Carter Burgess

DOT
DEPARTMENT OF TRANSPORTATION

CDOT DTD Analysis of Bicycle-Related and Pedestrian-Related Roadway Crashes Phase II

[June 2007]

Disclaimer

The contents of this report reflect the views of the author(s), who is (are) responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views of the Colorado Department of Transportation or the Federal Highway Administration. This report does not constitute a standard, specification, or regulation.

Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
CDOT-2007-11		

4. Title and Subtitle	5. Report Date
ANALYSIS OF BICYCLE-RELATED AND PEDESTRIAN-RELATED ROADWAY CRASHES	June 2007
	6. Performing Organization Code

7. Author(s)	8. Performing Organization Report No.
Michael P. Gill, Jr. P.E.	CDOT-2007-11

9. Performing Organization Name and Address	10. Work Unit No. (TRAIS)
Carter-Burgess 707 17th Street, Suite 2300 Denver, CO 80205-5204	11. Contract or Grant No. 97.30

12. Sponsoring Agency Name and Address	13. Type of Report and Period Covered
Colorado Department of Transportation - Research 4201 E. Arkansas Ave. Denver, CO 80222	Final Report
	14. Sponsoring Agency Code

15. Supplementary Notes

Prepared in cooperation with the US Department of Transportation, Federal Highway Administration

16. Abstract

The premise of this study is that crashes involving bicyclists and pedestrians are similar in characteristics, including type and cause. Using available data and existing analysis tools, the study conducted a corridor-specific approach along state highways within local and/or county jurisdictional boundaries to identify potential trends based on patterns in crash types and causes. For instance, do the majority of pedestrian crashes along a corridor occur at mid-block locations; at or near intersections that involve a pedestrian hit by a turning vehicle; or involve a pedestrian hit from behind while walking with traffic along a roadway shoulder (paved or unpaved) and not on a sidewalk? Do most bicycle crashes involve a motorist overtaking a bicyclist, a motorist turning or merging into the path of a bicyclist, or a bicyclist turning or merging into the path of a motorist?

By identifying common causal factors of bicycle and pedestrian crashes, this study should help planning and design efforts to provide safer intersections and corridors for use by pedestrians and bicyclists. The study developed recommendations to improve statewide, county and local data recording of bicycle and pedestrian crash factors.

Implementation:
The results of this study will help planners to assess similarities among crashes involving bicyclists and pedestrians, assist the 402 Safety Program by identifying bicycle and pedestrian education and outreach needs and audiences, and provide information to help in development of programs to reduce the frequency and severity of crashes involving bicyclists and pedestrians.

17. Keywords	18. Distribution Statement
pedestrian safety, bicycle safety, bicycle facilities, crosswalks, intersections, accidents	No restrictions. This document is available to the public through the National Technical Information Service 5825 Port Royal Road, Springfield, VA 22161

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price
None	None	181	

Form DOT F 1700.7 (8-72) Reproduction of completed page authorized

Table of Contents

List of Figures

List of Tables

I. INTRODUCTION

This report presents the results from the Phase II analysis of Bicycle-Related and Pedestrian-Related Roadway Crashes. Phase I of this research project focused on gathering existing crash data into PBCAT database (including correcting errors found on crash reports), geo-referencing the crashes, and high level statistical analysis of the data to determine if there were patterns worth further study. Phase I analysis indicated that if an intersection has a relatively high cyclist or pedestrian crash frequency, it will likely have a higher than normal proportion of crashes involving motorists making right-turns. This suggested that reducing the occurrence of crashes involving right-turns may improve the safety at the at-grade intersections. The objective of the Phase II research was to perform a geometric analysis of at-grade intersections to determine any relationships between intersection geometry and the pattern of crashes occurring.

The representatives of the participating agencies met on several occasions during Phase I and Phase II of the study to assist in guiding the research and discuss the outcomes. Based on the review of the Phase I study it was decided to concentrate on the top 25 crash intersections having a statistically significant difference in respect to right-turning vehicle crashes from the database as a whole. In addition, the panel identified a number of corridors – Folsom Street, Canyon Boulevard, Arapahoe Road, and Pearl Street – that were studied regardless of crash counts to determine what is working and what is not working along a continuous facility.

Geometric design, traffic volumes, and traffic control data were collected at the top 25 crash intersections as well as at 9 comparison intersections chosen to complement the high crash locations along the corridors listed above. The geometric data and traffic control data at these intersections were collected in February and March 2007 by visiting each intersection. Intersection turning movement counts, including pedestrian volumes, were collected in April 2007.

This report presents the analysis methodology and evaluation approaches used to evaluate the geometric data and crash data. Section 2 of the report presents a review of the safety literature concerning intersection design improvements. Section 3 describes the selection of the evaluation sites. The collection of data concerning those evaluation sites is described in section 4. Section 5 presents the evaluation plan for the study, while section 6 presents and interprets the evaluation results. The conclusions and recommendations of the study are presented in section 7.

Appendix A summarizes a list of published literature concerning bicycle and pedestrian safety improvements at at-grade intersections.

Appendix B summarizes selected relevant research papers/reports that were not discussed in section 2.

Appendix C presents the “Intersection Data Collection Form” and the summary of abbreviations used to collect the geometric design and traffic control data in the field.

Appendix D presents a design tool based on the project findings and information from other research projects. The matrix provided serves as a reference document to determine the potential engineering countermeasures to reduce the risk of urban pedestrian and bicycle related crashes.

Appendix E presents the detailed results of all statistical evaluations performed in the research; this appendix includes all evaluation results that are discussed in section 6 of the report, as well as other evaluations whose results were not statistically significant and were, therefore, not used.

Appendix F presents the traffic counts data gathered for this study.

II. LITERATURE REVIEW

This section summarizes the research on pedestrian safety in the United States focusing on crash characteristics and safety improvements/effects of various roadway features and traffic control devices. This section also summarizes other research documenting the effects of innovative engineering treatments on pedestrian safety. A list of references is located in Appendix A. Appendix B includes a short summary of other selected relevant reports not summarized here.

When reviewing existing research papers, the project team identified six reports which were especially pertinent to this study. These six reports are:

1. *A Review of Pedestrian Safety Research in the United States and Abroad*. Office of Safety Research and Development, U.S. Department of Transportation, Federal Highway Administration, Report # FHWA-RD-03-042, McLean, VA, 2004.

2. Field Evaluation of Two Methods for Restricting Right Turn on Red to Promote Pedestrian Safety. Richard A. Retting, Marsha S. Nitzberg, et al. *ITE Journal*, Vol. 72, No. 1, pp. 32-36, Washington, D.C., 2002.

3. Safety Analysis of Marked Versus Unmarked Crosswalks in 30 Cities. Charles V. Zegeer, Carol Tan Esse, J. Richard Stewart, Herman F. Huang, and Peter Lagerwey. *ITE Journal,* Vol. 74, No. 1, pp. 34-41, Washington, D.C., 2004.

4. Safety Benefits of Advance Stop Lines at Signalized Intersections: Results of a Field Evaluation. Richard A. Retting and Ron Van Houten. *ITE Journal*, Vol. 54, No. 9, pp. 47-49, Washington, D.C., 2000.

5. Improving Pedestrian Safety at Unsignalized Crossings. *NCHRP Report 562,* Transportation Research Board, Washington, D.C., 2006.

6. Pedestrian Safety Through a Raised Median and Redesigned Intersections. King, M. In *Transportation Research Record 1828,* pp. 56-66, Transportation Research Board, 2003.

These reports are summarized below:

1. A Review of Pedestrian Safety Research in the United States and Abroad

This document summarized research on pedestrian safety in the United States with a focus on crash characteristics and the safety effects of various roadway features and traffic control devices. Pedestrian education considerations and enforcement programs were also discussed. The report also contains a summary of main findings. The findings relevant to this study are listed below:

- In terms of marked versus unmarked crosswalks at uncontrolled intersections (i.e., no stop sign or traffic signal on the approach roadway) on a two lane road, the presence of a marked crosswalk alone is associated with no difference in pedestrian crash rate compared to an unmarked crosswalk. On multilane roads with traffic volumes above 12,000 vehicles per day, having a marked crosswalk alone (without other substantial improvements) is associated with a higher pedestrian crash rate (after controlling for other site factors) compared to an unmarked crosswalk. More substantial improvements are recommended to provide for safer pedestrian crossings at such locations, such as adding traffic signals (with pedestrian signals) when warranted, provide raised medians, and installing speed-reducing measures.

- Providing raised medians on multilane roads can substantially reduce pedestrian crash risk (and can also make it easier to cross the street).

- There is evidence that substantially improved nighttime lighting can enhance pedestrian safety in certain situations.

- At intersections with traffic signals, adding a WALK/DON'T WALK signal with a standard timing scheme (i.e., motorists move parallel to pedestrians and may turn right or left on a green light across pedestrian's path) has no significant effect on pedestrian crashes. Providing an exclusive pedestrian interval (i.e., motorists are stopped in all directions during the same interval each cycle while pedestrians cross in any direction) reduces pedestrian collisions by 50 percent.

- Allowing vehicles to make a right-turn-on-red (RTOR) maneuver appears to result in a small but clear safety problem for pedestrians. In fact, 21 percent of motorists violate NO TURN ON RED (NTOR) signs if given the opportunity, and 23 percent of RTOR violations result in a conflict with the pedestrian. Countermeasures that have been effective in reducing pedestrian risks related RTOR include illuminated NTOR signs, offset stop bars at intersections where RTOR is allowed (i.e., motorists are more likely to make a full stop often), variations in NTOR signs, and others.

- Various pedestrian and motorist warning signs have been found to reduce vehicle speeds or conflicts between pedestrian and motorists. These devices include the "strong yellow green" pedestrian warning sign, YIELD TO PEDESTRIANS WHEN TURNING sign, PEDESTRIANS WATCH FOR TURNING VEHICLES sign, three section WALK WITH CARE signal head, a DON'T START display to replace the flashing DON'T WALK display, and others.

- Curb medians provide a safer environment for pedestrians compared with two-way, left-turn lanes (TWLTLs), while undivided highways have the highest crash risk for pedestrians in TWLTL settings.

2. Field Evaluation of Two Methods for Restricting Right Turn on Red to Promote Pedestrian Safety

This study was conducted in Arlington County, VA. A group of 15 signalized intersections was selected from locations where the Arlington Department of Public Works was considering instituting pedestrian safety measures, partly due to citizen complaints about the impacts of right turn on red (RTOR) on pedestrians. The selected intersections were randomly assigned into three groups: control, no RTOR during specific hours (7.00AM - 7.00PM, Monday thru Friday), and no RTOR when pedestrians are present.

Figure 1. Sign prohibiting RTOR when pedestrians are present.

Figure 2. Sign prohibiting RTOR during specified hours.

At each site where RTOR was restricted, two signs were posted – one was mounted on a post near the stop sign on the right-hand side of the street, and a second sign was mounted overhead adjacent to the traffic signal indication. No other changes were made at these intersections. Each study site was one leg of intersection. Each study site was observed fro 10 hours both before and after installation of “no turn on red” signs. Observations were limited to weekdays between the hours of 8 am and 7 pm.

The study results indicated that traffic signs prohibiting RTOR during specific hours were very effective at increasing driver compliance with stop lines, reducing the number of pedestrians yielding the right of way to turning vehicles. Signs giving drivers discretion to turn right on red based on whether pedestrians are present were not found to be very effective. Stutts et al. reported that nearly 80 percent of intersection crashes involving pedestrians and turning vehicles occurred between 6 am and 6 pm and 95 percent occurred between 6 am and 10pm, RTOR restrictions and other countermeasures can help prevent pedestrian crashes at intersections.

3. Safety Analysis of Marked Versus Unmarked Crosswalks in 30 Cities

The purpose of the study was to determine whether marked crosswalks at uncontrolled locations were safer than unmarked crosswalks under various traffic and roadway conditions and to provide recommendations on how to provide safer crossings for pedestrians. In total, 1,000 marked crosswalk sites and 1,000 matched unmarked comparison sites in 30 major cities across the United States were selected for analysis.

Detailed information was collected at each of the 2,000 sites, including pedestrian crash history, estimates of daily pedestrian volumes, average daily traffic volume (ADT), number of lanes, speed limit, area type, median type, condition and type of crosswalk marking patterns, location type (mid-block versus intersection), and other site

characteristics. Crosswalk marking patterns found at the study sites included standard (parallel lines), solid (painted within the parallel lines), dashed lines, zebra, ladder, and continental patterns, as illustrated in MUTCD. Very few of the marked crosswalks had any type of supplemental pedestrian warning signs, traffic calming measures, or special treatments. Poisson modeling and negative binomial regression were used in the data analysis. Using these analysis techniques allowed for determining statistically valid safety relationships. A total of 229 pedestrian crashes at the 2,000 crossing sites were evaluated.

The analysis revealed that traffic and roadway factors related to a greater frequency of pedestrian crashes included higher pedestrian volumes, higher ADT, and a greater number of lanes. The presence of a raised median was associated with a significantly lower pedestrian crash rate at multi-lane sites with both marked and unmarked crosswalks. Also, on multi-lane roads, medians that were painted (but not raised) and center two-way-left-turn lanes did not offer significant safety benefits to pedestrians compared to multi-lane roads with no medians at all.

Factors having no significant effect on pedestrian crash rate included area type (such as residential or downtown), location type (intersection versus midblock), speed limit, traffic operation (one-way or two-way), condition of crosswalk marking, and crosswalk marking pattern. In terms of speed and crash severity, the analysis showed that speed limits of 35mph and greater were associated with a higher percentage of fatal crashes that sites having lower speed limits.

The results of the study indicate that there were no significant differences in crash rates between marked and unmarked crosswalks on two lane roads, multi-lane roads with an ADT less than 12,000, and multi-lane roads with an ADT less than 15,000 and raised medians. Marked crosswalks on multi-lane roads with an ADT greater than 12,000 and without raised medians, and marked crosswalks with an ADT greater than 15,000 with

raised medians had significantly higher pedestrian crash rates than locations with unmarked crossings.

Table 1: Example of Facilities Improvements to Enhance Pedestrian Safety

Table 3. Examples of facilities improvements to enhance pedestrian safety and/or ability to cross the street.

Pedestrian measure/treatment	Comments
Raised medians or raised crossing islands	These can reduce pedestrian crash risk on multi-lane roads significantly.
Installing traffic signals with pedestrian signals, where warranted	Current MUTCD signal warrants should be re-evaluated to better consider pedestrian needs.
Curb extensions	Curb extensions shorten street crossing distance and improve visibility between pedestrians and motorists.
Reducing four-lane undivided road sections to three lanes (for example, two through lanes with dual left-turn lane)	Lane reduction treatments (also called "road diets") can result in space for adding sidewalks and/or bike lanes as well as lower speeds and reductions in motor vehicle crashes.[1]
Raised crossings (raised crosswalks or raised intersections)	Raised crossings can result in reduced vehicle speeds and elevate pedestrians in the street for better visibility.
Street narrowing measures	Examples include street narrowing, chicanes, slow points, or "skinny street" designs, which can reduce vehicle speeds.
Pedestrian-friendly intersection designs	Examples include mini-circles, diagonal diverters and/or tighter turning radii.
Adequate nighttime lighting for pedestrians	This is particularly important for marked crosswalks and crossings near churches, schools and community centers with nighttime pedestrian activity.
Increasing the frequency of two- and three-lane arterials when designing new street networks	The goal is to minimize the construction of multi-lane arterials (for example, roads with four lanes or more).
Using various pedestrian warning signs, flashers and other traffic control devices to supplement marked crosswalks	Many of these devices are discussed in "Alternative Treatments for At-Grade Pedestrian Crossings."[2] The effects of many experimental traffic control devices are not well known. According to MUTCD, pedestrian crossing signs should be used only at locations that are unusually hazardous or where pedestrian activity is not readily apparent.
Installing advance stop lines on multi-lane road crossings up to 30 feet in advance of a marked crosswalk, along with the sign, "STOP HERE FOR CROSSWALK"	This measure was found by Van Houten to result in vehicles stopping further back from the crosswalk, thereby improving sight distance for motorists approaching in adjacent lanes.[3]
Removing on-street parking on the approaches to uncontrolled crosswalks	This measure can improve vision between motorists and pedestrians and may be used in conjunction with curb extensions.

1. Zegeer, C.V. et al. "Pedestrian Facilities Users Guide—Providing Safety and Mobility." Washington, DC, USA, Federal Highway Administration: 2002.
2. "Alternative Treatments for At-Grade Pedestrian Crossings." Washington, DC, ITE Pedestrian and Bicycle Task Force, 2001.
3. Van Houten, R. "The Effects of Advance Stop Lines and Sign Prompts on Pedestrian Safety in Crosswalks on a Multi-Lane Highway." *Journal of Applied Behavior Analysis*, Vol. 21 (1988).

Source: *Safety Analysis of Marked Versus Unmarked Crosswalks in 30 Cities*. Charles V. Zegeer, Carol Tan Esse, J. Richard Stewart, Herman F. Huang, and Peter Lagerwey. ITE Journal, Washington, D.C., January 2004.

4. Safety Benefits of Advance Stop Lines at Signalized Intersections: Results of a Field Evaluation

The purpose of this study was to investigate driver compliance with advance stop lines at signalized intersections and potential safety benefits from their use. A before and after design study was conducted at four signalized crosswalks in the city of St. Petersburg, FL, USA. During the baseline study the stop lines were located 4 feet back from the crosswalks. The stop lines at study sites were then removed, and experimental advanced stop lines were installed 20 feet from the crosswalks. Data collection for the baseline and experimental periods were done for 31 and 46 hours, respectively, during which times the numbers of drivers observed were 2,024 and 3,113, respectively.

Data such as driver compliance with stop sign locations, vehicle encroachment into crosswalks, vehicle path (turning left, right or proceeding through) and elapsed time for the front wheels of the lead vehicle to enter the intersection after onset of the green signal was collected. Analysis of driver compliance with stop sign was limited to through vehicles because turning vehicles, especially those turning right or left on red, are more likely to stop past marked stop lines in order to view traffic on the cross streets. Video cameras were deployed to compute the elapsed time between the start of the green signal phase and the lead vehicle entering the intersection.

The results indicated that overall 57 percent of drivers complied with advance stop lines. Overall, the percentage of drivers who stopped in the crosswalks declined from 25 percent to 7 percent after installation of advance stop lines. For each site and for the four sites combined, changes after intervention were found to be statistically significant. Safety benefits of advanced stop lines were also discussed in the paper. The authors suggested that advanced stop lines may prove useful in preventing multiple threat collisions, which involves a pedestrian being struck by a vehicle in a cross walk on a multiple road after another vehicle has yielded to the pedestrian, thereby reducing the

sight distance of the pedestrian and motorists approaching the crosswalk. Advanced stop signs also may reduce the risk of pedestrian crashes involving left-turning vehicles. Additional safety benefits may include potential reduction in the risk of right-angle collisions caused by red-light running, due to the increase in elapsed time for lead vehicles to enter the intersection after onset of green signals.

5. Improving Pedestrian Safety at Unsignalized Crossings

The study had two main objectives. First, to recommend selected engineering treatments to improve safety for pedestrians crossing high volume, high speed roadways at unsignalized intersections, in particular those served by public transportation, and second, to recommend modifications to the *Manual on Uniform Traffic Control Devices for Streets and Highways* (MUTCD) pedestrian traffic signal warrant. Phase I of the research focused on reviewing the literature, conducting surveys, and evaluating the state of the practice, and concluded with the development of a study approach for phase II to accomplish the research project objectives.

Based on the findings of the study, 3.5 ft/sec walking speed for the general population and 3.0 ft/sec walking speed for older pedestrians was recommended. The research team recommended the addition of red signal or beacon devices to the engineer's alternative for pedestrian crossings. The study results indicated that all red signal or beacon devices prompted high levels of motorist compliance on high volume, high speed streets, however, only a traffic signal is currently recognized in the MUTCD, and current pedestrian signal warrant is very difficult to meet. The research team recommended the inclusion of a new type of highway traffic signal (a "pedestrian beacon") in the MUTCD.

The study outlined a procedure to determine the intersection safety improvements. Two worksheets were provided – one for speeds 35 mph or less and the other for speeds exceeding 35 mph with a population less than 10,000 where a transit stop exists. The first

step would be select appropriate worksheet based on the 85th percentile speed on the major street. The second step would be to check the minimum pedestrian volume. If the pedestrian volume is fewer than 20 pedestrians per hour, then geometric improvements such as traffic calming, median refuge islands and curb extensions shall be considered rather than signs, signals, or markings. Third step would be to check if the pedestrian volumes satisfy the pedestrian signal warrant. The report also provided a synopsis of selected pedestrian crossing treatments more commonly being used in the United States. The treatments include advance signing, advance stop line and signing, median refuge islands, raised crosswalks, curb extension, roadway narrowing, markings and crossing signs, in-street pedestrian crossing signs, high visibility signs and markings, in-roadway warning lights, pedestrian crossing flags, overhead flashing amber beacons, pedestrian crosswalk signal, half signal, HAWK beacon signal, pedestrian beacon, and traffic signal.

6. Pedestrian Safety through a Raised Median and Redesigned Intersections

This paper documented the effect of a raised median, signalized and redesigned intersections, curbs, and sidewalks on vehicle speed, pedestrian exposure risk, driver predictability, and vehicle volume along a four lane suburban roadway in central New Jersey. The analysis used both qualitative tools (speed and volume counts, timing runs) and qualitative methods (pedestrian tracking, video, before-after photography). Together, before-after data and before-after imaging provided a clear picture of the benefits/limitations of the project.

Site data was collected in Plainsboro Township (near Princeton, New Jersey) where approximately 3,200 feet long section of Plainsboro Road, a four lane suburban roadway with 4 major intersections at about 1,000 feet intervals, was reconstructed. The reconstruction consisted of redesign of the two interior intersections with signals, intersection-only bike lanes, stop lines, textured crosswalks, and removal of two free

right-turn lanes, a 7.5 foot wide, 900 foot long raised median between the two interior intersections, narrower roadway width, timing the signal to maintain a speed of 45 mph, curb, bike lanes, street trees, sidewalks, and bus shelters along the corridor. The before-after data analysis was conducted and following results were obtained:

1. Vehicle speeds recorded by an automatic traffic recorder (ATR) placed at the median showed that the hourly average and 85th percentile speed fell by 2 to 3 mph due to reduction in lane width from 12 feet to 10.5 feet.

2. Mid-block pedestrian exposure risk is the time which a person is exposed to on-coming traffic while crossing the street. A measure of exposure risk is the width of traveled way within the edge line of curbs. Plainsboro Road was approximately 58 feet wide; with the raised median the roadway was transformed into two 21 feet wide streets, lowering the mid-block pedestrian exposure risk by 28%.

3. An overall measure of roadway safety is driver predictability. Examining the physical characteristics of the road and making a qualitative judgment regarding the ability of pedestrians, cyclists, and other motorists to predict the speed and actions of driver can assess driver predictability. The addition of a median and curbs increased driver predictability by keeping the vehicles on the roadway and in their half of the roadway. Addition of signals also created gaps in the traffic streams, which makes crossing mid-block easier. Striped bike lanes and stop lines at the intersection helped better organize the area.

4. No impact on traffic volumes was observed consistent with the nature of improvements which were not designed to affect traffic volumes.

III. SELECTION OF EVALUATION SITES

From the Phase I work, the project team identified the top 25 crash intersections **(Table 2**) as having a statistically significant difference in respect to right-turning vehicle crashes from the database as a whole. This indicated that there may be features of these specific intersections that will point to generalized mitigation strategies. Hence, these intersections were selected for further evaluation.

Table 2:
Intersections with Highest Number of Crashes
Part of an Identified Corridor

Folsom & Arapahoe	X
Baseline Rd & 29th	X
Broadway & Baseline	X
Arapahoe & 30th	X
Baseline & 30th	X
Spruce & Broadway	X
30th & Walnut	
Broadway & 18th	X
Pearl & 28th	X
Colorado & Regent	
Regent & Broadway	X
Pleasant & Broadway	X
Table Mesa & Broadway	X
Valmont & 30th	
Euclid & Broadway	X
Canyon E/B north side & 14th	X
Arapahoe & 33rd	X
17th & Athens	
Arapahoe & 17th	X
Conestoga & Arapahoe	X
28th & Arapahoe	X
Folsom & Canyon	X
28th & Iris	
University & Broadway	X
28th & Walnut	

In addition, at the request of the City of Boulder representatives on the Study team 9 more intersections (**Table 3**) were selected for their physical location within identified

Bike or pedestrian corridors. The idea was to include locations where the intersection was working well and to enhance the ability to compare corridor wide features instead of only intersection features. The study panel identified the following corridors for this consideration: – Folsom Street, Canyon Boulevard, Arapahoe Road, and Pearl Street – that were studied regardless of crash counts to determine what is working and what is not working on a continuous facility with regard to pedestrian-related and bike-related crashes.

Table 3:
Additional Study Intersections

WB US 36 & Baseline
Canyon & 28th
Pearl & Folsom
Pearl & 30th
Colorado & 28th
Canyon & 26th
Broadway & 27th Way
Arapahoe & Commerce/Eisenhower
Baseline & Mohawk
Baseline & Foothills

IV. SITE DATA COLLECTION

This section of the report documents the data collection performed at the selected study intersections. The type of data collected included geometric design and traffic control data, traffic volumes, and crash records. Each type of data is discussed below:

Geometric Design and Traffic Control Data

Geometric design data and traffic control features were collected in February and March 2007 by visiting each study intersection. The study intersections were visited by a research team member along with the University of Colorado at Denver graduate students who helped record the intersection data.

An "Intersection Data Collection Form" (**Figure 1**) was prepared to standardize the data collection activity. The outline of the form followed the guidelines suggested by Federal Highway Administration (FHWA) in its report Safety Effectiveness of Intersection Left and Right-turn Lanes FHWA-RD-02-089 (Summary included on appendix page B-2 of this report). The form was designed to document the observed site conditions and operations, geometric features, traffic control data and presence or absence of any mitigation measures to improve pedestrian safety. A sketch of a generic intersection was also included on the form. The preliminary form along with the abbreviations being used to record the data was forwarded to the study team for review. The revised Intersection Data Collection Form was then used to record the intersection geometric design and traffic control data.

