp

Density, D

Free-flow speed, FFS

Number of lanes, N

Average passenger-car speed, S

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: CHAgency or Company: PARSONS
Date Performed: 8/22/2007 Analysis Time Period: Midday Peak Freeway/Direction: I-75 SB
From/To: Plaza Ent./Springwells Ent. Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Flow Inputs and Adjustments_____ Volume, V 2765 veh/h Peak-hour factor, PHF 0.95 Peak 15-min volume, v15 728 v Trucks and buses 25 ջ Recreational vehicles Terrain type: Level Grade 0.00 용 Segment length 0.00 Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.889 Driver population factor, fp 1.00 Flow rate, vp 819 pc/h/ln ______Speed Inputs and Adjustments_____ ft Lane width 12.0 6.0 ft 1.00 interchange/mi Right-shoulder lateral clearance Interchange density Number of lanes, N 4 Free-flow speed: Measured FFS or BFFS 55.0 mi/h Lane width adjustment, fLW 0.0 mi/h 0.0 mi/h 2.5 mi/h 1.5 mi/h 55.0 mi/h Lateral clearance adjustment, fLC 0.0 2.5 Interchange density adjustment, fID 1.5 Number of lanes adjustment, fN Free-flow speed, FFS Urban Freeway _____LOS and Performance Measures_____ Flow rate, vp 819 pc/h/ln Free-flow speed, FFS 55.0 mi/h mi/h Average passenger-car speed, S 55.0 Number of lanes, N 4

14.9

pc/mi/ln

Phone: E-mail:		Fax:							
Operational Analysis									
oberacronar Wharksiz									
Analyst:	СН								
-	PARSONS								
	8/22/2007								
Analysis Time Period:									
Freeway/Direction:	I-75 SB								
From/To:	Springwells Ent./Dearborn Ent.								
Jurisdiction:									
	2035 (PA02)								
Description: Detroit Ri	Description: Detroit River International Crossing Project								
Flow Inputs and Adjustments									
Volume, V		3169	veh/h						
Peak-hour factor, PHF		0.95							
Peak 15-min volume, v15		834	V						
Trucks and buses		25	90						
Recreational vehicles		0	00						
Terrain type:		Level	el						
Grade		0.00	9						
Segment length		0.00	mi						
Trucks and buses PCE, ET		1.5							
Recreational vehicle PCE	·	1.2							
Heavy vehicle adjustment		0.889							
Driver population factor	, fp	1.00	4- 4-						
Flow rate, vp		938	pc/h/ln						
Speed Inputs and Adjustments									
Lane width		12.0	ft						
Right-shoulder lateral c	learance	6.0	ft						
Interchange density		1.00	interchange/mi						
Number of lanes, N		4	4						
Free-flow speed:		Measured							
FFS or BFFS		55.0	mi/h						
Lane width adjustment, f		0.0	mi/h						
Lateral clearance adjust	•	0.0	mi/h						
Interchange density adju		2.5	mi/h						
Number of lanes adjustme	nt, in	1.5	mi/h						
Free-flow speed, FFS		55.0	mi/h						
		Urban Freeway							
LOS and Performance Measures									
Flow rate, vp		938	pc/h/ln						
Free-flow speed, FFS		55.0	mi/h						
Average passenger-car sp	eed, S	55.0	mi/h						
Number of lanes, N		4							
Density, D		17.1	pc/mi/ln						

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: Agency or Company: PARSONS
Date Performed: 8/22/2007
Analysis Time Period: PM Peak
Freeway/Direction: I-75 SB
From/To: Ambassador Ent./Grand Ent. Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Flow Inputs and Adjustments_____ Volume, V 6041 veh/h Peak-hour factor, PHF 0.95 Peak 15-min volume, v15 1590 V Trucks and buses Recreational vehicles Terrain type: Level Grade 0.00 응 Segment length 0.00 Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.957 Driver population factor, fp 1.00 Flow rate, vp 1329 pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft Right-shoulder lateral clearance 6.0 ft. interchange/mi 1.00 Interchange density Number of lanes, N Free-flow speed: Measured FFS or BFFS 55.0 mi/h Lane width adjustment, fLW 0.0 mi/h Lateral clearance adjustment, fLC Interchange density adjustment, fID mi/h mi/h 0.0 2.5 Number of lanes adjustment, fN 0.0 mi/h 55.0 Free-flow speed, FFS mi/h Urban Freeway _____LOS and Performance Measures_____ pc/h/ln Flow rate, vp 1329 Free-flow speed, FFS mi/h mi/h 55.0 Average passenger-car speed, S 55.0 Number of lanes, N 5

24.2

pc/mi/ln

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: СН Agency or Company: PARSONS
Date Performed: 8/22/2007
Analysis Time Period: PM Peak
Freeway/Direction: I-75 SB From/To: Grand Ent./Clark Exit Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Flow Inputs and Adjustments_____ Volume, V 6512 veh/h Peak-hour factor, PHF 0.95 Peak 15-min volume, v15 1714 V Trucks and buses 10 0 Recreational vehicles Terrain type: Level Grade 0.00 Segment length 0.00 тi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.952 Driver population factor, fp 1.00 Flow rate, vp 1200 pc/h/ln ______Speed Inputs and Adjustments_____ Lane width 12.0 ft ft interchange/mi Right-shoulder lateral clearance 6.0 1.00 Interchange density Number of lanes, N Free-flow speed: Measured mi/h mi/h FFS or BFFS 55.0 0.0 Lane width adjustment, fLW mi/h mi/h mi/h mi/h Lateral clearance adjustment, fLC Interchange density adjustment, fID 0.0 2.5 Number of lanes adjustment, fN 0.0 0.0 55.0 Free-flow speed, FFS mi/h Urban Freeway LOS and Performance Measures_____ Flow rate, vp 1200 pc/h/ln Free-flow speed, FFS 55.0 mi/h mi/h Average passenger-car speed, S 55.0 Number of lanes, N 6

21.8

pc/mi/ln

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: CH Agency or Company: PARSONS
Date Performed: 8/22/2007 Date Performed:

Analysis Time Period: PM Peak
Freeway/Direction: I-75 SB
Clark Exit/Plaza Exit Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Flow Inputs and Adjustments____ Volume, V 6228 veh/h Peak-hour factor, PHF 0.95 Peak 15-min volume, v15 1639 Trucks and buses 10 0 Recreational vehicles Terrain type: Level Grade 0.00 9 Segment length 0.00 тi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.952 Driver population factor, fp 1.00 Flow rate, vp 1377 pc/h/ln _____Speed Inputs and Adjustments____ Lane width 12.0 ft ft interchange/mi Right-shoulder lateral clearance 6.0 1.00 Interchange density Number of lanes, N Free-flow speed: Measured FFS or BFFS mi/h 55.0 Lane width adjustment, fLW 0.0 mi/h Lateral clearance adjustment, fLC Interchange density adjustment, fID mi/h mi/h mi/h 0.0 2.5 Number of lanes adjustment, fN 0.0 υ.0 55.0 Free-flow speed, FFS mi/h Urban Freeway LOS and Performance Measures_____ Flow rate, vp pc/h/ln 1377 Free-flow speed, FFS mi/h mi/h 55.0 Average passenger-car speed, S 55.0 Number of lanes, N 5

25.0

pc/mi/ln

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: Agency or Company: PARSONS
Date Performed: 8/22/2007
Analysis Time Period: PM Peak
Freeway/Direction: I-75 SB
From/To: Plaza Exit/Junction Ent. Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Flow Inputs and Adjustments_____ Volume, V 5291 veh/h Peak-hour factor, PHF 0.95 Peak 15-min volume, v15 1392 Trucks and buses 9 0 Recreational vehicles Terrain type: Level Grade 0.00 Segment length 0.00 Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.957 Driver population factor, fp 1.00 Flow rate, vp 1455 pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft ft interchange/mi Right-shoulder lateral clearance 6.0 Interchange density 1.00 Number of lanes, N Free-flow speed: Measured mi/h mi/h FFS or BFFS 55.0 0.0 mi/h
0.0 mi/h
2.5 mi/h
1.5 mi/h
55.0 mi/h Lane width adjustment, fLW Lateral clearance adjustment, fLC Interchange density adjustment, fID Number of lanes adjustment, fN Free-flow speed, FFS Urban Freeway _____LOS and Performance Measures____ Flow rate, vp pc/h/ln 1455 Free-flow speed, FFS mi/h mi/h 55.0 Average passenger-car speed, S 55.0 Number of lanes, N 4 Density, D 26.5 pc/mi/ln

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: Agency or Company: PARSONS
Date Performed: 8/22/2007
Analysis Time Period: PM Peak
Freeway/Direction: I-75 SB
From/To: Junction From/To: Junction Ent./Livernois Exit Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Flow Inputs and Adjustments_____ Volume, V 5588 veh/h Peak-hour factor, PHF 0.95 Peak 15-min volume, v15 1471 9 0 Trucks and buses Recreational vehicles Level Terrain type: Grade 0.00 mi Segment length 0.00 Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.957 Driver population factor, fp 1.00 Flow rate, vp 1229 pc/h/ln _____Speed Inputs and Adjustments_____ 12.0 Lane width ft 6.0 ft Right-shoulder lateral clearance interchange/mi 1.00 Interchange density Number of lanes, N Free-flow speed: Measured 55.0 mi/h mi/h FFS or BFFS Lane width adjustment, fLW 0.0 Lateral clearance adjustment, fLC Interchange density adjustment, fID mi/h 0.0 2.5 mi/h Number of lanes adjustment, fN 0.0 mi/h 55.0 mi/h Free-flow speed, FFS Urban Freeway LOS and Performance Measures_____ pc/h/ln Flow rate, vp 1229 mi/h mi/h 55.0 Free-flow speed, FFS 55.0 Average passenger-car speed, S Number of lanes, N 5 22.3 Density, D pc/mi/ln

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: СН Analyst:
Agency or Company: PARSONS
Date Performed: 8/22/2007
Analysis Time Period: PM Peak
Freeway/Direction: I-75 SB
From/To: Livernois Exit/Plaza Ent. Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Flow Inputs and Adjustments_____ Volume, V 5410 veh/h Peak-hour factor, PHF 0.95 Peak 15-min volume, v15 1424 8 0 Trucks and buses Recreational vehicles Terrain type: Level Grade 0.00 Segment length 0.00 Мi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.962 Driver population factor, fp 1.00 Flow rate, vp 1481 pc/h/ln ______Speed Inputs and Adjustments_____ Lane width 12.0 ft Right-shoulder lateral clearance 6.0 ft interchange/mi Interchange density 1.00 Number of lanes, N Free-flow speed: Measured FFS or BFFS mi/h 55.0 0.0 Lane width adjustment, fLW mi/h 0.0 mi/h
2.5 mi/h
1.5 mi/h
55.0 mi/h Lateral clearance adjustment, fLC Interchange density adjustment, fID 0.0 2.5 1.5 Number of lanes adjustment, fN Free-flow speed, FFS Urban Freeway _____LOS and Performance Measures_____ 1481 Flow rate, vp pc/h/ln mi/h mi/h Free-flow speed, FFS 55.0 Average passenger-car speed, S 55.0 mi/h Number of lanes, N 4

26.9

pc/mi/ln

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: Analyst:
Agency or Company:
Date Performed:
Analysis Time Period:
Freeway/Direction:
From/To:
PARSONS
8/22/2007
PM Peak
Freeway/Direction:
I-75 SB
Plaza Ent./Springwells Ent. Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Flow Inputs and Adjustments_____ Volume, V 5900 veh/h Peak-hour factor, PHF 0.95 Peak 15-min volume, v15 1553 Trucks and buses 12 0 Recreational vehicles Terrain type: Level Grade 0.00 Segment length 0.00 Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.943 Driver population factor, fp 1.00 Flow rate, vp 1646 pc/h/ln _____Speed Inputs and Adjustments____ Lane width 12.0 ft ft interchange/mi 6.0 Right-shoulder lateral clearance Interchange density 1.00 Number of lanes, N Free-flow speed: Measured FFS or BFFS 55.0 mi/h 0.0 Lane width adjustment, fLW mi/h 0.0 mi/h
2.5 mi/h
1.5 mi/h
55.0 mi/h Lateral clearance adjustment, fLC Interchange density adjustment, fID 0.0 2.5 1.5 Number of lanes adjustment, fN Free-flow speed, FFS Urban Freeway LOS and Performance Measures____ Flow rate, vp 1646 pc/h/ln Free-flow speed, FFS 55.0 mi/h mi/h Average passenger-car speed, S 55.0 Number of lanes, N 4

29.9

pc/mi/ln

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: СН Agency or Company: PARSONS
Date Performed: 8/22/2007 Analysis Time Period: PM Peak
Freeway/Direction: I-75 SB From/To: Springwells Ent./Dearborn Ent. Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Flow Inputs and Adjustments____ Volume, V 6247 veh/h Peak-hour factor, PHF 0.95 Peak 15-min volume, v15 1644 12 0 Trucks and buses Recreational vehicles Terrain type: Level Grade 0.00 Segment length 0.00 Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.943 Driver population factor, fp 1.00 Flow rate, vp 1743 pc/h/ln _____Speed Inputs and Adjustments_____ 12.0 ft Lane width Right-shoulder lateral clearance 6.0 £t interchange/mi Interchange density 1.00 Number of lanes, N Free-flow speed: Measured mi/h FFS or BFFS 55.0 Lane width adjustment, fLW 0.0 mi/h Lateral clearance adjustment, fLC Interchange density adjustment, fID mi/h mi/h mi/h 0.0 2.5 Number of lanes adjustment, fN 1.5 1.5 55.0 Free-flow speed, FFS mi/h Urban Freeway _____LOS and Performance Measures_____ Flow rate, vp 1743 pc/h/ln Free-flow speed, FFS mi/h mi/h 55.0 Average passenger-car speed, S 55.0 Number of lanes, N 4 Density, D 31.7 pc/mi/ln

Phone: Fax: E-mail: ______Diverge Analysis______ Analyst: CH
Agency/Co.: PARSONS
Date performed: 8/22/2007 Analysis time period: AM Peak Freeway/Dir of Travel: I-75 NB Exit Ramp W of Dearborn Junction: Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Freeway Data_____ Type of analysis Diverge Number of lanes in freeway 55.0 5240 Free-flow speed on freeway mph vph Volume on freeway vph Off Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-Flow speed on ramp 35.0 mph vph Volume on ramp 99 Length of first accel/decel lane
Length of second accel/decel lane 120 ft ft. _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? No Volume on adjacent ramp vph Position of adjacent ramp Type of adjacent ramp Distance to adjacent ramp ft _____Conversion to pc/h Under Base Conditions Junction Components Freeway Ramp Adjacent Ramp 5240 99 0.95 0.95 1379 26 16 11 Volume, V (vph) vph Peak-hour factor, PHF Peak 15-min volume, v15 V Trucks and buses 용 0 0
Level Level
0.00 % 0.00 %
0.00 mi 0.00 mi
1.5 Recreational vehicles 용 Terrain type: Grade mi Length Trucks and buses PCE, ET 1.5 1.5 Recreational vehicle PCE, ER 1.2 1.2

```
Driver population factor, fP
                                1.00
                                          1.00
Flow rate, vp
                                5957
                                          110
                                                            pcph
     _____Estimation of V12 Diverge Areas
              L =
                           (Equation 25-8 or 25-9)
               ΕQ
              P = 0.436 Using Equation 8
               FD
               v = v + (v - v) P = 2659 pc/h
               12 R F R FD
              _____Capacity Checks____
                      Actual
                                 Maximum
                                              LOS F?
    \nabla = \Delta
                      5957
                                  9000
                                               Νo
    Fi F
                      2659
                                 4400
                                               No
    12
    \Delta = \Delta - \Delta
                      5847
                              9000
                                               No
    FO F R
                      110
                              2000
                                               No
    R
       Level of Service Determination (if not F)_____
                   D = 4.252 + 0.0086 v - 0.009 L = 26.0 pc/mi/ln
Density,
                                   12 D
Level of service for ramp-freeway junction areas of influence C
        _____Speed Estimation
Intermediate speed variable,
                                     D = 0.438
                                     S
Space mean speed in ramp influence area,
                                    S = 49.3
                                              mph
```

R

0

S = 57.8

S = 53.7

mph

mph

0.926

0.948

Heavy vehicle adjustment, fHV

Space mean speed in outer lanes,

Space mean speed for all vehicles,

Phone: Fax: E-mail: _____Diverge Analysis______ Analyst: СН Agency/Co.: Agency/Co.: PARSONS
Date performed: 8/22/2007 Analysis time period: AM Peak Freeway/Dir of Travel: I-75 NB Exit Ramp W of Springwells Junction: Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Freeway Data_____ Type of analysis Diverge Number of lanes in freeway 4 55.0 5141 mph vph Free-flow speed on freeway Volume on freeway vph _____Off Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 mph vph Free-Flow speed on ramp 35.0 Volume on ramp 402 250 Length of first accel/decel lane
Length of second accel/decel lane ft Length of second accel/decel lane ft ______Adjacent Ramp Data (if one exists) Does adjacent ramp exist? No Volume on adjacent ramp vph Position of adjacent ramp Type of adjacent ramp Distance to adjacent ramp ft _____Conversion to pc/h Under Base Conditions____ Junction Components Freeway Ramp Adjacent Ramp 5141 402 0.95 0.95 1353 106 16 2 0 0 Level Grade 0.00 % -3.31 % 0.00 mi 0.14 mi 1.5 1.5 Volume, V (vph) vph Peak-hour factor, PHF Peak 15-min volume, v15 v Trucks and buses 응 Recreational vehicles 양 Terrain type: Grade % mi ુ Length Trucks and buses PCE, ET 1.5 1.5 Recreational vehicle PCE, ER 1.2 1.2

```
Driver population factor, fP
                                       1.00
                              1.00
Flow rate, vp
                              5845
                                       427
                                                         pcph
        _____Estimation of V12 Diverge Areas
                          (Equation 25-8 or 25-9)
              ΕQ
              P = 0.436 Using Equation 8
              FD
              v = v + (v - v) P = 2789 pc/h
              12 R F R FD
              _____Capacity Checks____
                     Actual
                                           LOS F?
                                Maximum
                     5845
                                9000
   \Delta = \Delta
                                            No
    Fi F
                     2789
                               4400
                                            No
    12
                     5418
                            9000
    v = v - v
                                            No
       F R
    FO
                     427
                            2000
                                            No
    R
       Level of Service Determination (if not F)_____
Density,
                  D = 4.252 + 0.0086 v - 0.009 L = 26.0 pc/mi/ln
                                 12 D
                  R
Level of service for ramp-freeway junction areas of influence C
 _____Speed Estimation_____
Intermediate speed variable,
                                   D = 0.466
                                   S
Space mean speed in ramp influence area,
                                  s = 48.9
                                            mph
                                   R
```

