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To Nancy Fairchild, Transportation Planner

City of Mercer Island

FAX 206.236.3599

Date June 30, 2003

Project Jewish Community Center Master Plan Traffic Impact Analysis

From David W. Johnson

Remarks
Nancy,
Attached are the intersection level of service reports for existing (2002) and future with project conditions. Please note that with the refined Master Plan, the project volumes generated by JCC will be slightly less than the volumes analyzed in the original traffic analysis and the attached reports.



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June 30, 2003

Nancy Fairchild, Transportation Planner
Development Services
City of Mercer Island
9611 SE 36th Street
Mercer Island, WA 98040

Subject: Jewish Community Center Master Plan – Transportation Update (Revised)

Dear Ms. Fairchild:

This letter report serves as a supplemental update to the May 2002 Transportation Impact Analysis (TIA) prepared for the Jewish Community Center (JCC) Master Plan. This report identifies refinements to the proposed Master Plan and the effects of those changes on the transportation elements addressed in the original TIA.

Changes to the Master Plan Program

Changes to the original Master Plan program include the following:

1. The recreational facilities at the JCC will not be expanded and JCC programs will not change. The proposed parking garage that was incorporated into the recreational facility would also not be constructed.
2. The original plan assumed that the existing 200 student French American School (FAS) would relocate off-site and be replaced by a larger school (possibly the Jewish Day School) of 475 students. The original plan would have resulted in a net increase of 275 students. Current plans do not include housing a new private school. The existing FAS would be consolidated and additional FAS classrooms constructed on the JCC campus. FAS classes would no longer be held across East Mercer way at Herzl Ner Tamid.

An expanded FAS on-campus would accommodate 300 students. This would result in a net increase of 100 students (175 less than proposed in the original master plan).

3. Modifications to the site plan provide for improved vehicular circulation and parking layout. The revised parking supply for the campus would consist of 235 stalls. An internal circulation road would surround the FAS site and provide access to the school buildings and adjacent parking areas. On the north and west sides of the school the road would be one-way (clockwise) and provide adequate width to accommodate a 450 foot loading zone

JCC Master Plan – Transportation Update

June 30, 2003

Page 2

adjacent to the travel lane. This 20 foot wide road also serves as the fire access lane for the FAS.

The effects of these refinements on the transportation elements analyzed in the original TIA are summarized below.

Site Circulation

The revised parking lot layout provides for a more efficient circulation pattern and clear identification and separation of loading areas. The 450 foot loading zone for the FAS provides an efficient approach to accommodating the volume of arriving and departing school children that provides students with direct access between the loading area and school rooms. In addition a separate parking and loading area for the JCC Day Care Center is provided and the load zone at the primary JCC entrance is redesigned to accommodate bus loading and turn around.

The revised layout of the parking lots provides a more orderly vehicular and pedestrian circulation pattern for the campus while maximizing the retention of existing trees. The new parking lot configuration will clearly separate the primary vehicle circulation lanes from the parking areas. This will include constructing an intersection where the FAS and JCC access roads meet that will allow inbound traffic to flow freely and control outbound traffic with stop signs.

Traffic Volumes and Level of Service

The revised Master Plan does not include the expansion of recreational facilities at the JCC and provides school facilities for 100 new students rather than the 275 new students proposed in the original Master Plan. Traffic volumes would be less than those presented in the TIA and level of service delays would also be slightly less.

It should be noted that three of the FAS classes are currently housed at Herzl Ner Tamid. With the consolidation of the FAS onto the JCC campus, AM peak hour trips generated by this use would shift from the Herzl Ner Tamid access across East Mercer Way to the JCC access. PM peak hour trips would not be affected since existing FAS students attending classes at Herzl Ner Tamid that do not leave immediately after school walk over to the JCC for after school activities.

Parking Demand and Supply

The TIA for the Master Plan documented an existing peak parking demand for the entire JCC campus at midday of approximately 160 vehicles and projected a future demand of approximately 300 vehicles. The FAS at JCC currently generates a peak parking demand of approximately 18 stalls that serve administrative needs and classrooms for 100 students. (The remaining 100 students are located at Herzl Ner Tamid across East Mercer Way.) Without the expansion of JCC recreational facilities,

JCC Master Plan – Transportation Update

June 30, 2003

and a smaller school the forecasted parking demand would be less than the 300 vehicles forecasted in the TIA.

The expansion of school facilities to serve a total of 300 FAS students would generate a peak parking demand of approximately 15 more vehicles. This demand would be generated by the additional teachers and visitors to the expanded school. The forecasted peak (midday) parking demand for the JCC campus would be approximately 175 vehicles and is not anticipated to increase. The forecasted parking demand would be accommodated by the proposed supply of approximately 235 stalls. The proposed future supply represents an increase of 15 stalls over the existing supply of approximately 220 stalls.

Pedestrian Activity and Safety

The consolidation of FAS classes onto the JCC campus would reduce existing pedestrian travel between the JCC and Herzl Ner Tamid thereby reducing the potential for accidents on East Mercer Way. The provision of a 450 foot load zone adjacent to the FAS classrooms provides students a direct route between the loading area/pick-up plaza and their classrooms that does not cross a vehicle travel lane or parking area.

The City requested that the accident data in the original TIA be updated to include current data. Accident reports for 2002 and the available reports for 2003 were reviewed and the results incorporated into the expanded table from the original JCC transportation analysis. The findings (Table 1 below) show that the number of accidents in the general vicinity of the JCC has decreased.

Table 1. Crash Summary

Intersection (On E. Mercer Way)	Year					Accident Type					
	99	00	01	02	03	Rear End	Side Swipe	Right Angle	Fixed Object	Bike/ Ped.	Other or Not Specified
Westbound Ramp	2		2	3		3				2	2
SE 36 th Street	2	2	2			1		2		1	2
SE 38th Street	1		1								2
SE 40th Street	2				1		2				1
Herzl/Boat Ramp			1								1
SJCC access 4000 Block	1	1	1					3			1
Total	9	3	8	3	1	4	2	5	1	3	9

I trust this supplemental report provides you with the information needed to evaluate the transportation element of the revised Master Plan. If you have any questions or require additional information please do not hesitate to contact me.

JCC Master Plan – Transportation Update
June 30, 2003

Page 4

Sincerely,
Transportation Solutions, Inc.



David Johnson
Transportation Manager

CC: Christiane Pein, Weinstein AU

3: SE 36th St & East Mercer Way
2002 Existing

PM Peak Hour
6/30/2003

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50				50	50	50	50	50	50
Trailing Detector (ft)	0	0	0				0	0	0	0	0	0
Turning Speed (mph)	15		9	15			15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850						0.850			0.850
Flt Protected		0.997					0.950			0.950		0.850
Satd. Flow (prot)	0	1857	1583	0	0	0	1770	1863	1583	1770	1863	1583
Flt Permitted		0.997					0.547			0.679		
Satd. Flow (perm)	0	1857	1583	0	0	0	1019	1863	1583	1265	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			70						110			489
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3116			3384			1624			300	
Travel Time (s)		70.8			76.9			36.9			6.8	
Volume (vph)	26	366	64	0	0	0	46	112	101	20	236	450
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	398	70	0	0	0	50	122	110	22	257	489
Lane Group Flow (vph)	0	426	70	0	0	0	50	122	110	22	257	489
Turn Type	Perm		Perm				pm+pt		Perm	pm+pt		Perm
Protected Phases		4					5	2		1	6	
Permitted Phases	4		4				2		2	6		6
Detector Phases	4	4	4				5	2	2	1	6	6
Minimum Initial (s)	4.0	4.0	4.0				4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0				8.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	21.0	21.0	21.0	0.0	0.0	0.0	8.0	21.0	21.0	8.0	21.0	21.0
Total Split (%)	42%	42%	42%	0%	0%	0%	16%	42%	42%	16%	42%	42%
Yellow Time (s)	3.5	3.5	3.5				3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5				0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag							Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None				None	Coord	Coord	None	Coord	Coord
Act Effct Green (s)		14.8	14.8				26.4	25.6	25.6	25.6	24.0	24.0
Actuated g/C Ratio		0.30	0.30				0.53	0.51	0.51	0.51	0.48	0.48
v/c Ratio		0.78	0.14				0.08	0.13	0.13	0.03	0.29	0.48
Uniform Delay, d1		16.1	0.0				5.5	8.1	0.0	5.6	9.9	0.0
Delay		16.9	4.0				6.8	8.7	3.0	6.6	10.4	1.9
LOS		B	A				A	A	A	A	B	A
Approach Delay		15.1						6.1			4.9	
Approach LOS		B						A			A	
Queue Length 50th (ft)		107	0				7	17	0	3	38	0
Queue Length 95th (ft)		#190	20				19	54	24	11	106	50
Internal Link Dist (ft)		3036						1544				
50th Up Block Time (%)				3304								
95th Up Block Time (%)											220	
Turn Bay Length (ft)												

3: SE 36th St & East Mercer Way
2002 Existing

PM Peak Hour
6/30/2003

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
50th Bay Block Time %												
95th Bay Block Time %												
Queuing Penalty (veh)												

Intersection Summary

Area Type: Other
 Cycle Length: 50
 Actuated Cycle Length: 50
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 8.4
 Intersection Capacity Utilization 42.7%
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.











Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 3: SE 36th St & East Mercer Way

↑ ø2 21 s	↘ ø1 8 s	→ ø4 21 s
↓ ø6 21 s	↙ ø5 8 s	

7: EB I-90 Off Ramp & East Mercer Way
2002 Existing

PM Peak Hour
6/30/2003

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Turning Speed (mph)	15	9	15			9
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00
Flt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	1770	1583	0	1863	3539	0
Flt Permitted	0.950					
Satd. Flow (perm)	1770	1583	0	1863	3539	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		156				
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30			30	30	
Link Distance (ft)	3110			300	2428	
Travel Time (s)	70.7			6.8	55.2	
Volume (vph)	9	161	0	138	545	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	10	175	0	150	592	0
Lane Group Flow (vph)	10	175	0	150	592	0
Turn Type		Perm				
Protected Phases	4			2	6	
Permitted Phases		4				
Minimum Split (s)	20.0	20.0		20.0	20.0	
Total Split (s)	20.0	20.0	0.0	20.0	20.0	0.0
Total Split (%)	50%	50%	0%	50%	50%	0%
Yellow Time (s)	3.5	3.5		3.5	3.5	
All-Red Time (s)	0.5	0.5		0.5	0.5	
Lead/Lag						
Lead-Lag Optimize?						
Act Effct Green (s)	16.0	16.0		16.0	16.0	
Actuated g/C Ratio	0.40	0.40		0.40	0.40	
v/c Ratio	0.01	0.24		0.20	0.42	
Uniform Delay, d1	7.2	0.8		7.8	8.6	
Delay	7.3	2.6		8.2	8.9	
LOS	A	A		A	A	
Approach Delay	2.8			8.2	8.9	
Approach LOS	A			A	A	
Queue Length 50th (ft)	1	2		21	46	
Queue Length 95th (ft)	7	27		46	76	
Internal Link Dist (ft)	3030			220	2348	
50th Up Block Time (%)						
95th Up Block Time (%)						
Turn Bay Length (ft)						
50th Bay Block Time %						
95th Bay Block Time %						
Queuing Penalty (veh)						

Intersection Summary

All-Way Stop Control

ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	RJH	Intersection	EMW @ I-90 WB Ramps
Agency/Co.	Transportation Solutions Inc.	Jurisdiction	Mercer Island, WA
Date Performed	4/26/2002	Analysis Year	2002
Analysis Time Period	PM peak hour	Project ID	JCC

East/West Street: I-90 WB Ramps North/South Street: East Mercer Way

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
	L	T	R	L	T	R
Movement						
Volume	0	0	0	536	6	7
%Thrus Left Lane	50			50		

Approach	Northbound			Southbound		
	L	T	R	L	T	R
Movement						
Volume	161	4	0	0	13	7
%Thrus Left Lane	50			50		

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration			LTR		LT		TR	
PHF			1.00		1.00		1.00	
Flow Rate			549		165		20	
% Heavy Vehicles			0		0		0	
No. Lanes	0		1		1		1	
Geometry Group			1		1		1	
Duration, T	0.25							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns			1.0		1.0		0.0	
Prop. Right-Turns			0.0		0.0		0.3	
Prop. Heavy Vehicle			0.0		0.0		0.0	
hLT-adj			0.2	0.2	0.2	0.2	0.2	0.2
hRT-adj			-0.6	-0.6	-0.6	-0.6	-0.6	-0.6
hHV-adj			1.7	1.7	1.7	1.7	1.7	1.7
hadj, computed			0.00		0.00		0.00	

Departure Headway and Service Time

hd, initial value			3.20		3.20		3.20	
x, initial			0.49		0.15		0.02	
hd, final value			0.00		0.00		0.00	
x, final value			0.71		0.25		0.03	
Move-up time, m			2.0		2.0		2.0	
Service Time								

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity			769		415		270	
Delay			17.91		10.37		8.53	
LOS			C		B		A	
Approach: Delay			17.91		10.37		8.53	
LOS			C		B		A	
Intersection Delay	15.96							
Intersection LOS	C							

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst		Intersection	EMW at HERZL Entrance
Agency/Co.	Transportation Solutions Inc.	Jurisdiction	Mercer Island, WA
Date Performed	4/26/2002	Analysis Year	2002
Analysis Time Period	PM peak hour	Project ID	JCC

East/West Street: HERZL Entrance	North/South Street: East Mercer Way
Intersection Orientation: North-South	Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street Movement	Northbound			Southbound		
	1 L	2 T	3 R	4 L	5 T	6 R
Volume	0	229	45	40	241	0
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	0	229	45	40	241	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration			TR	LT		
Upstream Signal		0			0	

Minor Street Movement	Westbound			Eastbound		
	7 L	8 T	9 R	10 L	11 T	12 R
Volume	43	0	31	141	1	10
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	43	0	31	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach Movement	NB	SB	Westbound			Eastbound		
	1	4	7	8	9	10	11	12
Lane Configuration		LT		LR				
v (vph)		40		74				
C (m) (vph)		1301		566				
v/c		0.03		0.13				
95% queue length		0.10		0.45				
Control Delay		7.9		12.3				
LOS		A		B				
Approach Delay	--	--	12.3					
Approach LOS	--	--	B					

Two-Way Stop Control

TWO-WAY STOP CONTROL SUMMARY

General Information

Site Information

Analyst	
Agency/Co.	Transportation Solutions Inc.
Date Performed	4/26/2002
Analysis Time Period	PM peak hour

Intersection	EMW at JCC Entrance
Jurisdiction	Mercer Island, WA
Analysis Year	2002
Project ID	JCC

East/West Street: JCC Entrance

North/South Street: East Mercer Way

Intersection Orientation: North-South

Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street Movement	Northbound			Southbound		
	1 L	2 T	3 R	4 L	5 T	6 R
Volume	8	133	0	0	176	113
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	8	133	0	0	176	113
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LTR			LTR		
Upstream Signal		0			0	

Minor Street

Movement	Westbound			Eastbound		
	7 L	8 T	9 R	10 L	11 T	12 R
Volume	0	0	3	141	1	10
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	0	0	3	141	1	10
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0					
Flared Approach	N					
Storage	0					
RT Channelized			0		0	
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach Movement	NB	SB	Westbound			Eastbound		
	1	4	7	8	9	10	11	12
Lane Configuration	LTR	LTR		LTR			LTR	
v (vph)	8	0		3			152	
C (m) (vph)	1284	1464		922			586	
v/c	0.01	0.00		0.00			0.26	
95% queue length	0.02	0.00		0.01			1.03	
Control Delay	7.8	7.5		8.9			13.3	
LOS	A	A		A			B	
Approach Delay	--	--		8.9			13.3	
Approach LOS	--	--		A			B	

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	RJH
Agency/Co.	Transportation Solutions Inc.
Date Performed	4/26/2002
Analysis Time Period	PM peak hour

Site Information

Intersection	East Mercer Way and SE 40th
Jurisdiction	Mercer Island, WA
Analysis Year	2002
Project ID	JCC

East/West Street: SE 40th
 Intersection Orientation: North-South

North/South Street: East Mercer Way
 Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street Movement	Northbound			Southbound		
	1 L	2 T	3 R	4 L	5 T	6 R
Volume	3	110	0	0	144	37
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	3	110	0	0	144	37
Percent Heavy Vehicles	0	-	-	0	-	-
Median Type	Undivided					
RT Channelized						
Lanes	0	1	0	0	1	0
Configuration	LTR			LTR		
Upstream Signal		0			0	

Minor Street

Movement	Westbound			Eastbound		
	7 L	8 T	9 R	10 L	11 T	12 R
Volume	0	0	0	27	0	0
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	0	0	0	27	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach Movement	NB	SB	Westbound			Eastbound		
	1	4	7	8	9	10	11	12
Lane Configuration	LTR	LTR		LTR			LTR	
v (vph)	3	0		0			27	
C (m) (vph)	1407	1493		0			677	
v/c	0.00	0.00					0.04	
95% queue length	0.01	0.00					0.12	
Control Delay	7.6	7.4					10.5	
LOS	A	A		F			B	
Approach Delay	--	--					10.5	
Approach LOS	--	--					B	

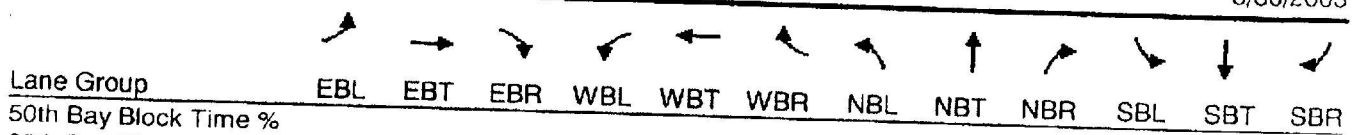
3: SE 36th St & East Mercer Way
Future w/ MP

PM Peak Hour
6/30/2003

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗				↘	↙	↕	↗	↖	↘
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50				50	50	50	50	50	50
Trailing Detector (ft)	0	0	0				0	0	0	0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850							0.850		0.850
Flt Protected		0.997					0.950			0.950		
Satd. Flow (prot)	0	1857	1583	0	0	0	1770	1863	1583	1770	1863	1583
Flt Permitted		0.997					0.469			0.641		
Satd. Flow (perm)	0	1857	1583	0	0	0	874	1863	1583	1194	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			85						164			489
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30		30		30
Link Distance (ft)		3116			3384			1624				300
Travel Time (s)		70.8			76.9			36.9				6.8
Volume (vph)	26	366	78	0	0	0	66	169	151	20	290	450
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	398	85	0	0	0	72	184	164	22	315	489
Lane Group Flow (vph)	0	426	85	0	0	0	72	184	164	22	315	489
Turn Type	Perm		Perm				pm+pt		Perm	pm+pt		Perm
Protected Phases		4					5	2		1	6	
Permitted Phases	4		4				2		2	6		6
Detector Phases	4	4	4				5	2	2	1	6	6
Minimum Initial (s)	4.0	4.0	4.0				4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0				8.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	21.0	21.0	21.0	0.0	0.0	0.0	8.0	21.0	21.0	8.0	21.0	21.0
Total Split (%)	42%	42%	42%	0%	0%	0%	16%	42%	42%	16%	42%	42%
Yellow Time (s)	3.5	3.5	3.5				3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5				0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag							Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None				None	Coord	Coord	None	Coord	Coord
Act Effct Green (s)		14.8	14.8				26.4	25.6	25.6	24.8	22.4	22.4
Actuated g/C Ratio		0.30	0.30				0.53	0.51	0.51	0.50	0.45	0.45
v/c Ratio		0.78	0.16				0.13	0.19	0.18	0.03	0.38	0.50
Uniform Delay, d1		16.1	0.0				5.7	8.4	0.0	5.8	11.4	0.0
Delay		16.9	3.7				7.1	8.8	2.5	6.7	11.8	1.9
LOS		B	A				A	A	A	A	B	A
Approach Delay		14.7						6.0			5.8	
Approach LOS		B						A			A	
Queue Length 50th (ft)		107	0				10	26	0	3	69	0
Queue Length 95th (ft)		#190	22				25	77	30	11	131	50
Internal Link Dist (ft)		3036			3304			1544			220	
50th Up Block Time (%)												
95th Up Block Time (%)												
Turn Bay Length (ft)												

3: SE 36th St & East Mercer Way
 Future w/ MP

PM Peak Hour
 6/30/2003



Lane Group
 50th Bay Block Time %
 95th Bay Block Time %
 Queuing Penalty (veh)

Intersection Summary

Area Type: Other
 Cycle Length: 50
 Actuated Cycle Length: 50
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 8.4
 Intersection Capacity Utilization 53.1%
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 3: SE 36th St & East Mercer Way