Civil Engineering graduate students from the University of Colorado at Denver helped to collect the intersection data. A training session was conducted for participating graduate students to train them in data collection and recording process. Various fields on the intersection data collection form and their relevance was explained to the graduate

Figure 1: Intersection Data Collection Form

Intersection Data Collection Sheet

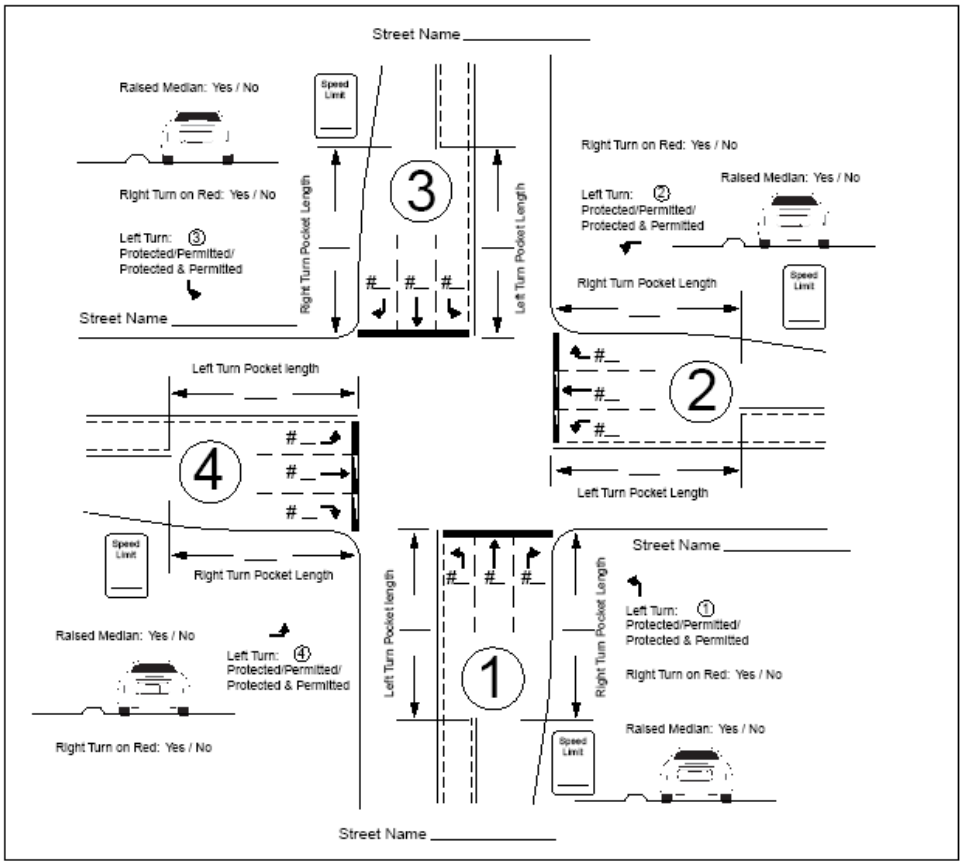


Figure D-1. Key Intersection Geometric and Traffic Control Variables.

Site Number _____ County _____ Data Collector Name _____

Intersection _____ B_____ A_____ C _____ Date _____ Time_____

	Acceptable Codes	Major Road NB or EB	Crossroad NB or EB	Major Road SB or WB	Crossroad SB or WB	Comments (use back if needed)
Name of Street:		Site	Office			
1. Type of left-turn treatment	N,C,P					
2. Type of right-turn treatment	N,I,L,R					
3. Horizontal alignment	T,G,M,S					
4. Approach grades	L,M,S / U,D					
5. Crest/sag vertical curves	N,C,S					
6. Total through-lane width (ft)	Numeric					
7. Right shoulder type	P,G,T,C					
8. Right shoulder width (ft)	Numeric					
9. Total LTL width (ft)	Numeric					
10. Total LTL length (ft)	Numeric					
11. Total RTL width (ft)	Numeric					
12. Total RTL length (ft)	Numeric					
13. Divided/undivided	D,U					
14. Median width (ft)	Numeric					
15. Median type	N,R,D,F					
16. One-way/two-way	1 or 2					
17. Left-turn prohibition	N,A,M,E,B					
18. Number of driveways within 250 ft	Numeric					
19. Type of driveways	N,C,I,R					
20. Curb parking within 250 ft	N,P,A					
21. Traffic control	N,ST,SG					
22. Pedestrian signals	Y,N					
23. Painted crosswalk on approach	Y,N					
24. Advance warning signs	Y,F,N					
25. Angle of intersection	Numeric					
26. Lighting	N,H,S,I/Y,N					
27. Character of development	C,B,I,M,R,X					
28. Level of pedestrian activity	L,M,H					

- Intersection Sight Distance:
  - Eastbound Right/Left Approach: _____
  - Westbound Right/Left Approach: _____
  - Southbound Right/Left Approach: _____
  - Northbound Right/Left Approach: _____

- Note down any other special features at the intersection that might affect safety:

students. The collected data at each intersection was verified to check for any errors. The graduate students were monitored throughout the data collection process. A total of 34 intersection data were recorded including the top 25 intersections with most crashes (identified in Phase I) and the 9 corridor intersections with fewer crashes in the last five years.

Traffic Volume Data

Traffic volume data were collected at ten of the study intersections. The following data set was obtained at each intersection: (Refer Appendix E)

- Major and Minor Road ADTs within the study area for year 2005.

- Intersection turning movement counts for morning and evening peak periods. (Including pedestrian counts)

Pedestrian-Related and Bicycle-Related Crash Data

The pedestrian-related and bicycle related crash data for the five year period (20r1 through 2005) were obtained from the City of Boulder and entered in the modified PBCAT database to create a comprehensive crash database during the Phase I of this study. As mentioned in Phase I report, the crash database was prepared by coding the accident reports received from the City of Boulder. Hence, the accuracy of the database depended upon the accuracy of information available in the accident reports. While reviewing and coding the accidents, a number of important parameters were found missing due to lack of consistency in describing the crash or drawing the crash diagram. Hence, the Phase I report provided a list of important parameters that would be helpful to have explicitly recorded on each crash report in order to improve the accuracy of the data collected in crash reports.

For the Phase II analysis, the crash data for top 25 intersections and another 9 comparison intersections were extracted from the comprehensive PBCAT database. In some cases, the computerized data were supplemented with collision diagrams prepared by manual or computer means to better understand the crash record at a particular intersection.

V. DATA ANALYSIS

The geometric field data collected as part of phase II of this study was incorporated into intersection specific data tables. The crash specific data entered in the PBCAT database (Phase I) was merged with the intersection data to create spreadsheets or other reports that could be used to allow for flexible analysis of the combined data. One of the more fruitful analyses involved comparing the difference in proportions of the various vehicle maneuvers with the presence or absence of geometric features.

As described in the above section, vehicle and pedestrian counts were taken at selected study intersections. While this information was useful in terms of describing the amount of vehicle and non-motorized use of the studied intersections, within this specific study, it was difficult to obtain significant results based on the vehicle, pedestrian, and cyclist volumes. The data is provided in the database compiled as part of this study and should prove useful in future studies.

The crashes were grouped by approach to an intersection. Each approach could have different geometric features from the number and type of approach lanes to left-turn signal control (permitted, protected/permitted, protected only) to physical features such as center medians and right-turn bypass islands, In these analyses, the geometric features were associated with the vehicle approach. It was not distinguished where the vehicle struck the pedestrian or cyclist. The vehicle encounters pedestrian and cyclists paths both entering the intersection and then again leaving the intersection. If, for example, a crosswalk were marked on the vehicle's entering leg and not on the exiting leg, the analysis considered the vehicle to be on an approach with a marked crosswalk, even if the actual collision occurred in the unmarked, exiting leg of the intersection. If desired, the information in the database could be used to determine exiting leg features encountered in addition to the approach leg features. For the purposes of this study, the features

associated with the approach leg were assumed to have a greater influence on the nature of pedestrian and bicycle related crashes.

Because of the structure of the data tables, this database has an enormous wealth of information that can continue to be used by CDOT, and the City of Boulder to continue to add to the available data as well as test other relationships. The ultimate goal of this study was to generate a preliminary guidance for the use of various features to enhance the safety of non-motorized users of the right of way. This design tool is provided as Appendix D.

Unless otherwise noted, the level of significance used to test the strength of the correlations described in the Results and Conclusions section was a 90% confidence interval.

VI. RESULTS AND CONCLUSIONS

Descriptive Statistics

In terms of raw numbers, the following results were obtained for the 34 studied intersections

- Out of 208 accidents at top 25 intersections, nearly 70% of the crashes involved collision with a bicycle. 30% of the crashes involved collision with pedestrians. Of the pedestrian crashes, just over 10% involved school age children. This amounts to 3% of the total number of crashes reported.

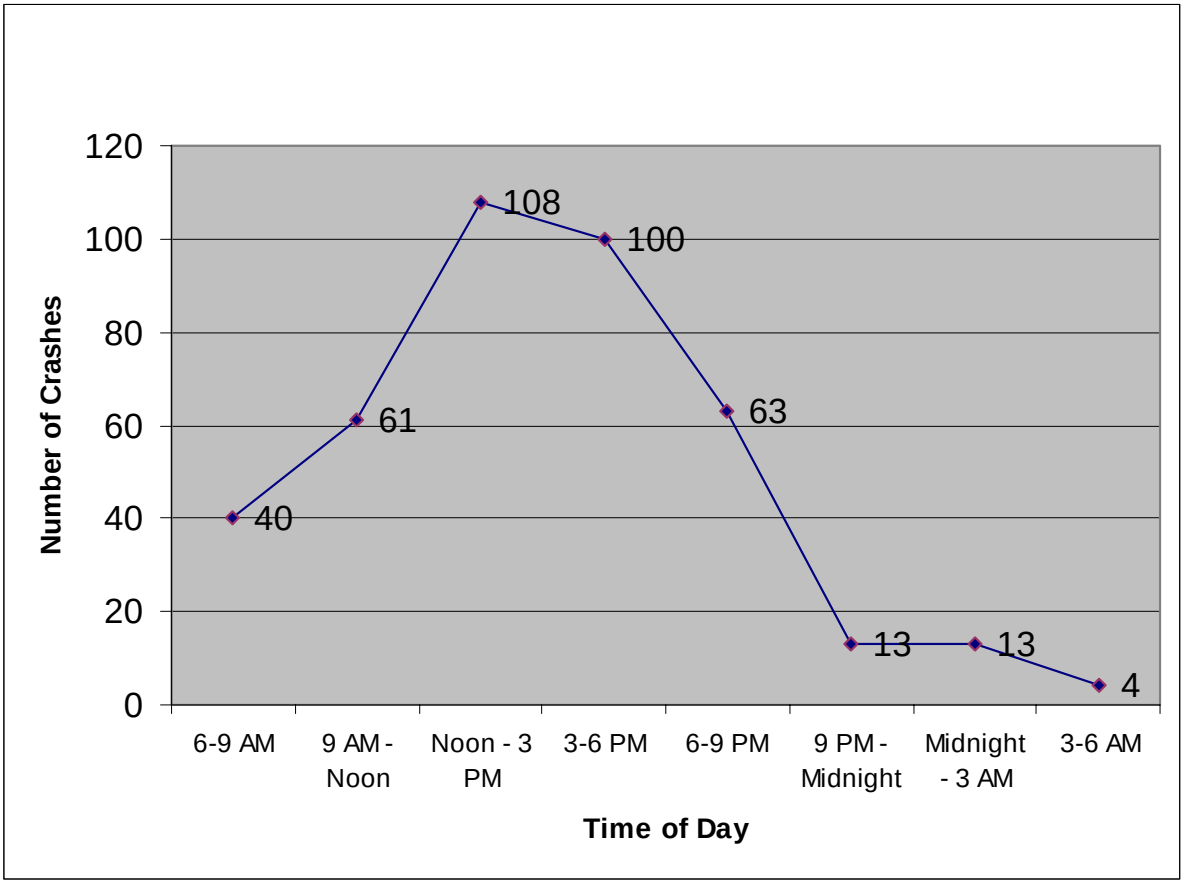
- Over half of those 208 accidents occurred at intersection locations (59%), while 17% occurred at a driveway access followed by non-intersection urban locations where 11% crashes occurred.

- Most of the crashes at these locations occurred on a leveled roadway (77%), during daylight (77%), when the road was dry (89%), with no adverse weather condition (89%).

When Do Bike/Pedestrians Collision Occur?

Time of Day: Collisions can occur at any time and are considered as random events, but there are trends involving the time of occurrence. Bicycle and pedestrian collisions occurred in the last five years along Broadway Street, Arapahoe Road, Canyon Boulevard, Pearl Street, Folsom Street, and Baseline Road corridors by time of day are shown in the graph below.

Figure 2: Crashes by Time of Day



Geometric Findings

Not surprisingly, many of the relationships between crash patterns and vehicle maneuvers were statistically insignificant. However, because of the number of data points collected and the number of approaches (the 34 intersection had 96 approaches with related crashes) used in the study, some useful statistically significant patterns were discovered. These relationships were used in developing the design guidance tool provided as an appendix to this report as well as to point out topics for future studies.

- Exclusive Right-turn Lanes

  - The data analyzed showed that the number of bicycle and pedestrian crashes involving right-turn vehicle maneuvers was significantly higher at locations where exclusive turn lanes existed and bypass islands did **not** exist.

    Where channelizing islands did exist, both with and without exclusive right-turn lanes, there was no significant difference in the proportion of right-turn related crashes.

  - **Conclusion** – Where exclusive right-turn lanes exist, right-turn channelizing islands should be considered. This result is somewhat counter-intuitive and contrary to results of other studies involving free right-turns. Most of the approaches included in this study were not free right-turns. The right-turning vehicles typically had no acceleration lane and were required to yield to cross traffic, slowing the vehicles.

    A possible explanation for this result is that where right-turn channelizing islands exist, the conflicts to the right-turning driver were dealt with separately. When entering the channelizing island area, the driver could possibly give more attention to the pedestrian and bicycle traffic before approaching the yield line and looking for vehicle conflicts.

    Where no channelizing island existed, vehicles conceivably approach the stop bar, look to their left for cross traffic and do not recheck for pedestrians or bicyclists before completing their right-turn maneuver.

    Another possibility explaining the difference could be the City of

Boulder's use of raised crossings to a channelizing island. While the relationship between raised and unraised crossings was found to be insignificant (see results described in insignificant relationships below) they could be influencing this result.

- Shared Right-turn Lanes

  - In a comparison similar to the previously described right turn island analysis, the use of a shared right-turn lane was compared to exclusive right-turn lanes. In this analysis, shared lanes had a significantly lower proportion of right-turn crashes than locations where exclusive right-turn lanes were present. This result is consistent with the island results described above and help to indicate that where exclusive right-turn lanes are provided, right-turn channelizing islands should also be considered. Based on the results of previous research, this may not be the case when an acceleration lane for the right-turning vehicles is provided.

  - **Conclusion** – Shared right-turn lanes did not appear to be less safe than other right-turn provisions. Previous studies (see literature review) have shown shared lanes to be somewhat less safe than exclusive lanes. With the information from the island analysis it appears that the presence or absence of islands for right-turning maneuvers has a stronger effect than the effect of a shared right-turn lane.

- Painted Crosswalks

  - An analysis of the proportion of vehicle maneuver and the presence or absence of a marked cross walk was completed. In a result consistent with other studies of uncontrolled pedestrian crossings, the proportion of right-turn maneuvers was significantly higher where painted crosswalks existed. As has been hypothesized elsewhere, this could be the result of both driver and pedestrian/cyclist behavior. Pedestrians and cyclists may be slightly less cautious where cross walks are marked and drivers making right-turns have their attention focused on vehicles to their left, away from where pedestrians and cyclists are likely to be located.

  - In a separate result, the proportion of straight vehicle maneuvers was significantly **less** where crosswalks were marked than where left unmarked. To help determine which maneuver was having the stronger effect on the significance of the crosswalks impact on the proportion of crashes, the difference of proportions was compared for right-turn crashes and left-turn crashes (ignoring straight crashes) and again for straight and left-turn crashes. From this data, it appears that marked crosswalks significantly reduce the proportion of crashes involving vehicles going straight through an intersection. - Much more so than is offset by the slight but significant increase in the proportion of right-turn crashes at marked crosswalks.

    These results need to be studied further however, as the locations where crosswalks were unmarked in this analysis were in all but one case also locations with non standard geometry (T-intersections or offset intersections). In the one standard approach where crossmarks were "unmarked", colored pavement was used to indicate a pedestrian space in

the intersection. For the purposes of this study, the data collection process only considered standard markings to be marked crosswalks.

- **Conclusion** – Where intersections are controlled and where right-turning volumes are relatively low, marked crosswalks should be considered to possibly reduce the number of crashes involving vehicles going straight through an intersection. Where right-turning volumes are relatively high, leaving crosswalks unmarked should be considered or other improvements should be considered in conjunction with the installation of painted crosswalks. Further study needs to be conducted.

- Left-turn Signal Phasing

  - Left-turn signal phasing, or more specifically, the use of protected only left-turn signal phasing was associated with significantly lower proportions of left-turn accidents.

  - **Conclusion** – Where left-turning vehicles have the potential to cause conflicts with high pedestrian or cyclist movements, protected left-turn phasing should be considered. As is the case with protected left-turns significantly reducing vehicle/vehicle conflicts, it is intuitively obvious that separating the pedestrian movement from the left-turning movement would result in fewer conflicts and fewer crashes.

- Speed Limits

  - The impact of speed limits on the proportion of vehicle crashes was studied with approach speed limits grouped into three categories; less than

35 mph, 35 mph, and greater than 35 mph. The results of this analysis indicated that the proportion of crashes involving vehicles going straight through an intersection were significantly higher on approaches with a speed limit of greater than 35 mph.

- **Conclusion** – Where pedestrians and bicyclists cross high speed approaches, special consideration should be given to alert both the pedestrian/cyclist and the driver to the crossing. Where feasible and consistent with engineering studies, efforts to reduce vehicle approach speed should be considered.

- Double Left-turns

  - Where double left-turns were provided on an approach, the proportion of left-turning related crashes was significantly higher. In what could be an aberration or could be a useful predictor, the proportion of right-turn crashes was significantly lower on approaches with double left-turn lanes.

  - **Conclusion**- With the earlier described result indicating that protected only left-turn phasing was associated with a lower proportion of left-turn related crashes, the increase in left-turn proportion on double left approaches is likely associated with locations where double lefts are provided without protected only phasing. This result reinforces that where left-turn conflicts with pedestrians or bicyclists occur, protected only phasing should be considered.

    Since there is no apparent relationship or potential cause and effect associated with why double left-turns would reduce right-turn crashes, it is

possible that right-turn crashes could be used to predict what the number of crashes would have been had the double left-turns been mitigated. More research needs to be done to determine whether this result is relevant or a meaningless correlation.

- Number of Through Lanes

  - The relationship between the proportions of crashes and the number of through lanes provided on an approach was analyzed. Three significant results were obtained. In a somewhat counter-intuitive result, the proportion of right-turn crashes on roadways with 0 or 1 through lane (0ne "T" intersection was included in the analysis) the proportion of right-turn crashes was significantly higher than the overall proportion. The proportion of straight crashes was significantly lower on these same roads.

    Additionally, on roadways with two or more through lanes on an approach, right-turn crashes were under-represented.

  - **Conclusion** – Since roads with fewer through lanes tend to be collectors and local roadways, it is likely that the proportion of turning movements on these smaller roadways is higher than on the roads with two or more through lanes. These results indicate that on smaller roadways, attention should be given to mitigating right-turn conflicts.

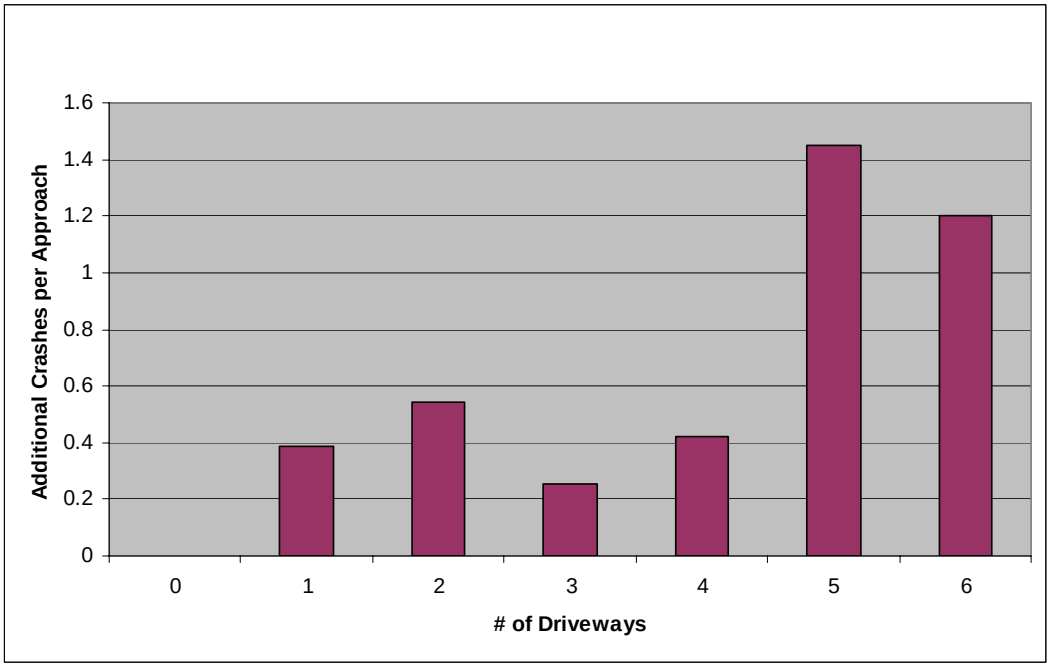
- Other Geometric relationships analyzed

    - Many other relationships were analyzed with no significant difference in the proportion of vehicle maneuver crash types. These included:

- Number of Driveways within 250 Feet of Intersection – The results below include all 34 intersections studied in detail as part of this Phase 2 work.

    - The presence of driveways within 250 feet of an intersection appears to be associated with more reported pedestrian and bicycle related crashes. Where 1-4 driveways were present there was roughly ½ of a crash more in the five year period per approach than where no driveways existed. Where more than 4 driveways were present 1 ¼ to 1.5 additional crashes were recorded for the five year period.

Figure 3: Additional Crashes per Approach



- **Conclusion** – As indicated in the Phase I research and other research, a substantial number of pedestrian and bicycle related crashes occur at driveways. The graphic above suggests that where driveways are present near an intersection, the number of crashes associated with that intersection approach rises. The graph also suggests that where driveways occur with 250 feet of an intersection, the number should be limited to four or less. When more than that number of driveways exists on an approach the expected number of crashes appears to rise dramatically. In the analysis done as part of this study no reason as to why one to four driveways would have similar crash numbers while 5 or more increased the number of crashes. While this pattern is interesting and worthy of future research, the pattern was not significant using a test for differences in proportions. Further analysis should be done to determine if there is significance to the pattern expressed in this data.

- Raised Crosswalks at Channelizing Islands

  - In this analysis, total crashes and right-turn crashes that occurred at an approach with channelizing island were compared with the total crashes and right-turn crashes that occurred at an approach with channelizing islands that has raised crosswalks. The proportion of right-turn crashes to total crashes at both the approaches was found to be similar.

  - **Conclusion** – On approaches with right-turn lanes with channelizing islands and where raised crosswalks were provided the proportion of crashes occurring were not significantly different than on approaches without raised crosswalks. However, field observations indicate that raised crosswalks indeed reduce the speed of the right turning vehicles and may prove to be useful in reducing the intensity of a bicycle-vehicle or

pedestrian-vehicle related crash. Also, as indicated in the discussion of channelized islands above, the raised crosswalks may be having an effect that has not been identified with the data and tests used in this study.

- Attached versus Detached Sidewalks

  - In this analysis, total pedestrian and bicycle related crashes at approaches with attached sidewalk were compared with the total pedestrian and bicycle related crashes at approaches with detached crosswalks. The data analyzed showed no significant difference in crashes at both attached and detached sidewalks.

  - **Conclusion** – Approaches with attached sidewalks does not appear to be less safe than the approaches with detached sidewalks.

- Raised Median Divided Approach

  - The impact of raised divided median on the proportion of pedestrian and bicycle related crashes at an approach was studied. The results indicated that the presence of a raised median at an approach does not seem to impact the proportion of crashes. The statistical analysis indicated no significant difference in proportion of crashes at an approach without raised median and at an approach with raised median.

  - **Conclusion** – Other study results indicate providing raised medians on multi-lane roads can reduce the pedestrian crash risk. The presence of raised medians discourages bicyclists and pedestrians from crossing a road at mid-block locations. However, on high speed/high volume streets, even

without a raised median, pedestrians or bicyclists tend to cross the street at designated crosswalk locations.

- Curb Parking within 250’ of Intersection

  - In this analysis, the relationship between the number of crashes and the approaches with curb parking within 250’ of intersection was analyzed. The analysis result indicated no significant difference in the proportion of crashes at an approach with curb parking and without curb parking.

  - **Conclusion** – This result was expected since the statistical analysis result for raised median divided approach indicated no significant pattern. Also, the crash database does not have a large number of dart-out crashes found typically at locations with curb parking.

