



BROADWAY BOULEVARD: EUCLID TO COUNTRY CLUB

Vissim Modeling Parameters and Assumptions

Introduction

Multi-modal traffic operations associated with the four cross section alternatives moved forward by the Broadway CTF will be evaluated using the microscopic traffic simulation model, VISSIM. The intent of this initial modeling effort is to develop multi-modal traffic performance measures for each alternative and traffic scenario. Additional detailed evaluation of potential refinements to roadway geometry, signal operations, and multi-modal demand scenarios is expected in order to support development of a preferred alternative(s).

The following model parameters and assumptions have been developed for the initial modeling effort based on data and input received from the City of Tucson Transportation Department and Sun Tran.

Alternatives

Four roadway cross section alternatives will be modeled and evaluated relative to impacts on multi-modal traffic performance measures.

- 4-lane with raised median; bicycle lanes, and sidewalks
- 4-lane with dedicated outside transit lanes, raised median, bicycle lanes, and sidewalks
- 6-lane with raised median, bicycle lanes, and sidewalks
- 6-lane with dedicated outside transit lanes, raised median, bicycle lanes, and sidewalks

Lane Widths

Lane width assumptions are based on input received from the City Traffic Engineering Division. These lane widths represent the current minimum desired by City Traffic Engineering from both an operational and safety perspective. Narrower lanes and median widths can be considered and evaluated for operational and safety impacts.

- Through Traffic lanes: 11'
- Bike Lanes: 6' +1'buffer
- Transit/Bus lanes: 11'
- Exclusive LT lanes: 10'; Dual LT Lanes: 11'
- Exclusive RT Lanes: 10'
- Median: 20', 6' min at pedestrian/bicycle crossings

Signalized Intersections

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- Lane configurations for each signalized intersection are as follows:

	NB			SB			EB				WB			
4-lanes	LT	Th	RT	LT	Th	RT	LT	Th	Bk	RT	LT	Th	Bk	RT
Euclid	1	2	1	1	2	1	2	2	1	1	2	2	1	1
Highland	1	1		1	1		1	2	1	*	1	2	1	*
Campbell	2	3	1	2	3	1	2	2	1	1	2	2	1	1
Tucson	1	1	1	1	1	1	1	2	1	1	1	2	1	1
Country Cl	1	2	1	1	2	1	1	3	1	1	1	2	1	1

4-lanes +T	NB			SB			EB				WB					
	LT	Th	RT	LT	Th	RT	LT	Th	Bus	BK	RT	LT	Th	Bus	BK	RT
Euclid	1	2	1	1	2	1	2	2	1	1	1	2	2	1	1	1
Highland	1	1		1	1		1	2	1	1	*	1	2	1	1	*
Campbell	2	3	1	2	3	1	2	2	1	1	1	2	2	1	1	1
Tucson	1	1	1	1	1	1	1	2	1	1	1	1	2	1	1	1
Country Cl	1	2	1	1	2	1	1	2	1	1	*	1	2	1	1	1

6-lanes	NB			SB			EB				WB			
	LT	Th	RT	LT	Th	RT	LT	Th	Bk	RT	LT	Th	Bk	RT
Euclid	1	2	1	1	2	1	2	3	1	1	2	3	1	1
Highland	1	1		1	1		1	3	1	*	1	3	1	*
Campbell	2	3	1	2	3	1	2	3	1	1	2	3	1	1
Tucson	1	1	1	1	1	1	1	3	1	1	1	3	1	1
Country Cl	1	2	1	1	2	1	1	3	1	*	1	3	1	1

6-lanes+T	NB			SB			EB				WB					
	LT	Th	RT	LT	Th	RT	LT	Th	Bus	Bk	RT	LT	Th	Bus	Bk	RT
Euclid	1	2	1	1	2	1	2	3	1	1	1	2	3	1	1	1
Highland	1	1		1	1		1	3	1	1	*	1	3	1	1	*
Campbell	2	3	1	2	3	1	2	3	1	1	1	2	3	1	1	1
Tucson	1	1	1	1	1	1	1	3	1	1	1	1	3	1	1	1
Country Cl	1	2	1	1	2	1	1	3	*	1	*	1	3	*	1	1

*Outside general purpose or transit lane shared with right-turns.

- Recently updated signal and timing plans, which reflect new pedestrian crossing requirements will be used. These requirements include providing longer “green” time to allow pedestrians to fully cross the roadway and to account for slower walking speeds as stipulated by ADA.

Unsignalized Intersections

- Full access median openings will be provided per the initial access management plan developed for Broadway. Median openings will be provided essentially every two blocks.

Pedestrian/Bicycle Crossings

- Pedestrian signals (HAWKS) at existing locations to remain with new HAWK at Treat Ave.
- Single stage crossing for 4-lane. Two-stage crossing for 4-lane +T, 6-lane, and 6-lane +T.
- HAWKS will not be coordinated with upstream traffic signals. Due to randomness of pedestrian crossings at HAWKS, the City has found it is very difficult to achieve coordinated operation.

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Transit Stops

- Departure side bus pull outs at signals for 4-lane only. No mid-block bus pull outs

Speed Limit: 35 mph

Traffic Volumes:

- Auto –PAG 2040 projections, 70% Growth 2040 projections.
- Bicycle – The PAG 2012 bicycle count report provides historical information regarding bicycle usage in the region and on specific routes. Referring to the Table 1, the report suggests that regional bicycle volumes have remained relatively unchanged between 2008 and 2012. However, counts taken on specific roadway sections (see Table 2) show marked changes. Counts taken in the vicinity of this project, at the Snake Bridge at Aviation Pkwy and Broadway suggest an increase of 13% per year from 2008 through 2012. Using bicycle counts taken in 2010 for the initial Broadway, Euclid to Country Club traffic study, we will double the bicycle volumes to reflect potential bicycle demand in 2040. This increase would result in a reduction in autos.