0.926

0.990

S = 58.3 mph

mph

0

S = 53.4

Heavy vehicle adjustment, fHV

Space mean speed in outer lanes,

Space mean speed for all vehicles,

Phone: Fax: E-mail: ______Diverge Analysis______ Analyst: CH
Agency/Co.: PARSONS
Date performed: 8/22/2007 Agency/Co.: Analysis time period: AM Peak Freeway/Dir of Travel: I-75 NB Plaza Exit Ramp W of Waterman Junction: Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Freeway Data______ Type of analysis Diverge 4 Number of lanes in freeway 55.0 mph 4739 vph Free-flow speed on freeway Volume on freeway ____Off Ramp Data_____ Side of freeway Right Number of lanes in ramp 2 mph vph ft Free-Flow speed on ramp 45.0 Volume on ramp 394 Length of first accel/decel lane 1963
Length of second accel/decel lane 0 1963 ft ______Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? No Volume on adjacent ramp vph Position of adjacent ramp Type of adjacent ramp Distance to adjacent ramp ft Conversion to pc/h Under Base Conditions_____ Freeway Ramp Junction Components Adjacent Ramp Volume, V (vph)

Peak-hour factor, PHF

Peak 15-min volume, v15

Trucks and buses

Recreational vehicles

Grade

Grade

Length

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

Ram

4739

394

0.95

0.95

0.95

1247

104

Crade

Grade

0.00

5.00

6

1.5

1.5

1.5

Recreational vehicle PCE, ER vph V 양 용 % mi

```
Flow rate, vp
                               5412
                                        467
                                                          pcph
             _____Estimation of V12 Diverge Areas
              L =
                          (Equation 25-8 or 25-9)
              ΕQ
              P = 0.260 Using Equation 0
              FD
              v = v + (v - v) P = 1753 pc/h
              12 R F R FD
                  _____Capacity Checks____
                     Actual
                                            LOS F?
                                Maximum
   v = v
                     5412
                                9000
                                             No
    Fi F
                     1753
                                4400
                                             No
    12
                     4945
                             9000
   \Lambda = \Lambda - \Lambda
                                             No
    FO
       F R
                     467
    V
                            4100
                                             Νo
    R
        Level of Service Determination (if not F)_____
Density,
                  D = 4.252 + 0.0086 v - 0.009 L = -16.0 pc/mi/ln
                                  12 D
                   R
Level of service for ramp-freeway junction areas of influence A
     Speed Estimation
Intermediate speed variable,
                                    D = 0.340
                                    S
Space mean speed in ramp influence area,
                                  S = 50.6  mph
                                    R
Space mean speed in outer lanes,
                                   S = 57.1 \quad mph
                                    0
```

0.922

1.00

0.889

1.00

S = 54.8

mph

Heavy vehicle adjustment, fHV

Space mean speed for all vehicles,

Driver population factor, fP

Phone: Fax: E-mail: ______Merge Analysis_____ Analyst: CH
Agency/Co.: PARSONS
Date performed: 8/23/2007 Agency/Co.: Analysis time period: AM Peak Freeway/Dir of Travel: I-75 NB Entrance Ramp W of Livernois Junction: Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway 4 Free-flow speed on freeway 55.0 4345 mph vph Volume on freeway vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph vph Volume on ramp 307 Length of first accel/decel lane
Length of second accel/decel lane 1164 ft ft ______Adjacent Ramp Data (if one exists)____ Does adjacent ramp exist? No Volume on adjacent Ramp vph Position of adjacent Ramp Type of adjacent Ramp Distance to adjacent Ramp ft ______Conversion to pc/h Under Base Conditions Junction Components Freeway Ramp Adjacent Ramp

 4345
 307

 0.95
 0.95

 1143
 81

 11
 3

 Volume, V (vph) vph Peak-hour factor, PHF Peak 15-min volume, v15 V 11 Trucks and buses Recreational vehicles 0 0 Level Grade % -1.20 % 0 응 Terrain type: Grade mi 0.06 mi Length mi Trucks and buses PCE, ET 1.5 1.5 Recreational vehicle PCE, ER 1.2 1.2 1.5

```
Driver population factor, fP
                               1.00
                                         1.00
Flow rate, vp
                               4825
                                         328
                                                          pcph
       _____Estimation of V12 Merge Areas____
              L =
                          (Equation 25-2 or 25-3)
              ΕQ
              P = 0.548 Using Equation 4
               FM
              v = v (P) = 2642 pc/h
               12 F FM
              _____Capacity Checks_____
                     Actual
                                Maximum LOS F?
    v
                     5153
                                9000
                                             No
    FΟ
                                4600
                     2970
                                             No
    R12
   Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 21.2 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C
  _____Speed Estimation____
Intermediate speed variable,
                                    M = 0.316
                                    S
                                   s = 50.9
Space mean speed in ramp influence area,
                                             mph
                                    R
                                    S = 52.9  mph
Space mean speed in outer lanes,
                                    0
```

0.948

0.985

S = 51.7 mph

Heavy vehicle adjustment, fHV

Space mean speed for all vehicles,

Phone: E-mail:	Fax:								
Diverge Analysis									
Analyst:	СН								
Agency/Co.:	PARSONS								
Date performed:									
Analysis time period:									
Freeway/Dir of Travel:									
Junction:	Exit Ramp W of Junction								
Jurisdiction:	DATE Namp w OI OunceIOH								
Analysis Year:	2035 (PA02)								
Description: Detroit R		onal Cros	ssing	g Project	ī.				
Freeway Data									
Type of analysis		D i	iverd	10					
Number of lanes in free	wa v	_	rvero	j C					
Free-flow speed on free	-		5.0		mph				
Volume on freeway	.way		552		vph				
-					_				
	Off I	Ramp Data	a						
Side of freeway		Ri	Lght						
Number of lanes in ramp									
Free-Flow speed on ramp			5.0		mph				
Volume on ramp	142			vph					
Length of first accel/d	64	647							
Length of second accel/	decel lane			•	ft				
Adjacent Ramp Data (if one exists)									
Does adjacent ramp exis	;t?	No)						
Volume on adjacent ramp			-		vph				
Position of adjacent ra				. 1					
Type of adjacent ramp	L								
Distance to adjacent ra	qmp				ft				
Con	version to pc/h	n Under E	Base	Conditio	ons				
Junction Components		Freeway	7	Ramp		Adjacent			
		_		-		Ramp			
Volume, V (vph)		4652		142		vph			
Peak-hour factor, PHF		0.95		0.95					
Peak 15-min volume, v15		1224		37		V			
Trucks and buses		11		5		90			
Recreational vehicles		0		0		%			
Terrain type:		Level		Grade		- -			
Grade		0.00	%	1.28	9	90			
Length		0.00	mi	0.03	mi	mi			
Trucks and buses PCE, E	T	1.5		1.5					
Recreational vehicle PC	E, ER	1.2		1.2					

```
Flow rate, vp
                               5166
                                         153
                                                          pcph
      _____Estimation of V12 Diverge Areas_____
              L =
                          (Equation 25-8 or 25-9)
               ΕQ
              P = 0.436 Using Equation 8
               FD
              v = v + (v - v) P = 2339 pc/h
               12 R F R FD
                   _____Capacity Checks____
                     Actual
                                 Maximum
                                            LOS F?
    v = v
                     5166
                                 9000
                                              No
    Fi F
                     2339
                                4400
                                              No
    12
    \Delta = \Delta - \Delta
                     5013
                             9000
                                              No
    FO F R
                     153 2000
                                              No
    R
       Level of Service Determination (if not F)
                  D = 4.252 + 0.0086 v - 0.009 L = 18.5 pc/mi/ln
Density,
                                 12 D
Level of service for ramp-freeway junction areas of influence B
     _____Speed Estimation
Intermediate speed variable,
                                    D = 0.442
                                    S
Space mean speed in ramp influence area,
                                   S = 49.3 \quad mph
                                    R
Space mean speed in outer lanes,
                                    S = 58.7 mph
Space mean speed for all vehicles,
                                   S = 54.0
                                             mph
```

0.948

1.00

0.976

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: Fax: E-mail: Merge Analysis_____ Analyst: CH
Agency/Co.: PARSONS
Date performed: 8/23/2007 Analysis time period: AM Peak Freeway/Dir of Travel: I-75 NB Entrance Ramp E of Clark: Junction: Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project Type of analysis Merge Number of lanes in freeway 4 55.0 mph 5203 vph Free-flow speed on freeway Volume on freeway On Ramp Data_____ Side of freeway Right Number of lanes in ramp mph vph 35.0 Free-flow speed on ramp Volume on ramp 329 Length of first accel/decel lane 590 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ No Does adjacent ramp exist? Volume on adjacent Ramp vph Position of adjacent Ramp Type of adjacent Ramp Distance to adjacent Ramp ft _____Conversion to pc/h Under Base Conditions_____ Freeway Ramp Junction Components Adjacent Ramp

 5203
 329

 0.95
 0.95

 1369
 87

 13
 22

 0
 0

 Volume, V (vph) vph Peak-hour factor, PHF Peak 15-min volume, v15 V Trucks and buses 양 0 0 Level Level Recreational vehicles 용 Terrain type: Grade mi mi Length mi Trucks and buses PCE, ET 1.5 1.5 Recreational vehicle PCE, ER 1.2 1.2

Flow rate, vp 5833 384 pcph _____Estimation of V12 Merge Areas_____ (Equation 25-2 or 25-3) ΕQ P = 0.358 Using Equation 4 FMv = v (P) = 2087 pc/h12 F FM _____Capacity Checks_____ Actual Maximum LOS F? V 6217 9000 No FO 2471 4600 NoR12 Level of Service Determination (if not F)_____ Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 20.9 pc/mi/ln12 Level of service for ramp-freeway junction areas of influence C _____Speed Estimation____ Intermediate speed variable, M = 0.326S Space mean speed in ramp influence area, S = 50.8mph R Space mean speed in outer lanes, S = 50.1mph 0

0.939

1.00

0.901

1.00

S = 50.3

mph

Heavy vehicle adjustment, fHV

Space mean speed for all vehicles,

Driver population factor, fP

Phone: Fax: E-mail: _____Diverge Analysis_____ Analyst: CH
Agency/Co.: PARSONS
Date performed: 8/23/2007 Analysis time period: AM Peak Freeway/Dir of Travel: I-75 NB Exit Ramp E of Grand Junction: Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Freeway Data_____ Type of analysis Diverge Number of lanes in freeway 55.0 5532 mph vph Free-flow speed on freeway Volume on freeway vph Off Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 mph vph Free-Flow speed on ramp 35.0 Volume on ramp 20 Length of first accel/decel lane 235 ft ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? No Volume on adjacent ramp vph Position of adjacent ramp Type of adjacent ramp Distance to adjacent ramp ft _____Conversion to pc/h Under Base Conditions_____ Freeway Ramp Junction Components Adjacent TR

5532 20

0.95 0.95

1456 5

14 25

0 0

Level Grade

0.00 % 2.94 %

0.00 mi 0.13 mi

1.5 1.5 Ramp Volume, V (vph) vph Peak-hour factor, PHF Peak 15-min volume, v15 V Trucks and buses 왕 Recreational vehicles 응 Terrain type: Grade % mi Length Trucks and buses PCE, ET 1.5 1.5 Recreational vehicle PCE, ER 1.2 1.2

```
Flow rate, vp
                                6231
                                          24
                                                             pcph
        ______Estimation of V12 Diverge Areas_____
                           (Equation 25-8 or 25-9)
               ΕQ
               P = 0.436 Using Equation 8
               FD
               v = v + (v - v) P = 2323 pc/h
               12 R F R FD
                  _____Capacity Checks____
                      Actual
                                  Maximum
                                              LOS F?
    \Delta = \Delta
                      5297
                                  9000
                                               Nο
     Fi F
                      2323
                                 4400
                                               Νo
     12
                     5273
                              9000
    \Lambda = \Lambda - \Lambda
                                               No
     FO F R
                      24
                                 2000
                                               No
    R
        Level of Service Determination (if not F)_____
                   D = 4.252 + 0.0086 v - 0.009 L = 22.1 pc/mi/ln
Density,
                                   12 D
Level of service for ramp-freeway junction areas of influence C
         _____Speed Estimation
Intermediate speed variable,
                                     D = 0.430
                                     S
Space mean speed in ramp influence area,
                                    S = 49.4
                                               mph
                                     R
Space mean speed in outer lanes,
                                     S = 58.4
                                                mph
```

S = 54.1

mph

0.935

1.00

0.889

1.00

Heavy vehicle adjustment, fHV

Space mean speed for all vehicles,

Driver population factor, fP

Phone: E-mail:	Fax:					
	Diver	ge Analys	sis_			
Analyst: Agency/Co.: Date performed: Analysis time period: Freeway/Dir of Travel: Junction: Jurisdiction: Analysis Year: Description: Detroit F	CH PARSONS 8/23/2007 Midday Peak I-75 NB Exit Ramp W of 2035 (PA02)	Dearborn nal Cross	n sing	Project	<u>.</u>	
	FreeFree	way Data_				
Type of analysis Number of lanes in free Free-flow speed on free Volume on freeway		4 55. 279	.0 95		mph vph	
						
Side of freeway Number of lanes in ramp Free-Flow speed on ramp Volume on ramp Length of first accel/c Length of second accel/	decel lane decel lane	44 120	. 0	o oviets	mph vph ft ft	
	Adjacent Ramp	Data (I)	L On	e exists	·)	
Does adjacent ramp exist Volume on adjacent ramp Position of adjacent ramp Type of adjacent ramp Distance to adjacent ramp	mp	No			vph ft	
Con	version to pc/h	Under Ba	ase	Conditio	ns	
Junction Components		Freeway		Ramp		Adjacent
Volume, V (vph) Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type: Grade Length Trucks and buses PCE, E Recreational vehicle PC	T	2795 0.95 736 25 0 Level 0.00 0.00 1.5	% mi	44 0.95 12 7 0 Level 0.00 0.00 1.5	% mi	Ramp vph v % % % mi

pcph

____Estimation of V12 Diverge Areas_____ (Equation 25-8 or 25-9) ΕQ P = 0.436 Using Equation 8 FDv = v + (v - v) P = 1470 pc/h12 R F R FD _____Capacity Checks____ Actual Maximum LOS F? v = v3310 9000 No Fi F 1470 4400 No 12 v = v - v3262 9000 No FO F R 48 2000 NoR Level of Service Determination (if not F)_____ D = 4.252 + 0.0086 v - 0.009 L = 15.8 pc/mi/lnDensity, 12 D Level of service for ramp-freeway junction areas of influence B _____Speed Estimation Intermediate speed variable, D = 0.432S Space mean speed in ramp influence area, S = 49.4mph Space mean speed in outer lanes, s = 60.3mph

1

S = 54.9

mph

Phone: Fax: E-mail: _____Diverge Analysis_____ CH Analyst: Agency/Co.: Agency/Co.: PARSONS
Date performed: 8/23/2007 Analysis time period: Midday Peak Freeway/Dir of Travel: I-75 NB Exit Ramp W of Springwells Junction: Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Freeway Data_____ Type of analysis Diverge Number of lanes in freeway 55.0 2751 mph vph Free-flow speed on freeway Volume on freeway _____Off Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-Flow speed on ramp 35.0 mph vph Volume on ramp 273 Length of first accel/decel lane 250 ft Length of second accel/decel lane ft. _____Adjacent Ramp Data (if one exists)____ Does adjacent ramp exist? No Volume on adjacent ramp vph Position of adjacent ramp Type of adjacent ramp Distance to adjacent ramp ft _____Conversion to pc/h Under Base Conditions Junction Components Freeway Ramp Adjacent Ramp 273 0.95 72 10 Volume, V (vph) 2751 vph Peak-hour factor, PHF 0.95 Peak 15-min volume, v15 724 V 25 Trucks and buses 0 0
Level Grade
0.00 % -3.31 %
0.00 mi 0.14 mi Recreational vehicles 용 Terrain type: Grade Length mi Trucks and buses PCE, ET 1.5 1.5

Recreational vehicle PCE, ER 1.2 1.2

```
Flow rate, vp
                               3258
                                        302
                                                          pcph
      _____Estimation of V12 Diverge Areas_____
                          (Equation 25-8 or 25-9)
               ΕQ
              P = 0.436 Using Equation 8
              FD
              v = v + (v - v) P = 1591 pc/h
              12 R F R FD
                  _____Capacity Checks_____
                     Actual
                                Maximum
                                            LOS F?
   v = v
                     3258
                                9000
                                             No
    Fi F
                     1591
                                4400
                                             No
    12
   \Delta r = \Delta - \Delta
                     2956
                            9000
                                             No
    FO F R
                     302
                          2000
                                             No
    R
       ___Level of Service Determination (if not F)_____
                  D = 4.252 + 0.0086 v - 0.009 L = 15.7 pc/mi/ln
Density,
                              12 D
                   R
Level of service for ramp-freeway junction areas of influence B
      ______Speed Estimation
Intermediate speed variable,
                                    D = 0.455
                                    S
Space mean speed in ramp influence area,
                                  S = 49.1  mph
Space mean speed in outer lanes,
                                   S = 60.3
                                              mph
                                    0
Space mean speed for all vehicles,
                                  S = 54.3 mph
```

