Chicago Department of Transportation

Evaluation of School Traffic Safety Program Traffic Control Measure Effectiveness

April 2005

Background

Since 2002, the Chicago Department of Transportation has undertaken a comprehensive experimental traffic safety program at selected elementary schools throughout the City of Chicago, using a combination of traffic control devices and other calming measures in an effort to slow traffic and improve safety around schools. These measures included the installation of speed humps along local street frontages of schools, variable speed indicator signs giving interactive speed indication to motorists passing by schools on arterial streets, installation of traditional school crossing warning signs and school zone 20 mph speed limit signs, and the experimental use of strong yellow/green (SYG) pavement marking materials to mark crosswalks, " SCHOOL" legends, speed humps, center lines, and stop bars in the blocks adjacent to schools. Nearly 90 schools have received some combination of these devices.

To assess the effectiveness of these devices, the City has undertaken an evaluation of the program by studying traffic speeds before and after implementation, reviewing crash data before and after installation of the devices, and surveying various interested parties familiar with the schools, such as crossing guards, school administrators, and parents. The analysis of the strong yellow/green pavement marking materials was undertaken since use of these non-standard materials had been approved on an experimental basis by the Federal Highway Administration (FHWA) in accordance with provisions of the Manual on Traffic Control Devices that require an evaluation of the effectiveness of the experimental device.

Typical School Traffic Safety Program Design Elements

In Chicago, schools are usually located in a typical Chicago neighborhood block that is 660 feet by 330 feet (center-of-street to center-of-street). The school safety program elements included school crossing warning signs on the approach to and at every intersection, 20 MPH during School Hours When Children Are Present speed limit signs on every surrounding street, speed humps on the local streets around the school (at least in the 660 foot blocks), interactive speed indicators on selected approaches along arterial street frontages, and strong yellow/green (SYG) pavement markings at the speed humps, at all crosswalks, at "SCHOOL" legends on arterial streets, and center lines and stop bars along streets adjacent to the schools. A typical schematic of the location of program controls is included as Exhibit 1 in the Appendix.

At the intersection of two local streets near a school, there is typically All-Way Stop Control. In addition, many of the local streets are one-way operation. Arterial streets typically are free flow along the school frontage, although there may be signalized intersections near the schools.

The combination of various elements installed on the surrounding streets obviously complicated efforts to undertake a scientific, controlled evaluation of individual control measures. However, it was the City's intent to install as comprehensive program of school traffic controls as possible, with different devices used in combination with the

goal of having the greatest impact on slowing vehicles and making the school environment safer, rather than just test the effectiveness of one single element at a time. The use of the strong yellow/green markings was likewise expanded beyond just marking every other bar of an International pattern (step ladder) crosswalk marking. The intent was to communicate to the motorists that they were entering a special school zone, as indicated not only by the yellow/green crosswalks, but the center line, any stop bars, SCHOOL legends, and speed hump markings, as well as more standard school warning and speed limit signs. Consequently, the analysis to some extent measures the overall effectiveness of the entire combination of program elements as much as the individual effectiveness of any one type of device.

Study Approach

In early 2004, the City directed T.Y. Lin International to conduct the study of the school safety program. The intent of the study was to evaluate the effectiveness of the various program elements in increasing motorist awareness of the school zones and associated controls, reducing speeds, and ultimately increasing safety. Various measures of effectiveness were considered in conducting this evaluation. One direct measure would be to analyze crash data before and after the installations. However, any analysis of crash data can be limited by the amount of available data and the need to wait several years to get sufficient data after the installations to draw meaningful conclusions.

An indirect measure of effectiveness is the speed of traffic before and after the installations. While reduction in traffic speed may not always result in a reduction in the incidence of crashes, it does correspond to a reduced severity of accidents. Furthermore, public perception and the presence of legislated school zone speed limits suggests that the public generally feels that traffic speeds should be reduced near schools where children are present. However, traffic speed may not necessarily be a good indicator of a motorist's level of awareness, as cited in previous research on SYG pedestrian warning signs.

Another means of measuring effectiveness involves a survey of system users or stakeholders, to see if they have noticed a difference in driver behavior, or, as drivers, if the new program elements have increased their awareness of the school zone and the need to drive more carefully. Interviews of drivers were considered, but it was decided that the police and personnel manpower requirements would be too substantial, and that motorists might not necessarily respond objectively when stopped by police or questioned by a representative of the transportation agency. Instead, interviews were conducted with individuals who would be affected by the motorists' potential change in behavior, namely, crossing guards and parents or school administrators speaking on behalf of the children. The surveys sought to ascertain the perceptions, admittedly subjective, of these interested parties on the effectiveness of the program.

