Broadway Traffic Investigation

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Purpose:

1. Learn more about the variability of traffic flow on Broadway
2. See how transit time between Euclid and Country Club on Broadway is related to number of cars traveling on Broadway.
3. See how transit time between Euclid and Country Club on Broadway is related to the number of signals operation.
4. Get an approximation of relative use of Broadway between bicycles and cars.

Summary Conclusion:

Options for intersection design should be given significant attention when functionality with regard to time of vehicle transit between Euclid and Country Club is being addressed by CTF.

Method:

1. Drive from Country Club to Euclid and then from Euclid to Country Club at different times of day over 3 days.
    a. Measure length of time for each transit
    b. Count the number of stops at lights during each transit. (a stop was counted if during a transit I had to come to complete stop at an intersection-length of time of stop was not measured).
    c. Driving speed was determined by traffic around me. (Top speeds ranged between 35 and 40 mph).
2. Count cars passing in each direction on Broadway for a 5 minute period following driving test.
    a. Individual cars were counted. Clumps or groups of cars noted as well.
    b. Pedestrians, bicyclists, and miscellaneous vehicles counted.
3. Measurements taken on Friday, October, 21; Sunday, October 23; and Monday October, 24 2012.

Analysis

1. Correlations between number of cars, transit time, car clumping, and light stops calculated
2. Transit time modeled using light stops, car clumping, and number of cars as predictors.
3. Differences between east and west flows analyzed using t-tests.

Results

Descriptive

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Cars in 5 min interval	26	99	36	135	85.81	28.307
Stops at lights	26	3	0	3	1.38	.983
Valid N (listwise)	26					

Correlations

		Transit time	Cars in 5 min interval	Stops at lights
Transit time	Pearson Correlation	1	.399*	.901**
	Sig. (2-tailed)		.043	.000
Cars in 5 min interval	Pearson Correlation		1	.533**
	Sig. (2-tailed)			.005
Stops at lights	Pearson Correlation			1
	Sig. (2-tailed)			

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Regression Modeling

Stops only

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.901[a]	.812	.805	.221965634321286

a. Predictors: (Constant), Stops at lights

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.122	1	5.122	103.966	.000[b]
	Residual	1.182	24	.049		
	Total	6.305	25			

a. Dependent Variable: Transit time

b. Predictors: (Constant), Stops at lights

Cars in five minutes only

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.399[a]	.159	.124	.469911662071671

a. Predictors: (Constant), Cars in 5 min interval

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.005	1	1.005	4.552	.043[b]
	Residual	5.300	24	.221		
	Total	6.305	25			

a. Dependent Variable: Transit time

b. Predictors: (Constant), Cars in 5 min interval

Cars in five minutes and stops at lights

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.906[a]	.822	.806	.221076880205268

a. Predictors: (Constant), Stops at lights, Cars in 5 min interval

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.181	2	2.590	52.999	.000[b]
	Residual	1.124	23	.049		
	Total	6.305	25			

a. Dependent Variable: Transit time

b. Predictors: (Constant), Stops at lights, Cars in 5 min interval

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.775	.141		26.720	.000
	Cars in 5 min interval	-.002	.002	-.114	-1.092	.286
	Stops at lights	.491	.053	.962	9.243	.000

a. Dependent Variable: Transit time

Bicycle transits made up 1% of traffic

Other modes observed at <1%: wheel chairs, skate boards, walking, ATV, golf cart, and pedestrians.

Limitations:

Sampling not random

Stops at lights recorded yes/no not by length of stop

Conclusions:

For levels of traffic up to 54 cars per minute number of stops required at traffic lights more predictive of transit time than number of cars on the roadway.

Implication: Signal design may be as important consideration as the size and width of roadway.