Table 1. Historical Regional Bicycle Data Summary. Source: PAG 2012 Regional Bicycle and Pedestrian Summary Report

Table 11. Four-year averages compared with 2012 data at 39 core locations

Attribute	2008	2009	2010	2011	2008-2011 Average	2012	2012 percent change from 4-year average
Total Bicyclists	7,529	5,496	6,512	7,022	6,640	6,737	1%
Female Riders	2,005	1,609	1,809	1,937	1,840	1,734	-6%
Male Riders	5,524	3,887	4,703	5,085	4,800	5,003	4%
Under 18 Riders	295	92	160	128	169	146	-13%
Age 18 to 65 Riders	7,039	5,280	6,158	6,721	6,300	6,471	3%
Over 65 Riders	195	124	194	173	172	120	-30%
Helmet Wearers	3,254	2,197	2,720	3,171	2,836	3,097	9%
No Helmet	4,275	3,299	3,792	3,851	3,804	3,640	-4%
Wrong Way Riders	385	232	208	188	253	206	-19%
Sidewalk Riders	660	422	410	345	459	377	-18%

- Pedestrians: No historical pedestrian volume data along Broadway is available. Assuming that local pedestrian trips within the corridor will increase with redevelopment of adjacent properties to uses that are more supportive to neighborhood needs, existing pedestrian volumes will be doubled to reflect 2040 conditions. This will result in a reduction in traffic volume on Broadway Blvd.

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Table 2. Historical Segment Bicycle Data Summary. Source: PAG 2012 Regional Bicycle and Pedestrian Summary Report

Table 12. Bicycle count totals at 39 core locations, with 2012 totals compared with the previous four-year average

Core location	2008 Total	2009 Total	2010 Total	2011 Total	2012 Total	4-year Average (2008 - 2011)	2012 Difference from Previous 4-year Average	2012 Percent Change from Previous 4-year Average
4th Ave / Lester St	44	33	50	64	81	48	33	70%
6th St / 9th Ave	58	69	97	81	129	76	53	69%
Arroyo Chico / Tucson Blvd	46	40	41	44	63	43	20	47%
Blacklidge Dr / Mountain Ave	372	204	307	413	444	324	120	37%
Cortaro Rd / Silverbell Rd	18	3	24	15	20	15	5	33%
3rd St / Swan Rd	94	53	78	73	99	75	25	33%
Craycroft Rd / Golf Links Rd	56	38	47	45	60	47	14	29%
Campbell Ave / River Rd	39	42	54	39	56	44	13	29%
Campbell Ave / Grant Rd	107	112	105	102	135	107	29	27%
Anklam Rd / St Mary's Rd	90	58	75	84	96	77	19	25%
Ajo Way / Mission Rd	61	17	28	93	61	50	11	23%
6th St / Highland Ave	501	540	365	610	611	504	107	21%
Ina Rd / Oracle Rd	95	56	61	106	95	80	16	20%
18th St / 6th Ave	60	62	59	75	75	64	11	17%
Rillito Pathway (North) / Oracle Rd	248	82	226	197	215	188	27	14%
Helen St / Mountain Ave	825	724	771	906	920	807	114	14%
Aviation Hwy / Broadway Blvd - Snake Bridge	269	105	124	120	175	155	21	13%
1st Ave / Tangerine Rd	103	44	103	110	101	90	11	12%
Broadway Blvd / Wilmot Rd	87	55	76	71	80	72	8	11%
Elm St / Tucson Blvd	223	204	234	149	217	203	15	7%
Alvernon Way / Ft Lowell Rd	71	31	43	35	47	45	2	4%
Camino del Sol / Continental Rd	18	6	35	33	24	23	1	4%
Columbus Blvd / Pima St	138	90	140	112	121	120	1	1%
Alvernon Way / Broadway Blvd	116	79	93	101	98	97	1	1%
Stone Ave / University Blvd	339	249	291	313	285	298	-13	-4%
3rd St / Campbell Ave	1,229	845	992	1,170	1,001	1,059	-58	-5%
22nd St / Kolb Rd	87	58	57	42	57	61	-4	-7%
La Cholla Blvd / River Rd	83	41	66	85	60	69	-9	-13%
Fairview Ave / Prince Rd	91	23	65	50	49	57	-8	-14%
Santa Cruz Pathway / St Mary's Rd	198	167	201	65	133	158	-25	-16%
Sunrise Dr / Swan Rd	93	40	107	105	72	86	-14	-17%
Congress St / Granada Ave	78	56	91	80	61	76	-15	-20%

Source: PAG 2012 Regional Bicycle and Pedestrian Summary Report

Transit Ridership:

Historical transit ridership on the Broadway section of Route 8 is provided in Table 3. The data indicates that ridership between 2000 and 2012 has increased roughly 20 percent (1.5 million to 1.8 million). Although the PAG travel forecasting model already accounts for growth in transit ridership on Broadway, the modeling will assess the effect of an additional increase (25% to 50%) in transit ridership on traffic operations. The increased transit ridership will be accompanied by a reduction in auto volume, an increase

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in pedestrian crossings at pedestrian signals, and increased number of transit stops and average transit dwell times at each stop (30 to 60 seconds).

Table 3. Historical Transit Usage on Broadway (Route 8). Source: SunTran