- Right Turn on Red Prohibitions

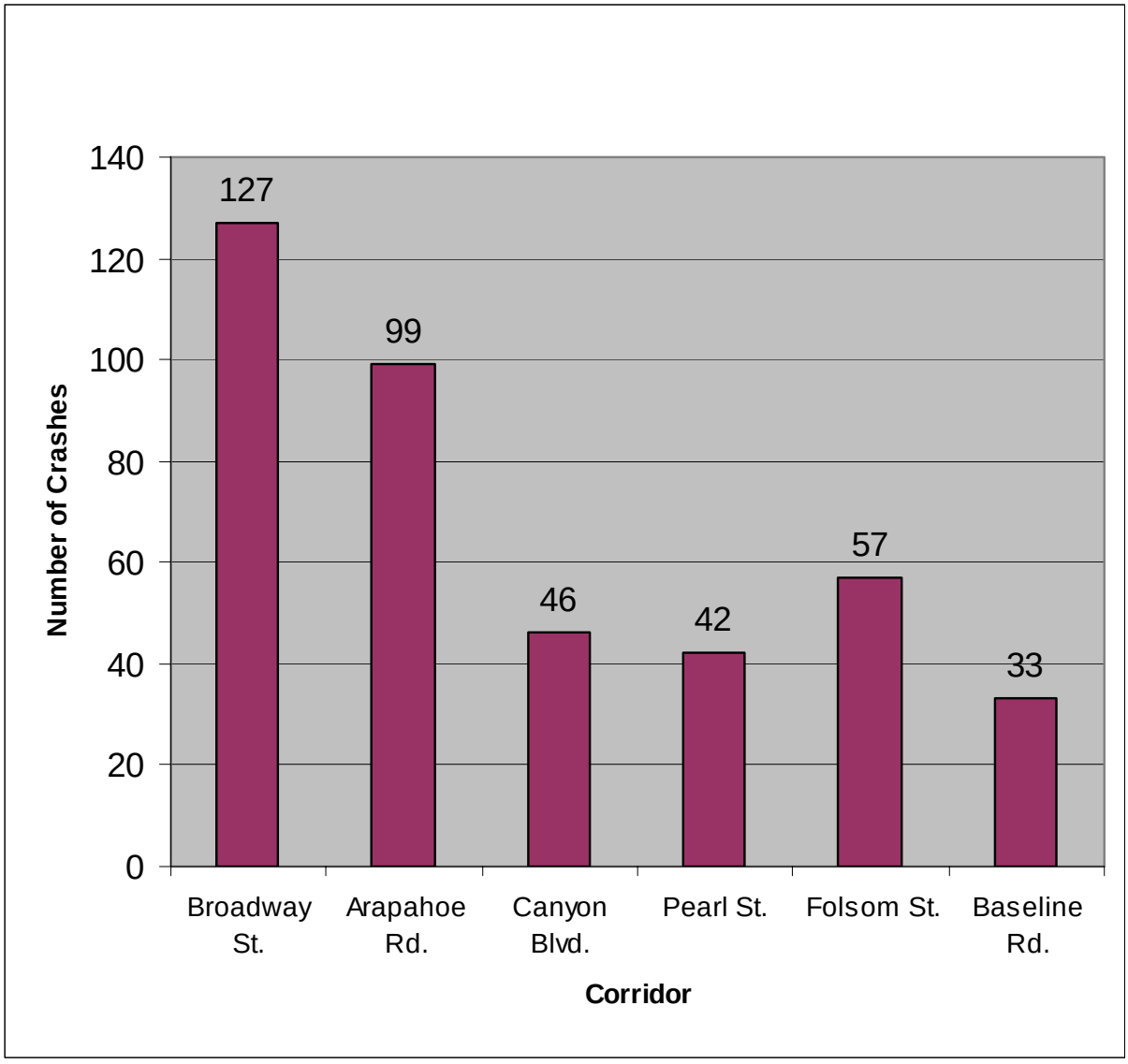
  - The impact of right turn on red (RTOR) prohibition on the proportion of vehicle crashes was studied. The results of this analysis indicated that the proportion of crashes at an intersection with RTOR prohibitions was not significantly higher at intersections with no RTOR prohibitions.

  - **Conclusion** – Other studies indicate that RTOR prohibitions can reduce the occurrence of pedestrian and cyclist related crashes. This result only indicates that this relationship is not significant in this data set.

Corridor Relationships

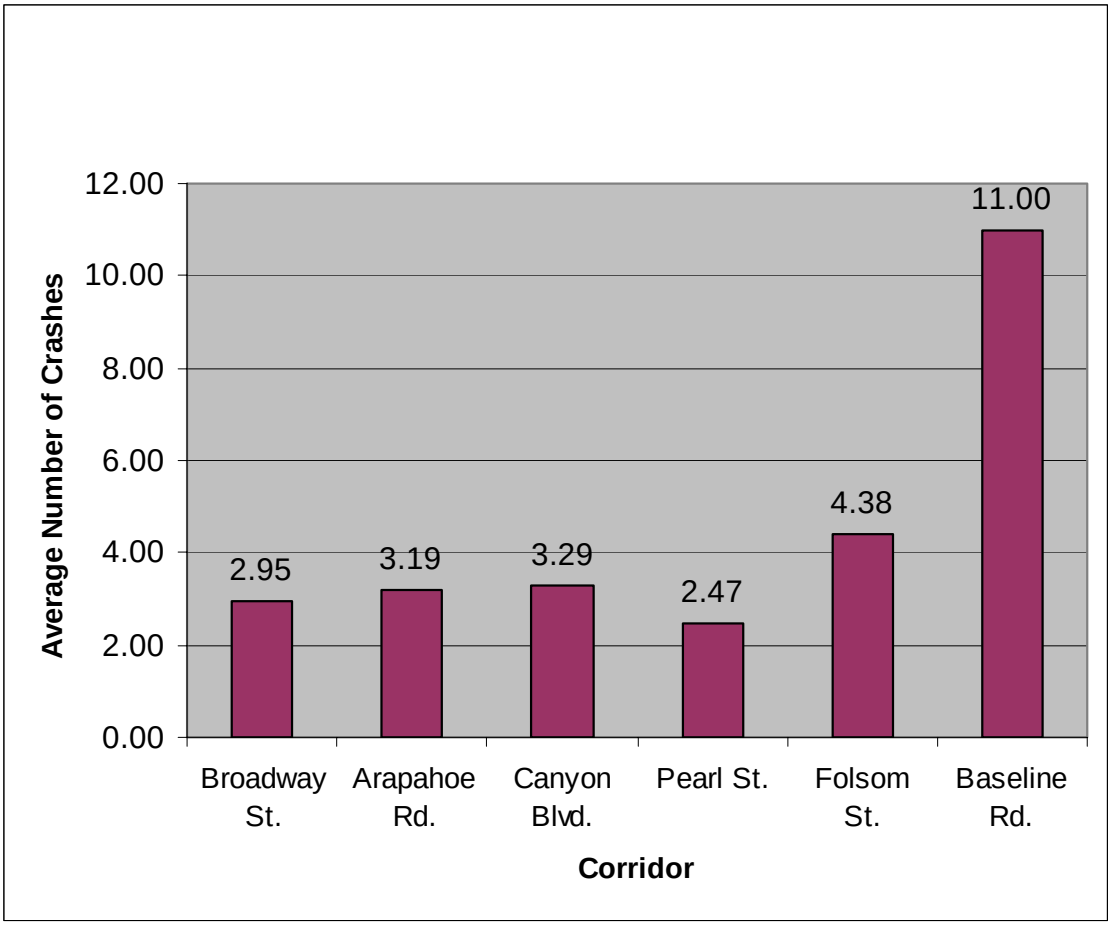
In examining the corridors identified by the Study Panel the total crashes recorded for the corridors were compared. In the Figure below, the total number of crashes occurring on each corridor is reported.

Figure 4:
Bicycle-Related and Pedestrian-Related Crashes: Year 2001 through 2005



While this indicates that the Broadway corridor has the most crashes, the per intersection number of crashes was also reviewed. This is presented in **Figure 5**.

Figure 5:
Average Number of Crashes per Intersection: Year 2001 through 2005



Comparing these two graphs, clearly the Baseline Corridor has a high number of crashes at a low number of intersections while the Broadway Corridor has a low number of crashes at many different intersections. The data reflected in the second graph is the average number of crashes at intersections where crashes occur. There are many intersections along all of these corridors where no crashes were reported.

In an effort to glean some useful design information from the corridor information, the data for on street and off street bicycle facilities was analyzed to see if any patterns occurred to determine if there was a difference in the safety of the two types of facilities. The on street vs. off street facility data are presented in **Table 4** below.

These data suggest that where off street bicycle facilities are provided, the number of crashes per intersection is lower than were on-street facilities are provided. This result however was not statistically significant. While this result hints that off-street facilities provide some safety benefit, many other questions need to be answered with future research including whether the type of facility is more important than the other geometric features. For example in the data set as a whole (not just on the identified corridors), of the 503 crashes reported as either at an intersection or at a driveway, 110, or greater than 20% occurred at driveways. While vehicle counts were not taken at any driveways as part of this study, it is safe to assume that volumes are much lower at driveways than at intersections indicating that the rate of crashes at driveways is extremely high. Whether off-street or on-street facilities are provided, special consideration needs to be given to both intersections and driveway crossings.

Other relationships analyzed with either no significant differences or where too little data was available for meaningful comparison included; shoulder presence, shoulder width, shoulder condition, and development type (commercial, residential, mixed use).

Table 4: On Street Vs. Off Street Bike Facilities										
Intersection	**NB Bike Lane**		**EB Bike Lane**		**SB Bike Lane**		**WB Bike Lane**		**Bike Crashes**	
	On Street	**Off Street**	**On Street**	**Off Street**	**On Street**	**Off Street**	**On Street**	**Off Street**	**on**	**off**
Folsom & Arapahoe	X				X				7	
Baseline Road & 29th Street			X				X		7	
Broadway & Baseline Road										
Arapahoe & 30th Street										
Baseline Road & 30th Street			X		X		X		6	
Spruce St. & Broadway										
Walnut Ave. & 30th Street			X				X		8	
Broadway & 18th Street						X				5
Pearl Street & 28th Street			X				X		7	
Regent Drive & Colorado			X				X		8	
Regent Drive & Broadway								X		6
Pleasant & Broadway						X	X		3	3
Table Mesa Drive & Broadway							X		6	
Valmont Road & 30th Street	X		X		X				6	
Euclid & Broadway						X				3
Canyon E/B North side & 14th street										
Arapahoe Ave & 33rd street										
Athens Street & 17th Street										
Arapahoe Ave & 17th Street	X				X				4	
Conestoga & Arapahoe Avenue	X				X				4	
28th Street & Arapahoe Avenue										
Folsom Street & Canyon Boulevard	X				X				5	
Iris Avenue & 28th Street										
University & Broadway			X		X		X		5	
Walnut Street & 28th Street			X				X		5	
								Total # of Crashes	**81**	**17**
								Total # of Intersections	**14**	**4**
								Average	**5.786**	**4.25**

VII RECOMMENDATIONS

While this study points to important, useful, and statistically significant differences in various geometric features and their impact on the occurrence of bicycle and pedestrian related crashes, this study is in no way exhaustive. The relationship between various features makes definitive conclusions difficult. The significant results and the design guidance tool should be used with caution and is not a substitute for good engineering judgment. As with most research the answers found in this study lead to more questions and more possible research to better understand the interaction of pedestrians, cyclists, and motorists.

General Recommendations

It is the strong recommendation of the project team that the database created as the basis of this study be augmented to include an ongoing data entry and data verification program. Significant effort was expended to make certain that the data entering the database used in this study reflected actual conditions of the crashes reported (Phase I of the study) and future data being entered into the database should receive similar verification procedures. As pointed out in Phase I, consistent entry of data is essential to being able to draw valid conclusions from the data. The PBCAT software proved very useful in working as a foundation for the entry and classification of the various crashes entered into the database. Combining the crash specific information with approach specific information provided the opportunity to make useful comparisons among the geometric features found in the Right of Way. As more crashes are recorded and as the geometric information of more intersections are recorded, the more useful and more specific the conclusions drawn can be.

The more difficult task that potentially could be improved in a future study is the use of “negative data”. Since this study focused on reported crashes, it was difficult to

determine useful information at locations where few or no crashes occurred. We were unable to answer questions along the lines of "what is working well" if there was nothing working poorly with which to compare. An example is in the corridor comparisons. The Baseline corridor shows a rate of 11 crashes per intersection where crashes occurred. There are many other intersections along the corridor where no crashes occurred. Perhaps a future study can be designed to compare intersections of similar geometric design and volumes to compare near misses, conflicts, and crashes.

Another potential use of continuing to update the database would be to utilize the geometric changes of intersections where crashes occur to perform before and after studies of the various changes.

Specific Recommendations

More specific research should be done to investigate the cause and effect of both the statistically significant patterns discovered in this study as well as the interesting though statistically insignificant patterns.

The relationship between the presence of right turn bypass islands and whether or not an exclusive right turn lane exists is important to address in a future study. The conventional wisdom at present is that these islands pose a risk to pedestrians and cyclists as the right turning vehicles are uncontrolled until they reach their yield line past the pedestrian crossing. The data collected for this study suggests that this may not be the case where no acceleration lane is provided. Also a more in depth study specifically designed to determine the impact of the use of raised crossings needs to be developed.

The crosswalk results also beg for additional study. Why do marked crosswalks appear to reduce the occurrence of crashes where vehicles are traveling straight through an

intersection while they appear to increase the occurrence of crashes involving right turning vehicles? Since these results involve a high number of non-standard intersections, is there another design element that could be used in conjunction with marked crosswalks that could mitigate the right turn increase while preserving the reduction of straight crashes achieved at marked crosswalks at intersections? For example, would simply painting the crosswalks more often or making the crosswalk signs more obvious have a beneficial impact.

There are many other relationships and combinations of relationships that could be studied using the existing data, the research team encourages CDOT and the City of Boulder to make the database available to other researchers and to continue to add data to the existing work completed to date.

GLOSSARY

Intersection Approach – Leg of an intersection on which vehicles enter the intersection.

Detached – Pedestrian or cyclist travel way that is separated from the vehicle travel way by any width of space not intend for travel parallel to the vehicle travel way. Examples include; grass strip, brick pavers, landscaped area, etc.

Driveway – Any connection to the travel way defined by a path allowing vehicle access crossing a pedestrian or cyclist facility that does not meet the definition of an intersection.

Intersection – The crossing of two named vehicular travel ways. In all cases in this study the crossings are controlled by either stop signs or signals.

NHTSA – National Highway Traffic Safety Administration

Right–Of–Way – Property owned by the State or Local government where travel-ways exist.

Geometric Characteristics – the shapes of a travel way, striping, or other physical features of an intersection or multi-use corridor.

On Street Facility – Marked bicycle lane on the same travel way as vehicle lanes

Off Street Facility – Marked or unmarked Facility that is separate from the vehicle travel way. May be attached (such as an attached sidewalk or multi-use trail) or detached.

Multi-Use trail – Facility that allows use by both cyclists and pedestrians.

GIS – Geographical Information System

Half Signal – A half-signal is a pedestrian signal located at a stop-controlled T intersection. Vehicular traffic on the side road must come to a stop before entering the intersection, but pedestrians can push a button to get the main road traffic to stop.

HAWK Pedestrian Flasher – The High-intensity Activated crossWalK or HAWK crossing is an extension of the traditional school bus flashing warning signal when children are crossing the road and the European level or emergency crossing signal. The signaling system is a combination of a beacon flasher and traffic control signaling technique for marked crossings.

Marked Crosswalks – Crosswalks defined with pavement markings.

APPENDIX A:

References

1. Stutts, J.C., W.W. Hunter, and W.E. Pein. Pedestrian-Vehicle Crash Types: An Update. In *Transportation Research Record 1538,* pp. 68-74, 1996.

2. *Safety Effectiveness of Intersection Left and Right-Turn Lanes*. U.S. Department of Transportation, Federal Highway Administration, Report #FHWA-RD-02-089, McLean, VA, 2002.

3. *How to Develop a Pedestrian Safety Action Plan.* Office of Safety Research and Development, U.S Department of Transportation, Federal Highway Administration, Report # FHWA-SA-05-12, McLean, VA, 2006.

4. *SEMCOG Traffic Safety Manual*. South-East Michigan Regional Council of Governments, September 1997.

5. King, M. Pedestrian Safety Through a Raised Median and Redesigned Intersections. In *Transportation Research Record 1828,* pp. 56-66, Transportation Research Board, Washington, D.C., 2003.

6. Retting, R.A., Ferguson, S.A. and McCarty, A.T. A Review of Evidence-Based Traffic Engineering Measures to Reduce Pedestrian Motor-Vehicle Crashes. *Transportation Research Board Annual Conference Paper 2004-002559,* Transportation Research Board, Washington, D.C., 2004.

7. Sandt, L., and Zegeer, C.V. Characteristics Related to Midblock Pedestrian-Vehicle Crashes and Potential Treatments. In *Transportation Research Record 1982,* pp. 113-121, Transportation Research Board, Washington, D.C., 2006.

8. Zegeer, C.V., Stewart, J.R., Huang, H., and Lagerwey, P. Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations. In *Transportation Research Record 1723*, pp. 56-68, Transportation Research Board, Washington, D.C., 2001.

APPENDIX B:

Summary of Selected Papers

1. *Safety Effectiveness of Intersection Left- and-Right-Turn Lanes.* Office of Safety Research and Development, U.S. Department of Transportation. Federal Highway Administration, Report # FHWA-RD-02-089, McLean, VA, 2004.

The objective of this study was to perform a well designed before-and-after evaluation of selected types of intersection design improvements. The research was performed as a part of pooled fund study, a portion of the funding for the research was contributed by highway agencies in the District of Columbia and the states of Iowa, Illinois, Louisiana, Minnesota, Montana, Nebraska, New Jersey, North Carolina, Oregon, and Virginia. Representatives of the participating highway agencies decided to focus the before-after evaluation on intersection design improvements involving left-and-right-turn lanes based on the safety literature review.

Geometric data, traffic control, traffic volume, and traffic accident data were gathered for a total of 280 improved intersections and 300 similar intersections that were not improved during the study period. The types of improvement projects evaluated included installation of added left-turn lanes, installation of added right-turn lanes, installation of added left-and-right-turn lanes, and extension of length of existing left-and-right-turn lanes. Three different evaluation methods were utilized in the research – before-and-after evaluation with yoked comparisons, before-and-after evaluation with a comparison group, and before-and after comparison with Empirical Bayes approach. All statistical significance tests were conducted at the 95 percent significance level. The conclusions of the study are listed below:

- Added left-turn lanes are effective in improving safety at signalized and unsignalized intersections in both rural and urban areas. At urban unsignalized intersections, installation of a left-turn lane on one approach would be expected to reduce accidents by 27% for four-leg intersections and by 33% for three-leg intersections. At four-leg urban signalized intersections, installation of a left-turn lane on one approach would be expected to reduce accidents by 10%.

- Added right-turn lanes are effective in improving safety at signalized and unsignalized intersections in both rural and urban areas. Right-turn lane installation reduced accidents on individual approaches to four-leg intersections by 27% at rural unsignalized intersections and by 18% at urban signalized intersections. Only limited results were found for right-turn lane installation at three-leg intersections. Installation of right-turn lanes on both major-road approaches to four-leg intersections would be expected to increase, but not quite double, the resulting effectiveness measures for total intersection accidents.

- A small sample of projects involving extension of the length of existing turn lanes at rural unsignalized and urban signalized intersections was evaluated. However, no reliable effectiveness measures could be developed from this small sample.

- In general, turn-lane improvements at rural intersections resulted in larger percentage reductions in accident frequency than comparable improvements at urban intersections.

- In the various evaluations performed, the effectiveness of turn-lane improvements in reducing fatal and injury accidents was greater than for total accidents in some cases, and less than for total accidents in others. Overall, there is no indication that any type of turn-lane improvement is either more or less effective for different accident severity levels.

2. Cyclists Perception and Evaluation of Street Characteristics. Peter van der Waerden, Aloys Borgers, and Harry Timmermans. *Transportation Research Board 83rd Annual Meeting CD ROM*, Washington, D.C., Transportation Research Board, 2004.

This paper presented an attempt to measure street characteristics in urban areas that are observed by cyclists, and how cyclists evaluate these street characteristics. The analysis consisted of two parts. First the cyclist's observation was compared with the actual situation and the second part consisted of the evaluation of the observations. It was found that the cyclists are most aware of pavement (especially asphalt) followed by bicycle paths and lanes (especially separate bicycle path) and priority at crossings. Cyclists were not aware of on-street parking facilities and bus lanes. However, these results must be treated with caution due to the small sample size (86 cyclists) of the study.

APPENDIX C:

Intersection Data Collection Form

Intersection Data Collection Sheet

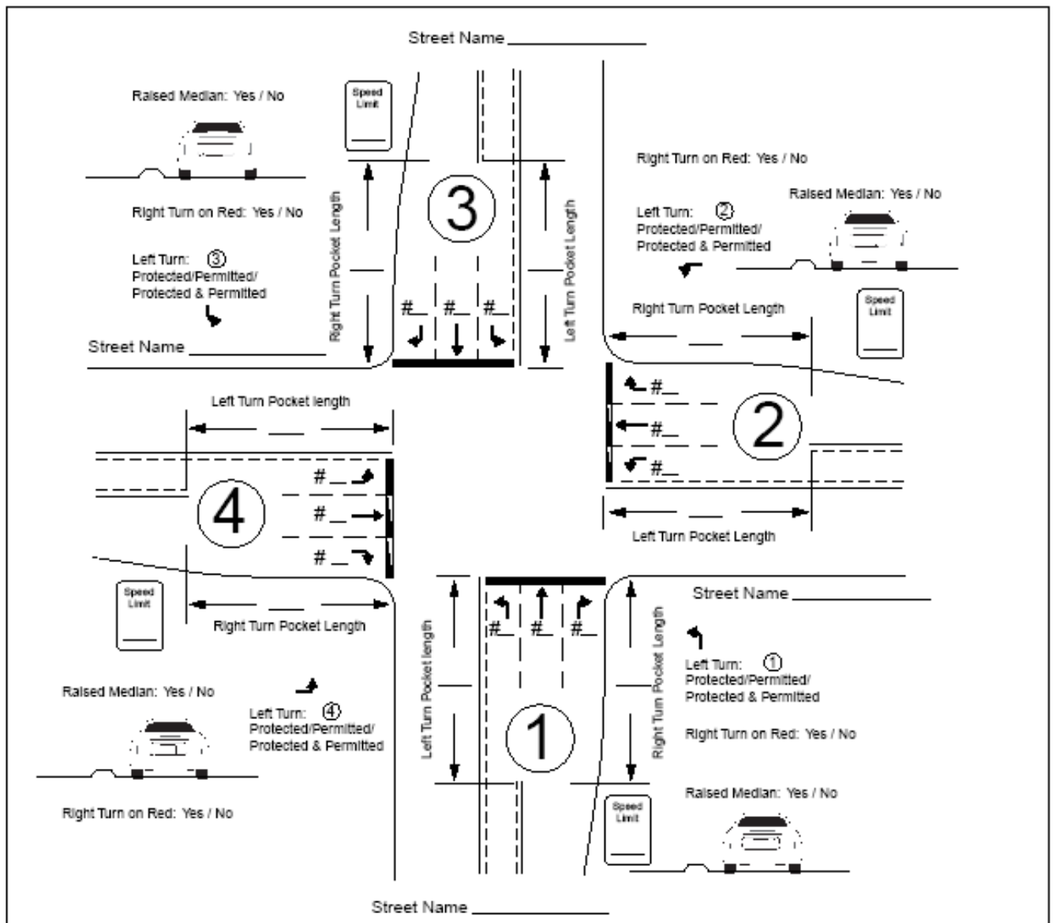


Figure D-1. Key Intersection Geometric and Traffic Control Variables.

Site Number _____ County _____ Data Collector Name _____

Intersection _____ B_____ A_____ C _____ Date _____ Time_____

	Acceptable Codes	Major Road NB or EB	Crossroad NB or EB	Major Road SB or WB	Crossroad SB or WB	Comments (use back if needed)
Name of Street:		Site	Office			
1. Type of left-turn treatment	N,C,P					
2. Type of right-turn treatment	N,I,L,R					
3. Horizontal alignment	T,G,M,S					
4. Approach grades	L,M,S / U,D					
5. Crest/sag vertical curves	N,C,S					
6. Total through-lane width (ft)	Numeric					
7. Right shoulder type	P,G,T,C					
8. Right shoulder width (ft)	Numeric					
9. Total LTL width (ft)	Numeric					
10. Total LTL length (ft)	Numeric					
11. Total RTL width (ft)	Numeric					
12. Total RTL length (ft)	Numeric					
13. Divided/undivided	D,U					
14. Median width (ft)	Numeric					
15. Median type	N,R,D,F					
16. One-way/two-way	1 or 2					
17. Left-turn prohibition	N,A,M,E,B					
18. Number of driveways within 250 ft	Numeric					
19. Type of driveways	N,C,I,R					
20. Curb parking within 250 ft	N,P,A					
21. Traffic control	N,ST,SG					
22. Pedestrian signals	Y,N					
23. Painted crosswalk on approach	Y,N					
24. Advance warning signs	Y,F,N					
25. Angle of intersection	Numeric					
26. Lighting	N,H,S,I/Y,N					
27. Character of development	C,B,I,M,R,X					
28. Level of pedestrian activity	L,M,H					

- Intersection Sight Distance:
  - Eastbound Right/Left Approach: _____
  - Westbound Right/Left Approach: _____
  - Southbound Right/Left Approach: _____
  - Northbound Right/Left Approach: _____

- Note down any other special features at the intersection that might affect safety:

1. Type of left-turn treatment:
N = No left-turn lanes.
C = Left-turn channelization defined by raised (curbed) or depressed median.
P = Painted left-turn channelization (no median or flush median).
NOTE: If number of left-turn lanes was zero, the type of left-turn treatment was N.

2. Type of right-turn treatment:
N = None.
I = Right-turn roadway created by a channelizing island *without* an exclusive right-turn lane upstream of it (i.e., traffic entered the right-turn roadway from a shared lane used by both through and right-turning traffic).
L = Right-turn roadway created by a channelizing island *with* an exclusive right-turn lane upstream of it (i.e., traffic entered the right-turn roadway from an exclusive right-turn lane).
R = Conventional exclusive right-turn lane with no channelizing island.

3. Horizontal alignment (of approach):
T = Tangent.
G = Gentle curve (radius over 600 m or 2,000 ft).
M = Moderate curve (radius from 150 to 600 m or 500 to 2,000 ft).
S = Sharp curve (radius less than 600 m or 500 ft).
NOTE: The G, M, and S codes were used if the intersection was located on a horizontal curve or if there was a horizontal curve on the approach within 250 feet of the intersection. The curve radius was estimated visually in the three categories shown.

4. Approach grades (within 75 m or 250 ft of the intersection):
L = Level (less than 2 percent grade).
M = Moderate grade (2 to 4 percent grade).
S = Steep grade (over 4 percent grade).
NOTE: The percent grade was estimated visually.

5. Crest/sag vertical curve (on approach):
N = None.
C = Crest vertical curve on approach.
S = Sag vertical curve on approach.
NOTE: Recorded presence of crest and sag vertical curves that extended through the intersection or were within 75 m (250 ft) of the intersection.

6. Total through-lane width (ft):
Combined total width of all the through lanes, including both shared left-turn and right-turn lanes. Widths of exclusive right- and left-turn lanes were not included in the total through-lane width. The number of lanes whose widths were measured matched the number of through lanes recorded.
NOTE: The through-lane width was measured at the stop line or crosswalk with a measuring wheel. The total through-lane width was recorded such that the total through-lane width divided by the number of through lanes equaled the average lane width for the through lanes.