1.00

0.952

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: Fax: E-mail: _____Diverge Analysis_____ CH Analyst: Agency/Co.: Agency/Co.: PARSONS
Date performed: 8/23/2007 Analysis time period: Midday Peak Freeway/Dir of Travel: I-75 NB Plaza Exit Ramp W of Waterman Junction: Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Freeway Data_____ Type of analysis Diverge Number of lanes in freeway 4 mph 55.0 2477 Free-flow speed on freeway Volume on freeway _____Off Ramp Data_____ Side of freeway Right Number of lanes in ramp 2 Free-Flow speed on ramp mph vph 45.0 Volume on ramp 708 Length of first accel/decel lane 1963
Length of second accel/decel lane 0 ft 1963 ft. ______Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? No Volume on adjacent ramp vph Position of adjacent ramp Type of adjacent ramp Distance to adjacent ramp ft _____Conversion to pc/h Under Base Conditions_____ Junction Components Freeway Ramp Adjacent Ramp 2477 708 0.95 0.95 652 186 25 25 0 0 Level Grade 0.00 % 5.00 % 0.00 mi 0.17 mi 1.5 1.5 Volume, V (vph) vph Peak-hour factor, PHF Peak 15-min volume, v15 V Trucks and buses 응 Recreational vehicles ે Terrain type: Grade Length mi Trucks and buses PCE, ET Trucks and buses PCE, ET 1.5 1.5 Recreational vehicle PCE, ER 1.2 2.5 1.5

```
Flow rate, vp
                              2933
                                        838
                                                          pcph
             ____Estimation of V12 Diverge Areas_____
              L =
                          (Equation 25-8 or 25-9)
              ΕQ
              P = 0.260 Using Equation 0
              FD
              v = v + (v - v) P = 1383 pc/h
              12 R F R FD
              _____Capacity Checks_____
                     Actual
                                Maximum
                                            LOS F?
   v = v
                     2933
                                9000
                                             No
    Fi F
                     1383
                               4400
                                             No
    12
   v = v - v
                     2095
                            9000
                                             No
    FO F R
                     838
                         4100
                                             No
    R
       Level of Service Determination (if not F)_____
Density,
                  D = 4.252 + 0.0086 v - 0.009 L = -19.2 pc/mi/ln
                                 12 D
                  R
Level of service for ramp-freeway junction areas of influence A
   _____Speed Estimation_____
Intermediate speed variable,
                                   D = 0.373
                                   S
Space mean speed in ramp influence area, S = 50.1 mph
Space mean speed in outer lanes,
                                   S = 60.3 \quad mph
                                   0
Space mean speed for all vehicles,
                                  S = 55.1
```

1.00

0.889

1.00

mph

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: Fax: E-mail: ______Merge Analysis_____ Analyst: CH
Agency/Co.: PARSONS
Date performed: 8/23/2007 Agency/Co.: Analysis time period: Midday Peak Freeway/Dir of Travel: I-75 NB Entrance Ramp W of Livernois Junction: Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Freeway Data_____ Type of analysis Merae Number of lanes in freeway 4 mph vph Free-flow speed on freeway 55.0 1769 Volume on freeway vph ____On Ramp Data____ Side of freeway Right Number of lanes in ramp 1 mph vph Free-flow speed on ramp 35.0 Volume on ramp 111 Length of first accel/decel lane 1164
Length of second accel/decel lane ft ft ______Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? No Volume on adjacent Ramp vph Position of adjacent Ramp Type of adjacent Ramp Distance to adjacent Ramp ft _____Conversion to pc/h Under Base Conditions____ Junction Components Freeway Ramp Adjacent Ramp 111 0.95 29 10 Volume, V (vph) 1769 vph Peak-hour factor, PHF 0.95 466 Peak 15-min volume, v15 V 25 Trucks and buses 읭 Recreational vehicles Ω 읭 Terrain type: Grade 응 mi 0.06 mi mi Length Trucks and buses PCE, ET 1.5 1.5
Recreational vehicle PCE, ER 1.2 1.2 1.5

```
Heavy vehicle adjustment, fHV
                                0.889
                                          0.952
Driver population factor, fP
                                1.00
                                          1.00
Flow rate, vp
                                2095
                                          123
                                                            pcph
       _____Estimation of V12 Merge Areas_____
                           (Equation 25-2 or 25-3)
               ΕQ
              P = 0.573 Using Equation 4
               FM
              v = v (P) = 1201 pc/h
               12 F FM
                  ____Capacity Checks____
                      Actual
                                 Maximum
                                           LOS F?
    V
                      2218
                                 9000
                                               No
    FΟ
                      1324
                                 4600
                                               No
    R12
      _____Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 8.4 pc/mi/ln
Level of service for ramp-freeway junction areas of influence A
          _____Speed Estimation____
Intermediate speed variable,
                                     M = 0.254
                                     S
Space mean speed in ramp influence area,
                                    S = 51.7
                                              mph
                                     R
Space mean speed in outer lanes,
                                     S = 55.0
                                              mph
                                     0
```

S = 53.0

mph

Phone: E-mail:	Fax:							
	Diver	ge Analy	sis_					
Analyst:	СН							
Agency/Co.:	PARSONS							
Date performed:								
Analysis time period:	Midday Poak							
Freeway/Dir of Travel:	T-75 NR							
Junction:	Exit Ramp W of	Jungtio	\n					
Jurisdiction:	date namp w or	duncere	711					
Analysis Year:	2035 (PA02)							
Description: Detroit R		nal Cros	sinc	, Project	-			
			_	_				
			`					
Type of analysis		Di	verg	ſe				
Number of lanes in free	_	4						
Free-flow speed on free	way	5.5	5.0		mph			
Volume on freeway		18	80		vph			
	Off R	amp Data	1					
Girls of Green		_ ,						
Side of freeway			ght					
Number of lanes in ramp					,			
Free-Flow speed on ramp			.0		mph			
Volume on ramp	ogal lama				vph			
Length of first accel/d Length of second accel/		64	ft ft					
dengen of second accer,	decei iane				ΙL			
	Adjacent Ramp	Data (i	for	ne exists	s)			
Does adjacent ramp exis	t?	No)					
Volume on adjacent ramp					vph			
Position of adjacent ra	mp				-			
Type of adjacent ramp								
Distance to adjacent ra	mp				ft			
Con	version to pc/h	Under E	Base	Conditio	ons			
Tungtion Company		П	_	Danie		7.1		
Junction Components		Freeway	7	Ramp		Adjacent Ramp		
Volume, V (vph)		1880		51		vph		
Peak-hour factor, PHF		0.95		0.95		VPII		
Peak 15-min volume, v15		495		13		V		
Trucks and buses		25		18		90		
Recreational vehicles		0		0		0		
Terrain type:		Level		Grade		O		
Grade		0.00	%	1.28	96	9		
Length		0.00	mi	0.03	mi	mi		
Trucks and buses PCE, E	T	1.5	***	1.5	<u>.</u>	шт		
Recreational vehicle PC		1.2		1.2				
	•	-		-				

```
Driver population factor, fP
                             1.00
                                      1.00
Flow rate, vp
                             2226
                                      59
                                                       pcph
        _____Estimation of V12 Diverge Areas
                         (Equation 25-8 or 25-9)
              EQ
             P = 0.436 Using Equation 8
              FD
             v = v + (v - v) P = 1004 pc/h
              12 R F R FD
                 _____Capacity Checks_____
                    Actual
                               Maximum
                                        LOS F?
   v = v
                    2226
                               9000
                                           Νo
    Fi F
                    1004
                              4400
                                           No
    12
                    2167 9000
   v = v - v
                                           No
    FO F R
                    59 2000
   V
                                           No
    R
      Level of Service Determination (if not F)_____
                 D = 4.252 + 0.0086 v - 0.009 L = 7.1 pc/mi/ln
Density,
                                12 D
                  R
Level of service for ramp-freeway junction areas of influence A
_____Speed Estimation_____
Intermediate speed variable,
                                 D = 0.433
                                  S
Space mean speed in ramp influence area,
                                 S = 49.4  mph
```

R

0

S = 60.3 mph

mph

S = 54.8

0.889

0.917

Heavy vehicle adjustment, fHV

Space mean speed in outer lanes,

Phone: E-mail:		Fax	:				
	Merge	Analysi	s				
Analyst: Agency/Co.: Date performed: Analysis time period: Freeway/Dir of Travel: Junction: Jurisdiction: Analysis Year: Description: Detroit R	CH PARSONS 8/23/2007 Midday Peak I-75 NB Entrance Ramp 2035 (PA02)	E of Cla	rk				
	Free	way Data					
Type of analysis Number of lanes in free Free-flow speed on free Volume on freeway	way	4 55 19	rge .0 84		mph vph		
	On R	amp Data					
Side of freeway Number of lanes in ramp Free-flow speed on ramp Volume on ramp Length of first accel/decel lane Length of second accel/decel lane		Right 1 35.0 395 590			mph vph ft ft		
	Adjacent Ramp	Data (i	f on	e exists	s)		
Does adjacent ramp exis Volume on adjacent Ramp Position of adjacent Ra Type of adjacent Ramp Distance to adjacent Ra	mp	No			vph ft		
Con	version to pc/h	Under B	ase	Conditio	ons		
Junction Components Volume, V (vph) Peak-hour factor, PHF Peak 15-min volume, v15		Freeway 1984 0.95		Ramp 395 0.95		Adjacent Ramp	vph
Trucks and buses Recreational vehicles Terrain type: Grade		522 25 0 Level	00	104 23 0 Level	o\o		V % %
Length Trucks and buses PCE, E Recreational vehicle PC		1.5 1.2	mi	1.5	mi		mi

```
Driver population factor, fP
                                1.00
                                         1.00
Flow rate, vp
                                2349
                                         464
                                                            pcph
       _____Estimation of V12 Merge Areas____
                           (Equation 25-2 or 25-3)
               EQ
              P = 0.348 Using Equation 4
               FM
              v = v (P) = 817 pc/h
               12 F FM
                   _____Capacity Checks_____
                                 Maximum LOS F?
                      Actual
    V
                      2813
                                 9000
                                               No
    FΟ
                      1281
                                4600
                                               No
    R12
        Level of Service Determination (if not F)
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 11.6 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
        _____Speed Estimation____
Intermediate speed variable,
                                     M = 0.294
                                     S
Space mean speed in ramp influence area,
                                    S = 51.2
                                     R
Space mean speed in outer lanes,
                                    S = 54.0
                                              mph
                                     0
Space mean speed for all vehicles,
                                    S = 52.7  mph
```

0.897

Heavy vehicle adjustment, fHV

Phone: E-mail:	Fax:				
Dive	rge Analysis	S			
Analyst: CH Agency/Co.: PARSONS Date performed: 8/23/2007 Analysis time period: Midday Peak Freeway/Dir of Travel: I-75 NB Junction: Exit Ramp E of Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River Internation	f Grand onal Crossir	ng Project			
Fre	eway Data				
Type of analysis Number of lanes in freeway Free-flow speed on freeway Volume on freeway Off	Diver 5 55.0 2379 Ramp Data		mph vph		
					
Side of freeway Number of lanes in ramp Free-Flow speed on ramp Volume on ramp Length of first accel/decel lane Length of second accel/decel lane Adjacent Ram	Right 1 35.0 244 235		mph vph ft ft		
	ip baca (ii c	me exist.	· /		
Does adjacent ramp exist? Volume on adjacent ramp Position of adjacent ramp Type of adjacent ramp Distance to adjacent ramp	No		vph		
Distance to adjacent famp			ft		
Conversion to pc/	h Under Base	e Condition	ons		
Junction Components	Freeway	Ramp	Adj: Ram	acent p	
Volume, V (vph) Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type: Grade Length Trucks and buses PCE, ET Recreational vehicle PCE, ER	2379 0.95 626 25 0 Level 0.00 % 0.00 mi 1.5	244 0.95 64 25 0 Grade 2.94 0.13 1.5	% mi	vph v % % mi	

```
Flow rate, vp
                                2817
                                         289
                                                           pcph
      _____Estimation of V12 Diverge Areas_
              L =
                           (Equation 25-8 or 25-9)
               ΕQ
              P = 0.436 Using Equation 8
               FD
              v = v + (v - v) P = 1391 pc/h
               12 R F R FD
                  _____Capacity Checks_____
                      Actual
                                 Maximum
                                            LOS F?
    \nabla = \nabla
                      2817
                                 9000
                                              No
    Fi F
                      1391
                                4400
                                              No
    12
                      2528
    \Delta = \Delta - \Delta
                             9000
                                              No
    FO F R
                      289
                             2000
                                              No
    R
       Level of Service Determination (if not F)
                  D = 4.252 + 0.0086 v - 0.009 L = 14.1 pc/mi/ln
Density,
                                  12 D
Level of service for ramp-freeway junction areas of influence B
       _____Speed Estimation_____
Intermediate speed variable,
                                    D = 0.454
                                    S
Space mean speed in ramp influence area,
                                   S = 49.1 \qquad mph
                                    R
Space mean speed in outer lanes,
                                    S = 60.3 \quad mph
                                    0
Space mean speed for all vehicles,
                                   S = 54.2
```

1.00

0.889

mph

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: Fax: E-mail: ______Diverge Analysis_____ Analyst: CH
Agency/Co.: PARSONS
Date performed: 8/23/2007 Analysis time period: PM Peak Freeway/Dir of Travel: I-75 NB Exit Ramp W of Dearborn Junction: Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Freeway Data_____ Type of analysis Diverge Number of lanes in freeway 4 55.0 3422 Free-flow speed on freeway mph vph Volume on freeway vph _____Off Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 35.0 mph vph Free-Flow speed on ramp Volume on ramp 29 Length of first accel/decel lane
Length of second accel/decel lane 120 ft ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? No Volume on adjacent ramp vph Position of adjacent ramp Type of adjacent ramp Distance to adjacent ramp ft _____Conversion to pc/h Under Base Conditions_____ Junction Components Freeway Ramp Adjacent R
3422 29
0.95 0.95
901 8
25 7
0 0
Level Level
0.00 % 0.00 %
0.00 mi 0.00 mi
1.5 1.5 Ramp Volume, V (vph) vph Peak-hour factor, PHF Peak 15-min volume, v15 V Trucks and buses 응 Recreational vehicles 9 Terrain type: Grade mi Length Trucks and buses PCE, ET 1.5 1.5 Recreational vehicle PCE, ER 1.2 1.2

```
Driver population factor, fP
                              1.00
                                       1.00
Flow rate, vp
                              4052
                                       32
                                                         pcph
         _____Estimation of V12 Diverge Areas
                          (Equation 25-8 or 25-9)
              ΕQ
              P =
                   0.436 Using Equation 8
              FD
              v = v + (v - v) P = 1785 pc/h
              12 R F R FD
                  _____Capacity Checks_____
                     Actual
                                           LOS F?
                                Maximum
                     4052
                                9000
    v = v
                                            No
    Fi F
                     1785
                               4400
                                            No
    12
    v = v - v
                    4020
                            9000
                                            No
    FO F R
                     32
                               2000
                                            No
    R
       Level of Service Determination (if not F)_____
                  D = 4.252 + 0.0086 v - 0.009 L = 18.5 pc/mi/ln
Density,
                                12 D
Level of service for ramp-freeway junction areas of influence B
_____Speed Estimation_____
Intermediate speed variable,
                                   D = 0.431
                                   S
Space mean speed in ramp influence area,
                                  S = 49.4
                                            mph
```

0.966

S = 59.8

S = 54.7

mph

mph

Heavy vehicle adjustment, fHV

Space mean speed in outer lanes,

Phone: E-mail:	Fax:							
	Diver	ge Analy	sis_					
Analyst:	СН							
Agency/Co.:	PARSONS							
Date performed:								
Analysis time period:								
Freeway/Dir of Travel:								
Junction:		- Contoar						
Jurisdiction:	Exit Ramp W of	. springw	етть	•				
Analysis Year:	2025 / D7021							
Description: Detroit R		nal Cros	sinc	Project	-			
-				-				
	rree	:way Data						
Type of analysis		Di	verg	re				
Number of lanes in free	way	4						
Free-flow speed on free	way	55	.0		mph			
Volume on freeway		33	91		vph			
	Off F	Ramp Data						
Side of freeway			ght					
Number of lanes in ramp		1			,			
Free-Flow speed on ramp	35.0			mph				
Volume on ramp		277			vph			
Length of first accel/d Length of second accel/		250			ft ft			
dength of second accer/	decel lane				1 L			
	Adjacent Ramp	Data (i	f or	e exists	s)			
Does adjacent ramp exis	t?	No						
Volume on adjacent ramp	•				vph			
Position of adjacent ra	mp							
Type of adjacent ramp								
Distance to adjacent ra	mp				ft			
Con	version to pc/h	under B	ase	Conditio	ons			
Junction Components		Freeway		Ramp		Adjacent		
danceron components		rreeway		Kamp		Ramp		
Volume, V (vph)		3391		277		vph		
Peak-hour factor, PHF		0.95		0.95				
Peak 15-min volume, v15		892		73		Λ		
Trucks and buses		25		1		90		
Recreational vehicles		0		0		90		
Terrain type:		Level		Grade		U		
Grade		0.00	엉	-3.31	90	00		
Length		0.00	mi	0.14	mi	mi		
Trucks and buses PCE, E	Т	1.5		1.5	*** <u></u>	шт		
Recreational vehicle PC		1.2		1.2				
. =	, —							

```
Flow rate, vp
                               4016
                                        293
                                                          pcph
       _____Estimation of V12 Diverge Areas_____
              L =
                          (Equation 25-8 or 25-9)
               ΕQ
              P = 0.436 Using Equation 8
              FD
              v = v + (v - v) P = 1916 pc/h
               12 R F R FD
                  _____Capacity Checks____
                     Actual
                                Maximum
                                          LOS F?
   v = v
                     4016
                                9000
                                             No
    Fi F
                     1916
                                4400
                                             No
    12
   v = v - v
                     3723
                             9000
                                             No
    FO F R
                     293
                                2000
                                             No
    R
     _____Level of Service Determination (if not F)
                  D = 4.252 + 0.0086 v - 0.009 L = 18.5 pc/mi/ln
Density,
                                  12 D
Level of service for ramp-freeway junction areas of influence B
   _____Speed Estimation_____
Intermediate speed variable,
                                   D = 0.454
                                    S
Space mean speed in ramp influence area,
                                  S = 49.1 \quad mph
                                   R
Space mean speed in outer lanes,
                                   S = 60.1  mph
Space mean speed for all vehicles,
                                   S = 54.3
                                            mph
```