↑ ø2 21 s	↘ ø1 8 s	→ ø4 21 s
↓ ø6 21 s	↙ ø5 8 s	

7: EB I-90 Off Ramp & East Mercer Way
Future w/ MP

PM Peak Hour
6/30/2003

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗		↑	↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Turning Speed (mph)	15	9	15			9
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00
Fr		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	1770	1583	0	1863	3539	0
Flt Permitted	0.950					
Satd. Flow (perm)	1770	1583	0	1863	3539	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		134				
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30			30	30	
Link Distance (ft)	3110			300	2428	
Travel Time (s)	70.7			6.8	55.2	
Volume (vph)	9	175	0	195	585	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	10	190	0	212	636	0
Lane Group Flow (vph)	10	190	0	212	636	0
Turn Type		Perm				
Protected Phases	4			2	6	
Permitted Phases		4				
Minimum Split (s)	20.0	20.0		20.0	20.0	
Total Split (s)	20.0	20.0	0.0	20.0	20.0	0.0
Total Split (%)	50%	50%	0%	50%	50%	0%
Yellow Time (s)	3.5	3.5		3.5	3.5	
All-Red Time (s)	0.5	0.5		0.5	0.5	
Lead/Lag						
Lead-Lag Optimize?						
Act Effct Green (s)	16.0	16.0		16.0	16.0	
Actuated g/C Ratio	0.40	0.40		0.40	0.40	
v/c Ratio	0.01	0.27		0.28	0.45	
Uniform Delay, d1	7.2	2.2		8.1	8.8	
Delay	7.3	3.5		8.5	9.0	
LOS	A	A		A	A	
Approach Delay	3.7			8.5	9.0	
Approach LOS	A			A	A	
Queue Length 50th (ft)	1	7		30	51	
Queue Length 95th (ft)	7	34		63	82	
Internal Link Dist (ft)	3030			220	2348	
50th Up Block Time (%)						
95th Up Block Time (%)						
Turn Bay Length (ft)						
50th Bay Block Time %						
95th Bay Block Time %						
Queuing Penalty (veh)						

Intersection Summary

7: EB I-90 Off Ramp & East Mercer Way
Future w/ MP

PM Peak Hour
6/30/2003

Area Type: Other

Cycle Length: 40

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 40

Control Type: Pretimed

Maximum v/c Ratio: 0.45

Intersection Signal Delay: 7.9

Intersection Capacity Utilization 36.0%

Intersection LOS: A

ICU Level of Service A

Splits and Phases: 7: EB I-90 Off Ramp & East Mercer Way

↑ ø2 20 s	↖ ø4 20 s
↓ ø6 20 s	

ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	RJH	Intersection	EMW @ I-90 WB Ramps
Agency/Co.	Transportation Solutions Inc.	Jurisdiction	Mercer Island, WA
Date Performed	5/13/2002	Analysis Year	FUTURE W/MP
Analysis Time Period	PM peak hour	Project ID	JCC

East/West Street: I-90 WB Ramps North/South Street: East Mercer Way

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
	L	T	R	L	T	R
Movement						
Volume	0	0	0	575	6	7
%Thrus Left Lane	50			50		

Approach	Northbound			Southbound		
	L	T	R	L	T	R
Movement						
Volume	217	5	0	0	14	7
%Thrus Left Lane	50			50		

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration			LTR		LT		TR	
PHF			1.00		1.00		1.00	
Flow Rate			588		222		21	
% Heavy Vehicles			0		0		0	
No. Lanes	0			1		1		1
Geometry Group				1		1		1
Duration, T						0.25		

Saturation Headway Adjustment Worksheet

Prop. Left-Turns			1.0		1.0		0.0	
Prop. Right-Turns			0.0		0.0		0.3	
Prop. Heavy Vehicle			0.0		0.0		0.0	
hLT-adj			0.2	0.2	0.2	0.2	0.2	0.2
hRT-adj			-0.6	-0.6	-0.6	-0.6	-0.6	-0.6
hHV-adj			1.7	1.7	1.7	1.7	1.7	1.7
hadj, computed			0.00		0.00		0.00	

Departure Headway and Service Time

hd, initial value			3.20		3.20		3.20	
x, initial			0.52		0.20		0.02	
hd, final value			0.00		0.00		0.00	
x, final value			0.79		0.35		0.03	
Move-up time, m				2.0		2.0		2.0
Service Time								

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity			739		472		271	
Delay			23.15		11.72		8.85	
LOS			C		B		A	
Approach: Delay			23.15		11.72		8.85	
LOS			C		B		A	
Intersection Delay			19.74					
Intersection LOS			C					

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	RJH	Intersection	EMW at HERZL Entrance
Agency/Co.	Transportation Solutions Inc.	Jurisdiction	Mercer Island, WA
Date Performed	5/13/2002	Analysis Year	FUTURE WMP
Analysis Time Period	PM peak hour	Project ID	JCC

East/West Street: HERZL Entrance	North/South Street: East Mercer Way
Intersection Orientation: North-South	Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
	1	2	3	4	5	6
Movement	L	T	R	L	T	R
Volume	0	331	57	50	309	0
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	0	331	57	50	309	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration			TR	LT		
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
	7	8	9	10	11	12
Movement	L	T	R	L	T	R
Volume	56	0	56	141	1	10
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	56	0	56	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
	1	4	7	8	9	10	11	12
Movement		LT		LR				
Lane Configuration		LT		LR				
v (vph)		50		112				
C (m) (vph)		1182		469				
v/c		0.04		0.24				
95% queue length		0.13		0.92				
Control Delay		8.2		15.1				
LOS		A		C				
Approach Delay	--	--	15.1					
Approach LOS	--	--	C					

Two-Way Stop Control

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	RJH	Intersection	EMW at JCC Entrance
Agency/Co.	Transportation Solutions Inc.	Jurisdiction	Mercer Island, WA
Date Performed	4/26/2002	Analysis Year	FUTURE W/ MP
Analysis Time Period	PM peak hour	Project ID	JCC

East/West Street: JCC Entrance	North/South Street: East Mercer Way
Intersection Orientation: North-South	Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street Movement	Northbound			Southbound		
	1 L	2 T	3 R	4 L	5 T	6 R
Volume	13	136	0	0	178	192
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	13	136	0	0	178	192
Percent Heavy Vehicles	0	-	-	0	-	-
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LTR			LTR		
Upstream Signal		0			0	

Minor Street Movement	Westbound			Eastbound		
	7 L	8 T	9 R	10 L	11 T	12 R
Volume	0	0	3	252	1	18
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	0	0	3	252	1	18
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0					
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach Movement	NB	SB	Westbound			Eastbound		
	1	4	7	8	9	10	11	12
Lane Configuration	LTR	LTR		LTR			LTR	
v (vph)	13	0		3			271	
C (m) (vph)	1200	1461		918			536	
v/c	0.01	0.00		0.00			0.51	
95% queue length	0.03	0.00		0.01			2.83	
Control Delay	8.0	7.5		8.9			18.4	
LOS	A	A		A			C	
Approach Delay	-	-		8.9			18.4	
Approach LOS	-	-		A			C	

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	RJH	Intersection	East Mercer Way and SE 40th
Agency/Co.	Transportation Solutions Inc.	Jurisdiction	Mercer Island, WA
Date Performed	5/13/2002	Analysis Year	FUTURE W/ MP
Analysis Time Period	PM peak hour	Project ID	JCC

East/West Street: SE 40th Street	North/South Street: East Mercer Way
Intersection Orientation: North-South	Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street Movement	Northbound			Southbound		
	1 L	2 T	3 R	4 L	5 T	6 R
Volume	3	117	0	0	153	38
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	3	117	0	0	153	38
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LTR			LTR		
Upstream Signal		0			0	

Minor Street Movement	Westbound			Eastbound		
	7 L	8 T	9 R	10 L	11 T	12 R
Volume	0	0	0	28	0	0
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	0	0	0	28	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach Movement	NB	SB	Westbound			Eastbound		
	1	4	7	8	9	10	11	12
Lane Configuration	LTR	LTR		LTR			LTR	
v (vph)	3	0		0			28	
C (m) (vph)	1395	1484		0			660	
v/c	0.00	0.00					0.04	
95% queue length	0.01	0.00					0.13	
Control Delay	7.6	7.4					10.7	
LOS	A	A		F			B	
Approach Delay	--	--					10.7	
Approach LOS	--	--					B	

**Jewish Community Campus
Master Plan**

**Transportation
Impact Analysis**

May 2002

Prepared for:

Weinstein Copeland Architects

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TABLE OF CONTENTS

INTRODUCTION.....	1
PROJECT DESCRIPTION	1
EXISTING CONDITIONS	4
EXISTING ACTIVITY PROGRAM.....	4
EXISTING TRAFFIC AND TRANSPORTATION CONDITIONS.....	7
<i>Existing Street Network.....</i>	7
<i>Existing Site Access.....</i>	7
<i>Traffic Volumes and Level of Service.....</i>	8
<i>Sight Distance.....</i>	10
<i>Existing Parking Supply and Demand.....</i>	11
<i>Crash History.....</i>	13
<i>Transit Operations and Passenger Loading.....</i>	14
<i>Pedestrian Activity.....</i>	15
FUTURE CONDITIONS WITH THE MASTER PLAN	16
PROPOSED ACTIVITY PROGRAM	16
FUTURE TRAFFIC AND TRANSPORTATION CONDITIONS.....	16
<i>Site Access and Circulation.....</i>	16
<i>Future Traffic Volumes and Level of Service.....</i>	17
<i>Future Parking Demand and Supply.....</i>	19
<i>Transit Operations and Passenger Loading.....</i>	20
<i>Pedestrian Activity.....</i>	20
MITIGATION.....	21
PHYSICAL IMPROVEMENTS	21
PROGRAMMATIC MEASURES	21

APPENDIX A: PROGRAM ACTIVITY SUMMARY

APPENDIX B: LEVEL OF SERVICE WORKSHEETS

LIST OF FIGURES

Figure 1. Vicinity Map	2
Figure 2. Site Location Map	3
Figure 3. Existing PM Peak Hour Traffic Volumes	9
Figure 4. Existing Weekday SJCC Parking Demand.	12
Figure 5. Future Traffic With Master Plan.	18
Figure 6. Forecasted JCC Master Plan Parking Demand.....	20

LIST OF TABLES

Table 1. Levels of Service for Unsignalized Intersections	8
Table 2. Signalized Intersection Level of Service Criteria	10
Table 3. Existing Intersection PM Peak Hour Level of Service Summary	10
Table 4. Sight Distance Values to East Mercer Way	11
Table 5. Crash Summary.....	14
Table 6. Bus Activity Summary	14
Table 7. Future Level of Service Summary with Master Plan	19
Table 8. TMP Program Model	23

Introduction

This report summarizes the transportation related findings and conclusions associated with the development of the proposed Master Plan for the Jewish Community Campus. The report includes a description of the existing facilities and associated programs, a summary of existing transportation and parking conditions, a forecast of future conditions with the Master Plan projects complete, a summary of findings based on the analysis of these forecasted conditions, and a list of mitigation measures and conclusions. The scope of the Master Plan includes the existing Stroum Jewish Community Center (SJCC) and its' proposed expansion, which would include the construction of a new larger school to replace the existing French-American School that would relocate off-site. This expansion would also include the construction of an underground parking garage.

Project Description

The site is located in the northeast section of Mercer Island, an island municipality located just east of Seattle. More specifically, the site is situated immediately south of I-90 at the grade separated interchange with E. Mercer Way. The general location of the facility is shown on Figure 1.