Other surrogate measures, such as observing pedestrian-vehicle conflicts and actions before and after the program installations, were not studied. While these measures have been used in evaluating devices such as SYG pedestrian warning signs and In-Street

Yield-to-Pedestrian signs, they were not employed for this study since there was a desire to evaluate speed on streets around the schools as well as conflicts at individual crossing locations, and the personnel needed to make multiple observations at many schools was substantial.

It should be noted that the analysis was limited only to those schools that were included in the School Traffic Safety Program, and not other comparison or control locations where no new devices were installed. In addition, there were no other comparison locations where similar pavement marking treatments might have been installed using white materials instead of SYG markings.

Crash Data Review

A Before-and-After analysis of crash data would only be meaningful for locations where a reasonable amount of After data could be collected. Crash data was available for the four years from 2000 to 2003. This precluded a study of 2003 and 2004 program locations.

For the 2002 program year, crash data was reviewed for 23 schools, with two years of before data (2000 and 2001), and one year of after data (2003). (There were a total of 25 schools in the 2002 program, but at two schools, speed humps and strong yellow/green pavement markings were not used at the local alderman's request.) Since various elements of the program were installed throughout 2002, it was decided to omit that year's data since the program was essentially "under construction" during that period. While traffic studies traditionally use three years of data to assess a before or after condition, the study used what data was available, given the study time frame. Results were aggregated for all similar location conditions to give an aggregate assessment of the before and after experience.

Speed Data Review

Speed studies were limited to schools included in the 2004 program. Since nearly 50 schools had already had various traffic control devices installed during the 2002 and 2003 program years, it was not possible to conduct Before condition speed studies at these locations. Traffic speed studies were conducted at 15 of the 40 schools included in the 2004 program. These 15 schools were selected for study since they had at least one arterial street frontage of the four blocks surrounding the school. Traffic volume and speed data was collected for the arterial frontage streets, as well as on local streets surrounding the school. However, in some cases where the local street blocks were short, were interrupted by driveways, or had speed humps in a short block, meaningful local street speed data could not be collected.

Before-condition speed and volume data was collected in May and June of 2004, after the Spring Break, but before Summer Recess and before the installation of any of the control devices. The program installations generally occurred in May through September of 2004, and the After-condition speed and volume counts were undertaken in October and

November of 2004. Automatic counting meters with pneumatic tubes were used to collect the speed and volume data. Analysis of the data focused on the peak hours of school pedestrian activity, typically 8 am to 9 am, and 2:30 pm to 3:30 pm. Total daily volume and speed data was also available.

Surveys of Interested Parties

Surveys of interested parties, or stakeholders, were undertaken in December of 2004, after the devices had been in place for several months. Over 90 persons were interviewed, including crossing guards, school administrators (principals and assistant principals), and parents. While these surveys do not provide an objective, physical measurement of the effectiveness of the devices, it was felt that they could provide some insight into the subjective public perception of their effectiveness.

Summary of Analysis

Crash Data Analysis

As noted, crash data was analyzed for 23 schools in the 2002 Program for which After-condition crash data was available. The results for all schools are summarized in Tables 1 and 2. Before the implementation of the various program elements, there were a total of 276.5 crashes per year on the streets surrounding these schools; after the installations, there were 229 crashes in 2003, or a reduction of 17.2 % overall (47.5 crashes per year, or about 2 per school.)

In an attempt to assess the effectiveness of the different program elements, the data was further broken down by street type---arterial versus local--- with additional breakout of arterial streets that had Speed Indicator signs installed. For arterial streets, there was an overall 13.6% reduction in crashes at midblock locations, and a 7.3% reduction at intersection locations. However, for just arterial streets with Speed Indicator signs, the reduction was 5.5% at midblock locations, and 38.2% at intersections. For arterial streets without Speed Indicators, where only the Yellow/Green markings and various school-related signs were installed, there was a 17.0% reduction in crashes at midblock locations, but a 23.6% increase at intersection locations.

For local streets, there was a 22.4% reduction in crashes at midblock locations, and a 27.7% reduction at intersections. For most of the local streets, speed humps were installed, and were the significant element of the program installed on these streets.

While there should be caution in drawing conclusions about crash experience on the basis of only one year of After-condition crash data, it appears that, in the aggregate, speed humps had a positive effect on reducing crashes on local streets, and Speed Indicator signs may have had a positive effect on arterial streets, particularly at intersections. However, the mixed results for crashes on arterial streets without Speed Indicators suggests that the other program elements installed on those streets---namely yellow/green

markings and school speed limit and warning signing---may not have had a significant effect on crash experience.