1.00

0.995

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: E-mail:	Fax:						
	Diver	rge Analy	ysis				
Analyst:	CH		_				
Agency/Co.:	PARSONS						
Date performed:							
Analysis time period:							
Freeway/Dir of Travel:		_					
Junction: Jurisdiction:	Plaza Exit Ram	np W of V	Vater	man			
Analysis Year:	2035 / DA021						
Description: Detroit R		nal Cros	ssing	g Project	t		
	Free	eway Data	a				
Type of analysis			iverd				
Number of lanes in free	wav	4	-	j c			
Free-flow speed on free		-	5.0		mph		
Volume on freeway	-		116		vph		
	Off F	Ramp Data	a				
Side of freeway		D i	ight				
Number of lanes in ramp			Lync				
Free-Flow speed on ramp		45.0			mph		
Volume on ramp	969			vph			
Length of first accel/decel lane			1963				
Length of second accel/	decel lane	0			ft		
	Adjacent Ramp	Data (i	lf on	ne exists	s)		
Does adjacent ramp exis	t?	No					
Volume on adjacent ramp					vph		
Position of adjacent ra	mp						
Type of adjacent ramp					- .		
Distance to adjacent ra	mp				ft		
Con	version to pc/h	Under E	Base	Conditio	ons		
Junction Components		Freeway	7	Ramp		Adjacent Ramp	
Volume, V (vph)		3116		969		vph	
Peak-hour factor, PHF		0.95		0.95		v P11	
Peak 15-min volume, v15		820		255		V	
Trucks and buses		25		25		96	
Recreational vehicles		0		0		용	
Terrain type:		Level		Grade			
Grade		0.00	용 .	5.00	% .	8	
Length	m	0.00	mi	0.17	mi	mi	
Trucks and buses PCE, E Recreational vehicle PC		1.5		1.5			
recreationar venicle PC	u, EK	1.2		2.5			

```
Driver population factor, fP
                                1.00
                                          1.00
Flow rate, vp
                                3690
                                          1148
                                                            pcph
      ______Estimation of V12 Diverge Areas____
               L =
                           (Equation 25-8 or 25-9)
               ΕQ
               P = 0.260 Using Equation 0
               FD
               v = v + (v - v) P = 1809 pc/h
               12 R F R FD
                _____Capacity Checks____
                      Actual
                                  Maximum
                                              LOS F?
    \nabla = \nabla
                      3690
                                  9000
                                               No
    Fi F
                      1809
                                 4400
                                               No
    12
    \Delta = \Delta - \Delta
                      2542
                              9000
                                               No
    FO F R
                      1148
                              4100
                                               No
    R
       Level of Service Determination (if not F)_____
                   D = 4.252 + 0.0086 v - 0.009 L = -15.5 pc/mi/ln
Density,
                                   12 D
Level of service for ramp-freeway junction areas of influence A
      _____Speed Estimation____
Intermediate speed variable,
                                     D = 0.401
                                     S
Space mean speed in ramp influence area,
                                    S = 49.8 \quad mph
                                     R
Space mean speed in outer lanes,
                                     S = 60.3 \quad mph
```

0

S = 54.7 mph

0.889

0.889

Heavy vehicle adjustment, fHV

Phone: E-mail:		Fa	x:				
	Merg	je Analys	is				
Analyst:	СН						
Agency/Co.:	PARSONS						
Date performed:							
Analysis time period:	PM Peak						
Freeway/Dir of Travel:							
Junction:	Entrance Ramp	W of Li	verno	ois			
Jurisdiction:							
Analysis Year:	2035 (PA02)						
Description: Detroit R		onal Cro	ssing	, Project	t		
	Fre	eway Dat	a				
Type of analysis		М	erge				
Number of lanes in free			_				
Free-flow speed on free	way	5	5.0		mph		
Volume on freeway		2	147		vph		
	On	Ramp Dat	a				
Side of freeway		R	ight				
Number of lanes in ramp			,				
Free-flow speed on ramp	3	5.0		mph			
Volume on ramp	1	33		vph			
Length of first accel/decel lane			164		ft		
Length of second accel/	decel lane				ft		
	Adjacent Ram	np Data (if on	ne exist:	s)		
Does adjacent ramp exis	t?	N	0				
Volume on adjacent Ramp					vph		
Position of adjacent Ran	qm				-		
Type of adjacent Ramp							
Distance to adjacent Ram	mp				ft		
Con	version to pc/	h Under	Base	Conditio	ons		 -
Junction Components		Freewa	У	Ramp		Adjacent Ramp	
Volume, V (vph)		2147		133		vpl	h
Peak-hour factor, PHF		0.95		0.95		1	
Peak 15-min volume, v15		565		35		V	
Trucks and buses		18		17		olo	
Recreational vehicles		0		0		양	
Terrain type:		Level		Grade			
Grade			%	-1.20	%	િ	
Length			тi	0.06	mi	mi	
-							
Trucks and buses PCE, E'Recreational vehicle PC		1.5 1.2		1.5 1.2			

```
Driver population factor, fP
                               1.00
                                        1.00
Flow rate, vp
                               2463
                                         152
                                                           pcph
      _____Estimation of V12 Merge Areas____
              L =
                          (Equation 25-2 or 25-3)
              ΕQ
              P = 0.570 Using Equation 4
              FM
              v = v (P) = 1403 pc/h
              12 F FM
                _____Capacity Checks_____
                     Actual
                                 Maximum LOS F?
    V
                     2615
                                 9000
                                              No
    FΟ
                     1555
                                4600
                                              No
    R12
        Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 10.2 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
  _____Speed Estimation
Intermediate speed variable,
                                    M = 0.258
                                    S
Space mean speed in ramp influence area,
                                    S = 51.6
                                             mph
                                    R
Space mean speed in outer lanes,
                                    S = 54.9
                                             mph
                                    0
```

0.922

S = 52.9

mph

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: _____Diverge Analysis_____ Analyst: CH
Agency/Co.: PARSONS
Date performed: 8/23/2007 Analysis time period: PM Peak Freeway/Dir of Travel: I-75 NB Exit Ramp W of Junction Junction: Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project Freeway Data Type of analysis Diverge Number of lanes in freeway 55.0 2280 Free-flow speed on freeway mph vph Volume on freeway vph Off Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 mph vph Free-Flow speed on ramp 35.0 Volume on ramp 61 Length of first accel/decel lane
Length of second accel/decel lane 647 ft ft ______Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? No Volume on adjacent ramp vph Position of adjacent ramp Type of adjacent ramp Distance to adjacent ramp ft _____Conversion to pc/h Under Base Conditions____ Junction Components Freeway Ramp Adjacent Ramp 2280 61 0.95 0.95 600 16 17 15 Volume, V (vph) vph Peak-hour factor, PHF Peak 15-min volume, v15 V 17 Trucks and buses 응 0 0 Level Grade 0.00 % 1.28 % 0.00 mi 0.03 mi Recreational vehicles 용 Terrain type: Grade mi Length Trucks and buses PCE, ET

1.5

Trucks and buses PCE, ET 1.5 1.5 Recreational vehicle PCE, ER 1.2 1.2

```
Driver population factor, fP
Flow rate, vp
                                2604
                                          69
                                                            pcph
      _____Estimation of V12 Diverge Areas____
                           (Equation 25-8 or 25-9)
               ΕQ
              P = 0.436 Using Equation 8
               FD
              v = v + (v - v) P = 1174 pc/h
               12 R F R FD
                   _____Capacity Checks____
                                              LOS F?
                      Actual
                                 Maximum
    v = v
                      2604
                                 9000
                                              No
    Fi F
                      1174
                                 4400
                                              No
    12
                      2535
    \Delta = \Delta - \Delta
                              9000
                                              No
    FO F R
                      69
                                2000
                                              No
    R
       Level of Service Determination (if not F)
                  D = 4.252 + 0.0086 v - 0.009 L = 8.5 pc/mi/ln
Density,
                                   12 D
Level of service for ramp-freeway junction areas of influence A
     _____Speed Estimation
Intermediate speed variable,
                                     D = 0.434
                                     S
Space mean speed in ramp influence area,
                                    S = 49.4
                                              mph
                                     R
Space mean speed in outer lanes,
                                    s = 60.3
                                               mph
```

1.00

0.930

1.00

S = 54.8

mph

Heavy vehicle adjustment, fHV

Phone: E-mail:		Fa>	κ:				
	Merge	e Analysi	.s				
Analyst: Agency/Co.: Date performed: Analysis time period: Freeway/Dir of Travel: Junction: Jurisdiction: Analysis Year: Description: Detroit R	PM Peak I-75 NB Entrance Ramp 2035 (PA02)			Projec	t		
	Free	eway Data	ı			··	
Type of analysis Number of lanes in free Free-flow speed on free Volume on freeway	way	4 5 5 2 3	erge 5.0 840		mph vph		
		чатр васе					
Side of freeway Number of lanes in ramp Free-flow speed on ramp Volume on ramp Length of first accel/de Length of second accel/de	ecel lane decel lane	1 35 70 59	0		mph vph ft ft		
	Adjacent Ramp	Data (1	.i on	e exist	s)		
Does adjacent ramp exist Volume on adjacent Ramp Position of adjacent Ram Type of adjacent Ramp Distance to adjacent Ram	mp	Nc)		vph ft		
Con	version to pc/h	under B	ase (Conditio	ons		
Junction Components Volume, V (vph) Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type:		Freeway 2340 0.95 616 21 0 Level		Ramp 709 0.95 187 13 0 Level		Adjacent Ramp	vph v %
Grade Length Trucks and buses PCE, ETRECTED Recreational vehicle PCI		1.5	% mi	1.5	% mi		% mi

```
Driver population factor, fP
                               1.00
                                         1.00
Flow rate, vp
                               2722
                                         795
                                                           pcph
       _____Estimation of V12 Merge Areas
              L =
                           (Equation 25-2 or 25-3)
               ΕQ
              P = 0.306 Using Equation 4
               FM
              v = v (P) = 834 pc/h
               12 F FM
              _____Capacity Checks____
                     Actual
                                 Maximum LOS F?
    V
                      3517
                                 9000
                                              No
    FΟ
                      1629
                                4600
                                              No
    R12
         Level of Service Determination (if not F)
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 14.1 pc/mi/ln
                                 12
Level of service for ramp-freeway junction areas of influence B
       _____Speed Estimation____
Intermediate speed variable,
                                    M = 0.300
                                    S
Space mean speed in ramp influence area,
                                   S = 51.1
                                              mph
                                     R
Space mean speed in outer lanes,
                                    S = 53.4  mph
                                    0
```

0.939

S = 52.3

mph

Heavy vehicle adjustment, fHV

Phone: E-mail:		Fax	::				
	Diver	ge Analy	sis				
· · · · · · · · · · · · · · · · · · ·			_				
Analyst:	СН						
Agency/Co.:	PARSONS						
Date performed: Analysis time period:	8/23/2007						
Analysis time period:	PM Peak						
Freeway/Dir of Travel:							
Junction:	Exit Ramp E of	Grand					
Jurisdiction:	003E (D700)						
Analysis Year: Description: Detroit R		nal Cros	sing	, Project	Ξ		
	Free	eway Data	l				
Type of analysis							
Number of lanes in free	Wav		verg	اح			
Free-flow speed on free			.0		mph		
Volume on freeway	way		49		vph		
-					_		
	Off R	Ramp Data					
Side of freeway		Ri	ght				
Number of lanes in ramp		_					
Free-Flow speed on ramp	35	.0		mph			
Volume on ramp	204			vph			
Length of first accel/d	23	5		ft			
Length of second accel/	decel lane				ft		
	Adjacent Ramp	Data (i	for	ne exists	s)		
Does adjacent ramp exis	t?	No	1				
Volume on adjacent ramp					vph		
Position of adjacent ra					- 1		
Type of adjacent ramp	_						
Distance to adjacent ra	mp				ft		
Con	version to pc/h	Under B	ase	Conditio	ons		
Junction Components		Freeway		Ramp		Adjacent	
-		4		1		Ramp	
Volume, V (vph)		3049		204		vph	
Peak-hour factor, PHF		0.95		0.95			
Peak 15-min volume, v15		802		54		V	
Trucks and buses		19		25		9	
Recreational vehicles		0		0		90	
Terrain type:		Level		Grade			
Grade		0.00	%	2.94	용	%	
Length		0.00	mi	0.13	mi	mi	
Trucks and buses PCE, E		1.5		1.5			
Recreational vehicle PC	E, EK	1.2		1.2			

```
Driver population factor, fP
                                1.00
                                          1.00
Flow rate, vp
                                3514
                                          242
                                                            pcph
        _____Estimation of V12 Diverge Areas____
              L =
                           (Equation 25-8 or 25-9)
               ΕQ
              P = 0.436 Using Equation 8
               FD
              v = v + (v - v) P = 1669 pc/h
               12 R F R FD
                 _____Capacity Checks_____
                      Actual
                                 Maximum
                                              LOS F?
    v = v
                      3514
                                 9000
                                               No
    Fi F
                      1669
                                 4400
                                              No
    12
                      3272
    v = v - v
                                9000
                                              No
    FO F R
                      242
                                 2000
                                              No
    R
       Level of Service Determination (if not F)
                  D = 4.252 + 0.0086 v - 0.009 L = 16.5 pc/mi/ln
Density,
                                   12 D
Level of service for ramp-freeway junction areas of influence B
          ______Speed Estimation
Intermediate speed variable,
                                     D = 0.450
                                     S
Space mean speed in ramp influence area,
                                    S = 49.2
                                              mph
                                     R
Space mean speed in outer lanes,
                                    S = 60.3
                                               mph
```

S = 54.5

mph

0.913

0.889

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: ______Merge Analysis_____ CH Analyst: CH
Agency/Co.: PARSONS
Date performed: 8/23/2007
Analysis time period: AM Peak
Freeway/Dir of Travel: I-75 SB Analyst: Junction: Service Dr Ent Ramp E of Grand Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Freeway Data______ Type of analysis Merge Number of lanes in freeway 4 55.0 mph 3386 vph Free-flow speed on freeway Volume on freeway ____On Ramp Data_____ Side of freeway Right Number of lanes in ramp Free-flow speed on ramp 35.0 mph 28 vph Volume on ramp Length of first accel/decel lane 590 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? No Volume on adjacent Ramp vph Position of adjacent Ramp Type of adjacent Ramp Distance to adjacent Ramp ft _____Conversion to pc/h Under Base Conditions_____ Junction Components Freeway Ramp Adjacent Ramp 3386 28 0.95 0.95 Volume, V (vph) vph Peak-hour factor, PHF
Peak 15-min volume, v15 891 7 14 18 0 0 Level Level 7 891 V Trucks and buses 응 Recreational vehicles 용 Terrain type: Length mi mi
Trucks and buses PCE, ET 1.5 1.5
Recreational vehicle PCE, ER 1.2 1.2 mi

```
0.935
Heavy vehicle adjustment, fHV Driver population factor, fP
                                        0.917
                                1.00
                                         1.00
Flow rate, vp
                                3814
                                         32
                                                            pcph
              Estimation of V12 Merge Areas_____
              L =
                           (Equation 25-2 or 25-3)
               ΕQ
               P = 0.402 Using Equation 4
               FM
               v = v (P) = 1532 pc/h
               12 F FM
                  ____Capacity Checks_____
                      Actual
                                 Maximum
                                             LOS F?
                      3846
                                 9000
    V
                                               Νo
     FO
    V
                      1564
                              4600
                                               No
    R12
          Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 14.0 pc/mi/ln
                            12
Level of service for ramp-freeway junction areas of influence B
        _____Speed Estimation
                                    M = 0.298
Intermediate speed variable,
                                     S
Space mean speed in ramp influence area,
                                    S = 51.1
                                               mph
                                     R
Space mean speed in outer lanes,
                                     S = 52.7  mph
                                     0
```

S = 52.0 mph

Fax: Phone: E-mail: _____Diverge Analysis______ CH Analyst: CH
Agency/Co.: PARSONS
Date performed: 8/23/2007
Analysis time period: AM Peak
Freeway/Dir of Travel: I-75 SB Analyst: Junction: Exit Ramp E of Clark Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Freeway Data_____ Diverge Type of analysis Number of lanes in freeway 4 55.0 mph 3414 vph Free-flow speed on freeway Volume on freeway ____Off Ramp Data_____ Side of freeway Right 1 Number of lanes in ramp mph vph 35.0 Free-Flow speed on ramp 602 Volume on ramp 140 Length of first accel/decel lane ft £t. Length of second accel/decel lane _____Adjacent Ramp Data (if one exists)_____ No Does adjacent ramp exist? Volume on adjacent ramp vph Position of adjacent ramp Type of adjacent ramp Distance to adjacent ramp ft ______Conversion to pc/h Under Base Conditions_____ Freeway Ramp Adjacent Junction Components Ramp 3414 602 0.95 0.95 898 158 14 1 0 0 Level Level 0.00 % 0.00 % 0.00 mi 0.00 mi vph Volume, V (vph) Peak-hour factor, PHF V Peak 15-min volume, v15 % Trucks and buses 양 Recreational vehicles Terrain type: Grade mi Length Trucks and buses PCE, ET 1.5 1.5 1.2 1.2 1.5 Recreational vehicle PCE, ER

Heavy vehicle adjustment, fHV Driver population factor, fP 1.00 1.00 Flow rate, vp 3845 637 pcph _____Estimation of V12 Diverge Areas____ L = (Equation 25-8 or 25-9) EQ P = 0.436 Using Equation 8 FDv = v + (v - v) P = 2036 pc/h12 R F R FD _____Capacity Checks____ Actual LOS F? Maximum $\Delta = \Delta$ 3845 9000 NoFi F 2036 4400 No12 v = v - v3208 9000 No FO F R 637 2000 V No R ____Level of Service Determination (if not F)_____ D = 4.252 + 0.0086 v - 0.009 L = 20.5 pc/mi/lnDensity, 12 D Level of service for ramp-freeway junction areas of influence C _____Speed Estimation_____ Intermediate speed variable, D = 0.485S Space mean speed in ramp influence area, S = 48.7 mph

Space mean speed in outer lanes,

Space mean speed for all vehicles,

R

0

 $S = 60.3 \quad mph$

S = 53.6 mph

0.935

0.995

Phone: Fax: E-mail: ______Diverge Analysis_____ Analyst: CH
Agency/Co.: PARSONS
Date performed: 8/23/2007
Analysis time period: AM Peak СН Analyst: Freeway/Dir of Travel: I-75 SB Junction: Plaza Exit Ramp E of Junction Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Freeway Data_____ Type of analysis Diverge Number of lanes in freeway Free-flow speed on freeway 4 55.0 mph 2812 vph Volume on freeway _____Off Ramp Data_____ Side of freeway Right Number of lanes in ramp 2 Free-Flow speed on ramp 45.0 mph Volume on ramp vph ft 216 Length of first accel/decel lane
Length of second accel/decel lane 1963 ft ______Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? No Volume on adjacent ramp vph Position of adjacent ramp Type of adjacent ramp Distance to adjacent ramp ft _____Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2812	216	-	vph
Peak-hour factor, PHF	0.95	0.95		-
Peak 15-min volume, v15	740	57		v
Trucks and buses	17	25		%
Recreational vehicles	0	0		90
Terrain type:	Level	Grade		
Grade	0.00 %	1.22	%	8
Length	0.00 m	i 0.46	mi	mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

```
0.922
Heavy vehicle adjustment, fHV
Driver population factor, fP
                            1.00
                                     1.00
                            3212
                                     256
Flow rate, vp
                                                      pcph
  _____Estimation of V12 Diverge Areas_____
             L =
                        (Equation 25-8 or 25-9)
              ΕQ
             P = 0.260 Using Equation 0
              FD
             v = v + (v - v) P = 1025 pc/h
              12 R F R FD
             _____Capacity Checks_____
                                        LOS F?
                   Actual
                              Maximum
   v = v
                    3212
                              9000
                                          No
    Fi F
   V
                   1025 4400
                                          No
    12
   \Delta = \Delta - \Delta
                  2956 9000
                                          No
    FO F R
                    256 4100
                                         No
   V
    R
   Level of Service Determination (if not F)_____
                 D = 4.252 + 0.0086 v - 0.009 L = -22.3 pc/mi/ln
Density,
                               12 D
Level of service for ramp-freeway junction areas of influence A
  Speed Estimation_____
Intermediate speed variable,
                                 D = 0.321
Space mean speed in ramp influence area, S = 50.8 mph
                                 R
                                S = 60.0  mph
Space mean speed in outer lanes,
                                 0
```

Space mean speed for all vehicles,

0.889

S = 56.7 mph

Phone: E-mail: Fax:

_____Merge Analysis_____

Analyst: CH

Agency/Co.: PARSONS Date performed: 8/23/2007
Analysis time period: AM Peak Freeway/Dir of Travel: I-75 SB

Junction: Ent. Ramp W of Junction

Jurisdiction:

Analysis Year: 2035 (PA02)

Description: Detroit River International Crossing Project

	Freeway Data		
Type of analysis	Merge		
Number of lanes in freeway	4		
Free-flow speed on freeway	55.0	mph	
Volume on freeway	2596	vph	
	On Ramp Data		

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	34	vph
Length of first accel/decel lane	1164	ft
Length of second accel/decel lane		ft

______Adjacent Ramp Data (if one exists)_____

No

Does adjacent ramp exist?