The SJCC is a private non-profit organization that is open to the entire community providing recreational and educational services with emphasis on education programs that are integrated with the broader Jewish community. The site is located at 3801 E. Mercer Way on Mercer Island and is served by a single driveway that intersects with E. Mercer Way. The existing site is illustrated in Figure 2. The Herzl-Ner Tamid Conservative Congregation synagogue is included in the figure to illustrate the proximate relationship between the synagogue and the SJCC. The synagogue is not part of the proposed Master Plan.

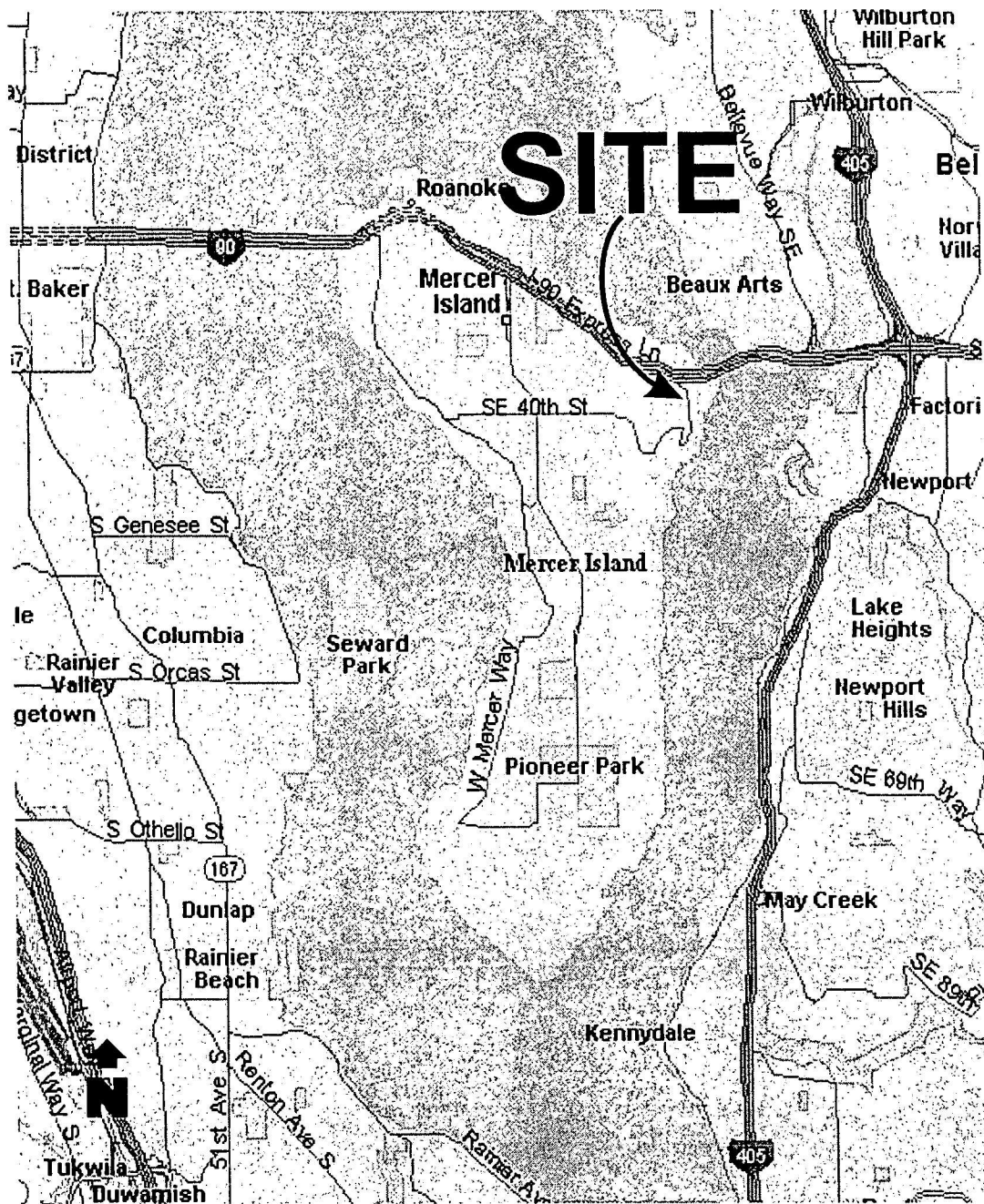


Figure 1
Vicinity Map

Jewish
Community Center
Master Plan

TSI

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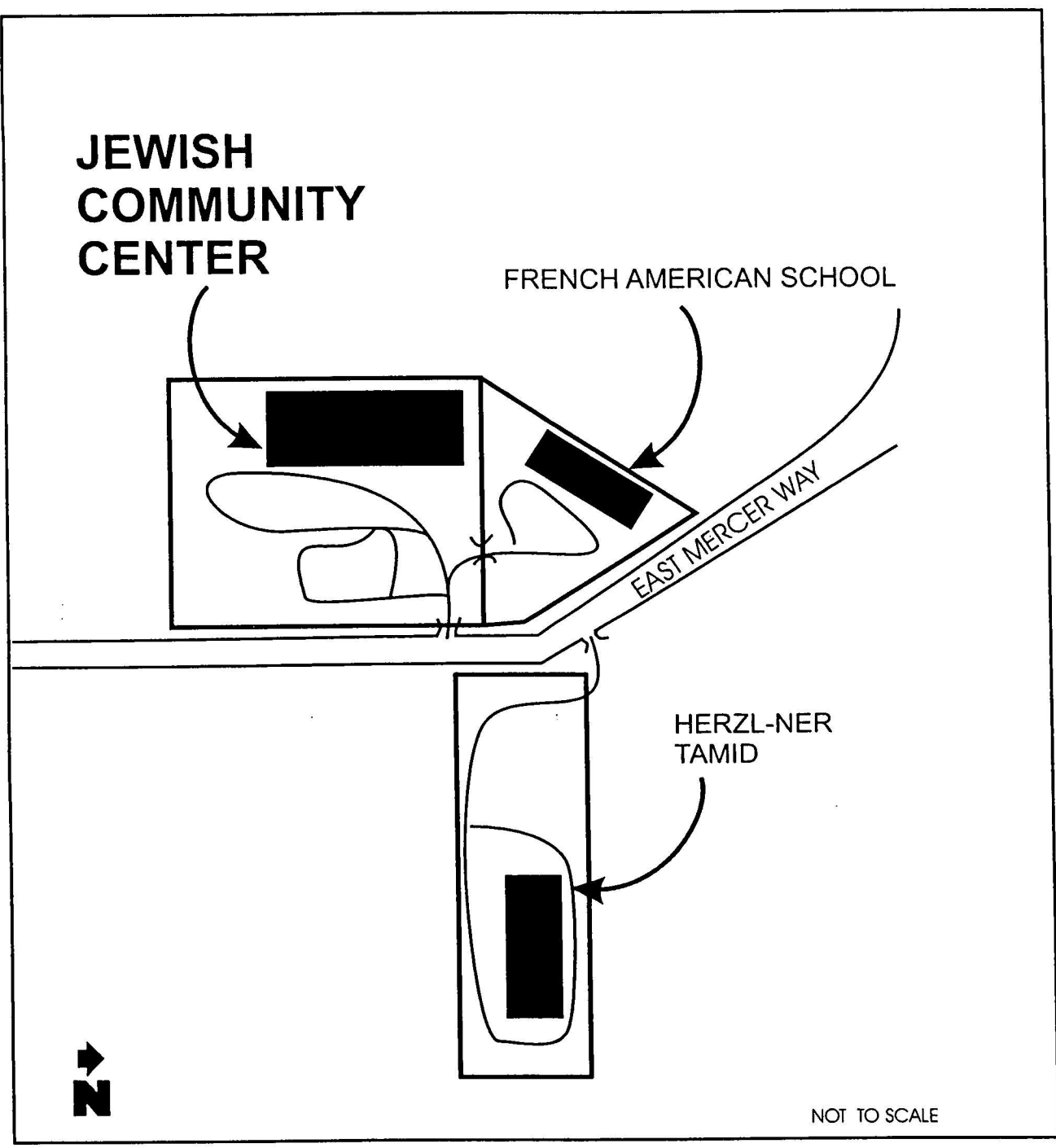


Figure 2
Existing Site

Existing Conditions

Existing Activity Program

Like most community, educational and religious organizations, the activity program defines the character of the land use. For the purpose of this analysis, these programs generally fall into two categories, regularly scheduled programs and special programs. A detailed listing of the programs is presented in Appendix A.

Regularly scheduled programs at the SJCC generally fall into four groups including: 1) early childhood care, 2) youth and family services, 3) adult and senior programs, and 4) a general health and physical education program. There are overlaps in these programs that will often permit an adult to participate in one program while their child is engaged in another. These programs are offered in on-campus facilities that include a pool, a gymnasium, and numerous classrooms and activity rooms.

The early childhood program includes a daycare facility that serves up to 245 children. Program attendance peaks between 9:30 AM and 12:30 PM and generally decreases after noon as parents arrive to pick up their children. In addition, there are family services for mothers with infants and pre-school children, and for preschoolers involving music, science, and religious education.

Youth and family service programs include before and after school care for grades K-5. These programs work in cooperation with public and school bus services to transport students to and from the Jewish Day School and to local Mercer Island grade schools on weekdays during the school year. These programs extend through mid-winter and holiday breaks to provide childcare services for working parents when public schools are closed for vacation. Programs vary in length from a few hours to a full day and are scheduled to begin at different times throughout the day. In the evening there are also special programs held for both parents and children including the Hebrew High School and B'nai Brith Youth programs. During the summer, theme camps for youth replace many of the school year programs. These summer camps use the SJCC as a base and will often bus young people to an off-campus activity center.

Adult and senior programs include art, cooking, wellness, dance, and other programs for adults of all ages. These include a wide range of health and physical education programs including aerobics, water exercise, and Tai Chi. Like the youth and family programs, these programs are scheduled throughout the day with sessions generally occurring in the morning, early afternoon, late afternoon, and evening. In addition, there are men and women's basketball leagues. Some of these classes are scheduled

to coincide with the childcare activities so parents can take advantage of these programs while their children are under the care of SJCC staff.

The general physical education program includes open gym, exercise facilities, and aquatics. Peak use of unscheduled pool and gymnasium time occurs in the early morning, noon, and late afternoon when they do not conflict with scheduled programs.

There are also some special events for youth and teens. These generally involve dances on weekends for the middle and high school aged youth. Most youth are driven and dropped off by their parents while some drive themselves. Attendance at these events is less than for combined weekday activity levels. These events are typically scheduled on Friday or Saturday nights and do not conflict with other scheduled activities.