Speed Data Analysis

The study included the collection of speed and volume data for 15 schools included in the 2004 School Safety Program. These schools were selected for study since each of them had at least one arterial street bordering the block in which the school was located. Speed data on a total of 16 arterial street segments was collected. Data on 30 local streets bordering the schools was also gathered.

On the arterial streets, there generally was no All-Way Stop control adjacent to the schools, which was the typical condition at intersections of local streets near schools. Consequently, it was felt that the relatively free-flow arterial street segments would be the best locations to evaluate the effect of various traffic control devices, including yellow/green pavement markings and interactive Speed Indicator signs, on traffic speeds adjacent to the schools. On the local streets, the typical program application involved the installation of speed humps, and it was felt that the midblock humps, in combination with stop controls at the upstream and downstream intersections, would have an impact on speed that overshadowed any impact from yellow/green markings or signing.

The speed studies focused on the peak hours of school crossing activity, namely from 8 am to 9 am and from 2:30 pm to 3:30 pm, when children are visibly present going to and from schools, and when crossing guards are also on duty. At these times, the "20 MPH School Speed Limit" is clearly in effect, since it is during school days and children are present.

The arterial streets studies typically were 42 to 48 feet in width, with two-way 24-hour volumes of 12,000 to 20,000 vehicles per day, and one-way school peak hour volumes of 300 to 600 vehicles per hour. Typically, one lane of traffic in each direction is provided on these streets throughout the day, although there may be peak period parking prohibitions in place from 7 AM to 9AM or from 4 PM to 6 PM. In addition, parking is typically prohibited during school days (8 AM to 4:30 PM) on the side of the street adjacent to the school. The local streets studies typically were about 30 feet in width, generally were one-way, and had 24-hour volumes of 600 to 1200 vehicles per day and one-way school peak hour volumes of 40 to 80 vehicles per hour. One traffic lane is provided (one lane in each direction on two-way streets), with on-street parking on both sides, although typically parking will again be prohibited along the school side of the street from 8 AM to 4:30 PM.

Mean traffic speeds and 85th percentile speeds were determined for each location before and after the implementation of the program elements. For the peak school hours, the speed limit was defined as 20 miles per hour for purposes of comparison to the mean and 85th percentile speeds. Data on the percentage of motorists exceeding the speed limit was also gathered and reviewed. The detailed speed and volume data for each location is included as Exhibit 2 in the Appendix.

The data for mean speeds was aggregated for all 16 arterial street segments and for all 30 local street segments in order to come up with an overall measure of mean speed before and after the installations. The aggregate mean speed was a weighted (by volume) arithmetic mean of all of the peak hour mean speeds for all locations. It roughly corresponds to the 50th percentile speed, rather than the 85th percentile speed. Similarly, the percentage of traffic exceeding the speed limit was aggregated for all arterial and all local streets segments. The 85th percentile speeds for all street segments were also reviewed. Since a volume-weighted arithmetic average of 85th percentile speeds would not represent a true aggregate of all 85th percentile speeds, only the mode and median values of all the individual peak hour 85th percentile speeds were examined.

The results of the various speed data analyses are summarized in Tables 3, 4, and 5.

Arterial Street Speeds

Effect of Combined Program Installation Elements

For all arterial locations, the overall average mean speed was 26.3 mph before the installations, and 25.6 mph after, a reduction in mean speed of only 2.7%. The percentage of traffic over the speed limit on arterials was 78.1% before, and 77.5 % after the installations, a reduction of only 0.8%.

While it was not possible to aggregate 85th percentile speeds for all locations, individual hourly 85th percentile speed data values were analyzed in an effort to see what changes may have occurred after the program installations. For arterial locations, the mode of 85th percentile speeds was 30 mph before (63 samples), and 30 mph after (64 samples). The median value of the 85th percentile speeds was 32 mph before and 30 mph after. While there was a modest reduction, the median 85th percentile speed was still 10 mph over the speed limit after the installation. Moreover, it is worth noting that the aggregate mean speed, which would roughly correspond to an "average" or 50th percentile speed, was itself 5 mph over the speed limit both before and after the program installations.

Speed Results on Streets with Speed Indicator Signs

For the arterials streets, the street segments that included an installation of a speed indicator sign were broken out for separate analysis, to see if there was a different impact between streets with the indicators and those streets that had only new yellow/green striping and signing. For the four street segments that had Speed Indicator signs (admittedly a small sample), the aggregate mean peak hour speed was 24.3 mph before the installation, and 25.0 mph after, an increase in speed of 2.9%. The percentage of traffic going faster than the 20 mph school zone speed limit was 75.4% before the installation, and 77.6% after, an increase of 2.9% in the percentage of motorists exceeding the speed limit.