Volume on adjacent Ramp vph Position of adjacent Ramp

Type of adjacent Ramp

Distance to adjacent Ramp ft

Conversion	to	pc/h	Under	Base	Conditions	

Junction Components	Freeway	Ramp	Adjacent
			Ramp
Volume, V (vph)	2596	34	vph
Peak-hour factor, PHF	0.95	0.95	
Peak 15-min volume, v15	683	9	v
Trucks and buses	14	12	90
Recreational vehicles	0	0	9
Terrain type:	Level	Grade	
Grade	%	-4.00 %	96
Length	mi	0.04 mi	mi
Trucks and buses PCE, ET	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	

```
Heavy vehicle adjustment, fHV Driver population factor, fP
                               1.00
                                        1.00
Flow rate, vp
                               2924
                                        38
                                                           pcph
              Estimation of V12 Merge Areas____
              L =
                          (Equation 25-2 or 25-3)
               ΕQ
              P = 0.584 Using Equation 4
              FM
              v = v (P) = 1707 pc/h
               12 F FM
              ____Capacity Checks____
                     Actual
                                 Maximum
                                           LOS F?
                     2962
                                 9000
    v
                                              No
    FO
                     1745
                             4600
    V
                                              No
    R12
    Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 11.8 pc/mi/ln
                           12
Level of service for ramp-freeway junction areas of influence B
 _____Speed Estimation_____
                                    M = 0.262
Intermediate speed variable,
                                    S
Space mean speed in ramp influence area,
                                    S = 51.6 mph
                                    R
Space mean speed in outer lanes,
                                    S = 54.6 mph
```

0.935 0.943

S = 52.8 mph

Phone: Fax: E-mail: _____Diverge Analysis______ Analyst: CH
Agency/Co.: PARSONS
Date performed: 8/23/2007
Analysis time period: AM Peak
Freeway/Dir of mark Freeway/Dir of Travel: I-75 SB Junction: Exit Ramp W of Livernois Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Freeway Data_____ Diverge Type of analysis Number of lanes in freeway 4 55.0 mph 2630 vph Free-flow speed on freeway Volume on freeway _____Off Ramp Data_____ Right Side of freeway Number of lanes in ramp Number of lanes in ramp Free-Flow speed on ramp mph vph 35.0 378 Volume on ramp Length of first accel/decel lane 647 ft Length of second accel/decel lane ft ______Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? No Volume on adjacent ramp vph Position of adjacent ramp Type of adjacent ramp Distance to adjacent ramp ft _____Conversion to pc/h Under Base Conditions_____

Freeway	Ramp	Adjacent
		Ramp
2630	378	vph
0.95	0.95	
692	99	v
14	0	90
0	0	90
Level	Grade	
0.00 %	5.00 %	90
0.00 mi	0.07 m	i mi
1.5	1.5	
1.2	2.5	
	2630 0.95 692 14 0 Level 0.00 % 0.00 mi	2630 378 0.95 0.95 692 99 14 0 0 0 Level Grade 0.00 % 5.00 % 0.00 mi 0.07 m 1.5 1.5

```
Heavy vehicle adjustment, fHV
Driver population factor, fP
                           0.935 1.000
                            1.00
                                     1.00
Flow rate, vp
                             2962
                                     398
                                                       pcph
       _____Estimation of V12 Diverge Areas_____
             L =
                         (Equation 25-8 or 25-9)
              EQ
             P = 0.436 Using Equation 8
             FD
             v = v + (v - v) P = 1516 pc/h
              12 R F R FD
              _____Capacity Checks_____
                    Actual
                             Maximum
                                         LOS F?
   v = v
                              9000
                    2962
                                           No
    Fi F
   V
                   1516 4400
                                           No
    12
   \Lambda = \Lambda - \Lambda
                  2564 9000
                                          No
    FO F R
                   398
                        2000
   V
                                          No
    R
  Level of Service Determination (if not F)_____
                 D = 4.252 + 0.0086 v - 0.009 L = 11.5 pc/mi/ln
Density,
                            12 D
Level of service for ramp-freeway junction areas of influence B
 Speed Estimation_____
Intermediate speed variable,
                                 D = 0.464
Space mean speed in ramp influence area, S = 49.0 mph
                                  R
Space mean speed in outer lanes,
                                 S = 60.3  mph
                                  0
```

 $S = 53.9 \quad mph$

Phone: Fax: E-mail: _____Merge Analysis_____ Analyst: CH
Agency/Co.: PARSONS
Date performed: 8/23/2007
Analysis time period: AM Peak Freeway/Dir of Travel: I-75 SB Junction: Entrance Ramp W of Springwells Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 4 55.0 mph 3020 vph Volume on freeway _____On Ramp Data_____ Right Side of freeway Number of lanes in ramp Free-flow speed on ramp 35.0 mph 134 vph 134 Volume on ramp Length of first accel/decel lane 370 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ No Does adjacent ramp exist? Volume on adjacent Ramp vph Position of adjacent Ramp Type of adjacent Ramp Distance to adjacent Ramp _____Conversion to pc/h Under Base Conditions_____ Adjacent Junction Components Freeway Ramp Ramp 3020 134 0.95 0.95 795 35 24 4 0 0 Volume, V (vph) vph Volume, v (vpn)
Peak-hour factor, PHF Peak 15-min volume, v15 v Trucks and buses 응 Recreational vehicles 용 Level Level % % % mi mi mi Terrain type:

Grade Length

Trucks and buses PCE, ET 1.5 1.5
Recreational vehicle PCE, ER 1.2 1.2

```
Heavy vehicle adjustment, fHV
Driver population factor, fP
                              0.893
                                        0.980
                               1.00
                                        1.00
Flow rate, vp
                               3560
                                        144
                                                           pcph
             _____Estimation of V12 Merge Areas_____
              L =
                           (Equation 25-2 or 25-3)
               ΕQ
              P = 0.318 Using Equation 4
               FM
              v = v (P) = 1131 pc/h
               12 F FM
                Capacity Checks
                     Actual
                                Maximum
                                              LOS F?
                                 9000
    V
                      3704
                                              No
    FO
                      1275
                             4600
                                              No
    R12
         Level of Service Determination (if not F)
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 13.0 pc/mi/ln
                           12
Level of service for ramp-freeway junction areas of influence B
  _____Speed Estimation____
                                    M = 0.309
Intermediate speed variable,
                                     S
Space mean speed in ramp influence area,
                                   S = 51.0  mph
                                    R
Space mean speed in outer lanes,
                                    S = 52.4  mph
                                    0
```

 $S = 51.9 \quad mph$

Space mean speed for all vehicles,

Fax: Phone: E-mail: _____Merge Analysis_____ CH Analyst: Agency/Co.: Agency/Co.: PARSONS
Date performed: 8/23/2007
Analysis time period: AM Peak Freeway/Dir of Travel: I-75 SB Junction: Entrance Ramp W of Dearborn Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Freeway Data______ Type of analysis Merge Number of lanes in freeway 4 55.0 mph 3153 vph Free-flow speed on freeway Volume on freeway _____On Ramp Data_____ Right Side of freeway Number of lanes in ramp 1 35.0 mph Free-flow speed on ramp 59 vph Volume on ramp Length of first accel/decel lane 400 ft ft Length of second accel/decel lane ______Adjacent Ramp Data (if one exists)______ Does adjacent ramp exist? No Volume on adjacent Ramp vph Position of adjacent Ramp Type of adjacent Ramp ft Distance to adjacent Ramp _____Conversion to pc/h Under Base Conditions_____ Adjacent Freeway Ramp Junction Components Ramp 3153 59 0.95 0.95 830 16 24 25 0 0 vph Volume, V (vph) Peak-hour factor, PHF V Peak 15-min volume, v15 용 Trucks and buses 용 Recreational vehicles Level Level Level
%
mi
1.5
1.2
1 1 Terrain type: % Grade mi mi Length Trucks and buses PCE, ET Recreational vehicle PCE, ER

```
0.893
Heavy vehicle adjustment, fHV Driver population factor, fP
                               1.00
                                         1.00
Flow rate, vp
                                3717
                                        70
                                                           pcph
           _____Estimation of V12 Merge Areas
              L =
                           (Equation 25-2 or 25-3)
               ΕQ
              P = 0.336 Using Equation 4
               FM
               v = v (P) = 1251 pc/h
               12 F FM
                  ____Capacity Checks____
                                 Maximum
                      Actual
                                              LOS F?
    V
                      3787
                                 9000
                                              No
    FO
                      1321
                             4600
    7.7
                                              No
    R12
        Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 13.2 pc/mi/ln
                            12
                       R
Level of service for ramp-freeway junction areas of influence B
Speed Estimation
Intermediate speed variable,
                                    M = 0.308
                                     S
Space mean speed in ramp influence area,
                                    S = 51.0 mph
                                     R
Space mean speed in outer lanes,
                                    S = 52.4  mph
```

0.889

 $S = 51.9 \quad mph$

Phone: Fax: E-mail: _____Merge Analysis_____ Analyst: CH
Agency/Co.: PARSONS
Date performed: 8/23/2007
Analysis time period: Midday Peak
Freeway/Dir of Travel: I-75 SB Analyst: CHJunction: Service Dr Ent Ramp E of Grand Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 4 55.0 mph 3048 vph Volume on freeway On Ramp Data Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 39 Volume on ramp vph Length of first accel/decel lane 590 ft Length of second accel/decel lane ft ______Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? No Volume on adjacent Ramp vph Position of adjacent Ramp Type of adjacent Ramp Distance to adjacent Ramp ft ______Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	3048	39	vph
Peak-hour factor, PHF	0.95	0.95	
Peak 15-min volume, v15	802	10	V
Trucks and buses	25	15	%
Recreational vehicles	0	0	%
Terrain type:	Level	Level	
Grade	90	90	90
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	

```
Heavy vehicle adjustment, fHV
Driver population factor, fP
                              1.00
                                        1.00
Flow rate, vp
                               3609
                                        44
                                                          pcph
              ____Estimation of V12 Merge Areas_____
              L =
                          (Equation 25-2 or 25-3)
               ΕQ
              P = 0.400 Using Equation 4
              FM
              v = v (P) = 1445 pc/h
               12 F FM
              _____Capacity Checks_____
                     Actual
                                Maximum
                                             LOS F?
    V
                     3653
                                9000
                                              No
    FΟ
                     1489
                             4600
                                              No
    R12
       Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 13.4 pc/mi/ln
                           12
                       R
Level of service for ramp-freeway junction areas of influence B
 Speed Estimation_____
Intermediate speed variable,
                                    M = 0.297
                                    S
Space mean speed in ramp influence area,
                                   S = 51.1  mph
Space mean speed in outer lanes,
                                    S = 52.9 \quad mph
```

0.889

0.930

S = 52.2 mph

Phone: Fax: E-mail: ______Diverge Analysis_____ Analyst: CH
Agency/Co.: PARSONS
Date performed: 8/23/2007
Analysis time period: Midday Peak CH Analyst: Freeway/Dir of Travel: I-75 SB Exit Ramp E of Clark Junction: Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Freeway Data_____ Type of analysis Diverge Number of lanes in freeway Free-flow speed on freeway 4 55.0 mph 3089 vph Volume on freeway _____Off Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-Flow speed on ramp 35.0 mph 298 Volume on ramp vph Length of first accel/decel lane 140 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? No Volume on adjacent ramp vph Position of adjacent ramp Type of adjacent ramp Distance to adjacent ramp ft _____Conversion to pc/h Under Base Conditions Junction Components Freeway Ramp Adjacent Ramp 3089 298 0.95 0.95 813 78 25 6 0 0 Volume, V (vph) vph Peak-hour factor, PHF Peak 15-min volume, v15 V Trucks and buses Recreational vehicles 9 Level Level
0.00 % 0.00 %
0.00 mi 0.00 mi Terrain type:

1.5 1.2

1.5

1.2

mі

Grade Length

Trucks and buses PCE, ET
Recreational vehicle PCE, ER

```
Heavy vehicle adjustment, fHV
Driver population factor, fP
                               1.00
                                         1.00
Flow rate, vp
                               3658
                                        323
                                                           pcph
              Estimation of V12 Diverge Areas
              L =
                          (Equation 25-8 or 25-9)
               ΕQ
              P = 0.436 Using Equation 8
               FD
              v = v + (v - v) P = 1777 pc/h
               12 R F R FD
               _____Capacity Checks
                      Actual
                                 Maximum
                                             LOS F?
    v = v
                      3658
                                 9000
                                              No
    Fi F
                      1777 4400
                                              No
    12
                      3335 9000
    \nabla = \Delta - \Delta
                                              No
    FO F R
                      323
                                2000
                                              No
    R
     ____Level of Service Determination (if not F)_____
                  D = 4.252 + 0.0086 v - 0.009 L = 18.3 pc/mi/ln
Density,
                                   12 D
Level of service for ramp-freeway junction areas of influence B
  _____Speed Estimation____
Intermediate speed variable,
                                    D = 0.457
Space mean speed in ramp influence area, S = 49.1
                                              mph
Space mean speed in outer lanes,
                                    s = 60.3
                                              mph
                                     0
```

0.889

0.971

S = 54.3 mph

Phone: Fax: E-mail: ______Diverge Analysis_____ Analyst: CH Agency/Co.: Agency/Co.: PARSONS
Date performed: 8/23/2007
Analysis time period: Midday Peak
Freeway/Dir of Travel: I-75 SB Junction: Plaza Exit Ramp E of Junction
Jurisdiction:
Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Freeway Data_____ Type of analysis Diverge Number of lanes in freeway Free-flow speed on freeway 4 55.0 mph 2791 vph Volume on freeway _____Off Ramp Data_____ Side of freeway Right Number of lanes in ramp Free-Flow speed on ramp 2 45.0 mph Volume on ramp vph ft 395 Length of first accel/decel lane 1963 Length of second accel/decel lane 0 ft ______Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? No Volume on adjacent ramp vph Position of adjacent ramp Type of adjacent ramp Distance to adjacent ramp ft _____Conversion to pc/h Under Base Conditions_____ Freeway Ramp Adjacent Junction Components Ramp 2791 395 0.95 0.95 734 104 25 25 0 0 Volume, V (vph) vph Peak-hour factor, PHF Peak 15-min volume, v15 v Trucks and buses 왕 Recreational vehicles 용 Level Grade
0.00 % 1.22 %
0.00 mi 0.46 mi Terrain type:

1.5 1.5 1.2 1.2

% mi

Grade

Length

Trucks and buses PCE, ET
Recreational vehicle PCE, ER

```
Heavy vehicle adjustment, fHV Driver population factor, fP
                               1.00
                                        1.00
Flow rate, vp
                               3305
                                        468
                                                           pcph
             ____Estimation of V12 Diverge Areas____
              L =
                           (Equation 25-8 or 25-9)
               ΕQ
              P = 0.260 Using Equation 0
               FD
              v = v + (v - v) P = 1206 pc/h
               12 R F R FD
               _____Capacity Checks
                     Actual
                                 Maximum
                                              LOS F?
    v = v
                     3305
                                 9000
                                              No
    Fi F
                     1206
                              4400
                                              No
    12
                     2837
                             9000
    v = v - v
                                              No
    FO F R
                      468
                                4100
                                              No
    R
      Level of Service Determination (if not F)
Density,
                  D = 4.252 + 0.0086 v - 0.009 L = -20.7 pc/mi/ln
                                  12 D
Level of service for ramp-freeway junction areas of influence A
 _____Speed Estimation____
Intermediate speed variable,
                                    D = 0.340
Space mean speed in ramp influence area,
                                    S = 50.6
                                             mph
```