One of the largest events during the year is the Purim Festival, which is a special festival for younger children. Up to 500 children attend. All children are transported to the festival by their parents with substantial family carpooling. This event is not time specific with a discrete start and end time like a sporting event. Rather, families come and go throughout the day. Therefore the parking demands and traffic volumes are not concentrated at one particular time but are distributed throughout the day.

The French-American School, a tenant on the SJCC property, currently has an enrollment of approximately 200 children. In the near term, the enrollment could increase to as many as 275 children. Most of their activity is concentrated at the existing portable classrooms on the SJCC site. In addition, there are three classrooms in the Herzl-Ner Tamid facilities that are currently used by the French-American School. The school generates a surge of activity in the morning as children are being dropped off and a complimentary rush of activity in the afternoon when children are being picked up.

The Herzl-Ner Tamid Conservative Congregation is not a part of the proposed Jewish Community campus, but shares facilities when it is mutually beneficial. Herzl-Ner Tamid currently utilizes SJCC parking facilities for large events such as the High Holy Days. Like most Jewish congregations, Herzl-Ner Tamid has a combination of regular and special events. On a regular basis there is a religious school that meets Monday through Thursday in the late afternoon. There are morning prayer meetings and adult religious education programs as well as committee meetings that typically use the facilities in the evening. On Friday nights and Saturday mornings there are the regular weekly services. These services often coincide with a bar or b'hat mitzvah. Throughout the week a small gift shop is open. The most consistent traffic related demand is generated by the weekday staff that administers congregational activities.

There are also special events hosted by both the SJCC and the synagogue. These community wide programs include the Purim Festival, discussed above, the Yom Hazikaron (Israeli Day of Remembrance), and Yom HaAtzmaut (Israeli Independence Day). In addition, there are the more traditional Roshushana and Yom Kippur and Hanukah holidays. These special events can attract as many as 1,000 attendees. In the following sections of the report, the characteristics associated with these special events are discussed separately from the normal daily activities.

Existing Traffic and Transportation Conditions

Mercer Island lies east of Seattle in Lake Washington. The only road connecting the island with the mainland is Interstate-90, which begins in Seattle and extends east over Mercer Island to Bellevue and points east. The project site is located in the northeast section of the island immediately south of Interstate-90.

Existing Street Network

Mercer Way circumscribes the island near the shoreline. Other residential streets generally conform to a grid network that shifts to adapt to the rolling contours and shoreline. This local roadway network is shown on Figure 2. East Mercer Way is a two-lane major collector with frequent intersections at residential driveways and intersecting streets. The posted speed limit in the vicinity of the site is 30 miles per hour. This two-lane facility has 11-foot wide lanes with narrow shoulders that vary from 2 to 6 feet.

Beyond regular maintenance, there are no plans for capital improvements involving major widening or new roadways that would substantially impact travel patterns in the area.

Based on discussions with the City of Mercer Island staff, the study area associated with this project focuses on E. Mercer Way from SE 40th Street north to the westbound I-90 ramps. Focus was placed at the site intersections as well as the major intersecting streets of SE 40th Street, SE 36th Street, the eastbound I-90 ramps and the westbound I-90 ramps.

Existing Site Access

The existing access to the SJCC is a single two-way driveway located approximately 400 feet south of the intersection of E. Mercer Way with SE 36th Street. The SJCC access generally aligns with a private road that accesses several homes that lead down to the lakefront. The Herzl-Ner Tamid synagogue shares access with the City of Mercer Island boat ramp. This driveway is located approximately 150 feet north of the SJCC access. A marked crosswalk is situated slightly south of the SJCC driveway and connects with a formal off-street path system.

Under the Master Plan, access to the Jewish Community campus would remain essentially the same as today.

Traffic Volumes and Level of Service

As is customary for most facilities, the weekday afternoon peak period was used to evaluate the traffic impacts associated with the planned development of this Master Plan. This is consistent with the period when volumes on these roads are highest and will overlap with some of the larger increases in traffic associated with increased SJCC activity.

In addition, a seven-day count was made at the major entrances leading to and from the site to evaluate daily versus weekend traffic fluctuations. The existing PM peak hour traffic volumes are illustrated in Figure 3.

While traffic volumes provide an important measure of activity on the area road system, it is important to determine the ability of the road network to accommodate these traffic volumes. In urban and suburban areas the road capacity is represented by the maximum number of vehicles that can be served by an intersection. This capacity varies according to the characteristics of road geometry, traffic control, and traffic volume characteristics. Intersections typically limit the capacity of the street network because it is at those locations where conflicting traffic movements must share the available road space. Therefore, intersection level of service (LOS) serves is the primary measure of traffic flow quality.

The LOS methodology used in this analysis is from the 2000 Highway Capacity Manual, the most generally accepted methodology for assessing street and roadway operations. At unsignalized intersections, vehicle delay on the controlled approaches is the level of service measure. Vehicle delay is classified on a scale that ranges from LOS-A indicating a very short delay of 10 seconds or less to LOS-F indicating a delay of 50 seconds or more. Table 1 summarizes the level of service ranges for unsignalized intersections. In urban areas, LOS-D or LOS-E is usually considered the minimum operational condition during peak hours. This calculated delay is defined for each of the intersection's controlled approaches and turning movements.

Table 1. Levels of Service for Unsignalized Intersections

Level of Service	Expected Traffic Delay	Average Delay per Vehicle
A	Little or no delay	≤10 seconds
B	Short traffic delay	10 to 15 seconds
C	Average traffic delay	15 to 25 seconds
D	Long traffic delay	25 to 35 seconds
E	Longer traffic delay	35 to 50 seconds
F	Very long traffic delay	> 50 seconds

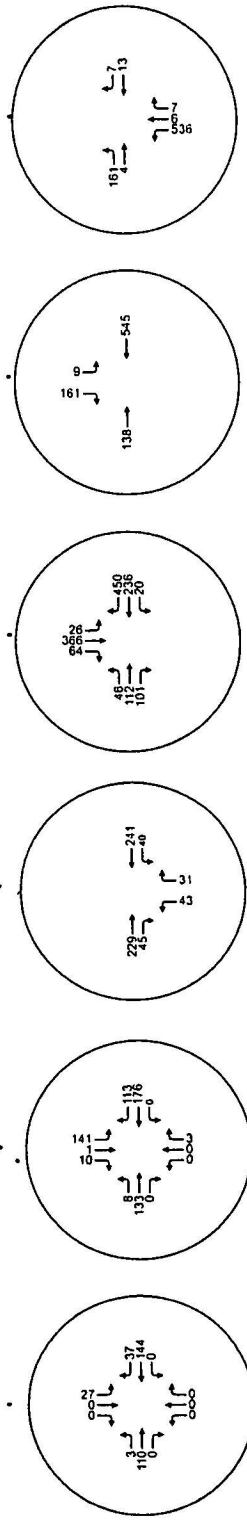
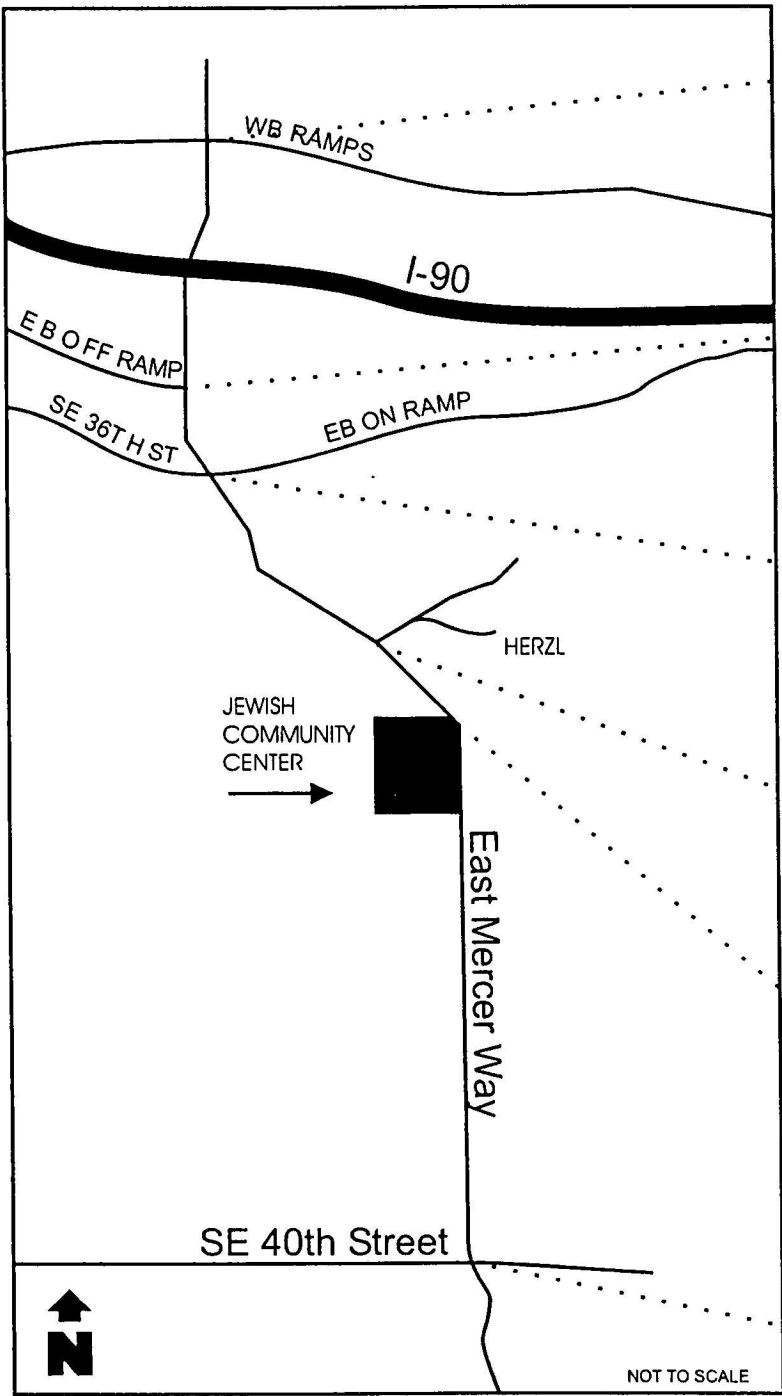


Figure 3
2002 Existing PM Peak
Hour Traffic Volumes

At signalized intersections level of service is also defined by seconds of delay using the same LOS-A through LOS-F classification system. The delay ranges (Table 2) are different since an overall average for the entire intersection is used as a measure of the intersection operation.

Table 2. Signalized Intersection Level of Service Criteria

Level of Service	Control Delay per Vehicle
A	≤ 10
B	10 to 20 seconds
C	20 to 35 seconds
D	35 to 55 seconds
E	55 to 80 seconds
F	> 80 seconds

Existing intersection levels of service were determined using SYNCRO and HCS, computer programs based on the methods defined in the Highway Capacity Manual. The results of this analysis are summarized in Table 3. All signalized intersections operate at LOS-A. This is a very good level of service considering the fact that these intersections are located at or near the I-90 ramps where a good portion of eastern island traffic volumes access I-90 to travel to Bellevue or Seattle. The unsignalized intersections were found to operate at LOS-C or better. This unsignalized level of service reflects the delay at the worst turning movement not the entire intersection.