7. Right shoulder type:
P = Paved.
G = Gravel.
T = Turf.
C = Curb.

8. Right shoulder width (ft):
Measured from the outside edge of the through lane or right-turn lane to the outside edge of the shoulder. This measurement was made with a measuring wheel.

9. Total LTL width (ft):
Combined total width of all exclusive left-turn lanes. The number of lanes whose widths were measured matched the total number of exclusive left-turn lanes recorded.
NOTE: The total left-turn lane width was measured at the stop line or crosswalk. This measurement was made with a measuring wheel. The total left-turn lane width was recorded such that the total left-turn lane width divided the total number of exclusive left-turn lanes equaled the average left-turn lane width.

10. Total LTL length (ft):
Total length of all exclusive left-turn lanes. NOTE: The total left-turn lane length was measured from the stop line or crosswalk to the upstream end of the left-turn lane(s). This measurement was made with a measuring wheel. If the left-turn lane included a taper at its upstream end, the length of the left-turn lane was measured to the last point at which the left-turn lane had its full width.

11. Total RTL width (ft):
Combined total width of all right-turn lanes. The number of lanes whose widths were measured matched the total number of right-turn lanes recorded. NOTE: The total right-turn lane width was measured at the stop line or crosswalk. This measurement was made with a measuring wheel. The total right-turn lane width was recorded such that the total right-turn lane width divided by the total number of right-turn lanes equaled the average right-turn lane width.

12. Total RTL length (ft):
Total length of all right-turn lanes. NOTE: The total right-turn lane length was measured from the stop line or crosswalk to the upstream end of the right-turn lane(s). This measurement was made with a measuring wheel. If the right-turn lane included a taper at its upstream end, the length of the right-turn lane was measured to the last point at which the right-turn lane had its full width.

13. Divided/undivided:
D = Divided (a raised or depressed median, or a flush median at least 1.2 m (4 ft) in width, was present between the lanes in opposing direction of travel).
U = Undivided (no median present; a roadway with a flush median less than 1.2 m (4 ft) in width.

14. Median width (ft):
Measured from inside edge of the through lane to inside edge of through lane in the opposite direction of travel (i.e., left-turn lanes cut into the median were included in the median width). This measurement was made with a measuring wheel. If the approach was undivided, the median width as recorded as 0 m (0 ft).

15. Median type:
N = No median.
R = Raised median (curbed with turf or pavement in the median).
D = Depressed median (turf median with no curbs). This type of median typically had a ditch or swale below roadway grade.
F = Flush median (paved median that was flush with the roadway grade).

16. One-way/two-way operation:
1 = One-way traffic operation on the intersection leg containing the approach.
2 = Two-way traffic operation on the intersection leg containing the approach.

17. Left-turn prohibition:
N = No left-turn prohibition on this approach.
A = Left turns prohibited from this approach at all times.
M = Left turns prohibited from this approach during the morning peak period only, but not at other times.
E = Left turns prohibited from this approach during the evening peak period only, but not at other times.
B = Left turns prohibited from this approach during both peak periods, but not at other times.

18. Number of driveways within 75 m or 250 ft:
Total number of driveways within 75 m (250 ft) of the intersection on both sides of the street on the intersection leg containing the approach in question.

19. Type of driveways:
N = No driveways (recorded as such if the number of driveways was equal to zero).
C = One or more commercial driveways included in the driveway count for this leg of the intersection.
I = One or more industrial/institutional driveways included in the driveway count for this leg, but no commercial driveways.
R = One or more residential driveways included in the driveway count for this leg, but no commercial or industrial/institutional driveways.
NOTE: This category was intended to establish a hierarchy in which the driveway type for the most heavily used driveway(s) was recorded. Commercial driveways are usually more heavily used throughout the day than industrial/institutional driveways, which in turn are usually more heavily used than residential driveways. Industrial/institutional driveways include those that serve factories, non-retail businesses, government buildings, hospitals, schools, churches, and apartment complexes (with more than 10 apartments).

20. Curb parking within 75 m or 250 ft:
N = No curb parking on the right side of the intersection approach within 250 ft of the intersection.
P = Parallel parking on the right side of the intersection approach within 250 ft of the intersection.
A = Angle parking on right side of the intersection approach within 250 ft of the intersection.
NOTE: Width of angle parking area was not included in width of through lanes.

21. Traffic control:
N = None.
ST = STOP controlled.
SG = Signalized.
****. Left-turn phasing (arrows):**
N = No protected left-turn phase (i.e., there was no green arrow so all left turns were made on the green ball).
A = Protected left-turn phase with left turns allowed only during the protected phase (i.e., all left turns were made with a green arrow, while no left turns were allowed on green ball).
B = Protected left-turn phase with left turns permitted both during the protected phase and on the green ball (i.e., protected/permissive operation).

22. Pedestrian signals:
Y = Pedestrian signals (WALK/DON'T WALK) present for crossing the approach in question.
N = No pedestrian signals for crossing the approach.

23. Painted crosswalk on approach:
Y = Painted or marked pedestrian crosswalk present on the approach in question.
N = No painted crosswalk on the approach in question.

24. Advance warning signs:
Y = Advance warning signs (e.g., SIGNAL AHEAD) present on the approach in question.
F = Advance warning signs present AND the warning signs were accompanied by flashing beacons.
N = No advance warning signs on the approach.
NOTE: If there was an advance warning sign with any legend other than SIGNAL AHEAD (or the SIGNAL AHEAD symbol sign), the sign legend was noted as a comment. Advisory speed limits are not typically used in conjunction with SIGNAL AHEAD signs; however, if an advisory speed limit was used on the approach (except for a temporary work zone speed limit), the magnitude of the advisory speed limit was noted as a comment.
****. Posted speed limit (mph):**
The posted regulatory speed limit (mph) on each approach.
NOTE: Regulatory speed limit signs are normally repeated at intervals to make sure that drivers are aware of the speed limit. If there were no speed limit signs within the immediate vicinity of the intersection, data collectors drove up to 1.6 km (1 mile) upstream to check for speed limit signs that applied to the approach in question. If there were no regulatory speed limits signs on the street, the following default speed limits were used:
25 mph = Business or residential district on a non-state highway.

55 mph = State highways or outside of business and residential areas on non-state highways.

25. Angle of intersection:
The angle between the intersecting approaches. The angle entered was the smallest angle between the intersecting approaches (i.e., entered as 90 degrees or an acute angle between 0 and 90 degrees).
NOTE: If the angle was other than 90 degrees, a sketch was made of the three or four approaches to illustrate which approaches intersected at acute, right, and obtuse angles.

26. Lighting:
N = None.
H = High-mast lighting (not expected at conventional highway intersections; more typical of freeway interchanges).
S = Street lighting (individual luminaries) continuously along one or both intersecting streets.
I = Street lighting (individual luminaries) at the intersection, but not along the intersecting streets.
NOTE: Ambient light sources other than street lighting present at the intersection were noted by a supplementary code of Y (Yes) or N (No).

27. Character of development:
A = Agricultural area.
C = Central business district/downtown.
B = Outlying commercial business district.
I = Industrial district.
M = Mixed commercial and residential development.
R = Residential development.
X = Other (describe in comment).

28. Level of pedestrian activity:
L = Low (almost no pedestrian activity).
M = Medium (pedestrian activity with some frequency).
H = High (pedestrian activity with some frequency).

APPENDIX D:

Design Guidance Tool

Objective	Countermeasures					
	Pedestrian/Bike Facility Desig	**Roadway Design**	**Intersection Design**	**Traffic Calming**	**Signs & Signals**	**Other Measures**
Reduce ped/bike crashes involving right-turning vehicles	Warning Signs for Pedestrians Approaching the Intersection	Advance Stop Lines Reduce Speed of Vehicles Approaching the Intersection **On smaller roadways where turning movements are a high proportion consider right turn mitigation strategies***	Raised Pedestrian Crosswalk at Right-Turn Approaches **Consider Channelizing Island at Exclusive Right-Turn Lanes*** Smaller Curb Radius Improve Sight Distance for Right-Turning Vehicles		Warning Signs for Motorists Prohibit Right-Turn on Red during Peak Hours of Pedestrian Activity Advance Stop Lines	Speed Monitoring Trailor School Zone Improvements
Reduce Ped/Bike Crashes Involving Left-Turning Vehicles	Signs for pedestrians approaching the intersection such as "Vehicle Crossing"		Raised Pedestrian Crossings **Avoid Double Left Installations. Where Double Lefts are necessary consider other mitigation measures.***		**Protected Left-Turn Phasing*** Prohibit Permitted Left-Turns during Peak Hours of Pedestrian Activity	 School Zone Improvements
Reduce Ped/Bike Crashes Involving Through Vehicles	Warning Signs for Pedestrians Approaching the Intersection Overpass/Underpass	If possible, Consider Off-Street Bike Facility	**Painted Crosswalks for Through Movements at Controlled intersections***			Illuminate Crosswalks for better Night-Time Visibility
Reduce Bicycle-Vehicle Crashes		Add a Separate On-Street Bike Lane If Possible, Consider Off-Street Bike Facility				
Reduce Pedestrian Exposure to Traffic	Overpass/Underpasses	Road Narrowing Reduce Number of Lanes Raised Median Pedestrian Island Crossing		Curb Extension Chokers Pedestrian Crossing Islands	Adequate Pedestrian Signal Timings Accessible Pedestrian Signal	
Reduce Mid-block Pedestrian Crossings	Improve Pedestrian Access and Mobility	Raised Medians, Landscaped Medians to Discourage Mid-Block Crossings Designated Mid-Block Crossings			Accessible Pedestrian Signal	Illuminate Crosswalks for better Night-Time Visibility
Reduce Speed of Vehicles		Road Narrowing Reduce Number of Lanes Driveway Improvements Curb Radius Reduction Right-Turn Slip Lane	**Engineering Measures to Reduce Approach Speed at Facilities with Speed Limit>**	Curb Extension Chokers Speed Humps Speed Tables Raised Pedestrian Crossings		Speed Monitoring Trailor School Zone Improvements
Improve Sight Distance and Visibility for Vehicles and Pedestrians	Roadway Lighting Crosswalk Enhancements	Add Bike Lane		Curb Extension Speed Tables Pedestrian Crossing Islands Raised Pedestrian Crossings	Sign Improvements Advance Stop Lines	
Improve Compliance with Traffic Laws			Red Light Cameras	Traffic Calming Measures		Speed Monitoring Trailor Pedestrian/Driver Education Police Enforcement

*CDOT DTD Phase II Analysis Results
Other Results based on Literature Review

6/29/2007

APPENDIX E:

Statistical Analysis Datasheets

Right Turn Crashes at Shared Right Turn Lanes with Channelizing Islands

Significance Test for Difference in Proportions — Islands with Shared Lane

Summary Statistics and User Input

Group	n	X	p_hat	n=All Crash Types X=Right turn Crashes
Sample1 (RT Crashes at Islands)	6	2	0.333	
Sample2 (34 intersections)	213	91	0.427	

null		Calculations			
alpha	0.1	pooled_p	0.425	(C5+C6)/(B5+B6)	
alternate	upper	SE	0.2046	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))	
		z	-0.459	((D5-D6)/SE	

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	Significance Test	
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	Ans
Pvalue	0.6768	1- NORMSDIST(z)	H1: P1 > P2	

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.646	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.323	NORMSDIST(z)

Right Turn Crashes at Exclusive Right Turn Lanes without Channelizing Islands

Significance Test for Difference in Proportions — Rt. Turn Lanes without Islands

Summary Statistics and User Input

Group	n	X	p_hat	n=All Crash Types X=Right turn Crashes
Sample1 (Right Turn Lanes)	46	26	0.565	
Sample2 (34 intersections)	213	91	0.427	

P1 = Probability of an accident at a Raised Median
P2 = Probability of an accident at 34 intersections

null		Calculations			
alpha	0.1	pooled_p	0.452	(C5+C6)/(B5+B6)	
alternate	upper	SE	0.0809	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))	
		z	1.705	((D5-D6)/SE	

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	Significance Test	
Decision	**Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	
Pvalue	0.0441	1- NORMSDIST(z)	H1: P1 > P2	Ans

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.088	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.956	NORMSDIST(z)

Right Turn Crashes at Exclusive Right Turn Lanes with Channelizing Islands

Significance Test for Difference in Proportions — Exclusive Rt. Turn Lanes with and without Islands

Summary Statistics and User Input

Group	n	X	p_hat	n=All Crash Types X=Right turn Crashes
Sample1 (Rt. Turn Lanes)	83	41	0.494	
Sample2 (34 intersections)	213	91	0.427	

null		Calculations		
alpha	0.1	pooled_p	0.446	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0643	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	1.038	((D5-D6)/SE

Results

Upper Test

			Significance Test	
upper z	1.2816	(-)NORMSINV(alpha)		
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	Ans
Pvalue	0.1497	1- NORMSDIST(z)	H1: P1 > P2	

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.299	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.850	NORMSDIST(z)

Right Turn Crashes at Exclusive Right Turn Lanes with Channelizing Islands

Significance Test for Difference in Proportions — Islands w/ exclusive Rt. Turn Lanes

Summary Statistics and User Input

Group	n	X	p_hat	n=All Crash Types X=Right turn Crashes
Sample1 (Rt. Turn Lanes w/ Islands)	37	15	0.405	
Sample2 (34 intersections)	213	91	0.427	

null		Calculations		
alpha	0.1	pooled_p	0.424	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0880	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	-0.248	((D5-D6)/SE

Results

Upper Test

			Significance Test	
upper z	1.2816	(-)NORMSINV(alpha)		
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	Ans
Pvalue	0.5979	1- NORMSDIST(z)	H1: P1 > P2	

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.804	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.402	NORMSDIST(z)

Right Turn Crashes at No Shared Lanes

Significance Test for Difference in Proportions

No Shared Lane
n=All Crash Types
X= Right Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (No Shared Lane)	102	53	0.520
Sample2 (34 intersections)	213	91	0.427

null		Calculations		
alpha	0.1	pooled_p	0.457	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0600	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	1.540	((D5-D6)/SE

Results

Upper Test				
upper z	1.2816	(-)NORMSINV(alpha)		Significance Test
Decision	**Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")		H0: P1 = P2
Pvalue	0.0618	1- NORMSDIST(z)		H1: P1 > P2 Ans

Other Tests

Two Sided Test		
two_z	1.645	ABS(NORMSINV(alpha/2
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H
Pvalue	0.124	2*(1-NORMSDIST(ABS(

Lower Test		
lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.938	NORMSDIST(z)

Left Turn Crashes at No Shared Lanes

Significance Test for Difference in Proportions

No Shared Lane
n=All Crash Types
X= Left Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (No Shared Lane)	102	11	0.108
Sample2 (34 intersections)	213	43	0.202

null		Calculations		
alpha	0.1	pooled_p	0.171	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0454	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	-2.072	((D5-D6)/SE

Results

Upper Test				
upper z	1.2816	(-)NORMSINV(alpha)		Significance Test
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")		H0: P1 = P2 Ans
Pvalue	0.9809	1- NORMSDIST(z)		H1: P1 > P2

Other Tests

Two Sided Test		
two_z	1.645	ABS(NORMSINV(alpha/2
Decision	Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H
Pvalue	0.038	2*(1-NORMSDIST(ABS(

Lower Test		
lower z	-1.282	NORMSINV(alpha)
Decision	Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.019	NORMSDIST(z)

Straight Crashes at No Shared Lanes

Significance Test for Difference in Proportions

No Shared Lane
n=All Crash Types
X= Straight

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (No Shared Lane)	102	25	0.245
Sample2 (34 intersections)	213	52	0.244

null		Calculations		
alpha	0.1	pooled_p	0.244	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0517	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	0.019	((D5-D6)/SE

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	Significance Test	
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	Ans
Pvalue	0.4925	1- NORMSDIST(z)	H1: P1 > P2	

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H
Pvalue	0.985	2*(1-NORMSDIST(ABS(

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.507	NORMSDIST(z)

Right Turn Crashes at Shared Right Turn Lanes

Significance Test for Difference in Proportions

Shared Rt. Turn Lane
n=All Crash Types
X= Rt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Shared Lane)	111	38	0.342
Sample2 (34 intersections)	213	91	0.427

null		Calculations		
alpha	0.1	pooled_p	0.398	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0573	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	-1.481	((D5-D6)/SE

Results

Upper Test				Significance Test
upper z	1.2816	(-)NORMSINV(alpha)		H0: P1 = P2
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")		H1: P1 > P2
Pvalue	0.9307	1- NORMSDIST(z)		

Ans

Other Tests

Two Sided Test			
two_z	1.645	ABS(NORMSINV(alpha/2)	
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")	
Pvalue	0.139	2*(1-NORMSDIST(ABS(z)	
Lower Test			
lower z	-1.282	NORMSINV(alpha)	
Decision	Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")	
Pvalue	0.069	NORMSDIST(z)	

Left Turn Crashes at Shared Right Turn Lanes

Significance Test for Difference in Proportions

Shared Rt. Turn Lane
n=All Crash Types
X= Lt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Shared Lane)	111	32	0.288
Sample2 (34 intersections)	213	43	0.202

null		Calculations		
alpha	0.1	pooled_p	0.231	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0494	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	1.750	((D5-D6)/SE

Results

Upper Test				Significance Test
upper z	1.2816	(-)NORMSINV(alpha)		H0: P1 = P2
Decision	**Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")		H1: P1 > P2
Pvalue	0.0401	1- NORMSDIST(z)		

Ans

Other Tests

Two Sided Test			
two_z	1.645	ABS(NORMSINV(alpha/2)	
Decision	Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")	
Pvalue	0.080	2*(1-NORMSDIST(ABS(z)	
Lower Test			
lower z	-1.282	NORMSINV(alpha)	
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")	
Pvalue	0.960	NORMSDIST(z)	

Straight Crashes at Shared Right Turn Lanes

Significance Test for Difference in Proportions

Shared Rt. Turn Lane
n=All Crash Types
X= Straight

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Shared Lane)	111	27	0.243
Sample2 (34 intersections)	213	52	0.244

null		Calculations		
alpha	0.1	pooled_p	0.244	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0503	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	-0.018	((D5-D6)/SE

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	
Pvalue	0.5070	1- NORMSDIST(z)	

Significance Test

H0: P1 = P2	Ans
H1: P1 > P2	

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2)
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.986	2*(1-NORMSDIST(ABS(z)

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.493	NORMSDIST(z)

Right Turn Crashes vs Left+Right Turn Crashes at Unpainted Crosswalks

Significance Test for Difference in Proportions

Unpainted Crosswalk
n=Left and Right Crashes
X= Rt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Unpainted Crosswalk)	11	7	0.636
Sample2 (34 intersections)	132	90	0.682

null		Calculations		
alpha	0.1	pooled_p	0.678	(C5+C6)/(B5+B6)
alternate	upper	SE	0.1466	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	-0.310	((D5-D6)/SE

Results

Upper Test				Significance Test
upper z	1.2816	(-)NORMSINV(alpha)		
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")		H0: P1 = P2 Ans
Pvalue	0.6217	1- NORMSDIST(z)		H1: P1 > P2

Other Tests

Two Sided Test			
two_z	1.645	ABS(NORMSINV(alpha/2))	
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")	
Pvalue	0.757	2*(1-NORMSDIST(ABS(z)))	
Lower Test			
lower z	-1.282	NORMSINV(alpha)	
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")	
Pvalue	0.378	NORMSDIST(z)	

Straight Crashes vs Left+Straight Turn Crashes at Unpainted Crosswalks

Significance Test for Difference in Proportions

Unpainted Crosswalk
n=Left and Straight Crashes
X= Straight

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Unpainted Crosswalk)	17	13	0.765
Sample2 (34 intersections)	93	51	0.548

null		Calculations		
alpha	0.05	pooled_p	0.582	(C5+C6)/(B5+B6)
alternate	upper	SE	0.1301	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	1.663	((D5-D6)/SE

Results

Upper Test				Significance Test
upper z	1.6449	(-)NORMSINV(alpha)		
Decision	**Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")		H0: P1 = P2
Pvalue	0.0482	1- NORMSDIST(z)		H1: P1 > P2 Ans

Other Tests

Two Sided Test			
two_z	1.960	ABS(NORMSINV(alpha/2))	
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")	
Pvalue	0.096	2*(1-NORMSDIST(ABS(z)))	
Lower Test			
lower z	-1.645	NORMSINV(alpha)	
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")	
Pvalue	0.952	NORMSDIST(z)	

Right Turn Crashes at Protected/Permitted Signal Phasing

Significance Test for Difference in Proportions

Protected/Permitted
n=All Crash Types
X= Rt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Prot/Perm)	99	43	0.434
Sample2 (34 intersections)	171	76	0.444

null		Calculations			
alpha	0.1	pooled_p	0.441	(C5+C6)/(B5+B6)	
alternate	upper	SE	0.0627	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))	
		z	-0.161	((D5-D6)/SE	

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	Significance Test	
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	Ans
Pvalue	0.5640	1- NORMSDIST(z)	H1: P1 > P2	

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.872	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.436	NORMSDIST(z)

Left Turn Crashes at Protected/Permitted Signal Phasing

Significance Test for Difference in Proportions

Protected/Permitted
n=All Crash Types
X= Lt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Prot/Perm)	99	25	0.253
Sample2 (34 intersections)	171	39	0.228

null		Calculations			
alpha	0.1	pooled_p	0.237	(C5+C6)/(B5+B6)	
alternate	upper	SE	0.0537	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))	
		z	0.455	((D5-D6)/SE	

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	Significance Test	
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	Ans
Pvalue	0.3244	1- NORMSDIST(z)	H1: P1 > P2	

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.649	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.676	NORMSDIST(z)

Straight Crashes at Protected/Permitted Signal Phasing

Significance Test for Difference in Proportions

Protected/Permitted
n=All Crash Types
X= Straight

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Prot/Perm)	99	20	0.202
Sample2 (34 intersections)	171	35	0.205

null		Calculations		
alpha	0.1	pooled_p	0.204	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0509	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	-0.052	((D5-D6)/SE

Results

Upper Test			Significance Test	
upper z	1.2816	(-)NORMSINV(alpha)	H0: P1 = P2	Ans
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H1: P1 > P2	
Pvalue	0.5208	1- NORMSDIST(z)		

Other Tests

Two Sided Test		
two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.958	2*(1-NORMSDIST(ABS(z)))
Lower Test		
lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.479	NORMSDIST(z)

Right Turn Crashes at Permitted Signal Phasing

Significance Test for Difference in Proportions Permitted

n=All Crash Types
X= Rt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Permitted)	45	23	0.511
Sample2 (34 intersections)	171	76	0.444

null		Calculations		
alpha	0.1	pooled_p	0.458	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0835	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	0.799	((D5-D6)/SE

Results

Upper Test				
upper z	1.2816	(-)NORMSINV(alpha)		Significance Test
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")		H0: P1 = P2 Ans
Pvalue	0.2123	1- NORMSDIST(z)		H1: P1 > P2

Other Tests

Two Sided Test			
two_z	1.645	ABS(NORMSINV(alpha/2))	
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")	
Pvalue	0.425	2*(1-NORMSDIST(ABS(z)))	
Lower Test			
lower z	-1.282	NORMSINV(alpha)	
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")	
Pvalue	0.788	NORMSDIST(z)	

Left Turn Crashes at Permitted Signal Phasing

Significance Test for Difference in Proportions Permitted

n=All Crash Types
X= Lt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Permitted)	45	11	0.244
Sample2 (34 intersections)	171	39	0.228

null		Calculations		
alpha	0.1	pooled_p	0.231	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0707	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	0.232	((D5-D6)/SE

Results

Upper Test				
upper z	1.2816	(-)NORMSINV(alpha)		Significance Test
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")		H0: P1 = P2 Ans
Pvalue	0.4084	1- NORMSDIST(z)		H1: P1 > P2

Other Tests

Two Sided Test			
two_z	1.645	ABS(NORMSINV(alpha/2))	
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")	
Pvalue	0.817	2*(1-NORMSDIST(ABS(z)))	
Lower Test			
lower z	-1.282	NORMSINV(alpha)	
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")	
Pvalue	0.592	NORMSDIST(z)	

Straight Crashes at Permitted Signal Phasing

Significance Test for Difference in Proportions

Permitted

n=All Crash Types

X= Straight

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Permitted)	45	6	0.133
Sample2 (34 intersections)	171	35	0.205

null		Calculations		
alpha	0.1	pooled_p	0.190	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0657	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	-1.086	((D5-D6)/SE

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	Significance Test	
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	Ans
Pvalue	0.8612	1- NORMSDIST(z)	H1: P1 > P2	

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.278	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.139	NORMSDIST(z)

Right Turn Crashes at Protected Signal Phasing

Significance Test for Difference in Proportions

Protected Only
n=All Crash Types
X= Rt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Protected)	27	10	0.370
Sample2 (34 intersections)	171	76	0.444

null		Calculations		
alpha	0.1	pooled_p	0.434	(C5+C6)/(B5+B6)
alternate	upper	SE	0.1026	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	-0.722	((D5-D6)/SE

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	Significance Test	
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	Ans
Pvalue	0.7647	1- NORMSDIST(z)	H1: P1 > P2	

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))	
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")	
Pvalue	0.471	2*(1-NORMSDIST(ABS(z)))	

Lower Test

lower z	-1.282	NORMSINV(alpha)	
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")	
Pvalue	0.235	NORMSDIST(z)	

Left Turn Crashes at Protected Signal Phasing

Significance Test for Difference in Proportions

Protected Only
n=All Crash Types
X= Lt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Protected)	27	3	0.111
Sample2 (34 intersections)	171	39	0.228

null		Calculations		
alpha	0.1	pooled_p	0.212	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0847	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	-1.382	((D5-D6)/SE

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	Significance Test	
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	Ans
Pvalue	0.9164	1- NORMSDIST(z)	H1: P1 > P2	

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))	
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")	
Pvalue	0.167	2*(1-NORMSDIST(ABS(z)))	

Lower Test

lower z	-1.282	NORMSINV(alpha)	
Decision	Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")	
Pvalue	0.084	NORMSDIST(z)	

Straight Crashes at Protected Signal Phasing

Significance Test for Difference in Proportions

Protected Only
n=All Crash Types
X= Straight

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Protected)	27	9	0.333
Sample2 (34 intersections)	171	35	0.205

null		Calculations		
alpha	0.1	pooled_p	0.222	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0861	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	1.494	((D5-D6)/SE