Space mean speed in outer lanes,

Space mean speed for all vehicles,

0.889

0.889

S = 60.1

S = 56.3

0

mph

mph

Phone: Fax: E-mail: ______Merge Analysis_____ Analyst: CH
Agency/Co.: PARSONS
Date performed: 8/23/2007
Analysis time period: Midday Peak
Freeway/Dir of Travel: I-75 SB Juniction: Ent. Ramp W of Junction Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Freeway Data_____ Merge Type of analysis Number of lanes in freeway Free-flow speed on freeway 4 55.0 mph 2396 vph Volume on freeway ____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Number of lanes in lamp Free-flow speed on ramp 35.0 mph 48 Volume on ramp vph Length of first accel/decel lane 1164 ft Length of second accel/decel lane ft ______Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? No Volume on adjacent Ramp vph Position of adjacent Ramp Type of adjacent Ramp Distance to adjacent Ramp ft _____Conversion to pc/h Under Base Conditions_____ Freeway Ramp Adjacent Junction Components Ramp 2396 48 0.95 0.95 631 13 25 17 0 0 Level Grade % -4.00 % Volume, V (vph) vph Peak-hour factor, PHF Peak 15-min volume, v15 V Trucks and buses 응 Recreational vehicles 용 Terrain type: % -4.00 % % mi mi Grade Length Trucks and buses PCE, ET 1.5
Recreational vehicle PCE, ER 1.2 1.5 1.2

1.2

Heavy vehicle adjustment, fHV Driver population factor, fP 1.00 1.00 Flow rate, vp 2837 55 pcph ___Estimation of V12 Merge Areas____ L = (Equation 25-2 or 25-3) ΕQ P = 0.582 Using Equation 4 v = v (P) = 1650 pc/h12 F FM _____Capacity Checks_____ Actual Maximum LOS F? 2892 9000 V No FO1705 4600 V No R12 Level of Service Determination (if not F) Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 11.5 pc/mi/ln12 R Level of service for ramp-freeway junction areas of influence B _____Speed Estimation____ Intermediate speed variable, M = 0.261S Space mean speed in ramp influence area, $S = 51.6 \quad mph$ R Space mean speed in outer lanes, S = 54.7 mph

Space mean speed for all vehicles,

0.889

0.922

S = 52.8 mph

Phone: Fax: E-mail: _____Diverge Analysis______ Analyst: CH Analyst: CH
Agency/Co.: PARSONS
Date performed: 8/23/2007
Analysis time period: Midday Peak Freeway/Dir of Travel: I-75 SB Jurisdiction: Exit Ramp W of Livernois Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project Freeway Data_____ Type of analysis Diverge Number of lanes in freeway Free-flow speed on freeway 4 55.0 mph 2443 vph Volume on freeway _____Off Ramp Data_____ Side of freeway Right Number of lanes in ramp Free-Flow speed on ramp 1 35.0 mph 172 Volume on ramp vph Length of first accel/decel lane 647 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? No Volume on adjacent ramp vph Position of adjacent ramp Type of adjacent ramp Distance to adjacent ramp ft _____Conversion to pc/h Under Base Conditions Freeway Ramp Adjacent Junction Components Ramp 2443 172 0.95 0.95 643 45 25 9 0 0 Volume, V (vph) vph Peak-hour factor, PHF Peak 15-min volume, v15 V Trucks and buses 용 Recreational vehicles Level Grade
0.00 % 5.00 % %
0.00 mi 0.07 mi mi 응

1.5 1.2

1.5 2.5

Terrain type:

Length

Trucks and buses PCE, ET Recreational vehicle PCE, ER

Grade

```
Heavy vehicle adjustment, fHV
Driver population factor, fP
                             0.889
                                       0.957
                              1.00
                                       1.00
Flow rate, vp
                              2893
                                       189
                                                         pcph
             Estimation of V12 Diverge Areas_____
              L =
                          (Equation 25-8 or 25-9)
              ΕQ
              P = 0.436 Using Equation 8
              FD
              v = v + (v - v) P = 1368 pc/h
               12 R F R FD
                  ____Capacity Checks
                                Maximum
                     Actual
                                            LOS F?
    v = v
                     2893
                                9000
                                             No
    Fi F
                     1368
                             4400
    v
                                             No
    12
                     2704 9000
    \nabla = \nabla - \nabla
                                             No
    FO F R
                     189
                               2000
    V
                                            No
    R
     Level of Service Determination (if not F)
Density,
                  D = 4.252 + 0.0086 v - 0.009 L = 10.2 pc/mi/ln
                                 12 D
Level of service for ramp-freeway junction areas of influence B
   _____Speed Estimation
Intermediate speed variable,
                                   D = 0.445
```

S = 49.2

0

S = 60.3 mph

S = 54.5 mph

mph

Space mean speed in ramp influence area,

Space mean speed in outer lanes,

Space mean speed for all vehicles,

Phone: Fax: E-mail: ______Merge Analysis_____ Analyst: CH
Agency/Co.: PARSONS
Date performed: 8/23/2007
Analysis time period: Midday Peak Analyst: Freeway/Dir of Travel: I-75 SB Junction: Entrance Ramp W of Springwells Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 4 55.0 mph 2765 vph Volume on freeway ____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 405 Volume on ramp vph Length of first accel/decel lane 370 ft Length of second accel/decel lane ft. _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? No Volume on adjacent Ramp vph Position of adjacent Ramp Type of adjacent Ramp Distance to adjacent Ramp ft. _____Conversion to pc/h Under Base Conditions____ Junction Components Freeway Ramp Adjacent Ramp 2765 405 0.95 0.95 728 107 25 22 0 0 Volume, V (vph) vph Peak-hour factor, PHF Peak 15-min volume, v15 V Trucks and buses 용 Recreational vehicles 용 Level Level Terrain type: Trucks and buses PCE, ET 1.5 1.5
Recreational vehicle PCE, ER 1.2 1.2 용 mi mi

```
Heavy vehicle adjustment, fHV
Driver population factor, fP
                              1.00
                                       1.00
Flow rate, vp
                               3274
                                       473
                                                          pcph
             _Estimation of V12 Merge Areas____
                          (Equation 25-2 or 25-3)
              L =
              ΕQ
              P = 0.277 Using Equation 4
              v = v (P) = 905 pc/h
               12 F FM
               _____Capacity Checks
                     Actual
                               Maximum LOS F?
                     3747
                                9000
    V
                                             No
    FO
                     1378
                            4600
    v
                                             No
    R12
      Level of Service Determination (if not F)
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 13.7 pc/mi/ln
                           12
Level of service for ramp-freeway junction areas of influence B
 _____Speed Estimation____
Intermediate speed variable,
                                   M = 0.311
                                    S
Space mean speed in ramp influence area,
                                  S = 51.0  mph
                                   R
                                   S = 52.5  mph
Space mean speed in outer lanes,
```

0.889 0.901

 $S = 51.9 \quad mph$

Phone: Fax: E-mail: ______Merge Analysis_____ Analyst: CH
Agency/Co.: PARSONS
Date performed: 8/23/2007
Analysis time period: Midday Peak
Freeway/Dir of Travel: I-75 SB Junction: Entrance Ramp W of Dearborn Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 4 55.0 mph 3169 vph Volume on freeway _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp Free-flow speed on ramp 1 35.0 mph 42 Volume on ramp vph Length of first accel/decel lane 400 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)____ No Does adjacent ramp exist? Volume on adjacent Ramp vph Position of adjacent Ramp Type of adjacent Ramp Distance to adjacent Ramp £t. _____Conversion to pc/h Under Base Conditions_____ Freeway Ramp Adjacent Ramp Junction Components 3169 42 0.95 0.95 834 11 25 24 0 0 Volume, V (vph) vph Peak-hour factor, PHF Peak 15-min volume, v15 v Trucks and buses 양 Recreational vehicles 응 Level Level Terrain type: Grade % %
Length mi mi
Trucks and buses PCE, ET 1.5 1.5
Recreational vehicle PCE, ER 1.2 1.2 тi

```
Heavy vehicle adjustment, fHV
Driver population factor, fP
                              1.00
                                       1.00
Flow rate, vp
                               3753
                                       50
                                                         pcph
              Estimation of V12 Merge Areas
              L =
                          (Equation 25-2 or 25-3)
              ΕQ
              P = 0.339 Using Equation 4
              FM
              v = v (P) = 1272 pc/h
               12 F FM
              _____Capacity Checks____
                     Actual
                               Maximum
                                           LOS F?
                     3803
                                9000
    V
                                             Νo
    FO
                     1322
                             4600
    V
                                             No
    R12
   Level of Service Determination (if not F)
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 13.3 pc/mi/ln
                       R
                           12
Level of service for ramp-freeway junction areas of influence B
_____Speed Estimation____
                                   M = 0.308
Intermediate speed variable,
                                    S
Space mean speed in ramp influence area,
                                   S = 51.0  mph
                                   R
Space mean speed in outer lanes,
                                   S = 52.3 mph
                                   0
```

0.889

0.893

S = 51.9 mph

Phone: Fax: E-mail: Merge Analysis_____ СН Analyst: Agency/Co.: Agency/Co.: FARSONS
Date performed: 8/23/2007
Analysis time period: PM Peak PARSONS Freeway/Dir of Travel: I-75 SB Junction: Service Dr Ent Ramp E of Grand Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway 4 55.0 mph 6041 vph Free-flow speed on freeway Volume on freeway vph _____On Ramp Data____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph Volume on ramp 469 vph Length of first accel/decel lane 590 ft Length of second accel/decel lane _____Adjacent Ramp Data (if one exists)_____ No Does adjacent ramp exist? Volume on adjacent Ramp vph Position of adjacent Ramp Type of adjacent Ramp Distance to adjacent Ramp ft ______Conversion to pc/h Under Base Conditions_____ Freeway Ramp Junction Components Adjacent 6041 469 0.95 0.95 1590 123 9 21 0 0 Ramp Volume, V (vph) vph Peak-hour factor, PHF Peak 15-min volume, v15 V Trucks and buses 용 0 0 Level % % mi mi Recreational vehicles 용 Terrain type:

Trucks and buses PCE, ET 1.5 1.5 Recreational vehicle PCE, ER 1.2 1.2

mi

Grade Length Heavy vehicle adjustment, fHV 0.957 0.905 Driver population factor, fP 1.00 1.00 Flow rate, vp 6645 546 pcph _____Estimation of V12 Merge Areas L = (Equation 25-2 or 25-3) EO P = 0.338 Using Equation 4 v = v (P) = 2243 pc/h12 F FM _____Capacity Checks_____ Actual Maximum LOS F? 7191 9000 No FO2789 4600 No R12 Level of Service Determination (if not F)_____ Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 23.3 pc/mi/lnR 12 A Level of service for ramp-freeway junction areas of influence C Speed Estimation_____ Intermediate speed variable, M = 0.343S Space mean speed in ramp influence area, S = 50.5 mph R

 $S = 48.9 \quad mph$

mph

0

S = 49.5

Space mean speed in outer lanes,

Space mean speed for all vehicles,

Phone: E-mail: Fax:

_____Diverge Analysis_____

Analyst: СН

Agency/Co.: PARSONS Date performed: 8/23/2007 Analysis time period: PM Peak Freeway/Dir of Travel: I-75 SB

Junction:

Exit Ramp E of Clark

Jurisdiction:

Analysis Year: 2035 (PA02)

Description: Detroit River International Crossing Project

Freeway Da	ta
------------	----

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	55.0	mph
Volume on freeway	6512	vph

____Off Ramp Data_____

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	284	vph
Length of first accel/decel lane	140	ft
Length of second accel/decel lane		ft

_____Adjacent Ramp Data (if one exists)____

Does adjacent ramp exist?

Volume on adjacent ramp

Position of adjacent ramp Type of adjacent ramp

Distance to adjacent ramp

No

vph ft

_____Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	6512	284	vph
Peak-hour factor, PHF	0.95	0.95	~
Peak 15-min volume, v15	1714	75	V
Trucks and buses	10	10	90
Recreational vehicles	0	0	90
Terrain type:	Level	Level	
Grade	0.00 %	0.00 %	%
Length	0.00 mi	0.00 mi	_ mi
Trucks and buses PCE, ET	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	

```
Heavy vehicle adjustment, fHV Driver population factor, fP
                              1.00
                                       1.00
Flow rate, vp
                              7197
                                       314
                                                         pcph
           _____Estimation of V12 Diverge Areas
                         (Equation 25-8 or 25-9)
              ΕQ
              P = 0.436 Using Equation 8
              FD
              v = v + (v - v) P = 3315 pc/h
               12 R F R FD
                  ____Capacity Checks
                     Actual
                                Maximum
                                           LOS F?
    v = v
                     7197
                                9000
                                            No
    Fi F
                     3315 4400
    V
                                            No
    12
                              9000
    \Delta = \Delta - \Delta
                    6883
                                           No
    FO F R
                     314
                              2000
                                           No
    V
      Level of Service Determination (if not F)
Density,
                  D = 4.252 + 0.0086 v - 0.009 L = 31.5 pc/mi/ln
                                 12
Level of service for ramp-freeway junction areas of influence D
  _____Speed Estimation____
Intermediate speed variable,
                                   D = 0.456
                                   S
Space mean speed in ramp influence area,
                                  S = 49.1
                                            mph
                                   R
                                  S = 56.7  mph
Space mean speed in outer lanes,
```

0

 $S = 52.9 \qquad mph$

0.952

0.952

Phone: E-mail:		Fax:					
<u></u>	Diver	ge Analys	is_	·			
Analyst: Agency/Co.: Date performed: Analysis time period: Freeway/Dir of Travel: Junction: Jurisdiction: Analysis Year: Description: Detroit R	I-75 SB Plaza Exit Ram 2035 (PA02)						
	Free	way Data_					
Type of analysis Number of lanes in free Free-flow speed on free Volume on freeway			_		mph vph		
	Off R	.amp Data_					
Side of freeway Number of lanes in ramp Free-Flow speed on ramp Volume on ramp Length of first accel/d Length of second accel/	ecel lane	Rig 2 45. 937 196	0		mph vph ft ft		
	Adjacent Ramp	Data (if	on	e exists	s)		
Does adjacent ramp exis Volume on adjacent ramp Position of adjacent ra Type of adjacent ramp Distance to adjacent ra	mp	No			vph ft		
Con	version to pc/h	. Under Ba	se	Conditio	ons		
Junction Components	<u>.</u>	Freeway		Ramp		Adjacent	
Volume, V (vph) Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type:		6228 0.95 1639 10 0 Level		937 0.95 247 16 0		Ramp	vph v %
Grade Length Trucks and buses PCE, E		0.00	% mi	Grade 1.22 0.46 1.5	% mi	9 n	i i

1.2

1.2

Recreational vehicle PCE, ER

```
Driver population factor, fP
                                   1.00
                                              1.00
Flow rate, vp
                                   6884
                                              1065
                                                                  pcph
               _____Estimation of V12 Diverge Areas___
                L =
                              (Equation 25-8 or 25-9)
                 EQ
                      0.260 Using Equation 0
                P =
                 FD
                v = v + (v - v) P = 2578 pc/h
                 12 R F R FD
                     _____Capacity Checks____
                        Actual
                                                   LOS F?
                                     Maximum
                        6884
                                     9000
    v = v
                                                   No
     Fi
                                     4400
                        2578
                                                   No
     12
                        5819
                                     9000
                                                   No
    v = v - v
        F R
     FO
                        1065
                                     4100
                                                   No
     R
        _____Level of Service Determination (if not F)______
                    D = 4.252 + 0.0086 v - 0.009 L = -8.9 pc/mi/ln
Density,
                                       12
Level of service for ramp-freeway junction areas of influence A
               _____Speed Estimation_____
                                        D = 0.394
Intermediate speed variable,
                                         S
                                        S = 49.9
Space mean speed in ramp influence area,
                                                    mph
                                         R
Space mean speed in outer lanes,
                                        S = 55.8
                                                    mph
                                         0
Space mean speed for all vehicles,
                                        S = 53.4
                                                    mph
```

0.952

0.926

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: ______Merge Analysis_____ Analyst: CH
Agency/Co.: PARSONS
Date performed: 8/23/2007
Analysis time period: PM Peak
Freeway/Dir of Travel: I-75 SB Junction: Ent. Ramp W of Junction Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway 4 55.0 mph 5292 wph Free-flow speed on freeway Volume on freeway _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp mph 35.0 Volume on ramp 296 vph Length of first accel/decel lane 1164 ft Length of second accel/decel lane ft. _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? No Volume on adjacent Ramp vph Position of adjacent Ramp Type of adjacent Ramp Distance to adjacent Ramp _____Conversion to pc/h Under Base Conditions_____ Freeway Ramp Adjacent Junction Components 5292 296 0.95 0.95 1393 78 9 0 0 0 Level Grade % -4.00 % Ramp Volume, V (vph) vph Peak-hour factor, PHF Peak 15-min volume, v15 V Trucks and buses 응 Recreational vehicles 9 Terrain type: õ mi Grade Length mi 0.04 miTrucks and buses PCE, ET 1.5
Recreational vehicle PCE, ER 1.2

1.5 1.2 1.2

Heavy vehicle adjustment, fHV Driver population factor, fP 0.957 1.000 1.00 1.00 Flow rate, vp 5821 312 pcph __Estimation of V12 Merge Areas_____ L = (Equation 25-2 or 25-3) ΕQ P = 0.550 Using Equation 4 v = v (P) = 3199 pc/h12 F FM _____Capacity Checks_____ Actual LOS F? Maximum 6133 9000 No FΟ 3511 4600 V No R12 Level of Service Determination (if not F) Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 25.4 pc/mi/lnR 12 A Level of service for ramp-freeway junction areas of influence C Speed Estimation Intermediate speed variable, M = 0.370S Space mean speed in ramp influence area, S = 50.2 mph R Space mean speed in outer lanes, S = 52.1 mph 0

S = 51.0 mph

Space mean speed for all vehicles,

Analyst: CH

Agency/Co.: PARSONS
Date performed: 8/23/2007
Analysis time period: PM Peak
Freeway/Dir of Travel: I-75 SB

Junction: Exit Ramp W of Livernois

Jurisdiction:

Analysis Year: 2035 (PA02)

Description: Detroit River International Crossing Project

_____Freeway Data_____

Type of analysis Diverge
Number of lanes in freeway 4
Free-flow speed on freeway 55.0 mph
Volume on freeway 5588 vph

Off Ramp Data_____

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	177	vph
Length of first accel/decel lane	647	ft
Length of second accel/decel lane		ft

______Adjacent Ramp Data (if one exists)_____

 $N \circ$

Does adjacent ramp exist?