Table 3. Existing Intersection PM Peak Hour Level of Service Summary

Intersection	LOS (Delay)
Signalized Intersections	
I-90 Eastbound Off-ramp at East Mercer Way	A (7.6 sec/veh)
SE 36 th Street/I-90 Eastbound On-ramp at East Mercer Way	A (8.4 sec/veh)
Unsignalized Intersections	
I-90 Westbound Ramps at East Mercer Way	C (16.0 sec/veh)
Herzl-Ner Tamid at East Mercer Way	B (12.3 sec/veh)
SJCC access at East Mercer Way	B (13.3 sec/veh)
SE 40 th Street at East Mercer Way	B (10.5 sec/veh)

Sight Distance

Sight distance was examined at both the SJCC and Herzl-Ner Tamid entrances to evaluate a driver's ability to exit from the driveways onto East Mercer Way safely and conveniently. The City of Mercer Island has adopted King County Road

Standards as the city standard for such evaluations. For a road with a 30-MPH design speed, King County has established a standard of 200-feet for safe stopping sight distance and 430-feet for entering sight distance.

Stopping sight distance is the distance required for a motorist to come to a complete stop after observing an object, like a stopped vehicle or pedestrian, in the road ahead. As shown in Table 4, the sight distance at both intersections in both directions substantially exceeds the 200-foot standard. This means that motorists should not have any difficulty stopping for a pedestrian in a crosswalk at this location.

Entering sight distance is the distance required for a driver entering the roadway from a side street or driveway without causing the traffic on the main street to slow down to less than 70 percent of the design speed. Therefore, the stopping sight distance is a measure used to evaluate safety while the entering sight distance is used to measure convenience. The comparison on Table 4 shows there is ample entering sight distance to the south but the sight distance to the north is restricted. From the SJCC driveway, the obstruction is a small group of scrub trees that have grown up on the WSDOT right-of-way. If these could be trimmed or cut down, the sight line to the signalized intersection would be adequate to meet the standard. The restriction from the Herzl-Ner Tamid is not a physical barrier but simply the signalized intersection at SE 36th Street. In fact, the sight line extends beyond the signalized intersection to the eastbound off-ramps. Thus, from a practical matter, the sight distance is met to the north from the Herzl-Ner Tamid driveway.

Table 4. Sight Distance Values to East Mercer Way

Driveway	Stopping Sight Distance (feet)		Stopping Sight Distance (feet)	
	To South	To North	To South	To North
Road Standard	200	200	430	430
SJCC	450	420	430	310 ¹
Herzl-Ner Tamid	460	390 ²	500	390 ²

1. Trimming of trees would increase the sight distance.
2. Distance to the signalized intersection of SE 36th Street at E Mercer Way.

Therefore, if the trees on the WSDOT right-of-way can be trimmed as part of the development of the JCC Master Plan, then all sight distance standards could be satisfied.

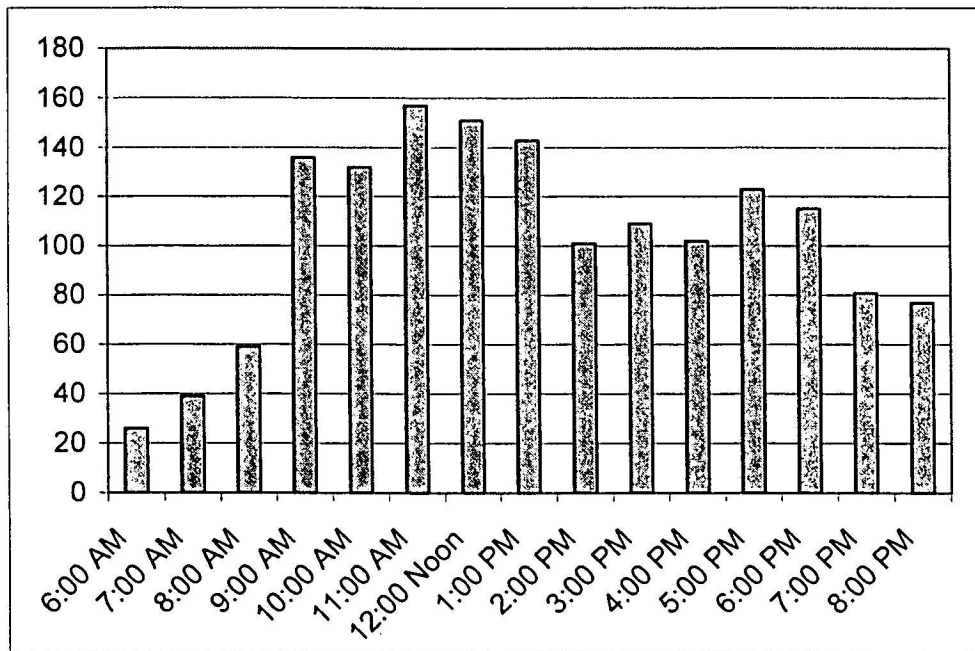
Existing Parking Supply and Demand

The SJCC has 163 marked parking stalls in paved lots and approximately 60 unmarked stalls in the gravel lot adjacent to the portables currently occupied by the French American School. Other nearby parking supplies include the Herzl-Ner Tamid synagogue, which has 119 stalls and the boat launch area that has about 65

spaces that are sized to accommodate a car and trailer. The existing SJCC and Herzl-Ner Tamid sites can accommodate a total of about 340 cars.

A parking study was performed to determine the current parking demand for both the SJCC and Herzl-Ner Tamid sites. This survey found the peak SJCC demand occurs around midday when the combination of early childhood, youth, and general recreation activities appear to coincide. Parking did not appear to reach the maximum capacity of the existing facilities although some people did park along the circulation isles where parking was closer to the building entrance even though there was parking available on-site in more remote locations. A summary of the current SJCC parking demand for a typical weekday is provided in Figure 4. The nearby Herzl-Ner Tamid site generated a peak demand of 35 to 40 vehicles between noon and 3:00 PM.

Figure 4. Existing Weekday SJCC Parking Demand.



A parking survey was also made during the Purim Festival, the only major special event that occurred during the study period. This is an event where families with young children come and leave throughout the day. The greatest parking demand was observed at about 2:00 PM when all of the SJCC's 220 stalls were occupied with some minor spillover into the Herzl-Ner Tamid parking lot (25 cars).

The regular Friday night and Saturday worship services at Herzl-Ner Tamid were also observed. Friday evening services were observed to have a parking demand of about 80 cars, which was somewhat less than that observed during the Saturday

morning services. The Saturday morning services often ran concurrently with some religious school for young people and the service was often coupled with a Bar or B'hat Mitzvah. On Saturdays, the attendance ranged from 350 to 400 people and the parking demand filled all of the Herzl-Ner Tamid parking lot with some encroachment on driveways and in unmarked paved areas (121 cars at maximum). Two or three cars parked off the street that leads down to the boat ramp; but the majority of spillover (up to 31 cars were observed) fell into the SJCC parking area. It is important to recognize that SJCC programs are scheduled at times that do not coincide with the larger regularly scheduled events at Herzl-Ner Tamid and vice versa. Accordingly, when parking demands for most major events exceed the parking supply on one site, it can spill over to the other and pedestrians can walk across the street.

Although not observed, there are the special celebrations associated with Israel's Independence and the High Holidays. Based on observations at the regular services and conversations with the staff, it is possible that the parking demand could reach 600 to 650 cars. The Herzl-Ner Tamid has a comprehensive transportation management program aimed at reducing the impacts of such major events. Their plan includes educating their congregation as to travel and parking options, encouragement of carpooling, on-site valet service to assist elderly with their automobiles, provision of spillover parking at the SJCC, utilization of off-site parking lots with a shuttle bus service, and special signing, and hiring of off-duty Mercer Island police to provide traffic and pedestrian controls.

Crash History

Motor vehicle crash records maintained by the City of Mercer Island were examined to determine if there were any patterns that suggested a safety problem in the vicinity of the site. Police reports from January 1, 1999 through December 31, 2001 identified 24 accidents in the section of East Mercer Way from the Westbound I-90 ramps to SE 40th Street. These were classified by year and by accident type to the extent the type of accident could be identified from the police record. This summary is presented on Table 5 below.

Table 5. Crash Summary

Intersection (On E. Mercer Way)	Year			Accident Type						
	99	00	01	Rear End	Side Swipe	Right Angle	Fixed Obj.	Bike/ Ped.	Park- ing	Not Specified
Westbound Ramp	2		2					2		2
SE 236 th Street	2	2	2	1		2		1		2
Herzl/Boat Ramp	1		1	1						1
SJCC	1	1	1			3				
40th	2				1					1
4000 Block	1		1				1			1
On-campus	1	1	1						3	
Other Parking Lot			2						2	
Total	10	4	10	2	1	5	1	3	5	7

The majority of incidents (19 crashes) involved property damage only. Even in locations with the most crashes, there was no consistent pattern to suggest that there is a systemic deficiency. Even at the SJCC entrance, each of the three right angle accidents involved a different set of turning movements for the cars involved. Only one collision may have been related to the possible entering sight distance limitation described earlier.

Transit Operations and Passenger Loading

Transit operations at the site are limited to a selected number of youth activities and some senior activities. A summary of these activities is presented in Table 6.

Table 6. Bus Activity Summary

Activity	Type and Number of Buses	Time of Day
Before and after school program	Three buses to Mercer Island Elementary Schools, one van to Bellevue, and one Chartered Metro bus to Jewish Day School. Jewish Day School bus will be eliminated if they relocate to the proposed Jewish Community campus.	8:00 – 8:30 in the morning and 2:30 – 3:15 in the afternoon
Yeshiva High School	One bus or vans/limo used to transport students between Yeshiva High School and SJCC for recreational activity	Friday afternoons
Senior Programs	One or two METRO Access Vans	Throughout the day mid morning and mid afternoon
Summer Camps	One to four school buses pick-up and drop-off children to take part in off-campus programs.	Typically leave in the morning and return in the mid afternoon.

All observed bus loading occurred along the curb in front of the SJCC main entrance. Students were able to board and alight safely.

The loading and unloading of preschool and youth was, however less organized. This is typical of most loading operations at early childhood and elementary schools. Like most locations, the existing drop-off, parking, and circulation functions are consolidated into one area.

Pedestrian Activity

Despite the significant amount of time spent observing traffic and parking conditions at the site, pedestrian activity levels adjacent to the campus were very low. Particular attention was given to the crosswalk that links the SJCC with Herzl-Ner Tamid across E. Mercer Way. The French American School students cross here as they walk back and forth between the classrooms at Herzl-Ner Tamid and the SJCC. French American School crossing activity would be eliminated when it relocates off-site.