The individual hourly 85th percentile speeds were analyzed for the four arterial streets segments, and the mode of 85th percentile speeds was 30 mph before the installations, and 30 mph after, while the median value was 30 or 32 mph before and 30 mph after, speeds which were 10 mph over the 20 mph speed limit even after the installations.

For whatever reason, the presence of the speed indicator signs did not result in significant reduction in speed in the school zone, as might have been expected based on their effectiveness in other locations throughout the country.

Speed Results on Streets with Only Strong Yellow-Green Pavement Markings

For the 12 arterial street segments that did not have Speed Indicator signs installed, the aggregate mean peak hour speed was 27.1 mph before the program installations, and 25.8 mph after, a decrease of 4.8%. The percentage of traffic going faster than the 20 mph speed limit was 79.4% before the installation, and 77.5% after, a decrease of 2.4% in the percentage of motorists exceeding the speed limit.

The individual hourly 85th percentile speeds were analyzed for these 12 arterial segments, and the mode of 85th percentile speeds was 30 mph before and 30 mph after, while the median value was 33 mph before and 30 mph after, speeds which again were 10 mph over the speed limit even after the installations.

These results did not indicate a significant reduction in speeds due to the installation of the combination of yellow/green pavement markings for crosswalks, centerlines and stop bars, and SCHOOL legends, and various school-related signs.

Local Street Speeds

Effect of Combined Program Installation Elements

For local street locations, the overall average mean speed was 16.5 mph before the installations, and 16.8 mph after, a slight increase of 1.8% in mean peak hour speed. The percentage of traffic over the 20 mph speed limit on local streets was 31.3% before, and 29.6% after, a reduction of only 5.4% in the percentage of motorists traveling over the speed limit.

The discrete values for 85th percentile speeds before and after the installations were also analyzed in a further effort to see whether the combined program elements had an effect on 85th percentile speeds. For the local street locations, the mode of the 85th percentile speeds was 24 mph before the installations, and 18 mph after the installations. The median value of the 85th percentile speeds was 24 mph before the installation, and 20 mph after. Thus, it appears that while the aggregate number of motorists traveling over the speed limit only dropped from 31.3% to 29.6%, a substantial number of individual locations had a fairly significant reduction in the value of the hourly 85th percentile speeds, as reflected in the change in the mode and median values of these hourly speeds.

Surveys of Interested Parties

As noted above, surveys were conducted with over 90 interested parties involved with school crossings, to see what their perceptions were on the effectiveness of the program installations. These included school crossing guards, parents, and school administrators, such as principals and assistant principals. The short survey attempted to assess whether the strong yellow/green markings had increased motorist awareness of the school zone, whether vehicle speeds had changed, and whether motorists were more likely to yield to pedestrians and the crossing guards. In addition, respondents were asked whether parents had commented on the yellow/green markings, and whether any other program measures such as speed humps had an effect on increasing traffic safety for the school children.

In terms of motorist awareness, 30% of the respondents felt that the yellow/green markings had increased awareness of the school zone, while 67% felt there was no increase in awareness (3% had no opinion). Regarding traffic speeds, 21% of respondents perceived a difference in speeds after the markings were installed, while 79% said there was no difference. Likewise, only 22% felt that the new markings made it more likely that vehicles would yield to pedestrians and crossing guards, while 78% felt there was no difference in the likelihood of yielding. Non-parent respondents said that 30% of parents had commented positively on the markings, 6% had commented negatively, while 60% had not commented on the markings.

By contrast, 96% of the respondents commented that speed humps had had a positive effect on traffic safety, while only 4% felt that speed humps had had no effect. Only a small number of respondents commented on the Speed Indicator signs, with no clear-cut opinion on their effectiveness.

While the survey responses are admittedly subjective, they do somewhat match the results of the speed analyses and crash data reviews. The speed data indicated that generally there was only a minor difference in traffic speeds on arterial streets, in terms of aggregate mean speeds, percentage of traffic exceeding the speed limit, or peak hour 85^{th} percentile speed values before and after the installations. There was also a minimal difference in crash experience on the arterials. On local streets, there was a greater difference in peak hour 85^{th} percentile speed values, and a somewhat greater difference in crashes, which seems to be reflected in the respondents' perception of the greater effectiveness of speed humps.

Conclusions and Recommendations

The analysis conducted was limited by the absence of control locations where similar marking treatments might have been installed using standard white pavement marking colors for crosswalks, "SCHOOL" legends, stop bars, and speed hump markings. The program analysis also generally was limited to assessing the combined effect of

yellow/green markings, improved signing, and speed humps (on local streets), rather than analyzing the effect of individual traffic control measures. Understandably, it was the City's intent to maximize the impact on motorists to increase their awareness, slow traffic, and improve overall safety in the school zones, rather than simply conduct a limited experiment on alternating color pattern crosswalks using a combination of white and strong yellow/green pavement marking materials.