Volume on adjacent ramp vph Position of adjacent ramp

Position of adjacent ran Type of adjacent ramp

Distance to adjacent ramp ft

_____Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp	Adjacent
			Ramp
Volume, V (vph)	5588	177	vph
Peak-hour factor, PHF	0.95	0.95	
Peak 15-min volume, v15	1471	47	V
Trucks and buses	9	23	96
Recreational vehicles	0	0	96
Terrain type:	Level	Grade	
Grade	0.00 %	5.00 %	%
Length	0.00 mi	0.07 mi	mi
Trucks and buses PCE, ET	1.5	1.5	
Recreational vehicle PCE, ER	1.2	2.5	

```
0.957
Heavy vehicle adjustment, fHV Driver population factor, fP
                                      0.897
                              1.00
                                        1.00
Flow rate, vp
                              6147
                                       208
                                                          pcph
              __Estimation of V12 Diverge Areas____
              L =
                          (Equation 25-8 or 25-9)
              ΕQ
              P = 0.436 Using Equation 8
              v = v + (v - v) P = 2797 pc/h
               12 R F R FD
             _____Capacity Checks_____
                                           LOS F?
                     Actual
                               Maximum
    v = v
                     6147
                                9000
                                             Νo
    Fi F
                     2797 4400
    V
                                             No
    12
    \Delta = \Delta - \Delta
                    5939
                               9000
                                             No
    FO F R
                     208
                            2000
                                             No
    R
    _____Level of Service Determination (if not F)____
Density,
                  D = 4.252 + 0.0086 v - 0.009 L = 22.5 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C
  _____Speed Estimation_____
                                  D = 0.447
Intermediate speed variable,
                                    S
Space mean speed in ramp influence area, S = 49.2 mph
```

Space mean speed in outer lanes,

Space mean speed for all vehicles,

R

 $S = 53.5 \qquad mph$

S = 57.7 mph

Phone: E-mail: Fax:

____Merge Analysis_____

Analyst: CH

Agency/Co.: PARSONS
Date performed: 8/23/2007
Analysis time period: PM Peak
Freeway/Dir of Travel: I-75 SB

Junction: Entrance Ramp W of Springwells

Jurisdiction:

Analysis Year: 2035 (PA02)

Description: Detroit River International Crossing Project

Freeway Data						
Type of analysis Number of lanes in freeway Free-flow speed on freeway Volume on freeway	Merge 4 55.0 5900	mph vph				
	On Ramp Data					
Side of freeway Number of lanes in ramp	Right 1					

Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	346	vph
Length of first accel/decel lane	370	ft
Length of second accel/decel lane		ft

______Adjacent Ramp Data (if one exists)_____

No

ft

Does adjacent ramp exist? Volume on adjacent Ramp Position of adjacent Ramp Type of adjacent Ramp Distance to adjacent Ramp

e on adjacent Ramp ion of adjacent Ramp

_____Conversion to pc/h Under Base Conditions_____

Junction Components	Freewa	У	Ramp		Adjacent Ramp	
Volume, V (vph)	5900		346			vph
Peak-hour factor, PHF	0.95		0.95			
Peak 15-min volume, v15	1553		91			V
Trucks and buses	12		16			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade		양		용		%
Length		mi		mi		mi
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, E	ER 1.2		1.2			

Driver population factor, fP 1.00 1.00 Flow rate, vp 6583 393 pcph Estimation of V12 Merge Areas L = (Equation 25-2 or 25-3)ΕQ P = 0.287 Using Equation 4 v = v (P) = 1886 pc/h12 F FM _____Capacity Checks_____ Actual Maximum LOS F? V 6976 9000 NoFΟ V 2279 4600 No R12 _____Level of Service Determination (if not F)_____ Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 20.8 pc/mi/lnR 12 Level of service for ramp-freeway junction areas of influence C _____Speed Estimation Intermediate speed variable, M = 0.333S Space mean speed in ramp influence area, $S = 50.7 \quad mph$ R Space mean speed in outer lanes, S = 48.2mph

0

S = 49.0 mph

0.943

0.926

Heavy vehicle adjustment, fHV

Space mean speed for all vehicles,

Phone: Fax: E-mail: _____Merge Analysis_____ Analyst: СН Agency/Co.: PARSONS
Date performed: 8/23/2007
Analysis time period: PM Peak
Freeway/Dir of Travel: I-75 SB
Junction: Entrance Ramp W of Dearborn Junction: Jurisdiction: Analysis Year: 2035 (PA02) Description: Detroit River International Crossing Project _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway 55.0 mph 6247 wph Free-flow speed on freeway Volume on freeway _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp mph 35.0 Volume on ramp 82 vph Length of first accel/decel lane 400 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists) Does adjacent ramp exist? $N \circ$ Volume on adjacent Ramp vph Position of adjacent Ramp Type of adjacent Ramp Distance to adjacent Ramp ft ______Conversion to pc/h Under Base Conditions_____ Junction Components Freeway Ramp Adjacent 6247 82 0.95 0.95 1644 22 12 4 Ramp Volume, V (vph) vph Peak-hour factor, PHF Peak 15-min volume, v15 V Trucks and buses 용 0 0 Recreational vehicles 읭 Level Level Terrain type: Grade % mi % mi

1.5 1.5 1.2 1.2

Length

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

%

тi

Heavy vehicle adjustment, fHV 0.943
Driver population factor, fP 1.00 1.00 Flow rate, vp 6970 88 pcph Estimation of V12 Merge Areas_____ L = (Equation 25-2 or 25-3) ΕQ P = 0.334 Using Equation 4 v = v (P) = 2330 pc/h12 F FM _____Capacity Checks____ Maximum Actual LOS F? 7058 9000 V NoFO2418 4600 V NoR12 _____Level of Service Determination (if not F)_____ Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 21.8 pc/mi/lnR 12 A Level of service for ramp-freeway junction areas of influence C _____Speed Estimation Intermediate speed variable, M = 0.337S Space mean speed in ramp influence area, S = 50.6 mph R

Space mean speed in outer lanes,

Space mean speed for all vehicles,

0.980

S = 48.3 mph

S = 49.1 mph

0

HCS+: Freeway Weaving Release 5.2

Phone: E-mail: Fax:

_____Operational Analysis_____

CH Analyst:

Agency/Co.: Agency/Co.: PARSONS
Date Performed: 8/23/2007
Analysis Time Period: AM Peak Freeway/Dir of Travel: I-75 NB

Weaving Location: From Livernois Ent/Junct. Exit

Jurisdiction:

2035 (PA02) Analysis Year:

Description: Detroit River International Crossing Project

_____Inputs_____

Freeway free-flow speed, SFF	55 mph
Weaving number of lanes, N	5
Weaving segment length, L	975 ft
Terrain type	Level
Grade	%
Length	mi
Weaving type	A
Volume ratio, VR	0.09
Weaving ratio, R	0.32

_____Conversion to pc/h Under Base Conditions____

	Non-Weaving Weaving		aving		
	V	V	V	V	
	A-C	B-D	A-D	B-C	
Volume, V	4203	0	142	307	veh/h
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	
Peak 15-min volume, v15	1106	0	37	81	V
Trucks and buses	12	0	5	3	%
Recreational vehicles	0	0	0	0	왕
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.943	1.000	0.976	0.985	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	4689	0	153	328	pc/h

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.15	0.00
b (Exhibit 24-6)	2.20	4.00
c (Exhibit 24-6)	0.97	1.30
d (Exhibit 24-6)	0.80	0.75
Weaving intensity factor, Wi	0.62	0.24
Weaving and non-weaving speeds, Si	42.74	51.36
Number of lanes required for		

unconstrained operation, Nw (Exhibit 24-7) 0.92
Maximum number of lanes, Nw (max) (Exhibit 24-7) 1.40
Type of operation is Unconstrained

______Weaving Segment Speed, Density, Level of Service and Capacity_____

Weaving segment speed, S	50.42	mph
Weaving segment density, D	20.51	pc/mi/ln
Level of service, LOS	С	
Capacity of base condition, cb	9335	pc/h
Capacity as a 15-minute flow rate, c	8807	pc/h
Capacity as a full-hour volume, ch	8367	pc/h

Limitations on Weaving Segments_____

		If Max Exce	eded See Note
	Analyzed	Maximum	Note
Weaving flow rate, Vw	481	2800	a
Average flow rate (pcphpl)	1034	2250	b
Volume ratio, VR	0.09	0.20	С
Weaving ratio, R	0.32	N/A	d
Weaving length (ft)	975	2500	е
Motos.			

- a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
- b. Capacity constrained by basic freeway capacity.
- c. Capacity occurs under constrained operating conditions.
- d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
- e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
- f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
- g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
- h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
- i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

Fax:

_____Operational Analysis_____

СН Analyst:

Analyst: CH
Agency/Co.: PARSONS
Date Performed: 8/23/2007
Analysis Time Period: AM Peak Freeway/Dir of Travel: I-75 NB

Weaving Location: From Clark Ent. to Grand Exit

Jurisdiction:

Analysis Year: 2035 (PA02)

Description: Detroit River International Crossing Project

______Inputs_____

Freeway free-flow speed, SFF	55	mph
Weaving number of lanes, N	5	
Weaving segment length, L	1251	ft
Terrain type	Level	
Grade		8
Length		mi
Weaving type	A	
Volume ratio, VR	0.07	
Weaving ratio, R	0.06	

_____Conversion to pc/h Under Base Conditions_____

	Non-Weaving		g Weaving		
	V	V	V	V	
	A-C	B-D	A-D	B-C	
Volume, V	5184	0	20	329	veh/h
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	
Peak 15-min volume, v15	1364	0	5	87	V
Trucks and buses	13	0	25	22	용
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.939	1.000	0.889	0.901	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	5811	0	23	384	pc/h

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.15	0.00
b (Exhibit 24-6)	2.20	4.00
c (Exhibit 24-6)	0.97	1.30
d (Exhibit 24-6)	0.80	0.75
Weaving intensity factor, Wi	0.58	0.23
Weaving and non-weaving speeds, Si	43.55	51.70
Number of lanes required for		

unconstrained operation, Nw (Exhibit 24-7) 0.79
Maximum number of lanes, Nw (max) (Exhibit 24-7) 1.40
Type of operation is Unconstrained

______Weaving Segment Speed, Density, Level of Service and Capacity_____

Weaving segment speed, S	51.07	mph
Weaving segment density, D	24.35	pc/mi/ln
Level of service, LOS	С	
Capacity of base condition, cb	9641	pc/h
Capacity as a 15-minute flow rate, c	9053	pc/h
Capacity as a full-hour volume, ch	8600	pc/h

Limitations on Weaving Segments_____

	Analyzed	Maximum	Note
Weaving flow rate, Vw	407	2800	a
Average flow rate (pcphpl)	1243	2250	b
Volume ratio, VR	0.07	0.20	С
Weaving ratio, R	0.06	N/A	d
Weaving length (ft)	1251	2500	е
Notos:			

- a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
- b. Capacity constrained by basic freeway capacity.
- c. Capacity occurs under constrained operating conditions.
- d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
- e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
- f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
- g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
- h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
- i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

Fax:

_____Operational Analysis_____

СН Analyst:

Agency/Co.: Agency/Co.: PARSONS
Date Performed: 8/23/2007
Analysis Time Period: Midday Peak Freeway/Dir of Travel: I-75 NB

Weaving Location: From Livernois Ent/Junct. Exit

Jurisdiction:

Analysis Year: 2035 (PA02)

Description: Detroit River International Crossing Project

_____Inputs______

Freeway free-flow speed, SFF	55 mph
Weaving number of lanes, N	5
Weaving segment length, L	975 ft
Terrain type	Level
Grade	9
Length	mi
Weaving type	A
Volume ratio, VR	0.08
Weaving ratio, R	0.32

_____Conversion to pc/h Under Base Conditions_____

	Non-Weaving		Weaving		
	V	V	V	V	
	A-C	B-D	A-D	B-C	
Volume, V	1719	0	51	111	veh/h
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	
Peak 15-min volume, v15	452	0	13	29	V
Trucks and buses	25	0	18	10	ે
Recreational vehicles	0	0	0	0	90
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.889	1.000	0.917	0.952	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	2035	0	58	122	pc/h

	weaving	Non-weaving
a (Exhibit 24-6)	0.15	0.00
b (Exhibit 24-6)	2.20	4.00
c (Exhibit 24-6)	0.97	1.30
d (Exhibit 24-6)	0.80	0.75
Weaving intensity factor, Wi	0.27	0.08
Weaving and non-weaving speeds, Si	50.52	56.84
Number of lanes required for		

unconstrained operation, Nw (Exhibit 24-7) 0.79
Maximum number of lanes, Nw (max) (Exhibit 24-7) 1.40
Type of operation is Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity_____

Weaving segment speed, S	56.27	mph
Weaving segment density, D	7.87	pc/mi/ln
Level of service, LOS	A	
Capacity of base condition, cb	9335	pc/h
Capacity as a 15-minute flow rate, c	8298	pc/h
Capacity as a full-hour volume, ch	7883	pc/h

Limitations on Weaving Segments_____

		If Max Exce	eded See Note
	Analyzed	Maximum	Note
Weaving flow rate, Vw	180	2800	a
Average flow rate (pcphpl)	443	2250	b
Volume ratio, VR	0.08	0.20	С
Weaving ratio, R	0.32	N/A	d
Weaving length (ft)	975	2500	е
Mataga			

- a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
- b. Capacity constrained by basic freeway capacity.
- c. Capacity occurs under constrained operating conditions.
- d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
- e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
- f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
- g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such
- h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
- i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

Fax:

_____Operational Analysis_____

CH Analyst:

Agency/Co.: Agency/Co.: PARSONS
Date Performed: 8/23/2007
Analysis Time Period: Midday Peak Freeway/Dir of Travel: I-75 NB

Weaving Location: From Clark Ent. to Grand Exit

Jurisdiction:

2035 (PA02) Analysis Year:

Description: Detroit River International Crossing Project

_____Inputs_____

Freeway free-flow speed, SFF	55 mph
Weaving number of lanes, N	5
Weaving segment length, L	1251 ft
Terrain type	Level
Grade	8
Length	mi
Weaving type	A
Volume ratio, VR	0.27
Weaving ratio, R	0.38

Conversion to pc/h Under Base Conditions_____

	Non-Wea	ving	Weaving		
	V	V	V	V	
	A-C	B-D	A-D	B-C	
Volume, V	1740	0	244	395	veh/h
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	
Peak 15-min volume, v15	458	0	64	104	V
Trucks and buses	25	0	25	23	િ
Recreational vehicles	0	0	0	0	ଚ
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.889	1.000	0.889	0.897	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	2060	0	288	463	pc/h

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.15	0.00
b (Exhibit 24-6)	2.20	4.00
c (Exhibit 24-6)	0.97	1.30
d (Exhibit 24-6)	0.80	0.75
Weaving intensity factor, Wi	0.91	0.09
Weaving and non-weaving speeds, Si	38.54	56.20
Number of lanes required for		

unconstrained operation, Nw (Exhibit 24-7) Maximum number of lanes, Nw (max) (Exhibit 24-7) 1.40 Constrained Type of operation is

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	50.07	mph
Weaving segment density, D	11.23	pc/mi/ln
Level of service, LOS	В	
Capacity of base condition, cb	9061	pc/h
Capacity as a 15-minute flow rate, c	8054	pc/h
Capacity as a full-hour volume, ch	7651	pc/h

Limitations on Weaving Segments

		If Max Exce	eded See Note
	Analyzed	Maximum	Note
Weaving flow rate, Vw	751	2800	a
Average flow rate (pcphpl)	562	2250	b
Volume ratio, VR	0.27	0.20	C
Weaving ratio, R	0.38	N/A	d
Weaving length (ft)	1251	2500	е
Notes.			

- a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
- b. Capacity constrained by basic freeway capacity.
- Capacity occurs under constrained operating conditions.
- Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
- Four-lane Type A segments do not operate well at volume ratios greater е. than 0.35. Poor operations and some local queuing are expected in such
- f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
- Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such
- Type B weaving segments do not operate well at volume ratios greater h. than 0.80. Poor operations and some local queuing are expected in such
- i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

Fax:

____Operational Analysis_____

СН Analyst:

Agency/Co.: Agency/Co.: PARSONS
Date Performed: 8/23/2007
Analysis Time Period: PM Peak Freeway/Dir of Travel: I-75 NB

Weaving Location: From Livernois Ent/Junct. Exit

Jurisdiction:

Analysis Year: 2035 (PA02)

Description: Detroit River International Crossing Project

_____Inputs_____

Freeway free-flow speed, SFF	55 m	nph
Weaving number of lanes, N	5	
Weaving segment length, L	975 f	Ēt.
Terrain type	Level	
Grade	9	Ś
Length	n	ni
Weaving type	A	
Volume ratio, VR	0.08	
Weaving ratio, R	0.31	

_____Conversion to pc/h Under Base Conditions_____

	Non-Weaving		Weaving		
	V	V	V	V	
	A-C	B-D	A-D	B-C	
Volume, V	2085	0	61	133	veh/h
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	
Peak 15-min volume, v15	549	0	16	35	V
Trucks and buses	18	0	15	17	90
Recreational vehicles	0	0	0	0	o _o
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.917	1.000	0.930	0.922	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	2392	0	69	151	pc/h

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.15	0.00
b (Exhibit 24-6)	2.20	4.00
c (Exhibit 24-6)	0.97	1.30
d (Exhibit 24-6)	0.80	0.75
Weaving intensity factor, Wi	0.32	0.09
Weaving and non-weaving speeds,	Si 49.21	56.11
Number of lanes required for		

unconstrained operation, Nw (Exhibit 24-7) 0.82
Maximum number of lanes, Nw (max) (Exhibit 24-7) 1.40
Type of operation is Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	55.45	mph
Weaving segment density, D	9.42	pc/mi/ln
Level of service, LOS	A	
Capacity of base condition, cb	9335	pc/h
Capacity as a 15-minute flow rate, c	8564	pc/h
Capacity as a full-hour volume, ch	8136	pc/h

Limitations on Weaving Segments

		If Max Exce	eded See Note
	Analyzed	Maximum	Note
Weaving flow rate, Vw	220	2800	а
Average flow rate (pcphpl)	522	2250	b
Volume ratio, VR	0.08	0.20	С
Weaving ratio, R	0.31	N/A	d
Weaving length (ft)	975	2500	е
Notog.			