The greatest number of crossings occurs on Saturday morning when the weekly worship services at Herzl-Ner Tamid generate spillover parking demand at the SJCC. During the morning and mid day period when the service begins and ends, about 30 to 50 people use the crosswalk.

During the High Holy Days, the Purim Festival and other special events hosted at Herzl-Ner Tamid, there are regular flows of pedestrians crossing between the synagogue and the SJCC. During the high attendance events, off-duty officers are posted to ensure safe pedestrian crossings.

Future Conditions With The Master Plan

Proposed Activity Program

The Jewish Community Campus (JCC) Master Plan includes the construction of some new facilities and a moderate expansion of existing programs. Expansion would include an additional 50 children in the Daycare program, expansion of some of the adult programs due to the presence of additional facilities, and a general increase in some of the physical education and health programs with the addition of the gymnasium and other exercise facilities.

In addition, the JCC Master Plan contemplates creating room for the Jewish Day School, which is presently located in Bellevue, or another private school program. A new school on the site could accommodate 475 children. The school facility would be located on the property currently occupied by the portable classrooms used by the French-American School. As noted above, the French-American School would be relocated off-site resulting in a net increase of approximately 275 students. The Master Plan also includes the collocation of administrative offices affiliated with the site. Bus and passenger loading would be enhanced by providing increased curb space within the site to minimize conflicts with the internal traffic aisles.

Future Traffic and Transportation Conditions

Site Access and Circulation

The Master Plan includes several projects that will enhance circulation, loading and access. The amount of uncontrolled parking will be substantially reduced and replaced by parking in a garage structure. This structure will only be accessible to SJCC members and will be the most convenient place to park since there will be both at grade and grade separated secure access to the SJCC itself. This parking facility in combination with a more disciplined site circulation pattern will substantially reduce the amount of motor vehicle traffic that circulates through the remaining surface parking area and past the bus and automobile loading areas.

Under the Master Plan, the number of loading areas would increase from the existing one loading area to three distinct loading areas – one for the new school, another for the new primary SJCC main entrance, and a third (in about the same location as the existing main SJCC entrance) for the principal use of the daycare. Many parents who are dropping off and picking up their children will find it even more convenient to park in the garage both because of weather protection and for the increased safety of their children.

While the circulation through the site remains one way, the site is designed with an intermediate turn-around that will serve as a shortcut for all except the early childhood program traffic.

The site will continue to be served by a single driveway off E Mercer Way that will be located in about the same location as it is today. Recommendations regarding design guidelines for this driveway are included in the Mitigation section of this report.

Future Traffic Volumes and Level of Service

Based on the expanded programs, it is estimated that the increased activity associated with the Master Plan would generate about 205 new PM Peak Hour trips – 120 trips outbound and 85 trips inbound and 1,920 new daily trips. This forecast is based on the forecasted activity increases for the SJCC and assumes that the French American School will relocate off-site. The forecasted volumes were assigned to the road network using existing PM peak hour circulation patterns as a guide and recognizing that the largest concentration of traffic would be destined for the freeway. This is because campus facilities, although open to the entire community, serve more than Mercer Island residents. The PM peak hour volumes resulting from Master Plan projects are depicted on Figure 5.

The intersection turning movement volumes illustrated in Figure 5 were analyzed to determine and changes in LOS due to the increased traffic volumes. The results are summarized below in Table 7. As expected, the average vehicle delays at the signalized intersections were observed to increase but the LOS were found to remain the same as the existing conditions at LOS-A.

As for the unsignalized intersections, the worst turning movement level of service drop would be from LOS-B to LOS-C at the campus entrance. This LOS decline is to be expected because the major side street movement leaving the site is a left turn, which is required to cross the southbound through movement on East Mercer Way and merge with the northbound movement.

Likewise there is a reduction in the LOS at the Herzl-Ner Tamid/boat ramp driveway but the increase in delay is not as significant because the predominant volume increase is making a right turn. At this intersection, the LOS also drops from LOS-B under existing conditions to LOS-C.

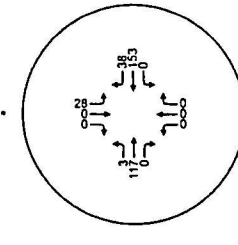
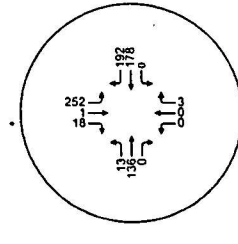
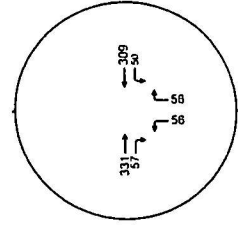
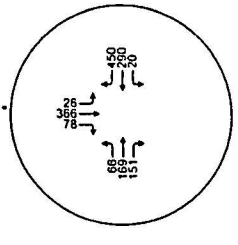
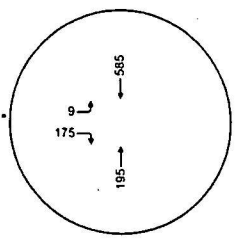
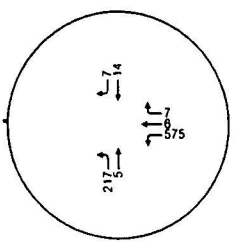
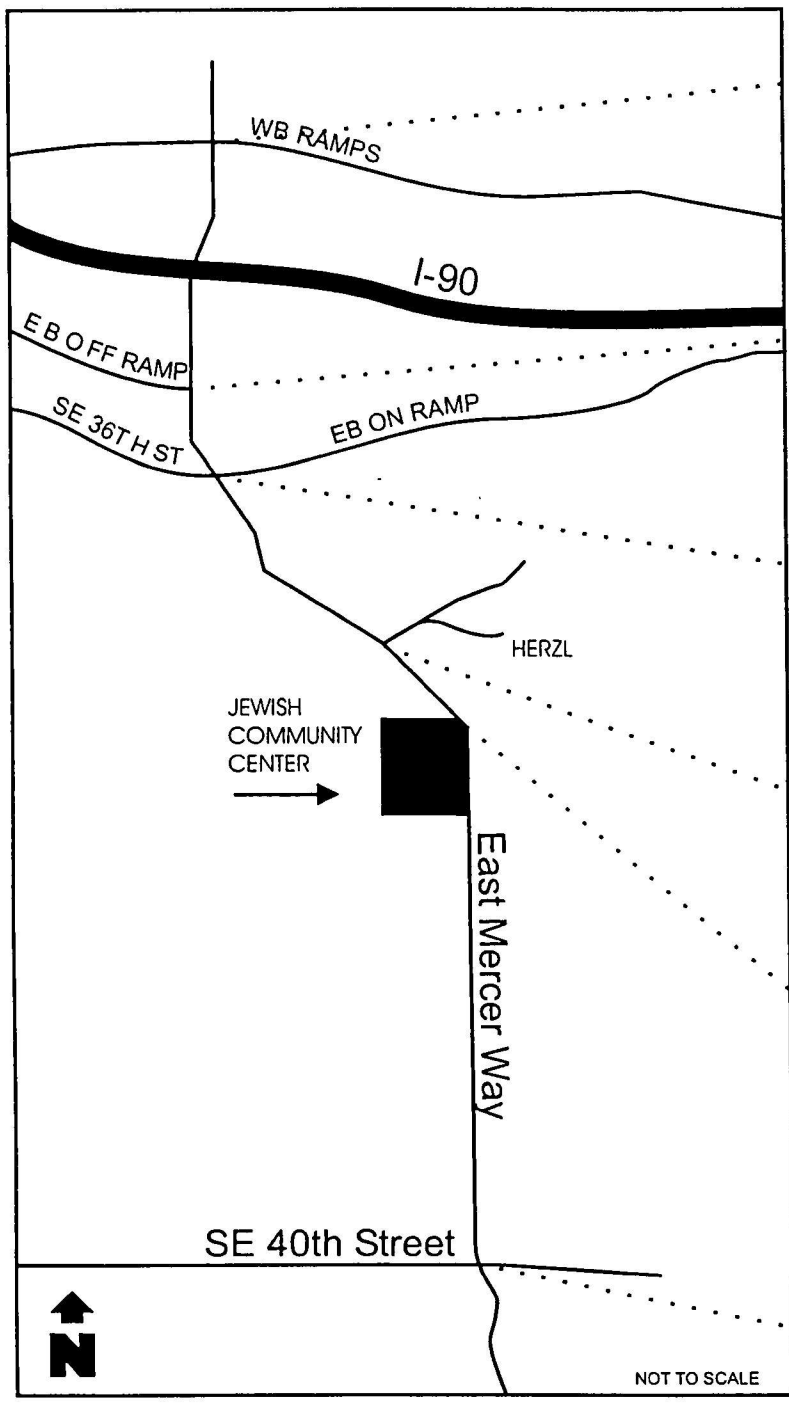


Table 7. Future Level of Service Summary with Master Plan

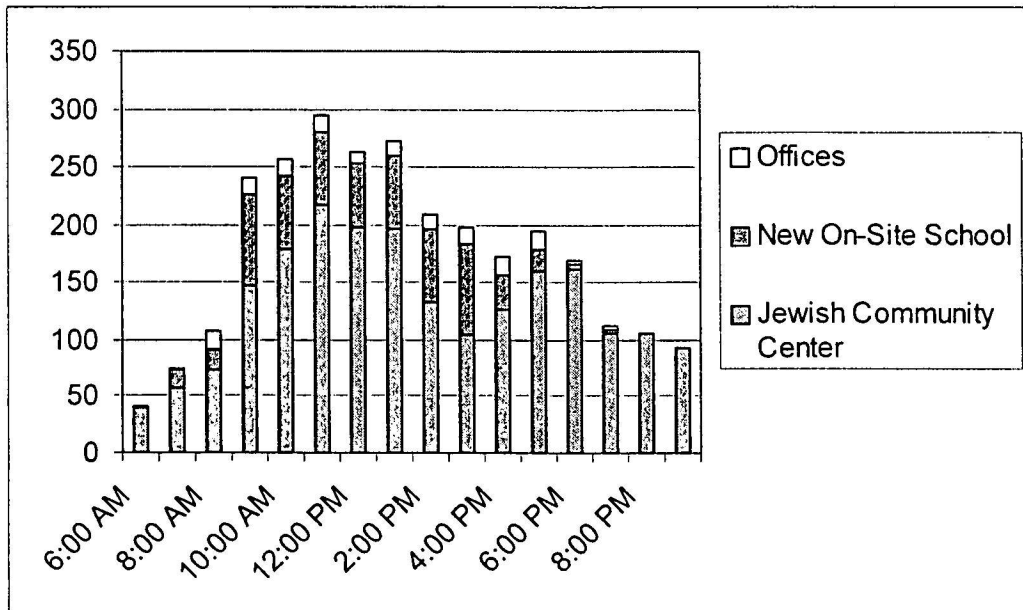
Intersection	Existing PM Peak LOS (Delay)	PM Peak LOS (Delay) w/ Master Plan
Signalized Intersections		
I-90 Eastbound Off-ramp at East Mercer Way	A (7.6 sec/veh)	A (7.9 sec/veh)
SE 36 th Street/I-90 Eastbound On-ramp at East Mercer Way	A (8.4 sec/veh)	A (8.4 sec/veh)
Unsignalized Intersections		
I-90 Westbound Ramps at East Mercer Way	C (16.0 sec/veh)	C (19.7 sec/veh)
Herzl-Ner Tamid at East Mercer Way	B (12.3 sec/veh)	C (15.1 sec/veh)
Campus access at East Mercer Way	B (13.3 sec/veh)	B (18.4 sec/veh)
SE 40 th Street at East Mercer Way	B (10.5 sec/veh)	B (10.7 sec/veh)