The usefulness of the crash analysis was somewhat limited by only having one year of After-condition data available for the 2002 Program installation locations. No After-condition analysis was possible for the 2003 Program locations, nor, obviously, for the 2004 Program schools.

The results of the analysis suggest that the use of strong yellow/green pavement markings did not seem to have a significant effect on traffic speeds or crash experience. On arterial streets, the change in aggregate mean speeds, the aggregate percentage of traffic exceeding the speed limit, and the mode and median values of peak hour 85th percentile speeds was minimal. The use of speed indicators, which have proven effective in reducing speeds in other locations throughout the country, did not have a large effect on either speeds or crashes during school peak hours. The combined use of speed indicators and strong yellow/green markings also did not have a major impact on reducing speeds or crashes.

On local streets, the locations studied all had a combination of speed humps and strong yellow/green pavement markings. Most of theses locations already had all-way stop control at adjoining intersections, thus already limiting the speeds on those streets. While the change in aggregate mean speeds and the aggregate percentage of traffic exceeding the speed limit was minimal, there did appear to be a reduction in the mode and median values of peak hour 85th percentile speeds. However, it seems reasonable to conclude that this reduction may have been largely attributable to the installation of speed humps rather than the yellow/green markings or upgraded school zone signing. This conclusion was reflected by the perception of survey respondents on the relative effectiveness of speed humps versus yellow/green markings.

One possibility for continuing the School Safety Program would be to provide the various elements such as speed humps, Speed Indicator signs at selective arterial street locations, other school zone signing upgrades, and new or improved crosswalk and "SCHOOL" legend and speed hump pavement markings, but using standard MUTCD white reflective pavement marking materials rather than the experimental strong yellow/green color. The use of standard colors in combination with the other School Program traffic control measures could prove to be as effective as the yellow/green in terms of alerting motorists to the presence of the school. At some point, however, application of engineering measures such as traffic control devices may be limited in usefulness, and enforcement efforts, possibly including automated speed enforcement cameras, might be needed in order to achieve greater effectiveness in reducing speeds in school zones and improving traffic safety in those areas.

Table 1

Annual Number of Crashes
2002 Program Locations

School	Arterial Mid-block		Arterial Intersection		Local Mid-Block		Local Intersection	
	Before	After	Before	After	Before	After	Before	After
Pritzker*	2	2	7	4	6.5	1	1	0
Pirie	-	-	-	-	4	2	0.5	0
Coles*	4	0	2.5	0	0.5	0	0.5	0
Our Lady of Fatima	5.5	7	9	11	5	1	0.5	0
Nightingale	-	-	-	-	2	4	1	2
Morrill	-	-	-	-	6.5	6	1	0
Fulton	-	-	-	-	5.5	2	0.5	0
Oglesby	3	1	2.5	6	4.5	5	0.5	0
Brownell	1	4	3	3	6.5	7	0.5	0
Kipling	-	-	-	-	0	3	2	0
Irving*	-	-	-	-	1.5	2	0.5	1
Von Humboldt	-	-	-	-	12	7	0.5	1
Ryerson	-	-	-	-	6	5	4	1
Key	16	13	8.5	14	3	1	1	1
Whistler*	0.5	2	2.5	0	2	4	0	1
Monroe	-	-	-	-	8.5	5	1.5	3
Dever	-	-	-	-	2	0	1	0
Smyser	14	12	9	6	11.5	11	1	2
Volta	-	-	-	-	8.5	5	1	2
Peterson*	8.5	5	12.5	8	2.5	1	0	0
Ogden	5	6	9	10	16.5	13	4.5	3
Hawthorne	-	-	-	-	5.5	5	0.5	0
Brennemann*	3	2	2.5	1	2	5	-	-
Total	**62.5**	**54**	**68**	**63**	**122.5**	**95**	**23.5**	**17**

*speed indicator location

Table 2

Annual Number of Crashes by Street and Control Type
2002 Program Locations

	Before		After		% Change	
	Midblock	Intersections	Midblock	Intersections	Midblock	Intersections
All Streets	185	91.5	149	80	-19.5%	-12.6%
Arterial Streets						
All Arterial Streets	62.5	68	54	63	-13.6%	-7.3%
Speed Indicator Streets	18	17	34	21	-5.5%	-38.2%
SYG-Only Streets	44.5	37	34	42	-17.0%	+23.6%
Local Streets						
All Local Streets	122.5	23.5	95	17	-22.4%	-27.7%