Results

Upper Test			Significance Test	
upper z	1.2816	(-)NORMSINV(alpha)		
Decision	**Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	
Pvalue	0.0675	1- NORMSDIST(z)	H1: P1 > P2	Ans

Other Tests

Two Sided Test		
two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.135	2*(1-NORMSDIST(ABS(z)))
Lower Test		
lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.932	NORMSDIST(z)

Right Turn Crashes at Speed Limit <35

Significance Test for Difference in Proportions

Speed Limit <35
n=All Crash Types
X= Rt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (<35)	116	55	0.474
Sample2 (34 intersections)	213	91	0.427

null		Calculations		
alpha	0.1	pooled_p	0.444	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0573	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	0.818	((D5-D6)/SE

Results

Upper Test				
upper z	1.2816	(-)NORMSINV(alpha)	Significance Test	
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	Ans
Pvalue	0.2066	1- NORMSDIST(z)	H1: P1 > P2	

Other Tests

Two Sided Test		
two_z	1.645	ABS(NORMSINV(alpha
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.413	2*(1-NORMSDIST(ABS
Lower Test		
lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.793	NORMSDIST(z)

Left Turn Crashes at Speed Limit <35

Significance Test for Difference in Proportions

Speed Limit <35
n=All Crash Types
X= Lt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (<35)	116	24	0.207
Sample2 (34 intersections)	213	43	0.202

null		Calculations		
alpha	0.1	pooled_p	0.204	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0465	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	0.108	((D5-D6)/SE

Results

Upper Test				
upper z	1.2816	(-)NORMSINV(alpha)	Significance Test	
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	Ans
Pvalue	0.4570	1- NORMSDIST(z)	H1: P1 > P2	

Other Tests

Two Sided Test		
two_z	1.645	ABS(NORMSINV(alpha
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.914	2*(1-NORMSDIST(ABS
Lower Test		
lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.543	NORMSDIST(z)

Straight Crashes at Speed Limit <35

Significance Test for Difference in Proportions

Speed Limit <35
n=All Crash Types
X= Straight

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (<35)	116	24	0.207
Sample2 (34 intersections)	213	52	0.244

null		Calculations		
alpha	0.1	pooled_p	0.231	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0486	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	-0.766	((D5-D6)/SE

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	Significance Test	
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	Ans
Pvalue	0.7780	1- NORMSDIST(z)	H1: P1 > P2	

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.444	2*(1-NORMSDIST(ABS

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.222	NORMSDIST(z)

Right Turn Crashes at Speed Limit 35

Significance Test for Difference in Proportions

Speed Limit 35

n=All Crash Types

X= Rt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (35)	83	33	0.398
Sample2 (34 intersections)	213	91	0.427

null		Calculations		
alpha	0.1	pooled_p	0.419	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0638	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	-0.464	((D5-D6)/SE

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	Significance Test
Decision	**o Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2
Pvalue	0.6788	1- NORMSDIST(z)	**H1: P1 > P2** Ans

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.642	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.321	NORMSDIST(z)

Left Turn Crashes at Speed Limit 35

Significance Test for Difference in Proportions

Speed Limit 35

n=All Crash Types

X= Lt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (35)	83	16	0.193
Sample2 (34 intersections)	213	43	0.202

null		Calculations		
alpha	0.1	pooled_p	0.199	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0517	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	-0.176	((D5-D6)/SE

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	Significance Test
Decision	**o Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2
Pvalue	0.5699	1- NORMSDIST(z)	**H1: P1 > P2** Ans

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.860	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.430	NORMSDIST(z)

Straight Crashes at Speed Limit 35

Significance Test for Difference in Proportions

Speed Limit 35
n=All Crash Types
X= Straight

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (35)	83	22	0.265
Sample2 (34 intersections)	213	52	0.244

null		Calculations		
alpha	0.1	pooled_p	0.250	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0560	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	0.374	((D5-D6)/SE

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	Significance Test
Decision	**o Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2
Pvalue	0.3544	1- NORMSDIST(z)	**H1: P1 > P2** Ans

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.709	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.646	NORMSDIST(z)

Right Turn Crashes at Speed Limit >35

Significance Test for Difference in Proportions

Speed Limit > 35
n=All Crash Types
X= Rt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (>35)	9	3	0.333
Sample2 (34 intersections)	213	91	0.427

null		Calculations		
alpha	0.1	pooled_p	0.423	(C5+C6)/(B5+B6)
alternate	upper	SE	0.1681	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	-0.558	((D5-D6)/SE

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	Significance Test
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2
Pvalue	0.7117	1- NORMSDIST(z)	**H1: P1 > P2** Ans

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.577	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.288	NORMSDIST(z)

Left Turn Crashes at Speed Limit >35

Significance Test for Difference in Proportions

Speed Limit > 35
n=All Crash Types
X= Lt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (>35)	9	1	0.111
Sample2 (34 intersections)	213	43	0.202

null		Calculations		
alpha	0.1	pooled_p	0.198	(C5+C6)/(B5+B6)
alternate	upper	SE	0.1357	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	-0.669	((D5-D6)/SE

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	Significance Test
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2
Pvalue	0.7483	1- NORMSDIST(z)	**H1: P1 > P2** Ans

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.503	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.252	NORMSDIST(z)

Straight Crashes at Speed Limit >35

Significance Test for Difference in Proportions

Speed Limit > 35
n=All Crash Types
X= Straight

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (>35)	9	5	0.556
Sample2 (34 intersections)	213	52	0.244

null		Calculations		
alpha	0.02	pooled_p	0.257	(C5+C6)/(B5+B6)
alternate	upper	SE	0.1487	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	2.095	((D5-D6)/SE

Results

Upper Test

upper z	2.0537	(-)NORMSINV(alpha)	Significance Test
Decision	**Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2
Pvalue	0.0181	1- NORMSDIST(z)	**H1: P1 > P2** Ans

Other Tests

Two Sided Test

two_z	2.326	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.036	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-2.054	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.982	NORMSDIST(z)

Right Turn Crashes at approaches with <2 Left Turn Lanes

Significance Test for Difference in Proportions

<2 Left Turn Lanes
n=All Crash Types
X= Rt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (<2 Lt Turn Lanes)	173	82	0.474
Sample2 (34 intersections)	213	91	0.427

null		Calculations		
alpha	0.1	pooled_p	0.448	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0509	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	0.919	((D5-D6)/SE

Results

Upper Test

			Significance Test	
upper z	1.2816	(-)NORMSINV(alpha)		
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	Ans
Pvalue	0.1791	1- NORMSDIST(z)	H1: P1 > P2	

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.358	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.821	NORMSDIST(z)

Left Turn Crashes at approaches with <2 Left Turn Lanes

Significance Test for Difference in Proportions

<2 Left Turn Lanes
n=All Crash Types
X= Lt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (<2 Lt Turn Lanes)	173	29	0.168
Sample2 (34 intersections)	213	43	0.202

null		Calculations		
alpha	0.1	pooled_p	0.187	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0399	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	-0.859	((D5-D6)/SE

Results

Upper Test

			Significance Test	
upper z	1.2816	(-)NORMSINV(alpha)		
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	Ans
Pvalue	0.8048	1- NORMSDIST(z)	H1: P1 > P2	

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.390	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.195	NORMSDIST(z)

Straight Crashes at approaches with <2 Left Turn Lanes

Significance Test for Difference in Proportions

<2 Left Turn Lanes
n=All Crash Types
X= Straight

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (<2 Lt Turn Lanes)	173	40	0.231
Sample2 (34 intersections)	213	52	0.244

null		Calculations		
alpha	0.1	pooled_p	0.238	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0436	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	-0.296	((D5-D6)/SE

Results

Upper Test

			Significance Test	
upper z	1.2816	(-)NORMSINV(alpha)		
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	Ans
Pvalue	0.6165	1- NORMSDIST(z)	H1: P1 > P2	

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.767	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.384	NORMSDIST(z)

Right Turn Crashes at approaches with 2 Left Turn Lanes

Significance Test for Difference in Proportions — Double Left Turn

n=All Crash Types
X= Rt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Double Left)	40	9	0.225
Sample2 (34 intersections)	213	91	0.427

Calculations

null		pooled_p	0.395	(C5+C6)/(B5+B6)
alpha	0.1	SE	0.0842	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
alternate	upper	z	-2.400	((D5-D6)/SE

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	
Pvalue	0.9918	1- NORMSDIST(z)	

Significance Test

H0: P1 = P2
H1: P1 > P2 — Ans

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.016	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.008	NORMSDIST(z)

Left Turn Crashes at approaches with 2 Left Turn Lanes

Significance Test for Difference in Proportions — Double Left Turn

n=All Crash Types
X= Lt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Double Left)	40	14	0.350
Sample2 (34 intersections)	213	43	0.202

Calculations

null		pooled_p	0.225	(C5+C6)/(B5+B6)
alpha	0.1	SE	0.0720	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
alternate	upper	z	2.057	((D5-D6)/SE

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	
Decision	**Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	
Pvalue	0.0198	1- NORMSDIST(z)	

Significance Test

H0: P1 = P2
H1: P1 > P2 — Ans

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.040	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.980	NORMSDIST(z)

Straight Crashes at approaches with 2 Left Turn Lanes

Significance Test for Difference in Proportions

Double Left Turn

n=All Crash Types

X= Straight

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Double Left)	40	12	0.300
Sample2 (34 intersections)	213	52	0.244

null		Calculations		
alpha	0.1	pooled_p	0.253	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0749	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	0.746	((D5-D6)/SE

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	Significance Test	
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	Ans
Pvalue	0.2279	1- NORMSDIST(z)	H1: P1 > P2	

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.456	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.772	NORMSDIST(z)

Right Turn Crashes at Approaches with 1 Through Lane or less

Significance Test for Difference in Proportions

0-1 Through Lanes
n=All Crash Types
X= Rt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (0-1 Through Lanes)	72	40	0.556
Sample2 (34 intersections)	204	85	0.417

null		Calculations		
alpha	0.1	pooled_p	0.453	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0682	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	2.035	((D5-D6)/SE

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	Significance Test
Decision	**Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2
Pvalue	0.0209	1- NORMSDIST(z)	H1: P1 > P2 Ans

Other Tests

Two Sided Test

two_z		1.645	ABS(NORMSINV(alpha/2
Decision	Reject H0		IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H
Pvalue		0.042	2*(1-NORMSDIST(ABS(

Lower Test

lower z		-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0		IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue		0.979	NORMSDIST(z)

Left Turn Crashes at Approaches with 1 Through Lane or less

Significance Test for Difference in Proportions

0-1 Through Lanes
n=All Crash Types
X= Lt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (0-1 Through Lanes)	72	13	0.181
Sample2 (34 intersections)	204	42	0.206

null		Calculations		
alpha	0.1	pooled_p	0.199	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0548	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	-0.463	((D5-D6)/SE

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	Significance Test
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2 Ans
Pvalue	0.6781	1- NORMSDIST(z)	H1: P1 > P2

Other Tests

Two Sided Test

two_z		1.645	ABS(NORMSINV(alpha/2
Decision	Do Not Reject H0		IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H
Pvalue		0.644	2*(1-NORMSDIST(ABS(

Lower Test

lower z		-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0		IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue		0.322	NORMSDIST(z)

Straight Crashes at Approaches with 1 Through Lane or less

Significance Test for Difference in Proportions

0-1 Through Lanes
n=All Crash Types
X= Straight

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (0-1 Through Lanes)	72	10	0.139
Sample2 (34 intersections)	204	50	0.245

null		Calculations		
alpha	0.1	pooled_p	0.217	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0565	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	-1.878	((D5-D6)/SE

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	Significance Test	
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	Ans
Pvalue	0.9698	1- NORMSDIST(z)	H1: P1 > P2	

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2	
Decision	Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H	
Pvalue	0.060	2*(1-NORMSDIST(ABS(	

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.030	NORMSDIST(z)

Right Turn Crashes at Approaches with 2 Through Lanes

Significance Test for Difference in Proportions — 2 Through Lanes; n=All Crash Types; X= Rt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (2 Through Lanes)	116	37	0.319
Sample2 (34 intersections)	204	85	0.417

null		Calculations		
alpha	0.1	pooled_p	0.381	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0565	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	-1.730	((D5-D6)/SE

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	Significance Test
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2 Ans
Pvalue	0.9582	1- NORMSDIST(z)	H1: P1 > P2

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.084	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.042	NORMSDIST(z)

Left Turn Crashes at Approaches with 2 Through Lanes

Significance Test for Difference in Proportions — 2 Through Lanes; n=All Crash Types; X= Lt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (2 Through Lanes)	116	27	0.233
Sample2 (34 intersections)	204	42	0.206

null		Calculations		
alpha	0.1	pooled_p	0.216	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0478	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	0.562	((D5-D6)/SE

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	Significance Test
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2 Ans
Pvalue	0.2871	1- NORMSDIST(z)	H1: P1 > P2

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.574	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.713	NORMSDIST(z)

Straight Crashes at Approaches with 2 Through Lanes

Significance Test for Difference in Proportions 2 Through Lanes

n=All Crash Types

X= Straight

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (2 Through Lanes)	116	35	0.302
Sample2 (34 intersections)	204	50	0.245

null		Calculations		
alpha	0.1	pooled_p	0.266	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0514	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	1.103	((D5-D6)/SE

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	Significance Test	
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	Ans
Pvalue	0.1351	1- NORMSDIST(z)	H1: P1 > P2	

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.270	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.865	NORMSDIST(z)

Right Turn Crashes at Approaches with 3 Through Lanes

Significance Test for Difference in Proportions

3 Through Lanes
n=All Crash Types
X= Rt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (3 Lanes)	16	8	0.500
Sample2 (34 intersections)	204	85	0.417

null		Calculations		
alpha	0.1	pooled_p	0.423	(C5+C6)/(B5+B6)
alternate	upper	SE	0.1282	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	0.650	((D5-D6)/SE

Results

Upper Test				
upper z	1.2816	(-)NORMSINV(alpha)		Significance Test
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")		H0: P1 = P2 Ans
Pvalue	0.2579	1- NORMSDIST(z)		H1: P1 > P2

Other Tests

Two Sided Test			
two_z	1.645	ABS(NORMSINV(alpha/2))	
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")	
Pvalue	0.516	2*(1-NORMSDIST(ABS(z)))	
Lower Test			
lower z	-1.282	NORMSINV(alpha)	
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")	
Pvalue	0.742	NORMSDIST(z)	

Left Turn Crashes at Approaches with 3 Through Lanes

Significance Test for Difference in Proportions

3 Through Lanes
n=All Crash Types
X= Lt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (3 Lanes)	16	2	0.125
Sample2 (34 intersections)	204	42	0.206

null		Calculations		
alpha	0.1	pooled_p	0.200	(C5+C6)/(B5+B6)
alternate	upper	SE	0.1038	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	-0.779	((D5-D6)/SE

Results

Upper Test				
upper z	1.2816	(-)NORMSINV(alpha)		Significance Test
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")		H0: P1 = P2 Ans
Pvalue	0.7820	1- NORMSDIST(z)		H1: P1 > P2

Other Tests

Two Sided Test			
two_z	1.645	ABS(NORMSINV(alpha/2))	
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")	
Pvalue	0.436	2*(1-NORMSDIST(ABS(z)))	
Lower Test			
lower z	-1.282	NORMSINV(alpha)	
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")	
Pvalue	0.218	NORMSDIST(z)	

Straight Crashes at Approaches with 3 Through Lanes

Significance Test for Difference in Proportions

3 Through Lanes
n=All Crash Types
X= Straight

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (3 Lanes)	16	5	0.313
Sample2 (34 intersections)	204	50	0.245

null		Calculations		
alpha	0.02	pooled_p	0.250	(C5+C6)/(B5+B6)
alternate	upper	SE	0.1124	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	0.600	((D5-D6)/SE

Results

Upper Test

			Significance Test	
upper z	2.0537	(-)NORMSINV(alpha)		
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	Ans
Pvalue	0.2744	1- NORMSDIST(z)	**H1: P1 > P2**	

Other Tests

Two Sided Test

two_z	2.326	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.549	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-2.054	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.726	NORMSDIST(z)

Right Turn Crashes at Signalized Intersection with no Pedestrian Indication

Significance Test for Difference in Proportions

Signalized Intersection no Ped Indication
n=All Crash Types
X= Rt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (No Ped Indication)	6	1	0.167
Sample2 (34 intersections)	181	78	0.431

null		Calculations		
alpha	0.1	pooled_p	0.422	(C5+C6)/(B5+B6)
alternate	upper	SE	0.2050	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	-1.289	((D5-D6)/SE

Results

Upper Test				
upper z	1.2816	(-)NORMSINV(alpha)	Significance Test	
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	Ans
Pvalue	0.9014	1- NORMSDIST(z)	H1: P1 > P2	

Other Tests

Two Sided Test			
two_z	1.645	ABS(NORMSINV(alpha/2	
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")	
Pvalue	0.197	2*(1-NORMSDIST(ABS(	
Lower Test			
lower z	-1.282	NORMSINV(alpha)	
Decision	Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")	
Pvalue	0.099	NORMSDIST(z)	

Left Turn Crashes at Signalized Intersection with no Pedestrian Indication

Significance Test for Difference in Proportions

Signalized Intersection no Ped Indication
n=All Crash Types
X= Lt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (No Ped Indication)	6	0	0.000
Sample2 (34 intersections)	181	39	0.215

null		Calculations		
alpha	0.1	pooled_p	0.209	(C5+C6)/(B5+B6)
alternate	upper	SE	0.1686	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	-1.278	((D5-D6)/SE

Results

Upper Test				
upper z	1.2816	(-)NORMSINV(alpha)	Significance Test	
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	Ans
Pvalue	0.8994	1- NORMSDIST(z)	H1: P1 > P2	

Other Tests

Two Sided Test			
two_z	1.645	ABS(NORMSINV(alpha/2	
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")	
Pvalue	0.201	2*(1-NORMSDIST(ABS(	
Lower Test			
lower z	-1.282	NORMSINV(alpha)	
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")	
Pvalue	0.101	NORMSDIST(z)	

Straight Crashes at Signalized Intersection with no Pedestrian Indication

Significance Test for Difference in Proportions

Signalized Intersection no Ped Indication
n=All Crash Types
X= Straight

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (No Ped Indication)	6	4	0.667
Sample2 (34 intersections)	181	40	0.221

null		Calculations		
alpha	0.1	pooled_p	0.235	(C5+C6)/(B5+B6)
alternate	upper	SE	0.1760	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	2.532	((D5-D6)/SE

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	
Decision	**Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	
Pvalue	0.0057	1- NORMSDIST(z)	

Significance Test

H0: P1 = P2
H1: P1 > P2 Ans

Other Tests

Two Sided Test

two_z		1.645	ABS(NORMSINV(alpha/2
Decision	Reject H0		IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue		0.011	2*(1-NORMSDIST(ABS(

Lower Test

lower z		-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0		IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue		0.994	NORMSDIST(z)

Right Turn Crashes at Signalized Intersection with Pedestrian Indication

Significance Test for Difference in Proportions

Signalized Intersection Ped Indication
n=All Crash Types
X= Rt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Ped Indication)	175	77	0.440
Sample2 (34 intersections)	181	78	0.431

null		Calculations		
alpha	0.1	pooled_p	0.435	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0526	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	0.172	((D5-D6)/SE

Results

Upper Test				
upper z	1.2816	(-)NORMSINV(alpha)		Significance Test
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")		H0: P1 = P2 Ans
Pvalue	0.4316	1- NORMSDIST(z)		H1: P1 > P2

Other Tests

Two Sided Test			
two_z	1.645	ABS(NORMSINV(alpha/2))	
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")	
Pvalue	0.863	2*(1-NORMSDIST(ABS(z))	
Lower Test			
lower z	-1.282	NORMSINV(alpha)	
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")	
Pvalue	0.568	NORMSDIST(z)	

Left Turn Crashes at Signalized Intersection with Pedestrian Indication

Significance Test for Difference in Proportions

Signalized Intersection Ped Indication
n=All Crash Types
X= Lt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Ped Indication)	175	39	0.223
Sample2 (34 intersections)	181	39	0.215

null		Calculations		
alpha	0.1	pooled_p	0.219	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0439	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	0.168	((D5-D6)/SE

Results

Upper Test				
upper z	1.2816	(-)NORMSINV(alpha)		Significance Test
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")		H0: P1 = P2 Ans
Pvalue	0.4331	1- NORMSDIST(z)		H1: P1 > P2

Other Tests

Two Sided Test			
two_z	1.645	ABS(NORMSINV(alpha/2))	
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")	
Pvalue	0.866	2*(1-NORMSDIST(ABS(z))	
Lower Test			
lower z	-1.282	NORMSINV(alpha)	
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")	
Pvalue	0.567	NORMSDIST(z)	

Straight Crashes at Signalized Intersection with Pedestrian Indication

Significance Test for Difference in Proportions

Signalized Intersection Ped Indication
n=All Crash Types
X= Straight

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Ped Indication)	175	36	0.206
Sample2 (34 intersections)	181	40	0.221

null		Calculations		
alpha	0.1	pooled_p	0.213	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0434	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	-0.352	((D5-D6)/SE

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	Significance Test	
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	Ans
Pvalue	0.6375	1- NORMSDIST(z)	H1: P1 > P2	

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.725	2*(1-NORMSDIST(ABS(z))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.363	NORMSDIST(z)

Raised Crosswalks

Significance Test for Difference in Proportions

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Crashes at RT Chann Islands)	48	19	0.396
Sample2 (Crashes at RT Chann Islands with raised Crosswalk)	23	9	0.391

P1 = Probability of an accident at an approach with attached sidewalk.
P2 = Probability of an accident at all approaches of 34 intersections under consideration.

null		Calculations		
alpha	0.1	pooled_p	0.394	(C5+C6)/(B5+B6)
alternate	upper	SE	0.1239	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	0.037	((D5-D6)/SE

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	Significance Test	
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	
Pvalue	0.4854	1-NORMSDIST(z)	**H1: P1 > P2**	Ans

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.971	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.515	NORMSDIST(z)

Right Turn Crashes at Attached Sidewalk

Significance Test for Difference in Proportions

Attached Walk
n=All Crash Types
X= Rt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Attached Walk)	107	49	0.458
Sample2 (34 intersections)	195	81	0.415

null		Calculations		
alpha	0.1	pooled_p	0.430	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0596	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	0.714	((D5-D6)/SE

Results

Upper Test

			Significance Test	
upper z	1.2816	(-)NORMSINV(alpha)		
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	
Pvalue	0.2375	1- NORMSDIST(z)	H1: P1 > P2	Ans

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.475	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.763	NORMSDIST(z)

Do Not Reject H0.

Left Turn Crashes at Attached Sidewalk

Significance Test for Difference in Proportions

Attached Walk
n=All Crash Types
X= Lt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Attached Walk)	107	21	0.196
Sample2 (34 intersections)	195	41	0.210

null		Calculations		
alpha	0.1	pooled_p	0.205	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0486	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	-0.288	((D5-D6)/SE

Results

Upper Test

			Significance Test	
upper z	1.2816	(-)NORMSINV(alpha)		
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	
Pvalue	0.6133	1- NORMSDIST(z)	H1: P1 > P2	Ans

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.773	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.387	NORMSDIST(z)

Do Not Reject H0.

Straight Crashes at Attached Sidewalk

Significance Test for Difference in Proportions

Attached Walk
n=All Crash Types
X= Straight

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Attached Walk)	107	23	0.215
Sample2 (34 intersections)	195	48	0.246

null		Calculations		
alpha	0.1	pooled_p	0.235	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0510	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	-0.612	((D5-D6)/SE

Results

Upper Test

			Significance Test	
upper z	1.2816	(-)NORMSINV(alpha)		
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	
Pvalue	0.7296	1- NORMSDIST(z)	H1: P1 > P2	Ans

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.541	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.270	NORMSDIST(z)

Right Turn Crashes at Detached Sidewalk

Significance Test for Difference in Proportions Detatched Walk

n=All Crash Types
X= Rt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Detatched Walk)	88	32	0.364
Sample2 (34 intersections)	195	81	0.415

null		Calculations		
alpha	0.1	pooled_p	0.399	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0629	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	-0.823	((D5-D6)/SE

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	Significance Test
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2
Pvalue	0.7947	1- NORMSDIST(z)	H1: P1 > P2 Ans

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.411	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.205	NORMSDIST(z)

Do Not Reject H0.

Left Turn Crashes at Detached Sidewalk

Significance Test for Difference in Proportions Detatched Walk

n=All Crash Types
X= Lt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Detatched Walk)	88	20	0.227
Sample2 (34 intersections)	195	41	0.210

null		Calculations		
alpha	0.1	pooled_p	0.216	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0528	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	0.322	((D5-D6)/SE

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	Significance Test
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2
Pvalue	0.3736	1- NORMSDIST(z)	H1: P1 > P2 Ans

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.747	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.626	NORMSDIST(z)

Do Not Reject H0.