- Notes:
- a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
- b. Capacity constrained by basic freeway capacity.
- c. Capacity occurs under constrained operating conditions.
- d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
- e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
- f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
- g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
- h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
- i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

Fax:

____Operational Analysis_____

СН Analyst:

Agency/Co.: Agency/Co.: PARSONS
Date Performed: 8/23/2007
Analysis Time Period: PM Peak Freeway/Dir of Travel: I-75 NB

Weaving Location: From Clark Ent. to Grand Exit

Jurisdiction:

Analysis Year: 2035 (PA02)

Description: Detroit River International Crossing Project

_____Inputs_____

Freeway free-flow speed, SFF	55	mph
Weaving number of lanes, N	5	
Weaving segment length, L	1251	ft
Terrain type	Level	
Grade		8
Length		mi
Weaving type	A	
Volume ratio, VR	0.30	
Weaving ratio, R	0.23	

____Conversion to pc/h Under Base Conditions_____

	Non-Weaving		Weaving		
	V	V	V	V	
	A - C	B-D	A-D	B-C	
Volume, V	2136	0	204	709	veh/h
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	
Peak 15-min volume, v15	562	0	54	187	V
Trucks and buses	18	0	25	13	용
Recreational vehicles	0	0	0	0	용
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.917	1.000	0.889	0.939	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	2450	0	241	794	pc/h

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.15	0.00
b (Exhibit 24-6)	2.20	4.00
c (Exhibit 24-6)	0.97	1.30
d (Exhibit 24-6)	0.80	0.75
Weaving intensity factor, Wi	1.18	0.13
Weaving and non-weaving speeds, Si	35.62	54.69
Number of lanes required for		

unconstrained operation, Nw (Exhibit 24-7)

Maximum number of lanes, Nw (max) (Exhibit 24-7)

Type of operation is

1.85

Constrained

Weaving Segment Speed, Density, Level of Service and Capacity_____

Weaving segment speed, S Weaving segment density, D		mph pc/mi/ln
Level of service, LOS	В	4-
Capacity of base condition, cb	9061	pc/h
Capacity as a 15-minute flow rate, c	8313	pc/h
Capacity as a full-hour volume, ch	7897	pc/h

Limitations on Weaving Segments_____

		If Max Exce	eded See Note
	Analyzed	Maximum	Note
Weaving flow rate, Vw	1035	2800	a
Average flow rate (pcphpl)	697	2250	b
Volume ratio, VR	0.30	0.20	С
Weaving ratio, R	0.23	N/A	d
Weaving length (ft)	1251	2500	е
Notoge			

- a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
- b. Capacity constrained by basic freeway capacity.
- c. Capacity occurs under constrained operating conditions.
- d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
- e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
- f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
- g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
- h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
- i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

Fax:

_____Operational Analysis_____

CH

Analyst:
Agency/Co.: PARSONS Date Performed: 8/23/2007 Analysis Time Period: AM Peak Freeway/Dir of Travel: I-75 SB

Weaving Location: From Amb. Ent. to Clark Exit

Jurisdiction:

Analysis Year: 2035 (PA02)

Description: Detroit River International Crossing Project

_____Inputs_____ Freeway free-flow speed, SFF 55 mph Weaving number of lanes, N 5 1316 ft Weaving segment length, L Terrain type Level 용 Grade Length Мi A Weaving type

0.20 Volume ratio, VR Weaving ratio, R 0.17

_____Conversion to pc/h Under Base Conditions_____

	Non-Weaving		Non-Weaving Weaving			
	V	V	V	V		
	A-C	B-D	A-D	B-C		
Volume, V	2692	0	602	120	veh/h	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95		
Peak 15-min volume, v15	708	0	158	32	V	
Trucks and buses	17	0	1	4	용	
Recreational vehicles	0	0	0	0	용	
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2		
Heavy vehicle adjustment, fHV	0.922	1.000	0.995	0.980		
Driver population adjustment, fP	1.00	1.00	1.00	1.00		
Flow rate, v	3074	0	636	128	pc/h	

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.15	0.00
b (Exhibit 24-6)	2.20	4.00
c (Exhibit 24-6)	0.97	1.30
d (Exhibit 24-6)	0.80	0.75
Weaving intensity factor, Wi	1.05	0.11
Weaving and non-weaving speeds, Si	36.96	55.67
Number of lanes required for		

unconstrained operation, Nw (Exhibit 24-7)

Maximum number of lanes, Nw (max) (Exhibit 24-7)

Type of operation is

1.48

Constrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	50.57	mph
Weaving segment density, D	15.18	pc/mi/ln
Level of service, LOS	В	
Capacity of base condition, cb	9134	pc/h
Capacity as a 15-minute flow rate, c	8418	pc/h
Capacity as a full-hour volume, ch	7997	pc/h

Limitations on Weaving Segments_____

		If Max Exce	eded See Note
	Analyzed	Maximum	Note
Weaving flow rate, Vw	764	2800	а
Average flow rate (pcphpl)	767	2250	b
Volume ratio, VR	0.20	0.20	С
Weaving ratio, R	0.17	N/A	d
Weaving length (ft)	1316	2500	е
Notes:			

- a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
- b. Capacity constrained by basic freeway capacity.
- c. Capacity occurs under constrained operating conditions.
- d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
- e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
- f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
- g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
- h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
- i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

Fax:

_____Operational Analysis______

CH Analyst: Agency/Co.: PARSONS
Date Performed: 8/23/2007 Analysis Time Period: AM Peak Freeway/Dir of Travel: I-75 SB

Weaving Location: From Junct. Ent. to Liver.Exit

Jurisdiction:

Analysis Year: 2035 (PA02)

Description: Detroit River International Crossing Project

_____Inputs_____ Freeway free-flow speed, SFF 55 mph Weaving number of lanes, N 5 1100 ft Weaving segment length, L Level Terrain type 응 Grade mi Length Weaving type 0.15 Volume ratio, VR 0.09 Weaving ratio, R

_____Conversion to pc/h Under Base Conditions_____

	Non-Weaving		Weaving		
	V	V	V	V	
	A-C	B-D	A-D	B-C	
Volume, V	2218	0	378	34	veh/h
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	
Peak 15-min volume, v15	584	0	99	9	V
Trucks and buses	17	0	0	12	્રે
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.922	1.000	1.000	0.943	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	2533	0	397	37	pc/h

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.15	0.00
b (Exhibit 24-6)	2.20	4.00
c (Exhibit 24-6)	0.97	1.30
d (Exhibit 24-6)	0.80	0.75
Weaving intensity factor, Wi	0.37	0.13
Weaving and non-weaving speeds, Si	47.94	54.91
Number of lanes required for		

unconstrained operation, Nw (Exhibit 24-7) Maximum number of lanes, Nw (max) (Exhibit 24-7) 1.40 Type of operation is Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity_____

Weaving segment speed, S	53.77	mph
Weaving segment density, D	11.04	pc/mi/ln
Level of service, LOS	В	
Capacity of base condition, cb	9216	pc/h
Capacity as a 15-minute flow rate, c	8494	pc/h
Capacity as a full-hour volume, ch	8069	pc/h

Limitations on Weaving Segments

		If Max Exce	eded See Note
	Analyzed	Maximum	Note
Weaving flow rate, Vw	434	2800	a
Average flow rate (pcphpl)	593	2250	b
Volume ratio, VR	0.15	0.20	С
Weaving ratio, R	0.09	N/A	d
Weaving length (ft)	1100	2500	е
Motog			

- a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
- b. Capacity constrained by basic freeway capacity.
- Capacity occurs under constrained operating conditions. c.
- Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
- Four-lane Type A segments do not operate well at volume ratios greater е. than 0.35. Poor operations and some local queuing are expected in such cases.
- f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
- Five-lane Type A segments do not operate well at volume ratios greater g. than 0.20. Poor operations and some local queuing are expected in such cases.
- Type B weaving segments do not operate well at volume ratios greater h. than 0.80. Poor operations and some local queuing are expected in such
- i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such

Fax:

_____Operational Analysis_____

Analyst:

СН

Agency/Co.: PARSONS
Date Performed: 8/23/2007
Analysis Time Period: Midday Peak Freeway/Dir of Travel: I-75 SB

Weaving Location: From Amb. Ent. to Clark Exit

Jurisdiction:

Analysis Year:

2035 (PA02)

Description: Detroit River International Crossing Project

_____Inputs_____

Freeway free-flow speed, SFF	55	mph
Weaving number of lanes, N	5	
Weaving segment length, L	1316	ft
Terrain type	Level	
Grade		8
Length		mi
Weaving type	A	
Volume ratio, VR	0.12	
Weaving ratio, R	0.23	

Conversion to pc/h Under Base Conditions______

	Non-Wea	ving	Weaving		
	V	V	V	V	
	A-C	B-D	A-D	B-C	
Volume, V	2702	0	298	89	veh/h
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	
Peak 15-min volume, v15	711	0	78	23	V
Trucks and buses	25	0	6	7	용
Recreational vehicles	0	0	0	0	왕
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.889	1.000	0.971	0.966	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	3199	0	323	96	pc/h

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.15	0.00
b (Exhibit 24-6)	2.20	4.00
c (Exhibit 24-6)	0.97	1.30
d (Exhibit 24-6)	0.80	0.75
Weaving intensity factor, Wi	0.36	0.13
Weaving and non-weaving speeds, S:	i 48.03	54.84
Number of lanes required for		

unconstrained operation, Nw (Exhibit 24-7) 1.06 Maximum number of lanes, Nw (max) (Exhibit 24-7) 1.40 Unconstrained Type of operation is

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	53.95	mph
Weaving segment density, D	13.41	pc/mi/ln
Level of service, LOS	В	
Capacity of base condition, cb	9617	pc/h
Capacity as a 15-minute flow rate, c	8548	pc/h
Capacity as a full-hour volume, ch	8121	pc/h

Limitations on Weaving Segments_____

		If Max Exce	eded See Note
	Analyzed	Maximum	Note
Weaving flow rate, Vw	419	2800	a
Average flow rate (pcphpl)	723	2250	b
Volume ratio, VR	0.12	0.20	С
Weaving ratio, R	0.23	N/A	d
Weaving length (ft)	1316	2500	е
Notes.			

- a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
- b. Capacity constrained by basic freeway capacity.
- Capacity occurs under constrained operating conditions.
- d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
- Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
- f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
- Five-lane Type A segments do not operate well at volume ratios greater q. than 0.20. Poor operations and some local queuing are expected in such cases.
- Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such
- i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

Fax:

Operational Analysis_____

Analyst:

СН Agency/Co.: PARSONS
Date Performed: 8/23/2007
Analysis Time Period: Midday Peak

Freeway/Dir of Travel: I-75 SB

Weaving Location: From Junct. Ent. to Liver.Exit

Jurisdiction:

Analysis Year: 2035 (PA02)

Weaving ratio, R

Description: Detroit River International Crossing Project

______Inputs_____ Freeway free-flow speed, SFF 55 mph Weaving number of lanes, N 1100 ft Weaving segment length, L Level Terrain type 응 Grade mi Length Α Weaving type 0.08 Volume ratio, VR

0.22

_____Conversion to pc/h Under Base Conditions_____

	Non-Wea	ving	Weaving		
	V	V	V	V	
	A-C	B-D	A-D	B-C	
Volume, V	2225	0	172	48	veh/h
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	
Peak 15-min volume, v15	586	0	45	13	V
Trucks and buses	25	0	9	17	90
Recreational vehicles	0	0	0	0	90
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.889	1.000	0.957	0.922	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	2634	0	189	54	pc/h

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.15	0.00
b (Exhibit 24-6)	2.20	4.00
c (Exhibit 24-6)	0.97	1.30
d (Exhibit 24-6)	0.80	0.75
Weaving intensity factor, Wi	0.31	0.10
Weaving and non-weaving speeds, Si	49.23	55.98
Number of lanes required for		

unconstrained operation, Nw (Exhibit 24-7) 0.84 Maximum number of lanes, Nw (max) (Exhibit 24-7) 1.40 Type of operation is Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	55.34	mph
Weaving segment density, D	10.40	pc/mi/ln
Level of service, LOS	В	
Capacity of base condition, cb	9484	pc/h
Capacity as a 15-minute flow rate, c	8430	pc/h
Capacity as a full-hour volume, ch	8008	pc/h

Limitations on Weaving Segments_____

		If Max Exce	eded See Note
	Analyzed	Maximum	Note
Weaving flow rate, Vw	243	2800	a
Average flow rate (pcphpl)	575	2250	b
Volume ratio, VR	0.08	0.20	С
Weaving ratio, R	0.22	N/A	d
Weaving length (ft)	1100	2500	е
Motes.			

- a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
- b. Capacity constrained by basic freeway capacity.
- Capacity occurs under constrained operating conditions.
- Three-lane Type A segments do not operate well at volume ratios greater d. than 0.45. Poor operations and some local queuing are expected in such cases.
- Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
- f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
- Five-lane Type A segments do not operate well at volume ratios greater g. than 0.20. Poor operations and some local queuing are expected in such cases.
- Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such
- i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

HCS+: Freeway Weaving Release 5.2

Phone: E-mail: Fax:

_____Operational Analysis_____

Analyst:

CH PARSONS Agency/Co.: Agency/Co.:

Date Performed: 8/23/2007

Analysis Time Period: PM Peak

Freeway/Dir of Travel: I-75 SB

Weaving Location: From Amb. Ent. to Clark Exit

Jurisdiction:

Analysis Year:

2035 (PA02)

Description: Detroit River International Crossing Project

_____Inputs_____

Freeway free-flow speed, SFF	55	mph
		шрп
Weaving number of lanes, N	5	
Weaving segment length, L	1316	ft
Terrain type	Level	
Grade		ૄ
Length		mi
Weaving type	A	
Volume ratio, VR	0.14	
Weaving ratio, R	0.32	

_____Conversion to pc/h Under Base Conditions____

	Non-Weaving		Weaving		
	V	V	V	V	
	A-C	B-D	A-D	B-C	
Volume, V	5648	0	284	580	veh/h
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	
Peak 15-min volume, v15	1486	0	75	153	V
Trucks and buses	9	0	10	22	ଚ୍ଚ
Recreational vehicles	0	0	0	0	00
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.957	1.000	0.952	0.901	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	6212	0	313	677	pc/h

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.15	0.00
b (Exhibit 24-6)	2.20	4.00
c (Exhibit 24-6)	0.97	1.30
d (Exhibit 24-6)	0.80	0.75
Weaving intensity factor, Wi	0.74	0.34
Weaving and non-weaving speeds, Si	40.91	48.52
Number of lanes required for		

unconstrained operation, Nw (Exhibit 24-7) Maximum number of lanes, Nw (max) (Exhibit 24-7) 1.40 Type of operation is Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S Weaving segment density, D	47.31 30.44	mph pc/mi/ln
Level of service, LOS	D	
Capacity of base condition, cb	9491	pc/h
Capacity as a 15-minute flow rate, c	9082	pc/h
Capacity as a full-hour volume, ch	8628	pc/h

Limitations on Weaving Segments_____

		If Max Exce	eded See Note
	Analyzed	Maximum	Note
Weaving flow rate, Vw	990	2800	a
Average flow rate (pcphpl)	1440	2250	b
Volume ratio, VR	0.14	0.20	С
Weaving ratio, R	0.32	N/A	d
Weaving length (ft)	1316	2500	е
37 1			

- Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
- b. Capacity constrained by basic freeway capacity.
- Capacity occurs under constrained operating conditions.
- Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such
- e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
- f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
- Five-lane Type A segments do not operate well at volume ratios greater g. than 0.20. Poor operations and some local queuing are expected in such cases.
- Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such
- Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

Phone:

Fax:

E-mail:

_____Operational Analysis_____

Analyst:

СН

Agency/Co.:

PARSONS

Date Performed: 8/23/2007
Analysis Time Period: PM Peak

Freeway/Dir of Travel: I-75 SB

Weaving Location:

From Junct. Ent. to Liver.Exit

Jurisdiction:

Analysis Year: 2035 (PA02)

Description: Detroit River International Crossing Project

Т	n	n	u	+	c	
1	ΤT	\sim	u	L	S	

Freeway free-flow speed, SFF	55	mph
Weaving number of lanes, N	5	
Weaving segment length, L	1100	ft
Terrain type	Level	
Grade		8
Length		mi
Weaving type	A	
Volume ratio, VR	0.08	
Weaving ratio, R	0.40	

Conversion to pc/h Under Base Conditions_____

	Non-Weaving		Weaving		
	V	V	V	V	
	A-C	B-D	A-D	B-C	
Volume, V	5114	0	177	296	veh/h
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	
Peak 15-min volume, v15	1346	0	47	78	V
Trucks and buses	9	0	23	0	용
Recreational vehicles	0	0	0	0	용
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.957	1.000	0.897	1.000	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	5625	0	207	311	pc/h

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.15	0.00
b (Exhibit 24-6)	2.20	4.00
c (Exhibit 24-6)	0.97	1.30
d (Exhibit 24-6)	0.80	0.75
Weaving intensity factor, Wi	0.66	0.26
Weaving and non-weaving speeds, Si	42.17	50.63
Number of lanes required for		

unconstrained operation, Nw (Exhibit 24-7) 0.90
Maximum number of lanes, Nw (max) (Exhibit 24-7) 1.40
Type of operation is Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity_____

Weaving segment speed, S 49.79 mph
Weaving segment density, D 24.68 pc/mi/ln
Level of service, LOS C
Capacity of base condition, cb 9484 pc/h
Capacity as a 15-minute flow rate, c 9076 pc/h
Capacity as a full-hour volume, ch 8622 pc/h

_____Limitations on Weaving Segments______

		If Max Exce	eeded See Note
	Analyzed	Maximum	Note
Weaving flow rate, Vw	518	2800	а
Average flow rate (pcphpl)	1228	2250	b
Volume ratio, VR	0.08	0.20	С
Weaving ratio, R	0.40	N/A	d
Weaving length (ft)	1100	2500	е
AT - do a			

- a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
- b. Capacity constrained by basic freeway capacity.
- c. Capacity occurs under constrained operating conditions.
- d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
- e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
- f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
- g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
- h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such
- i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.