Table 3

Aggregate Mean Peak Hour Traffic Speeds (Miles Per Hour)

Arterial Streets	Before	After	% Change
All Arterial Streets	26.3	25.6	-2.7%
Speed Indicator Streets	24.3	25.0	+2.9%
SYG-Only Streets	27.1	25.8	-4.8%
Local Streets			
All Local Streets	16.5	16.8	+1.8%

Table 4

Aggregate Percentage of Traffic Over the Speed Limit

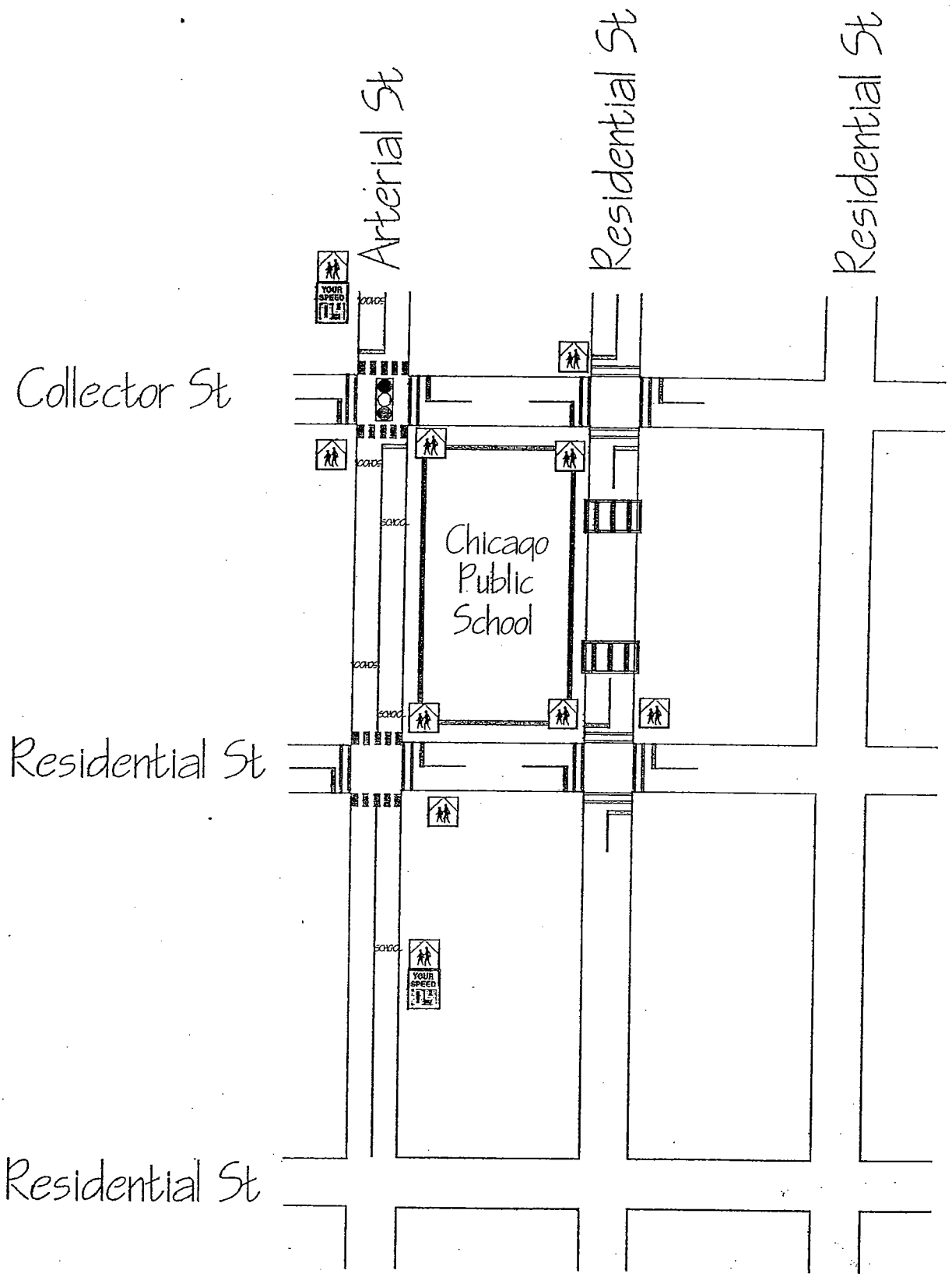
Arterial Streets	Before	After	% Change
All Arterial Streets	78.1%	77.9%	-0.8%
Speed Indicator Streets	75.4%	77.6%	+2.9%
SYG-Only Streets	79.4%	77.5%	-2.4%
Local Streets			
All Local Streets	31.3%	29.6%	-5.4%