Future Parking Demand and Supply

A parking demand forecast was developed based upon current demand patterns and planned programmatic changes. Increases in campus parking demand would be due to the expansion of the Early Childhood daycare program and to a lesser degree to increased participation in the adult, senior, and general recreation programs that are available to the general membership. One of the larger incremental increases in campus parking demand would be due to the addition of a new school, possibly the Jewish Day School. The combination of these demands on the site would result in the need for a total of 300 to 330 parking spaces depending on the amount of flexibility desired to accommodate parking turnover. If staff were able to use a portion of the Herzl-Ner Tamid site for parking, this additional parking supply might be able to be reduced. The projected hourly parking demand is illustrated in Figure 6 below.

The parking supply could be phased depending on the specific dates when certain programs, like the new school are added. If the full compliment of 300 to 330 parking spaces were provided, it would also help to reduce some of the pressures associated with special events like the High Holy Days. This would reduce reliance on the alternate sites currently used, including the remote park and ride.

Figure 6. Forecasted JCC Master Plan Parking Demand



Transit Operations and Passenger Loading

Transit activity should remain about the same as today. If the Jewish Day School (JDS) relocates to the proposed Jewish community campus, it is anticipated that the existing bus that transfers children to Bellevue would be replaced by a JDS bus that brings children from Bellevue or Seattle. With the added curbside loading area, there is increased capacity for buses and loading should occur in a more orderly manner even if with a small increase in the number of buses.

As noted in the description of circulation and loading under the future program description section, the relocation of buildings on the campus would substantially improve the efficiency and safety of vehicular circulation on the campus.

Pedestrian Activity

With the relocation of the French American School off of the site, pedestrian crossings between the Jewish community campus and Herzl-Ner Tamid would be reduced. However, there would remain a need for a safe crossing of E. Mercer Way to support the spillover parking demand generated by the weekly worship services.

Although there is no documentation of a safety hazard, several suggestions to enhance the safety of this crossing are developed in the Mitigation Measures section of the report.

Mitigation

Physical Improvements

To ensure the sight lines from the campus driveway meet or exceed adopted City standards, the trees on the WSDOT right-of-way should be trimmed or removed as part of the development of the JCC Master Plan so a clear line of sight can be provided up to the SE 36th Street intersection. In addition, the landscape plan for the site should be developed with these sight lines in mind so the land contours around the garage and landscaping is low enough to not restrict the sight lines for drivers.

When the Jewish community campus garage and a new entrance for the site are constructed, the crosswalk should be aligned closer to the intersection of the campus driveway so it does not appear to be in a semi-mid-block location. This will enhance motorist expectations that there is a possibility of pedestrians crossing at this point. While pedestrian crossings are infrequent, and traffic volumes are relatively low in this area, it might be desirable to install either pedestrian activated imbedded pavement lights or a signal flag system in accordance with City standards.

To mitigate the increased traffic volume, it is proposed that the entry drive be designed with two lanes out and one lane in. The outbound lanes should be constructed to provide a shared right turn/thru lane and an exclusive left turn lane. If there were sufficient right-of way, it would also be desirable to construct a short northbound center lane along East Mercer Way to provide increased safety for motorists making the eastbound to northbound turning movement.

The Master Plan proposes the construction of a new garage and a reconfiguration of surface parking to provide a total of 300 to 330 spaces on the Jewish community campus. With the expanded activity program this parking would adequately serve all regularly scheduled events and all of the special events on the campus.

Programmatic Measures

As noted above, most events currently hosted at the SJCC are accommodated on the site with minimal traffic and parking impact. Even some of the special events like the teen dances and the Purim Festival have minimal impact due to the careful scheduling and cooperation among the program coordinators and facility managers to minimize overlapping schedules.

The principal challenges for these facilities are the special holidays when up to 1,000 people attend time specific events. Since these major celebrations occur infrequently, the best tool for managing the demand is a Transportation

Management Program (TMP) focused on reducing traffic and parking demand generated by such events. It is suggested that a TMP be structured into a four part program that would effectively manage traffic and parking demands associated with special events:

1. Scheduling and Education – This group of programs reduces potential impacts by minimizing conflicts with other events in the immediate area and informs both the congregants and neighbors of the upcoming events.
2. Travel Demand Reduction Programs – These are programs that reduce the number of automobiles traveling to the site.
3. Traffic and Parking Demand Management – These programs ensure safety and efficient traffic and pedestrian flow for those who do drive to the area.
4. Monitor and Update the TMP – These are common sense strategies to continually improve the TMP to respond to changes in conditions so future events are managed more efficiently.

A suggested series of programs is outlined in Table 8 below.

Table 8. Special Event TMP Program Model

Program	Program Summary
<u>Scheduling and Education</u>	
Avoid Event Schedule Overlap	Avoid scheduling events at the SJCC and at the future school that conflict with special celebrations are forecasted to exceed an attendance of 400 people.
Educate Campus Users	Provide campus users with information of the various programs available including carpooling, particularly for the elderly, and park and ride options.
Neighborhood Education	Continue to announce upcoming SJCC special events in the community newspaper.
<u>Demand Reduction Programs</u>	
Encourage Carpooling	In addition to the goodwill generated by carpooling with others and providing rides to those who may not be able to drive, consider providing carpools with reserved parking that is located near building entrances.
Maintain a Park and Ride Program	Operate a park and ride program using the available remote parking areas of neighboring institutions. Publicize this information and the attributes of convenience in special event announcements.
<u>Manage Traffic and Parking Demand</u>	
Maintain a traffic and Pedestrian Safety Plan	Retain off-duty Mercer Island Police or other sworn officers to direct and manage traffic as well as the pedestrian crossing between the campus and Herzl-Ner Tamid.
Discourage on-street parking	So neighbors are not adversely impacted, work with the City to post enforceable NO PARKING signs on East Mercer Way from SE 36 th to SE 40 th and along the boat ramp road.
Employ Valet Parking	Retain a professional valet service for special events to assist the elderly and manage the demand associated with those who drive but are unable to walk or use a shuttle service
<u>Monitor and Update the TMP</u>	
Monitor the TMP	Monitor the effectiveness of the TMP during each special event and prepare a brief summary of what worked and what could be improved. Periodically review with the city.
Update the TMP	Through observations of individual events determine if there are minor adjustments that can be used to enhance the experience of special event attendees and minimize impacts on neighbors and motorists traveling through this corridor on major event days.

Appendix A
Strom Jewish Community Center Program Activity Summary

Program	Description	Participants and Staff	Schedule	Travel Mode	Projected Usage Change with Master Plan
Early Childhood					
Daycare program	Children 3 months to 6 years. Some mothers stay after to swim.	305	Morning with small afternoon session.	Auto drop-off with some carpool.	Total enrollment not likely to exceed 300.
Early childhood education	Early childhood education for parents and preschool children.	20	Morning and afternoon sessions. Up to two classes concurrently	Drive automobiles with minimal carpooling.	Remain about the same.
Youth and Family					
Before-school program	Childcare and activities prior to School.	15	Early Morning.	Auto drop-off with some carpool.	Remain about the same.
Transportation to JDS	Buses transport students from before school program to public schools and JDS.	25	Morning and afternoon.	Auto drop-off with some carpool. Buses from Mercer Island public schools, vans from Bellevue and JDS.	JDS is already using SJCC for student drop off.
After-school program	Childcare and activities following school.	30	Late afternoon.	Auto pick-up with some carpools.	Remain about the same.
Youth basketball league	Organized youth basketball.	25	Late afternoon.	Auto drop-off with some carpools.	Remain about the same.
Teen programs	Various.	20	Evenings.	Auto drop-off with some carpools. Some teens drive.	Remain about the same.
Hebrew High School	Jewish education for teens.	250	Evenings.	Parent drop-off with some carpools. Some teens drive.	Remain about the same.
B'nai Brith Youth Meetings	Religious studies for youth.	80	Monday nights.	Parent drop-off with some carpools.	Remain about the same.
Kumon Math Classes	Special math/learning classes.	20	Tuesday and Thursday evenings.	Auto drop-off.	Remain about the same.
Students from Yeshiva	Use physical education facilities to complement the academic program offered at their existing school.	30	Friday afternoons.	Bus from Yeshiva High school.	Remain about the same.
Adult and Seniors					
Aerobics, dance classes, crafts, Hebrew Language, Travel		50	During weekdays and some evenings.	Drive automobiles with minimal carpooling. Some seniors use Metro Access Service.	May increase with increased facilities to 75.

Basketball leagues		30	Weekday evenings.	Drive automobiles with minimal carpooling.	May increase with increased facilities to 50.
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Activity	Description	Participants and Staff	Schedule	Travel Mode	Projected Usage Change with Master Plan
General Recreation					
Recreational uses, swimming, fitness center, racquetball and basketball courts, personal training	Open sessions for general recreation, fitness and health.	100	Early morning through late evening (5:30am – 10:00pm).	Drive automobiles with minimal carpooling.	May increase with increased facilities to 125 -150.
French American School					
	School for grade school students emphasizing French culture and language. Three rooms are currently being used at Hertzl-Ner Tamid.	200	Drop off for kids at Herzl 8:30, at FAS site 8:45. Pick up at 3:00 pm.	Auto drop-off with some carpools.	Will relocate off-site. Replaced by new school with an enrollment of 270 short-term to eventually 475 students over 20 years.
Special Events					
SJCC					
Community Celebrations	Purim – Children's festival in the late winter.	400	Sunday all day.	Drive together as families with some carpooling.	Remain about the same.
Teen Dances	Dance social for young people.	200	Saturday evenings once a month.	Parent drop-off with some carpools. Some teens drive.	Remain about the same.
Youth Theater	Families attend to see their children perform in plays. Not a large event.	150	Occasional evenings, Sunday afternoon 2 or 3 times per year.	Drive together as families with some carpooling.	Remain about the same.