Through Crashes at Detached Sidewalk

Significance Test for Difference in Proportions Detatched Walk

n=All Crash Types
X= Straight

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Detatched Walk)	88	25	0.284
Sample2 (34 intersections)	195	48	0.246

null		Calculations		
alpha	0.1	pooled_p	0.258	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0562	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	0.675	((D5-D6)/SE

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	Significance Test	
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	
Pvalue	0.2498	1- NORMSDIST(z)	H1: P1 > P2	Ans

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.500	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.750	NORMSDIST(z)

Right Turn Crashes at Divided Approach

Significance Test for Difference in Proportions

Divided Approach - Rt Turns
n=All Crash Types
X= Right Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Divided Approach)	128	53	0.414
Sample2 (34 intersections)	213	91	0.427

null			Calculations	
alpha	0.1	pooled_p	0.422	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0552	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	-0.238	((D5-D6)/SE

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	Significance Test	
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	Ans
Pvalue	0.5942	1- NORMSDIST(z)	H1: P1 > P2	

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.812	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.406	NORMSDIST(z)

Left Turn Crashes at Divided Approach

Significance Test for Difference in Proportions

Divided Approach - Left Turns
n=All Crash Types
X= Left Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Divided Approach)	128	24	0.188
Sample2 (34 intersections)	213	43	0.202

null			Calculations	
alpha	0.1	pooled_p	0.196	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0444	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	-0.324	((D5-D6)/SE

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	Significance Test	
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	Ans
Pvalue	0.6269	1- NORMSDIST(z)	H1: P1 > P2	

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.746	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.373	NORMSDIST(z)

Through Crashes at Divided Approach

Significance Test for Difference in Proportions

Divided Approach - Lt Turns
n=All Crash Types
X= Straight

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Divided Approach)	128	32	0.250
Sample2 (34 intersections)	213	52	0.244

		Calculations			
null					
alpha	0.1	pooled_p	0.246	(C5+C6)/(B5+B6)	
alternate	upper	SE	0.0482	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))	
		z	0.122	((D5-D6)/SE	
Results					
Upper Test					
upper z	1.2816	(-)NORMSINV(alpha)		Significance Test	
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")		H0: P1 = P2	Ans
Pvalue	0.4515	1- NORMSDIST(z)		H1: P1 > P2	

Other Tests

Two Sided Test		
two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.903	2*(1-NORMSDIST(ABS(z)))
Lower Test		
lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.548	NORMSDIST(z)

Right Turn Crashes at locations where Curb Parking within 250 feet of Intersection allowed

Significance Test for Difference in Proportions

Parking Allowed w/in 250' of Int.
n=All Crash Types
X= Rt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Parking Allowed)	39	16	0.410
Sample2 (34 intersections)	213	91	0.427

null		Calculations		
alpha	0.1	pooled_p	0.425	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0861	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	-0.197	((D5-D6)/SE

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	Significance Test	
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	Ans
Pvalue	0.5781	1- NORMSDIST(z)	H1: P1 > P2	

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.844	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.422	NORMSDIST(z)

Straight Crashes at locations where Curb Parking within 250 feet of Intersection allowed

Significance Test for Difference in Proportions

Parking Allowed w/in 250' of Int.
n=All Crash Types
X=Straight

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Parking Allowed)	39	9	0.231
Sample2 (34 intersections)	213	52	0.244

null		Calculations		
alpha	0.1	pooled_p	0.242	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0746	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	-0.179	((D5-D6)/SE

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	Significance Test	
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	Ans
Pvalue	0.5711	1- NORMSDIST(z)	H1: P1 > P2	

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.858	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.429	NORMSDIST(z)

Right Turn Crashes at Approaches with No Right Turn on Red Prohibition

Significance Test for Difference in Proportions

No Right Turn On Red
n=All Crash Types
X= Rt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (NoRightOnRed)	26	14	0.538
Sample2 (34 intersections)	188	81	0.431

null			Calculations		
alpha	0.1		pooled_p	0.444	(C5+C6)/(B5+B6)
alternate	upper		SE	0.1040	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
			z	1.035	((D5-D6)/SE

Results

Upper Test				
upper z	1.2816	(-)NORMSINV(alpha)	Significance Test	
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	Ans
Pvalue	0.1503	1- NORMSDIST(z)	H1: P1 > P2	

Other Tests

Two Sided Test			
two_z	1.645	ABS(NORMSINV(alpha/2))	
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")	
Pvalue	0.301	2*(1-NORMSDIST(ABS(z)))	
Lower Test			
lower z	-1.282	NORMSINV(alpha)	
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")	
Pvalue	0.850	NORMSDIST(z)	

Left Turn Crashes at Approaches with No Right Turn on Red Prohibition

Significance Test for Difference in Proportions

No Right Turn On Red
n=All Crash Types
X= Lt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (NoRightOnRed)	26	3	0.115
Sample2 (34 intersections)	188	39	0.207

null			Calculations		
alpha	0.1		pooled_p	0.196	(C5+C6)/(B5+B6)
alternate	upper		SE	0.0831	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
			z	-1.108	((D5-D6)/SE

Results

Upper Test				
upper z	1.2816	(-)NORMSINV(alpha)	Significance Test	
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	Ans
Pvalue	0.8660	1- NORMSDIST(z)	H1: P1 > P2	

Other Tests

Two Sided Test			
two_z	1.645	ABS(NORMSINV(alpha/2))	
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")	
Pvalue	0.268	2*(1-NORMSDIST(ABS(z)))	
Lower Test			
lower z	-1.282	NORMSINV(alpha)	
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")	
Pvalue	0.134	NORMSDIST(z)	

Straight Crashes at Approaches with No Right Turn on Red Prohibition

Significance Test for Difference in Proportions

No Right Turn On Red
n=All Crash Types
X= Straight

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (NoRightOnRed)	26	6	0.231
Sample2 (34 intersections)	188	42	0.223

null		Calculations			
alpha	0.1	pooled_p	0.224	(C5+C6)/(B5+B6)	
alternate	upper	SE	0.0873	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))	
		z	0.084	((D5-D6)/SE	

Results

Upper Test

upper z	1.2816	(-)NORMSINV(alpha)	Significance Test	
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	Ans
Pvalue	0.4664	1- NORMSDIST(z)	H1: P1 > P2	

Other Tests

Two Sided Test

two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.933	2*(1-NORMSDIST(ABS(z)))

Lower Test

lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.534	NORMSDIST(z)

Right Turn Crashes at Approaches with Right Turn on Red Prohibition

Significance Test for Difference in Proportions

Right Turn on Red
n=All Crash Types
X= Rt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Right On Red)	162	67	0.414
Sample2 (34 intersections)	188	81	0.431

null		Calculations		
alpha	0.1	pooled_p	0.423	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0530	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	-0.326	((D5-D6)/SE

Results

Upper Test				Significance Test
upper z	1.2816	(-)NORMSINV(alpha)		H0: P1 = P2
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")		H1: P1 > P2
Pvalue	0.6278	1- NORMSDIST(z)		

Ans

Other Tests

Two Sided Test			
two_z	1.645	ABS(NORMSINV(alpha/2))	
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")	
Pvalue	0.744	2*(1-NORMSDIST(ABS(z)))	
Lower Test			
lower z	-1.282	NORMSINV(alpha)	
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")	
Pvalue	0.372	NORMSDIST(z)	

Left Turn Crashes at Approaches with Right Turn on Red Prohibition

Significance Test for Difference in Proportions

Right Turn on Red
n=All Crash Types
X= Lt. Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Right On Red)	162	37	0.228
Sample2 (34 intersections)	188	39	0.207

null		Calculations		
alpha	0.1	pooled_p	0.217	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0442	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	0.474	((D5-D6)/SE

Results

Upper Test				Significance Test
upper z	1.2816	(-)NORMSINV(alpha)		H0: P1 = P2
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")		H1: P1 > P2
Pvalue	0.3178	1- NORMSDIST(z)		

Ans

Other Tests

Two Sided Test			
two_z	1.645	ABS(NORMSINV(alpha/2))	
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")	
Pvalue	0.636	2*(1-NORMSDIST(ABS(z)))	
Lower Test			
lower z	-1.282	NORMSINV(alpha)	
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")	
Pvalue	0.682	NORMSDIST(z)	

Straight Crashes at Approaches with Right Turn on Red Prohibition

Significance Test for Difference in Proportions

Right Turn on Red
n=All Crash Types
X= Straight

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Right On Red)	162	36	0.222
Sample2 (34 intersections)	188	42	0.223

null		Calculations		
alpha	0.1	pooled_p	0.223	(C5+C6)/(B5+B6)
alternate	upper	SE	0.0446	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))
		z	-0.026	((D5-D6)/SE

Results

Upper Test				
upper z	1.2816	(-)NORMSINV(alpha)	Significance Test	
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	Ans
Pvalue	0.5106	1- NORMSDIST(z)	H1: P1 > P2	

Other Tests

Two Sided Test		
two_z	1.645	ABS(NORMSINV(alpha/2))
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H0")
Pvalue	0.979	2*(1-NORMSDIST(ABS(z)))
Lower Test		
lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.489	NORMSDIST(z)

Left Turn Crashes at Exclusive Left Turn Lanes

Significance Test for Difference in Proportions

Left Turn Lanes
n=All Crash Types
X= Left Turns

Summary Statistics and User Input

Group	n	X	p_hat
Sample1 (Excl. Lt. Turn Lane)	157	34	0.217
Sample2 (34 intersections)	213	43	0.202

null		Calculations			
alpha	0.1	pooled_p	0.208	(C5+C6)/(B5+B6)	
alternate	upper	SE	0.0427	SQRT(pooled_p*(1-pooled_p)*(1/B5 + 1/B6))	
		z	0.344	((D5-D6)/SE	

Results

Upper Test			Significance Test	
upper z	1.2816	(-)NORMSINV(alpha)		
Decision	**Do Not Reject H0**	IF(z>upper_z,"Reject H0", "Do Not Reject H0")	H0: P1 = P2	Ans
Pvalue	0.3655	1- NORMSDIST(z)	H1: P1 > P2	

Other Tests

Two Sided Test		
two_z	1.645	ABS(NORMSINV(alpl
Decision	Do Not Reject H0	IF(ABS(z)>two_z), "Reject H0", "Do Not Reject H
Pvalue	0.731	2*(1-NORMSDIST(AB
Lower Test		
lower z	-1.282	NORMSINV(alpha)
Decision	Do Not Reject H0	IF(z<lower_z,"Reject H0", "Do Not Reject H0")
Pvalue	0.635	NORMSDIST(z)

APPENDIX F:

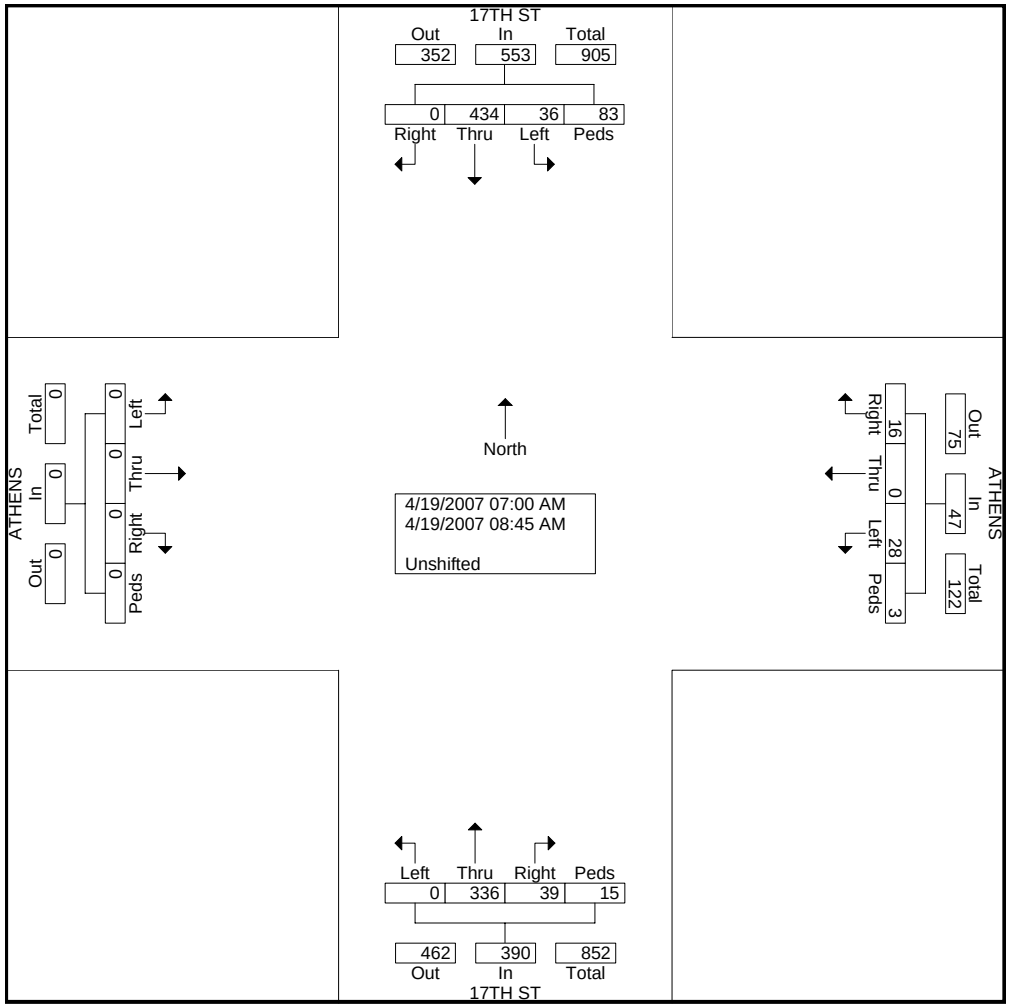
Turning Movement Datasheets

All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : 17TH&ATHENSAM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 1

Groups Printed- Unshifted

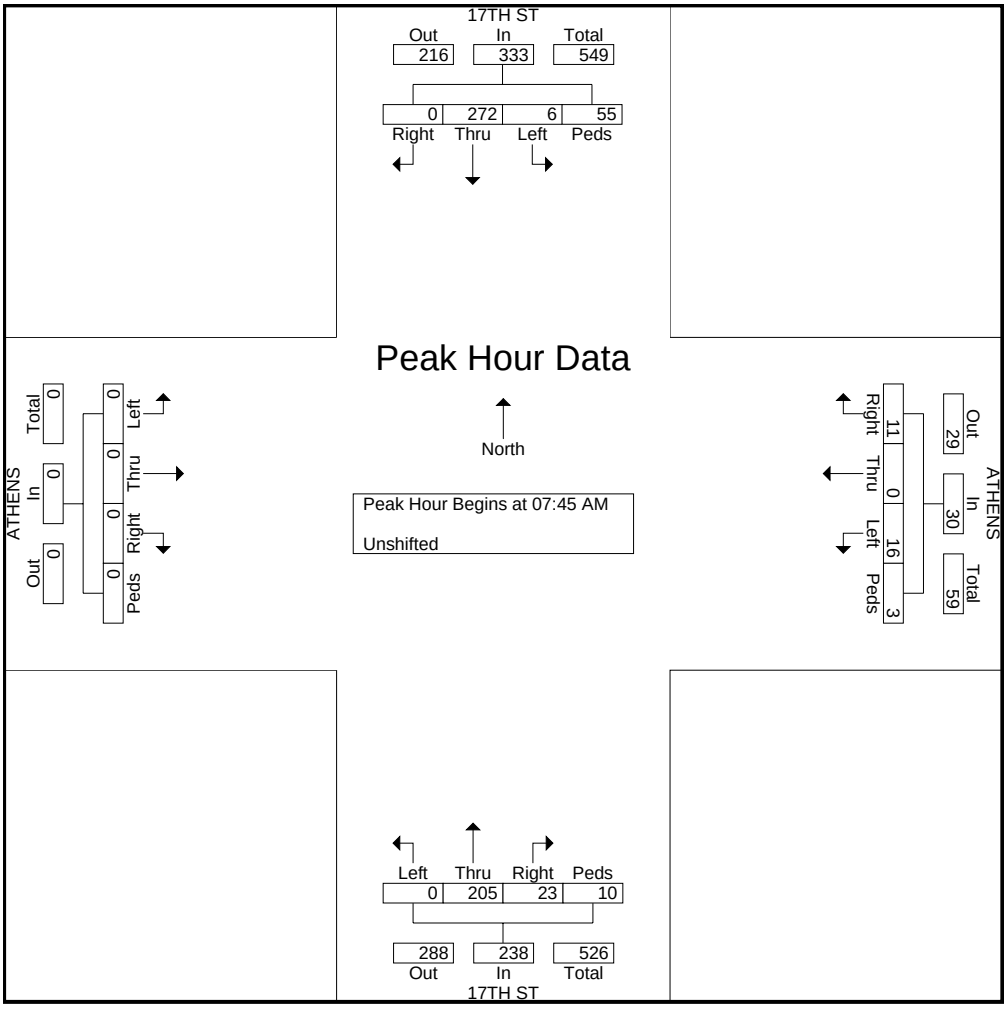
	17TH ST Southbound				ATHENS Westbound				17TH ST Northbound				ATHENS Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	7	21	0	6	1	0	1	0	0	20	1	0	0	0	0	0	57
07:15 AM	13	34	0	1	4	0	0	0	0	31	3	5	0	0	0	0	91
07:30 AM	7	44	0	5	5	0	2	0	0	32	4	0	0	0	0	0	99
07:45 AM	3	94	0	39	3	0	4	0	0	55	3	4	0	0	0	0	205
Total	30	193	0	51	13	0	7	0	0	138	11	9	0	0	0	0	452
08:00 AM	1	63	0	6	2	0	1	2	0	49	9	3	0	0	0	0	136
08:15 AM	0	58	0	4	7	0	3	0	0	53	5	0	0	0	0	0	130
08:30 AM	2	57	0	6	4	0	3	1	0	48	6	3	0	0	0	0	130
08:45 AM	3	63	0	16	2	0	2	0	0	48	8	0	0	0	0	0	142
Total	6	241	0	32	15	0	9	3	0	198	28	6	0	0	0	0	538
Grand Total	36	434	0	83	28	0	16	3	0	336	39	15	0	0	0	0	990
Apprch %	6.5	78.5	0	15	59.6	0	34	6.4	0	86.2	10	3.8	0	0	0	0	
Total %	3.6	43.8	0	8.4	2.8	0	1.6	0.3	0	33.9	3.9	1.5	0	0	0	0	



All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : 17TH&ATHENSAM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 2

	17TH ST Southbound					ATHENS Westbound					17TH ST Northbound					ATHENS Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	3	94	0	39	136	3	0	4	0	7	0	55	3	4	62	0	0	0	0	0	205
08:00 AM	1	63	0	6	70	2	0	1	2	5	0	49	9	3	61	0	0	0	0	0	136
08:15 AM	0	58	0	4	62	7	0	3	0	10	0	53	5	0	58	0	0	0	0	0	130
08:30 AM	2	57	0	6	65	4	0	3	1	8	0	48	6	3	57	0	0	0	0	0	130
Total Volume	6	272	0	55	333	16	0	11	3	30	0	205	23	10	238	0	0	0	0	0	601
% App. Total	1.8	81.7	0	16.5		53.3	0	36.7	10		0	86.1	9.7	4.2		0	0	0	0		
PHF	.500	.723	.000	.353	.612	.571	.000	.688	.375	.750	.000	.932	.639	.625	.960	.000	.000	.000	.000	.000	.733

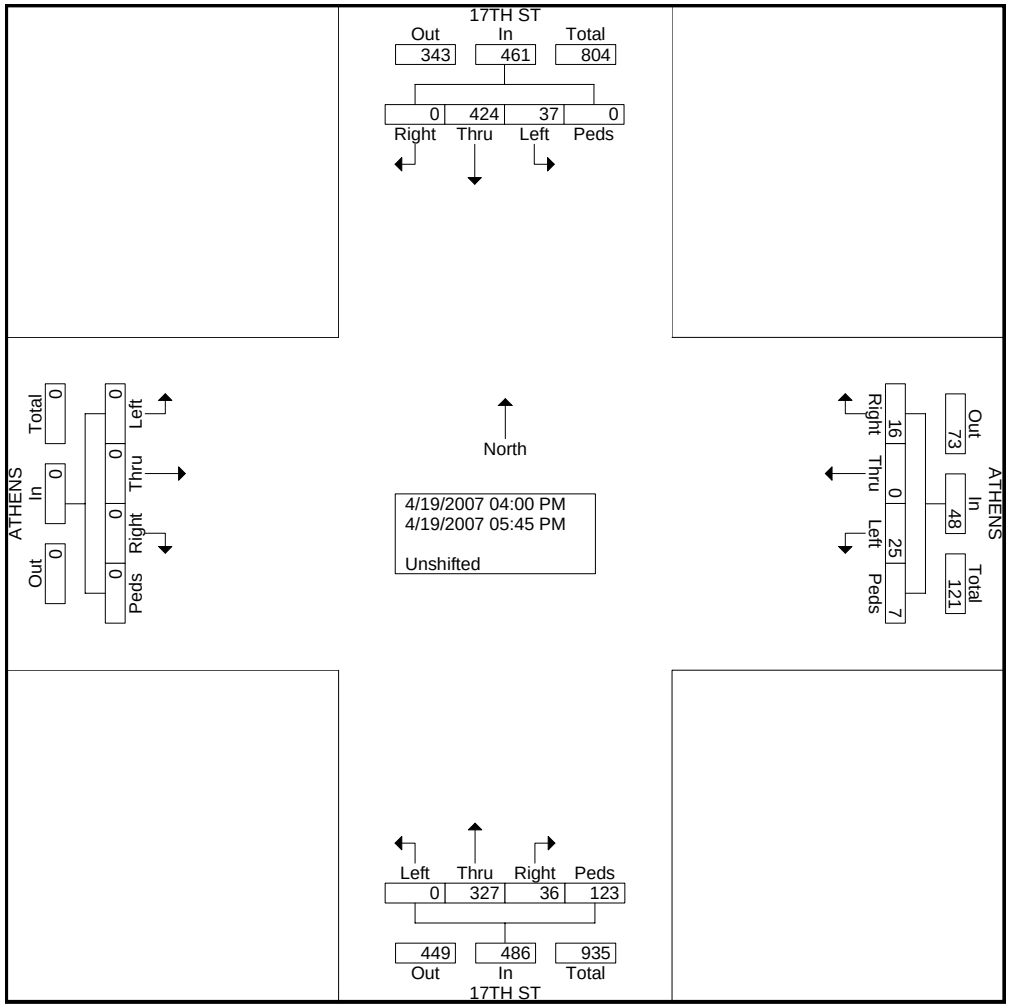


All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : 17TH&ATHENSPM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 1

Groups Printed- Unshifted

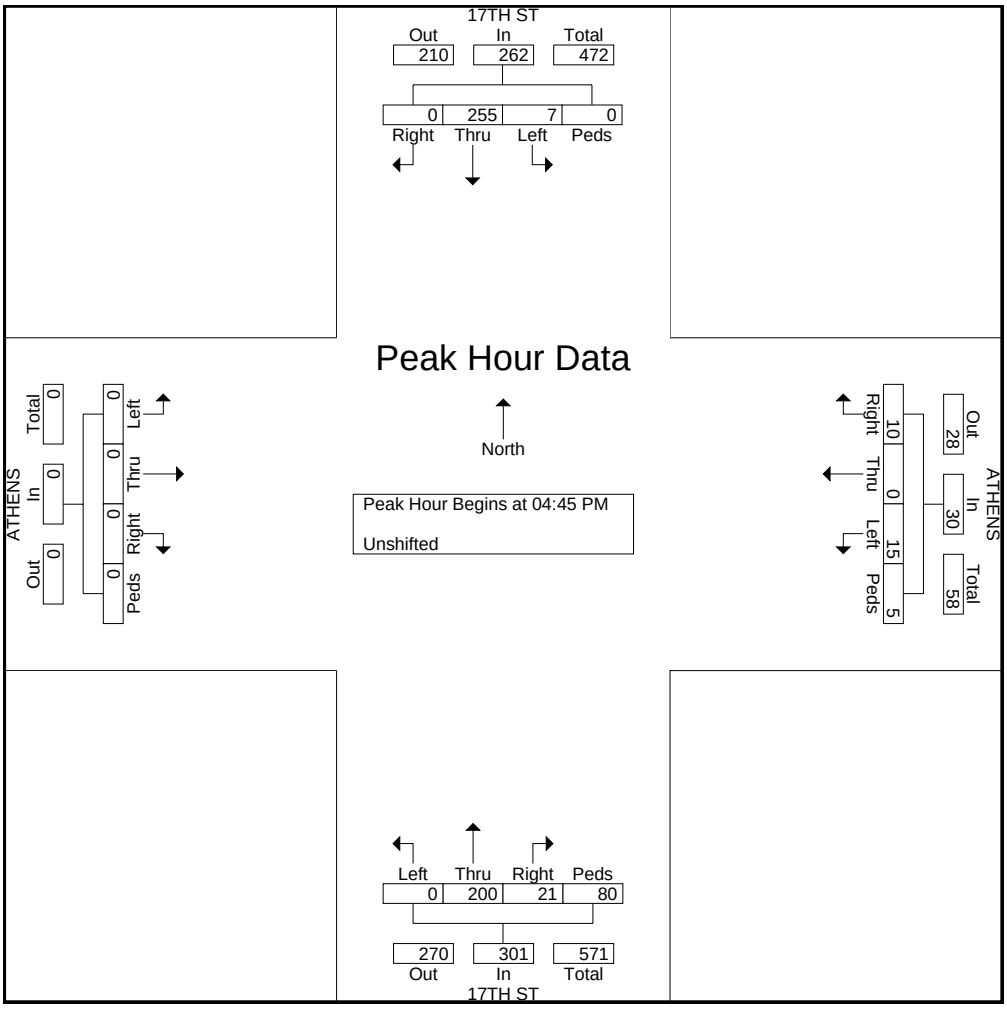
	17TH ST Southbound				ATHENS Westbound				17TH ST Northbound				ATHENS Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
04:00 PM	8	22	0	0	0	0	1	0	0	20	1	6	0	0	0	0	58
04:15 PM	13	35	0	0	4	0	0	2	0	32	2	5	0	0	0	0	93
04:30 PM	7	45	0	0	4	0	3	0	0	30	4	14	0	0	0	0	107
04:45 PM	3	87	0	0	2	0	3	1	0	53	2	49	0	0	0	0	200
Total	31	189	0	0	10	0	7	3	0	135	9	74	0	0	0	0	458
05:00 PM	1	58	0	0	2	0	1	3	0	48	8	12	0	0	0	0	133
05:15 PM	0	57	0	0	7	0	4	0	0	53	5	8	0	0	0	0	134
05:30 PM	3	53	0	0	4	0	2	1	0	46	6	11	0	0	0	0	126
05:45 PM	2	67	0	0	2	0	2	0	0	45	8	18	0	0	0	0	144
Total	6	235	0	0	15	0	9	4	0	192	27	49	0	0	0	0	537
Grand Total	37	424	0	0	25	0	16	7	0	327	36	123	0	0	0	0	995
Apprch %	8	92	0	0	52.1	0	33.3	14.6	0	67.3	7.4	25.3	0	0	0	0	
Total %	3.7	42.6	0	0	2.5	0	1.6	0.7	0	32.9	3.6	12.4	0	0	0	0	



All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : 17TH&ATHENSPM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 2