Table 5

85th Percentile Peak Hour Speed Values
(Miles Per Hour)

	Before		After	
Arterial Streets	Mode	Median	Mode	Median
All Arterial Streets	30	32	30	30
Speed Indicator Streets	30	30/32	30	30
SYG-Only Streets	30	33	30	30
Local Streets				
All Local Streets	24	24	18	20

Appendix



City of Chicago Department of Transportation
Bureau of Traffic
Traffic Calming Division

School Traffic Safety Proposal
Pilot Program Plan

Arterial Street Model

January 15, 2002

EXHIBIT 1

Exhibit 2

Speed and Volume Data by School

ARTERIAL STREETS

BOONE - PRATT

BEFORE

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
EB	25	17	202	37.6%	26	17	399	44.6%	29	23	5,906	7.3%
WB	30	26	397	96.5%	28	23	484	74.2%	30	26	6,256	9.6%

AFTER

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
EB	25	17	323	37.8%	25	16	271	36.5%	28	21	4,440	4.8%
WB	29	24	231	81.4%	27	21	275	62.9%	29	25	4,251	6.5%

BOUCHETT - JEFFERIES

BEFORE

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
NB	32	24	824	71.0%	30	22	606	60.0%	36	29	11,304	46.1%
SB	32	25	569	80.3%	30	22	741	61.5%	34	28	11,388	29.9%

AFTER

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
NB	34	25	681	71.1%	33	26	567	85.2%	36	29	10,004	44.8%
SB	33	27	472	91.9%	32	25	622	78.0%	34	28	8,830	32.4%

BUDLONG - FOSTER

BEFORE

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
EB	30	24	714	75.4%	30	24	609	78.3%	33	26	11,171	23.7%
WB	28	20	655	56.2%	29	20	685	58.0%	30	24	11,768	14.3%

AFTER

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
EB	30	23	328	68.3%	29	22	258	59.7%	32	26	6,975	21.0%
WB	30	24	325	46.8%	25	15	326	31.3%	32	25	7,691	18.5%

CROWN - CERMAK

BEFORE

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
EB	35	30	548	97.6%	35	30	500	98.4%	35	30	8,109	46.6%
WB	33	27	422	90.5%	32	27	666	92.0%	33	27	8,856	24.3%

AFTER

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
EB	35	30	542	95.6%	33	28	487	94.5%	34	29	7,285	36.5%
WB	33	27	422	90.5%	30	25	644	85.7%	30	26	7,754	14.7%

ARTERIAL STREETS

FARADAY - MADISON

BEFORE

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
EB	34	29	597	95.3%	35	29	432	95.6%	35	30	7,335	44.8%
WB	-	-	-	-	33	26	449	84.2%	35	29	5,898	37.8%

AFTER

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
EB	31	24	423	70.7%	33	27	270	87.4%	34	28	5,282	31.0%
WB	29	22	366	62.3%	32	26	470	84.5%	34	27	6,924	29.0%

HEARST - 47TH

BEFORE

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
EB	40	34	597	96.8%	39	31	556	92.1%	39	34	7,844	75.5%
WB	40	34	406	99.5%	36	31	629	98.4%	39	33	8,175	67.9%

AFTER

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
EB	39	32	576	94.8%	35	29	444	88.1%	38	32	7,151	68.0%
WB	39	32	411	98.8%	36	30	556	95.9%	38	32	7,069	63.2%

HINTON - 71ST

BEFORE

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
EB	35	29	523	94.5%	33	26	509	83.7%	38	32	8,879	61.6%
WB	36	27	490	77.8%	33	24	535	68.2%	38	31	9,548	54.8%

AFTER

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
EB	36	29	398	91.0%	35	29	405	84.9%	38	32	7,114	64.7%
WB	33	25	327	67.6%	35	28	421	86.7%	37	31	7,825	56.3%

HOWE - CHICAGO

BEFORE

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
EB	33	26	330	77.9%	30	23	548	69.0%	32	25	8,416	18.1%
WB	30	24	553	73.8%	28	21	640	57.0%	29	22	9,963	9.1%

AFTER

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
EB	30	23	297	68.7%	30	22	229	57.6%	30	24	4,560	12.5%
WB	28	19	289	37.0%	27	19	382	45.0%	28	20	6,040	8.5%

ARTERIAL STREETS

LEMOYNE - ADDISON

BEFORE

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
EB	37	27	523	74.4%	36	29	483	88.0%	39	32	8,880	61.5%
WB	30	25	409	80.7%	30	26	463	86.2%	31	26	8,107	16.5%

AFTER

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
EB	30	25	426	82.2%	29	24	330	78.5%	30	26	6,240	13.2%
WB	30	26	271	83.8%	30	25	321	80.4%	32	26	5,499	18.3%

HALSTED

BEFORE

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
NB	24	19	258	44.2%	24	18	326	35.3%	24	18	6,007	0.7%
SB	27	23	497	75.9%	27	22	384	70.3%	28	23	6,611	2.4%

AFTER

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
NB	25	19	163	47.2%	23	16	267	28.5%	25	19	4,355	1.4%
SB	28	23	402	76.4%	25	21	269	62.1%	27	23	4,865	2.4%

OLD SULLIVAN - 83RD

BEFORE

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
EB	31	25	248	83.1%	30	24	197	80.7%	33	26	3,292	23.0%
WB	33	27	214	86.9%	33	26	220	86.4%	35	28	3,260	37.6%

AFTER

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
EB	30	24	272	75.7%	28	23	247	78.9%	33	25	3,456	24.2%
WB	34	28	189	91.5%	31	25	184	81.0%	35	28	2,754	37.3%

OWEN - 83RD

BEFORE

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
EB	30	25	140	80.7%	31	26	186	88.2%	32	27	1,509	18.5%
WB	29	25	216	88.9%	29	26	148	91.9%	30	25	2,300	8.1%

AFTER

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
EB	30	25	151	91.4%	29	25	141	89.0%	30	26	1,448	10.0%
WB	30	26	180	87.8%	30	26	149	96.0%	30	26	2,049	11.7%

ARTERIAL STREETS

ST. ANDREW - ADDISON

BEFORE

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
EB	39	28	729	77.1%	44	32	610	87.7%	42	31	11,507	59.7%
WB	25	19	565	39.8%	25	19	645	42.6%	29	24	10,428	9.6%

AFTER

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
EB	25	16	313	41.5%	27	19	272	51.8%	30	22	7,172	12.9%
WB	26	19	231	49.4%	26	20	366	57.4%	30	24	6,891	12.7%

ST. BARBARA - ARCHER

BEFORE

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
EB	40	32	833	98.0%	40	32	589	97.6%	40	32	9,818	57.8%
WB	42	35	418	95.5%	41	32	749	91.5%	42	34	9,836	69.6%

AFTER

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
EB	38	30	718	95.8%	39	32	512	95.5%	39	32	9,037	55.6%
WB	39	31	391	91.3%	40	32	728	89.8%	41	33	9,399	63.7%

ST. THECLA - DEVON

BEFORE

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
EB	36	32	719	99.7%	38	33	592	99.5%	38	33	10,163	78.0%
WB	35	29	629	88.6%	34	27	678	81.3%	36	30	10,076	57.0%

AFTER

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
EB	36	30	443	90.5%	34	29	362	88.7%	36	30	6,599	56.7%
WB	35	30	466	90.6%	34	28	458	84.1%	35	30	7,129	53.4%

STOCKTON - MONTROSE

BEFORE

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
EB	32	27	589	89.5%	33	27	522	90.0%	34	29	8,681	35.2%
WB	30	23	479	73.3%	28	19	501	49.5%	30	24	8,434	14.4%

AFTER

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
EB	30	25	411	86.1%	30	26	341	83.6%	32	27	6,151	21.8%
WB	29	23	341	68.9%	29	22	344	62.8%	30	25	6,329	14.5%

LOCAL STREETS

BOONE - FAIRFIELD

BEFORE

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
NB	18	11	118	7.6%	19	15	21	9.5%	20	15	626	0.5%

AFTER

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
NB	18	13	162	4.9%	20	14	32	12.5%	21	15	626	0.2%

NORTH SHORE

BEFORE

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
WB	15	10	149	3.4%	18	13	41	2.4%	18	13	1,353	0.1%

AFTER

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
WB	15	11	180	0.6%	15	11	49	0.0%	16	13	1,136	0.0%

WASHNETAW

BEFORE

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
SB	22	15	116	18.1%	15	11	40	2.5%	20	15	1,027	0.5%

AFTER

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
SB	17	12	185	2.7%	16	11	71	0.0%	19	14	1,034	0.3%

BOUCHETT - 73RD

BEFORE

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
EB	27	22	98	71.4%	27	21	138	64.5%	29	23	1,802	7.0%
WB	25	18	240	38.0%	25	16	176	28.4%	26	19	2,587	6.2%

AFTER

	AM (8a - 9a)				PM (2:30p - 3:30p)				ALL DAY			
	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit	85th % tile Speed	Mean Speed	Volume	% > Speed Limit
EB	26	22	90	61.1%	27	22	131	66.4%	29	24	1,644	7.9%
WB	25	18	233	35.6%	25	17	165	27.9%	27	20	2,363	7.1%