	17TH ST Southbound					ATHENS Westbound					17TH ST Northbound					ATHENS Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	3	87	0	0	90	2	0	3	1	6	0	53	2	49	104	0	0	0	0	0	200
05:00 PM	1	58	0	0	59	2	0	1	3	6	0	48	8	12	68	0	0	0	0	0	133
05:15 PM	0	57	0	0	57	7	0	4	0	11	0	53	5	8	66	0	0	0	0	0	134
05:30 PM	3	53	0	0	56	4	0	2	1	7	0	46	6	11	63	0	0	0	0	0	126
Total Volume	7	255	0	0	262	15	0	10	5	30	0	200	21	80	301	0	0	0	0	0	593
% App. Total	2.7	97.3	0	0		50	0	33.3	16.7		0	66.4	7	26.6		0	0	0	0		
PHF	.583	.733	.000	.000	.728	.536	.000	.625	.417	.682	.000	.943	.656	.408	.724	.000	.000	.000	.000	.000	.741

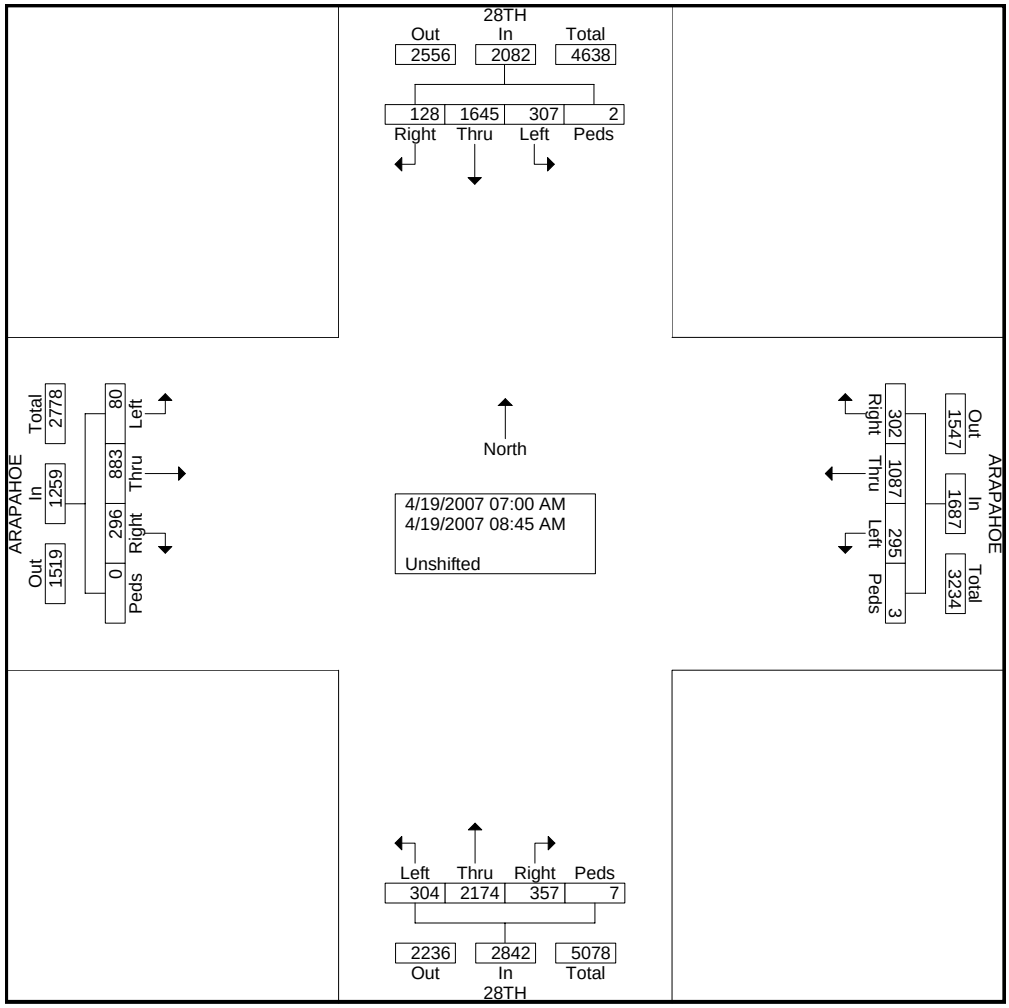


All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : 28TH&ARAPAHOEAM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 1

Groups Printed- Unshifted

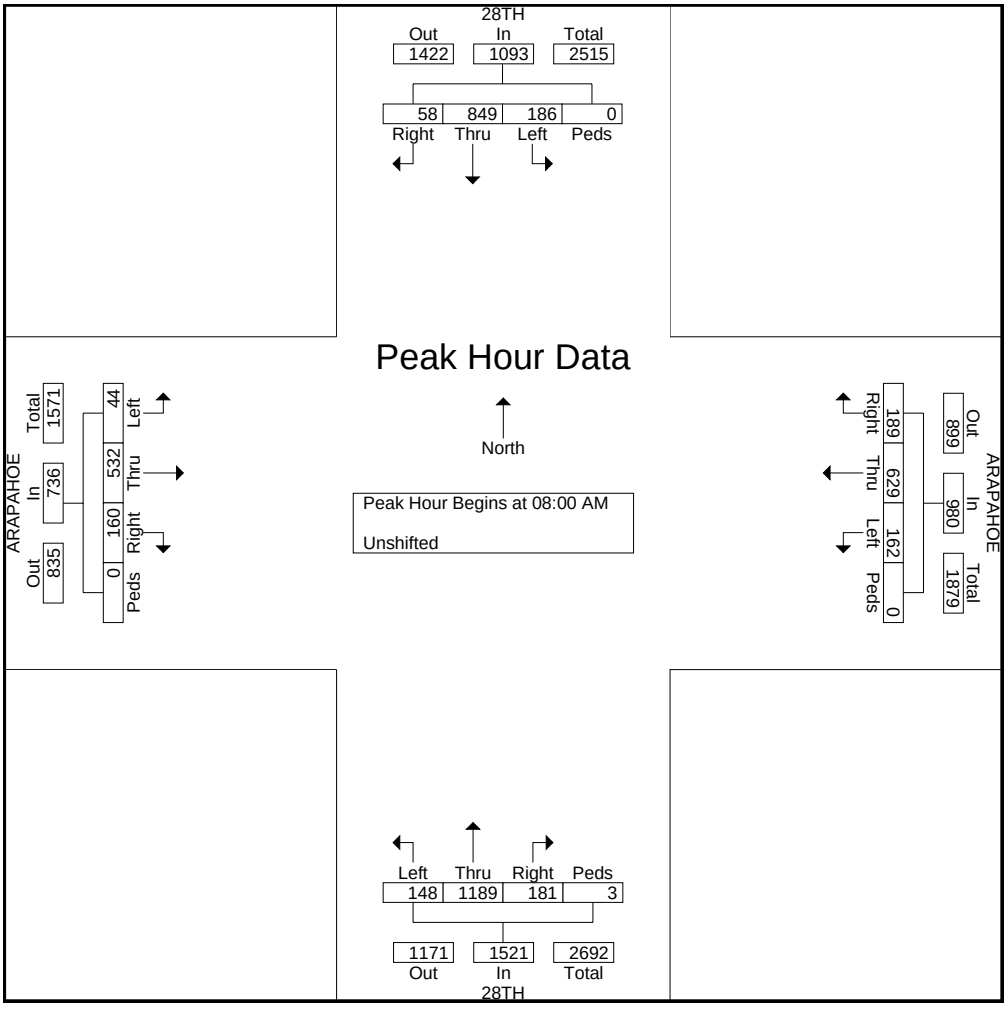
	28TH Southbound				ARAPAHOE Westbound				28TH Northbound				ARAPAHOE Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	23	192	21	0	35	101	21	0	46	170	41	0	10	60	23	0	743
07:15 AM	26	180	23	1	30	83	15	0	39	241	35	4	13	67	38	0	795
07:30 AM	37	198	16	1	29	133	30	2	42	273	53	0	8	97	32	0	951
07:45 AM	35	226	10	0	39	141	47	1	29	301	47	0	5	127	43	0	1051
Total	121	796	70	2	133	458	113	3	156	985	176	4	36	351	136	0	3540
08:00 AM	54	222	17	0	20	141	32	0	35	317	36	0	6	91	42	0	1013
08:15 AM	40	216	14	0	37	166	48	0	34	289	51	2	9	142	29	0	1077
08:30 AM	38	204	10	0	60	134	56	0	33	295	49	1	18	153	46	0	1097
08:45 AM	54	207	17	0	45	188	53	0	46	288	45	0	11	146	43	0	1143
Total	186	849	58	0	162	629	189	0	148	1189	181	3	44	532	160	0	4330
Grand Total	307	1645	128	2	295	1087	302	3	304	2174	357	7	80	883	296	0	7870
Apprch %	14.7	79	6.1	0.1	17.5	64.4	17.9	0.2	10.7	76.5	12.6	0.2	6.4	70.1	23.5	0	
Total %	3.9	20.9	1.6	0	3.7	13.8	3.8	0	3.9	27.6	4.5	0.1	1	11.2	3.8	0	



All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : 28TH&ARAPAHOEAM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 2

	28TH Southbound					ARAPAHOE Westbound					28TH Northbound					ARAPAHOE Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	54	222	17	0	293	20	141	32	0	193	35	317	36	0	388	6	91	42	0	139	1013
08:15 AM	40	216	14	0	270	37	166	48	0	251	34	289	51	2	376	9	142	29	0	180	1077
08:30 AM	38	204	10	0	252	60	134	56	0	250	33	295	49	1	378	18	153	46	0	217	1097
08:45 AM	54	207	17	0	278	45	188	53	0	286	46	288	45	0	379	11	146	43	0	200	1143
Total Volume	186	849	58	0	1093	162	629	189	0	980	148	1189	181	3	1521	44	532	160	0	736	4330
% App. Total	17	77.7	5.3	0		16.5	64.2	19.3	0		9.7	78.2	11.9	0.2		6	72.3	21.7	0		
PHF	.861	.956	.853	.000	.933	.675	.836	.844	.000	.857	.804	.938	.887	.375	.980	.611	.869	.870	.000	.848	.947

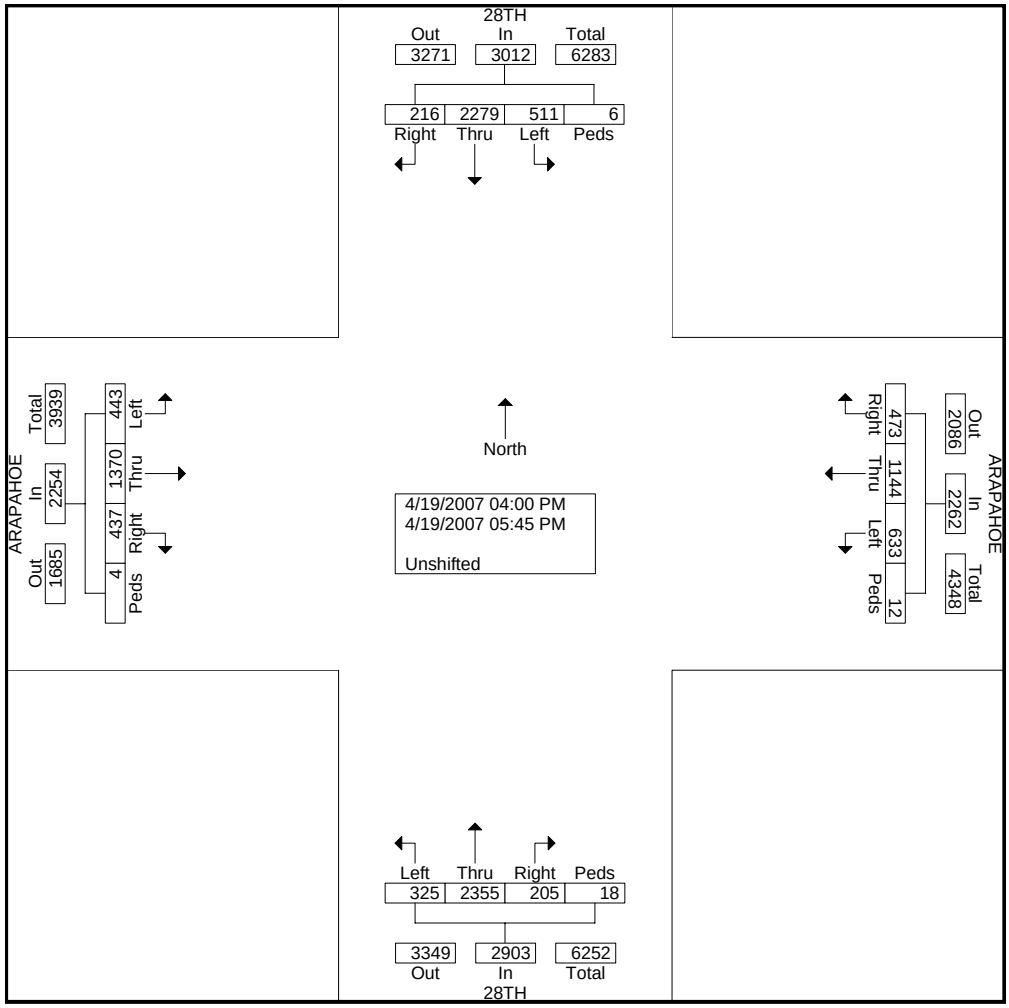


All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : 28TH&ARAPAHOEPM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 1

Groups Printed- Unshifted

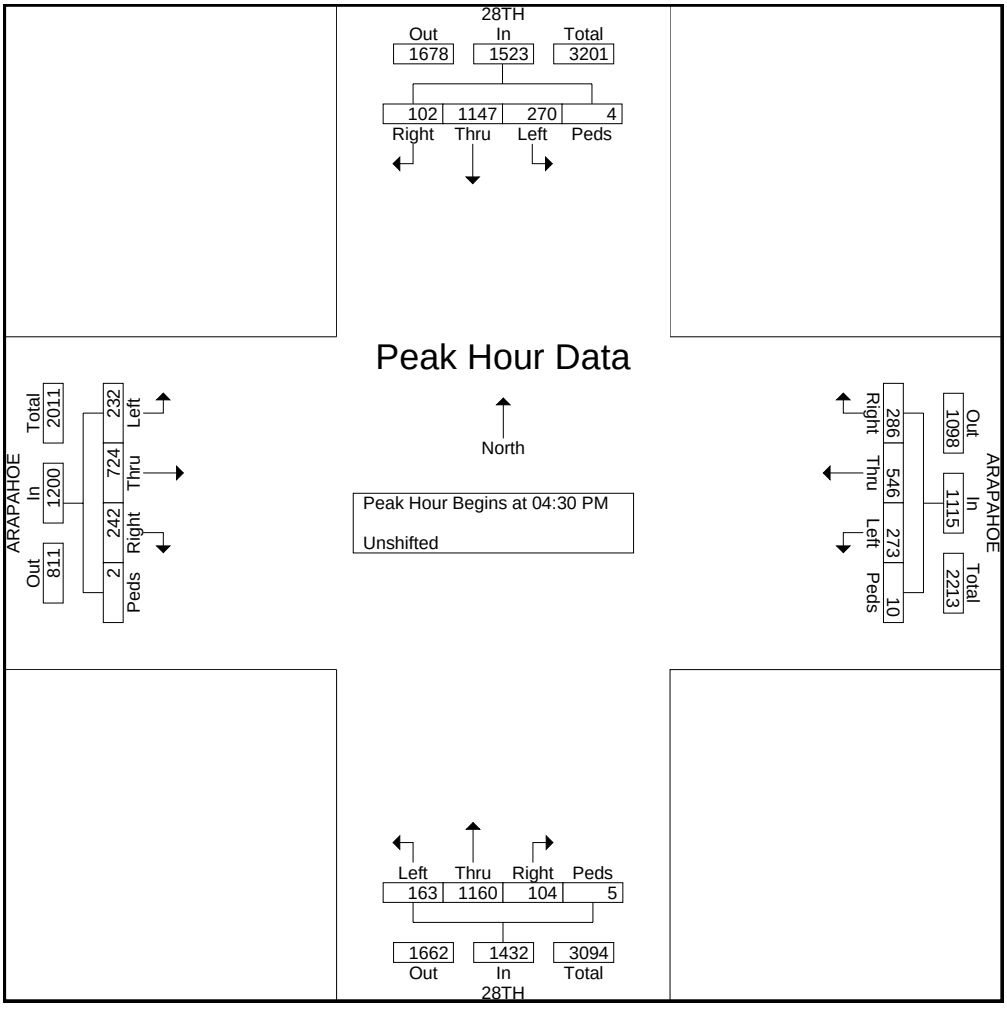
	28TH Southbound				ARAPAHOE Westbound				28TH Northbound				ARAPAHOE Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
04:00 PM	76	293	33	0	80	140	49	0	40	262	23	3	56	160	47	0	1262
04:15 PM	55	295	30	0	108	145	42	0	47	299	24	1	69	166	39	0	1320
04:30 PM	83	288	24	1	82	124	61	1	41	267	40	1	76	157	71	1	1318
04:45 PM	59	274	23	2	28	104	123	2	40	298	34	0	45	202	60	0	1294
Total	273	1150	110	3	298	513	275	3	168	1126	121	5	246	685	217	1	5194
05:00 PM	67	298	29	0	80	161	52	2	37	275	16	4	48	172	70	0	1311
05:15 PM	61	287	26	1	83	157	50	5	45	320	14	0	63	193	41	1	1347
05:30 PM	51	289	28	2	95	132	46	0	23	321	28	5	37	152	64	2	1275
05:45 PM	59	255	23	0	77	181	50	2	52	313	26	4	49	168	45	0	1304
Total	238	1129	106	3	335	631	198	9	157	1229	84	13	197	685	220	3	5237
Grand Total	511	2279	216	6	633	1144	473	12	325	2355	205	18	443	1370	437	4	10431
Apprch %	17	75.7	7.2	0.2	28	50.6	20.9	0.5	11.2	81.1	7.1	0.6	19.7	60.8	19.4	0.2	
Total %	4.9	21.8	2.1	0.1	6.1	11	4.5	0.1	3.1	22.6	2	0.2	4.2	13.1	4.2	0	



All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : 28TH&ARAPAHOEPM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 2

	28TH Southbound					ARAPAHOE Westbound					28TH Northbound					ARAPAHOE Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	83	288	24	1	396	82	124	61	1	268	41	267	40	1	349	76	157	71	1	305	1318
04:45 PM	59	274	23	2	358	28	104	123	2	257	40	298	34	0	372	45	202	60	0	307	1294
05:00 PM	67	298	29	0	394	80	161	52	2	295	37	275	16	4	332	48	172	70	0	290	1311
05:15 PM	61	287	26	1	375	83	157	50	5	295	45	320	14	0	379	63	193	41	1	298	1347
Total Volume	270	1147	102	4	1523	273	546	286	10	1115	163	1160	104	5	1432	232	724	242	2	1200	5270
% App. Total	17.7	75.3	6.7	0.3		24.5	49	25.7	0.9		11.4	81	7.3	0.3		19.3	60.3	20.2	0.2		
PHF	.813	.962	.879	.500	.961	.822	.848	.581	.500	.945	.906	.906	.650	.313	.945	.763	.896	.852	.500	.977	.978

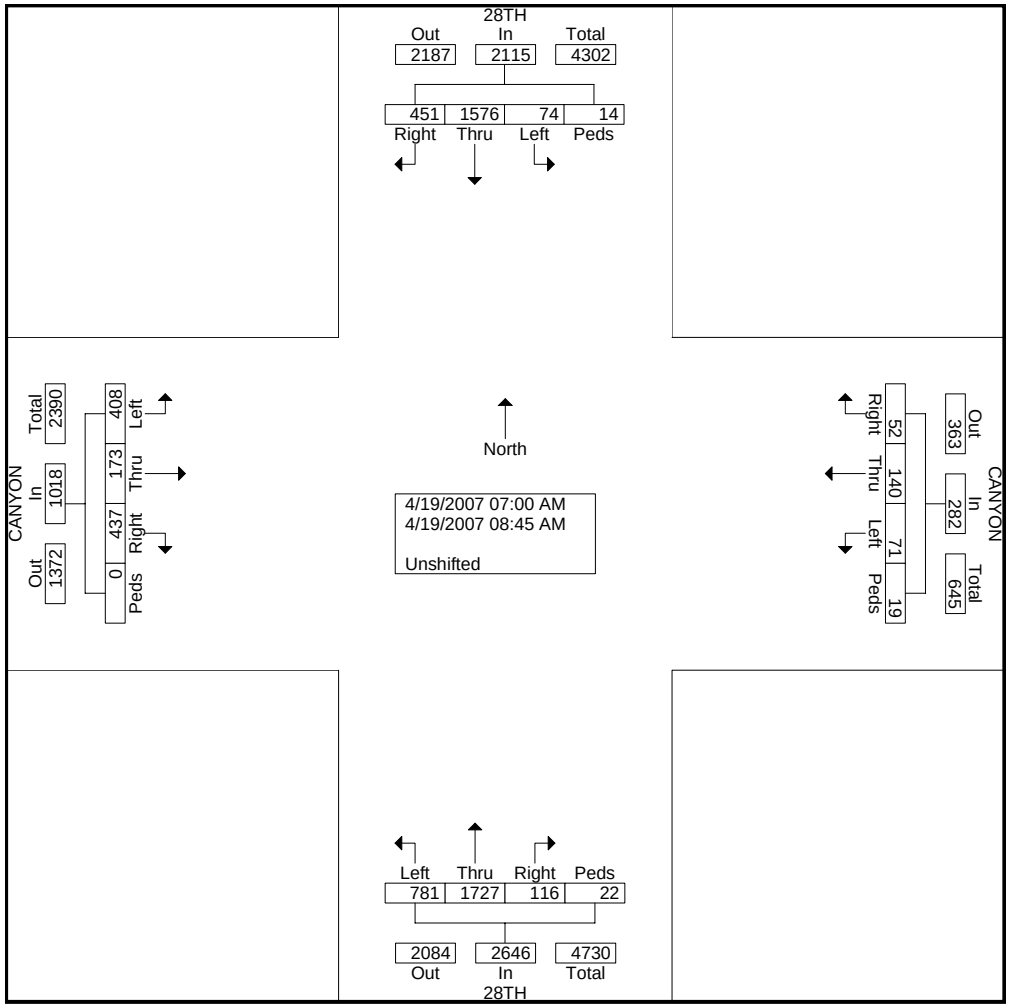


All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : 28TH&CANYONAM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 1

Groups Printed- Unshifted

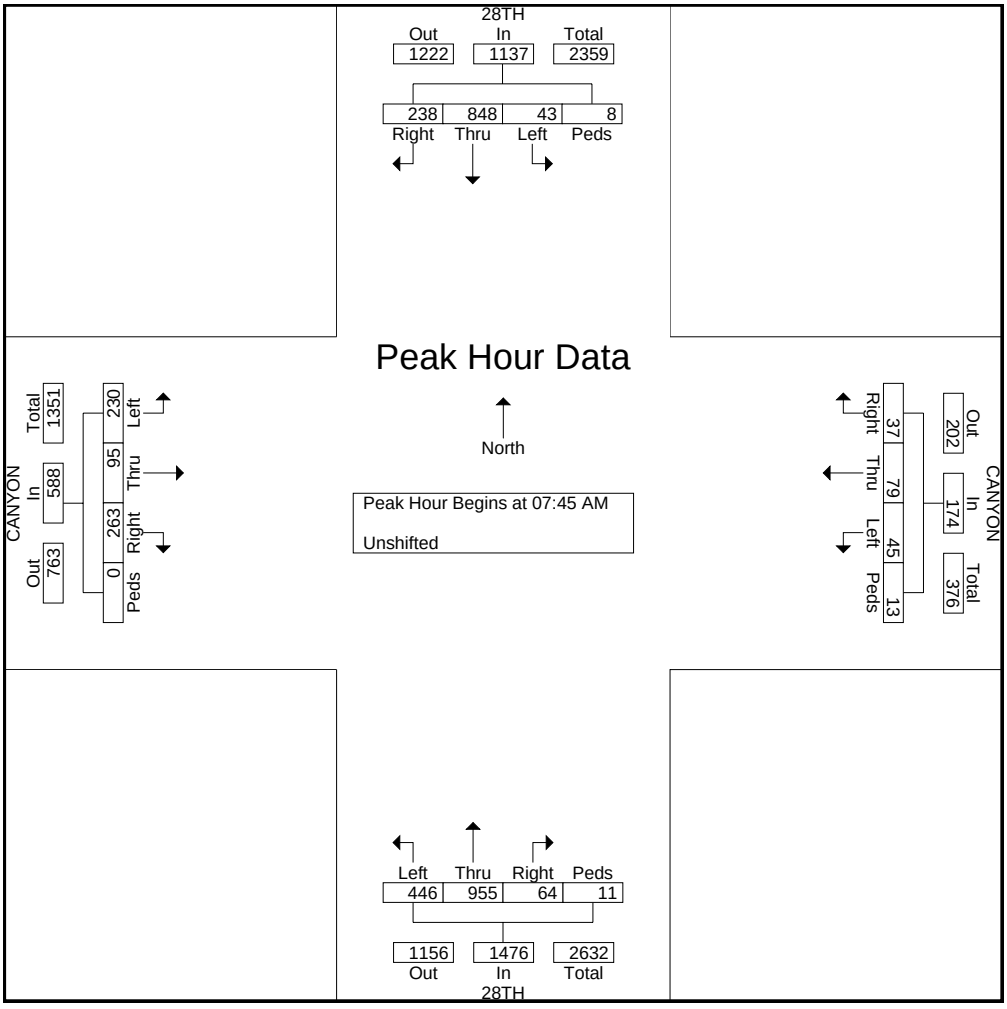
	28TH Southbound				CANYON Westbound				28TH Northbound				CANYON Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	6	167	41	1	5	6	5	1	77	148	12	4	33	10	31	0	547
07:15 AM	5	167	41	1	7	15	4	2	80	184	17	4	33	13	37	0	610
07:30 AM	10	214	58	2	3	19	2	1	86	197	8	2	39	14	53	0	708
07:45 AM	10	251	74	2	10	15	10	3	112	246	21	1	46	23	63	0	887
Total	31	799	214	6	25	55	21	7	355	775	58	11	151	60	184	0	2752
08:00 AM	8	218	57	1	8	16	9	1	118	220	13	2	65	27	64	0	827
08:15 AM	13	203	49	3	17	19	5	5	107	249	15	5	62	21	70	0	843
08:30 AM	12	176	58	2	10	29	13	4	109	240	15	3	57	24	66	0	818
08:45 AM	10	180	73	2	11	21	4	2	92	243	15	1	73	41	53	0	821
Total	43	777	237	8	46	85	31	12	426	952	58	11	257	113	253	0	3309
Grand Total	74	1576	451	14	71	140	52	19	781	1727	116	22	408	173	437	0	6061
Apprch %	3.5	74.5	21.3	0.7	25.2	49.6	18.4	6.7	29.5	65.3	4.4	0.8	40.1	17	42.9	0	
Total %	1.2	26	7.4	0.2	1.2	2.3	0.9	0.3	12.9	28.5	1.9	0.4	6.7	2.9	7.2	0	



All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : 28TH&CANYONAM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 2

	28TH Southbound					CANYON Westbound					28TH Northbound					CANYON Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	10	251	74	2	337	10	15	10	3	38	112	246	21	1	380	46	23	63	0	132	887
08:00 AM	8	218	57	1	284	8	16	9	1	34	118	220	13	2	353	65	27	64	0	156	827
08:15 AM	13	203	49	3	268	17	19	5	5	46	107	249	15	5	376	62	21	70	0	153	843
08:30 AM	12	176	58	2	248	10	29	13	4	56	109	240	15	3	367	57	24	66	0	147	818
Total Volume	43	848	238	8	1137	45	79	37	13	174	446	955	64	11	1476	230	95	263	0	588	3375
% App. Total	3.8	74.6	20.9	0.7		25.9	45.4	21.3	7.5		30.2	64.7	4.3	0.7		39.1	16.2	44.7	0		
PHF	.827	.845	.804	.667	.843	.662	.681	.712	.650	.777	.945	.959	.762	.550	.971	.885	.880	.939	.000	.942	.951

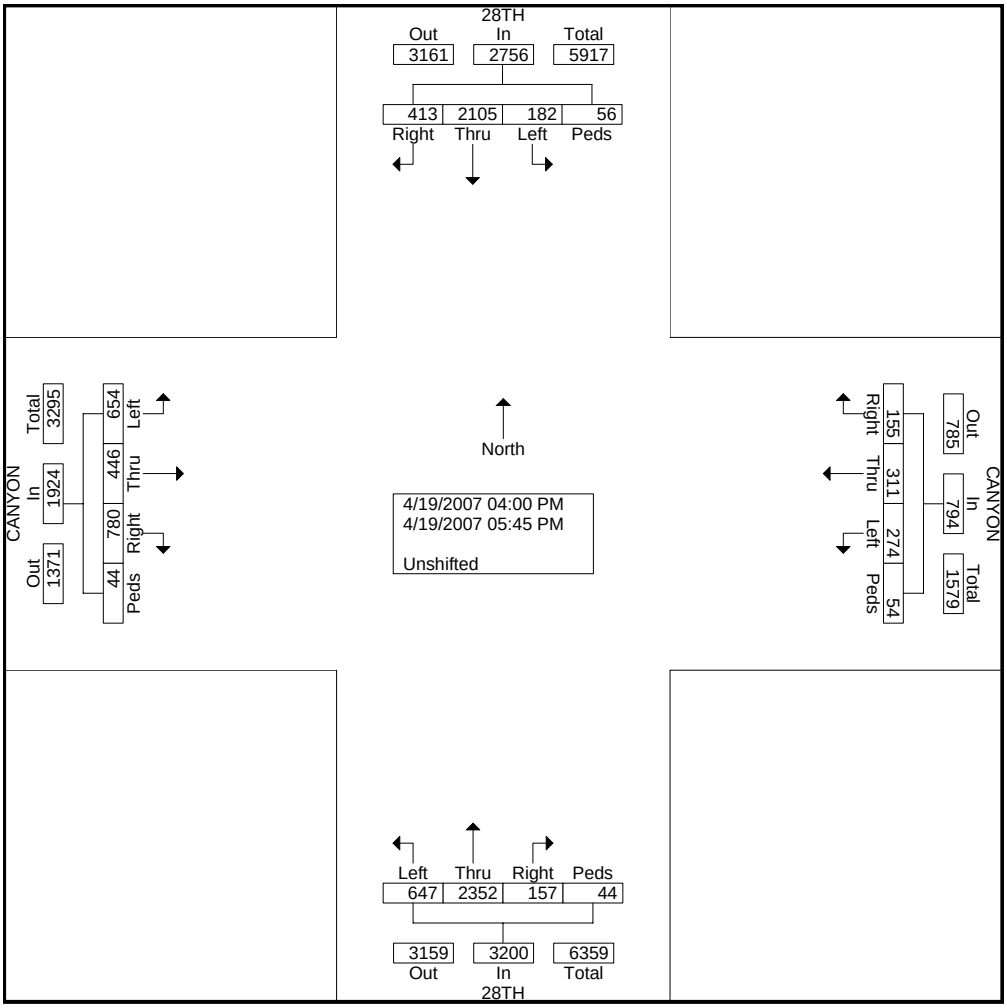


All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : 28TH&CANYONPM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 1

Groups Printed- Unshifted

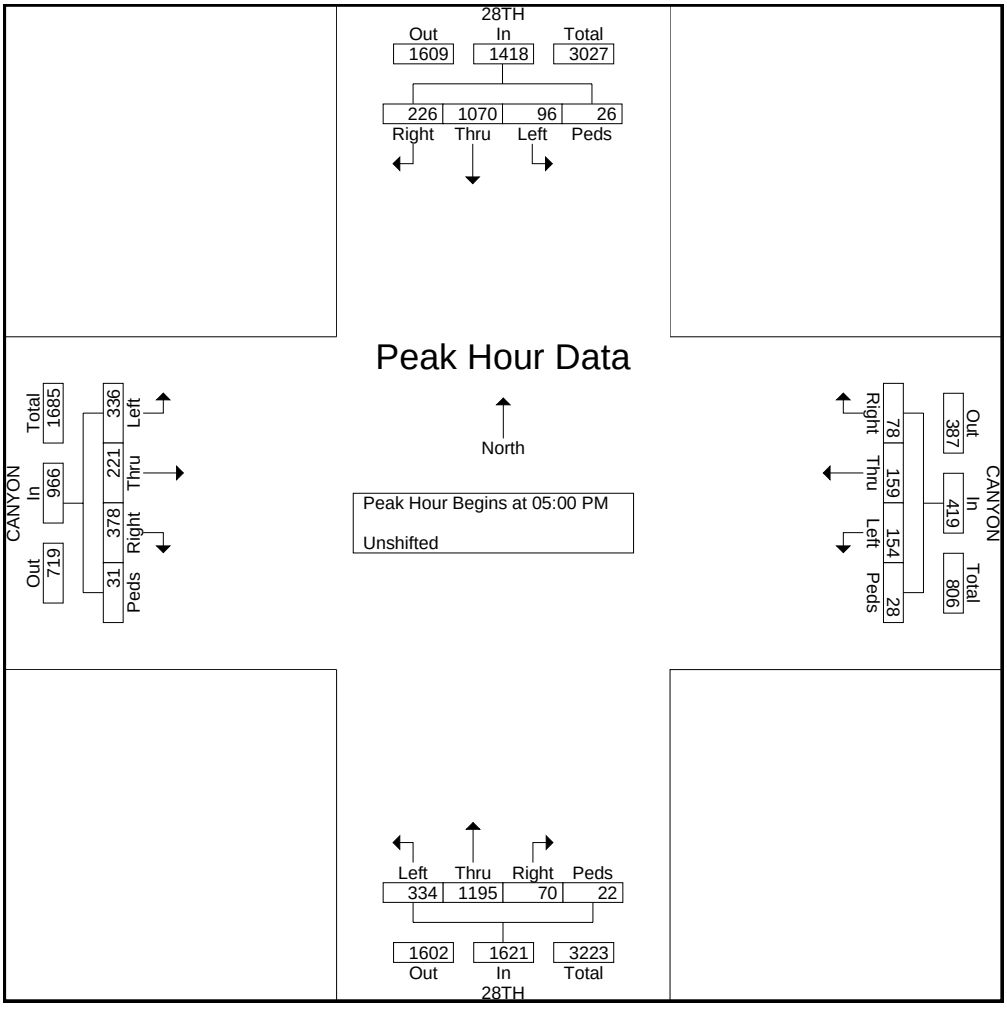
	28TH Southbound				CANYON Westbound				28TH Northbound				CANYON Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
04:00 PM	28	269	45	7	27	29	18	3	82	290	24	11	73	48	101	2	1057
04:15 PM	17	231	40	8	40	43	20	9	79	305	22	4	85	68	112	3	1086
04:30 PM	21	293	49	8	21	44	17	5	73	295	23	5	66	52	88	6	1066
04:45 PM	20	242	53	7	32	36	22	9	79	267	18	2	94	57	101	2	1041
Total	86	1035	187	30	120	152	77	26	313	1157	87	22	318	225	402	13	4250
05:00 PM	20	276	51	7	39	43	26	4	83	281	17	6	71	51	86	9	1070
05:15 PM	27	252	65	7	52	30	17	9	99	310	21	6	94	62	104	8	1163
05:30 PM	28	285	45	7	29	39	17	7	67	280	20	5	91	53	94	6	1073
05:45 PM	21	257	65	5	34	47	18	8	85	324	12	5	80	55	94	8	1118
Total	96	1070	226	26	154	159	78	28	334	1195	70	22	336	221	378	31	4424
Grand Total	182	2105	413	56	274	311	155	54	647	2352	157	44	654	446	780	44	8674
Apprch %	6.6	76.4	15	2	34.5	39.2	19.5	6.8	20.2	73.5	4.9	1.4	34	23.2	40.5	2.3	
Total %	2.1	24.3	4.8	0.6	3.2	3.6	1.8	0.6	7.5	27.1	1.8	0.5	7.5	5.1	9	0.5	



All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : 28TH&CANYONPM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 2

	28TH Southbound					CANYON Westbound					28TH Northbound					CANYON Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	20	276	51	7	354	39	43	26	4	112	83	281	17	6	387	71	51	86	9	217	1070
05:15 PM	27	252	65	7	351	52	30	17	9	108	99	310	21	6	436	94	62	104	8	268	1163
05:30 PM	28	285	45	7	365	29	39	17	7	92	67	280	20	5	372	91	53	94	6	244	1073
05:45 PM	21	257	65	5	348	34	47	18	8	107	85	324	12	5	426	80	55	94	8	237	1118
Total Volume	96	1070	226	26	1418	154	159	78	28	419	334	1195	70	22	1621	336	221	378	31	966	4424
% App. Total	6.8	75.5	15.9	1.8		36.8	37.9	18.6	6.7		20.6	73.7	4.3	1.4		34.8	22.9	39.1	3.2		
PHF	.857	.939	.869	.929	.971	.740	.846	.750	.778	.935	.843	.922	.833	.917	.929	.894	.891	.909	.861	.901	.951

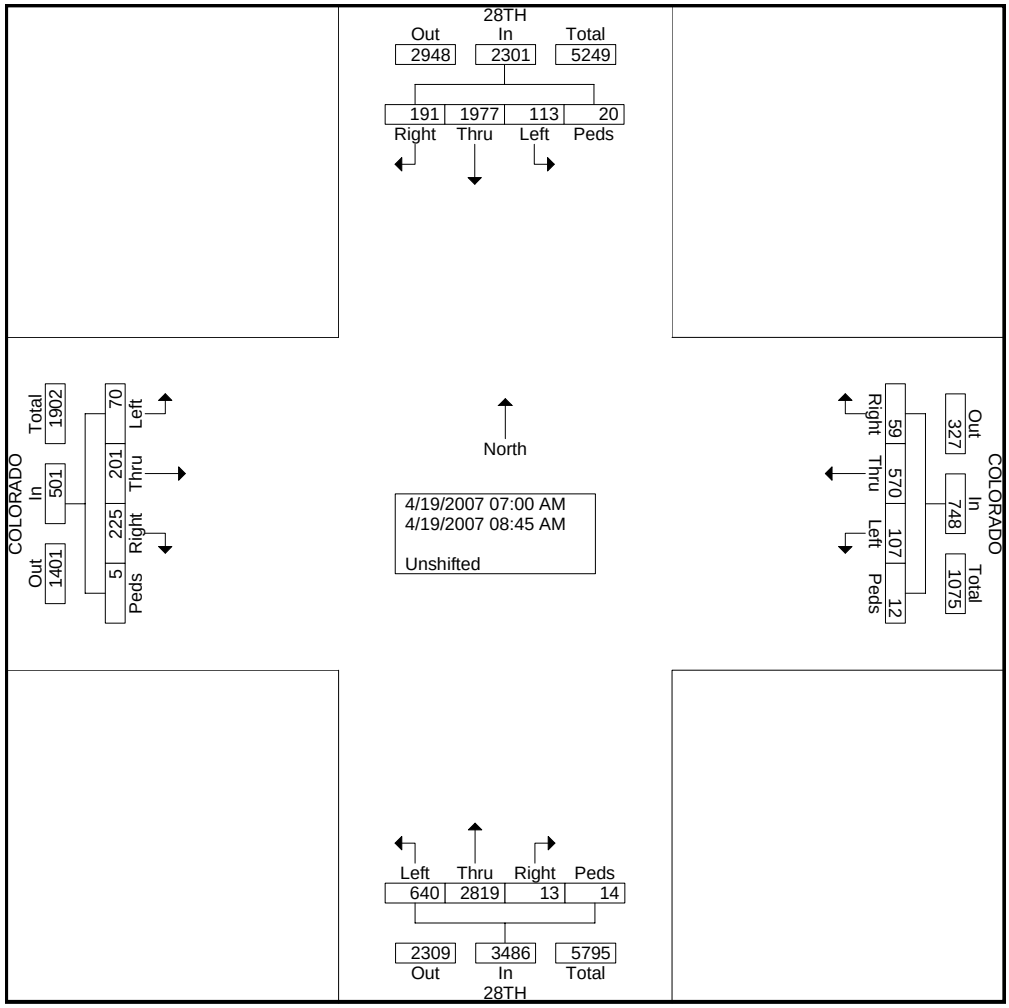


All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : 28TH&COLORADOAM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 1

Groups Printed- Unshifted

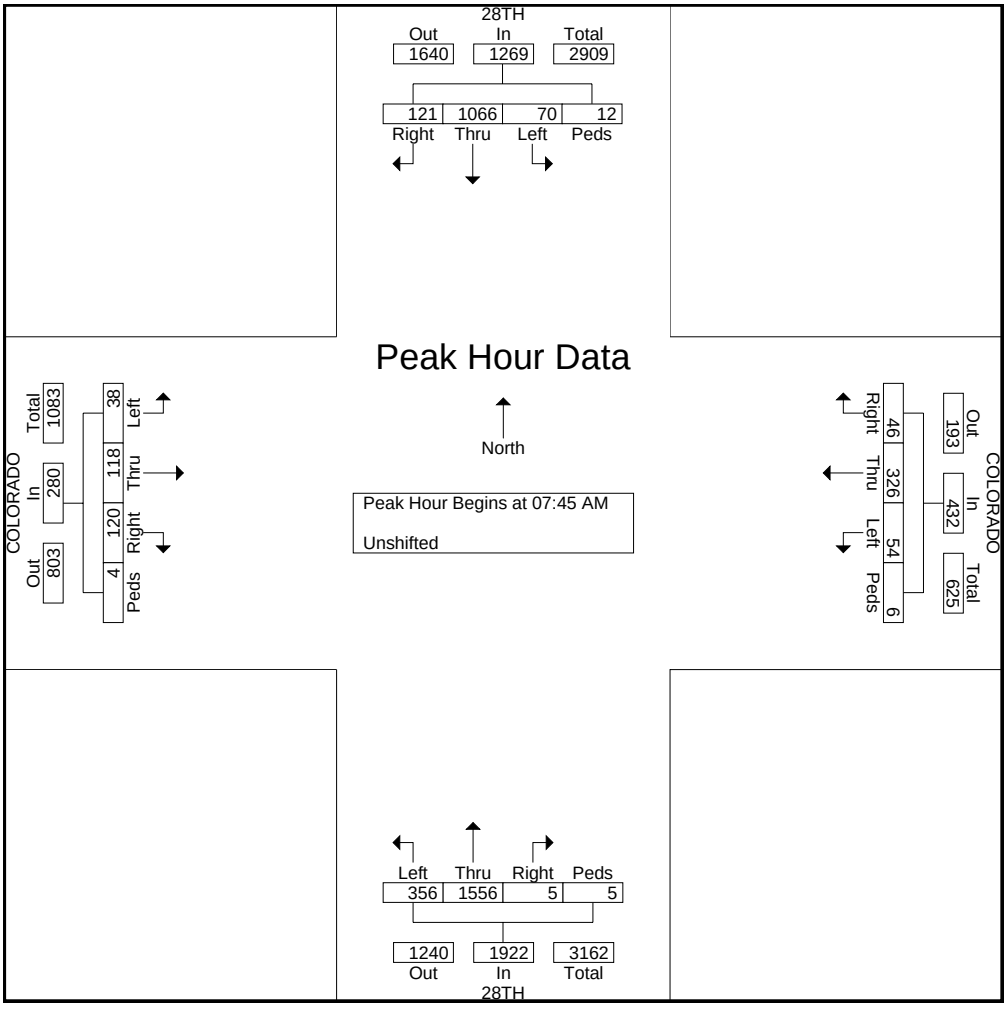
	28TH Southbound				COLORADO Westbound				28TH Northbound				COLORADO Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	9	185	12	0	14	38	2	0	40	269	3	0	6	18	28	0	624
07:15 AM	9	237	12	2	10	42	1	1	51	276	4	2	5	19	27	1	699
07:30 AM	10	269	22	1	14	81	4	2	81	362	1	3	8	25	21	0	904
07:45 AM	13	278	38	3	14	105	13	1	102	419	0	3	5	28	32	3	1057
Total	41	969	84	6	52	266	20	4	274	1326	8	8	24	90	108	4	3284
08:00 AM	25	224	28	2	10	78	14	1	82	423	0	0	11	30	30	0	958
08:15 AM	22	280	26	3	17	71	7	2	85	358	2	2	11	30	28	1	945
08:30 AM	10	284	29	4	13	72	12	2	87	356	3	0	11	30	30	0	943
08:45 AM	15	220	24	5	15	83	6	3	112	356	0	4	13	21	29	0	906
Total	72	1008	107	14	55	304	39	8	366	1493	5	6	46	111	117	1	3752
Grand Total	113	1977	191	20	107	570	59	12	640	2819	13	14	70	201	225	5	7036
Apprch %	4.9	85.9	8.3	0.9	14.3	76.2	7.9	1.6	18.4	80.9	0.4	0.4	14	40.1	44.9	1	
Total %	1.6	28.1	2.7	0.3	1.5	8.1	0.8	0.2	9.1	40.1	0.2	0.2	1	2.9	3.2	0.1	



All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : 28TH&COLORADOAM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 2

	28TH Southbound					COLORADO Westbound					28TH Northbound					COLORADO Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	13	278	38	3	332	14	105	13	1	133	102	419	0	3	524	5	28	32	3	68	1057
08:00 AM	25	224	28	2	279	10	78	14	1	103	82	423	0	0	505	11	30	30	0	71	958
08:15 AM	22	280	26	3	331	17	71	7	2	97	85	358	2	2	447	11	30	28	1	70	945
08:30 AM	10	284	29	4	327	13	72	12	2	99	87	356	3	0	446	11	30	30	0	71	943
Total Volume	70	1066	121	12	1269	54	326	46	6	432	356	1556	5	5	1922	38	118	120	4	280	3903
% App. Total	5.5	84	9.5	0.9		12.5	75.5	10.6	1.4		18.5	81	0.3	0.3		13.6	42.1	42.9	1.4		
PHF	.700	.938	.796	.750	.956	.794	.776	.821	.750	.812	.873	.920	.417	.417	.917	.864	.983	.938	.333	.986	.923

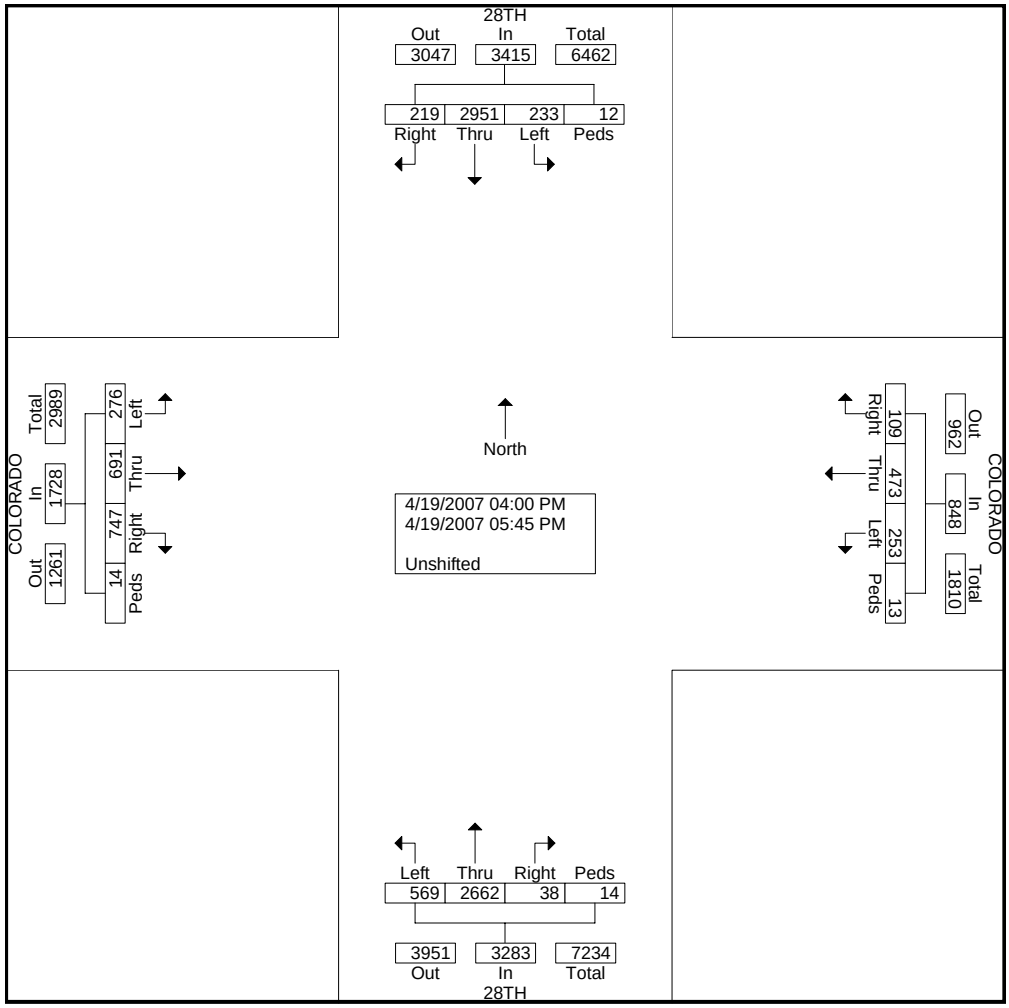


All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : 28TH&COLORADOPM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 1

Groups Printed- Unshifted

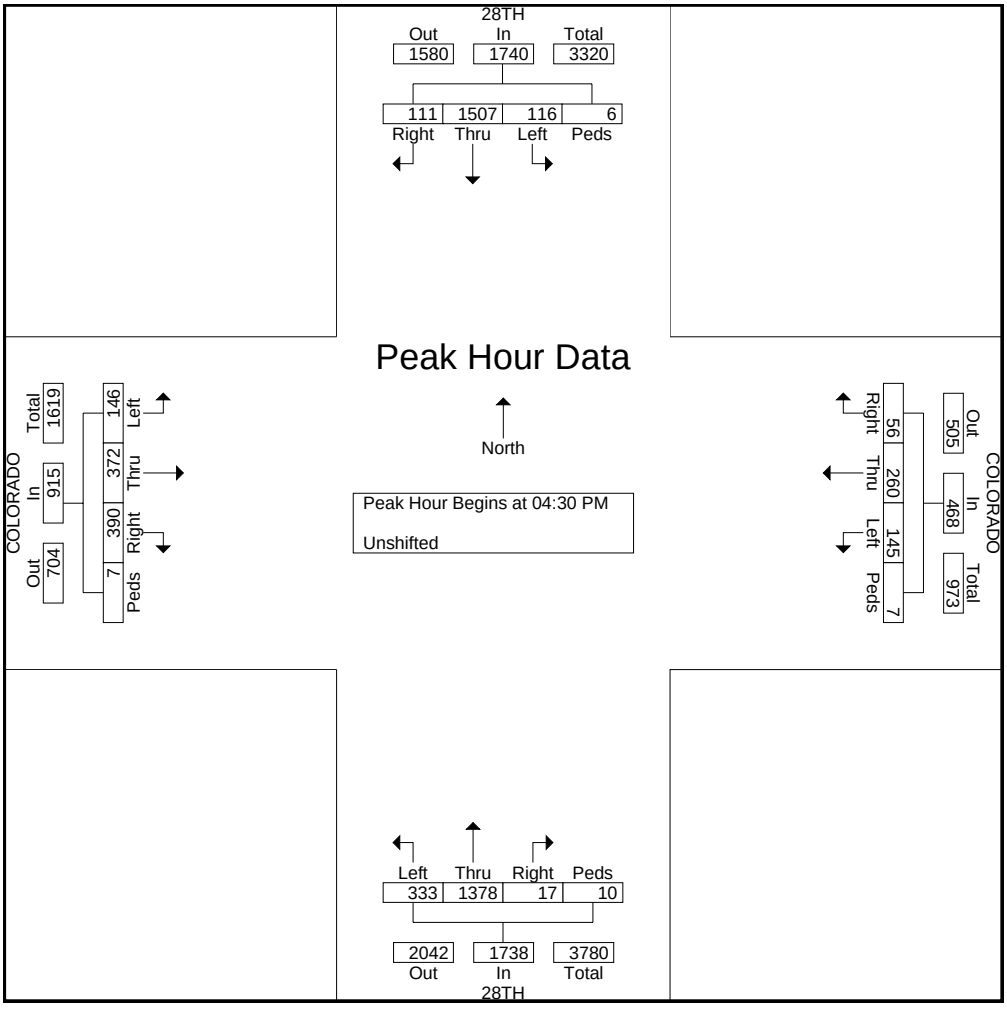
	28TH Southbound				COLORADO Westbound				28TH Northbound				COLORADO Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
04:00 PM	34	333	30	0	27	44	13	2	56	289	2	2	23	71	104	2	1032
04:15 PM	30	349	32	5	21	71	15	2	64	345	9	1	32	87	98	4	1165
04:30 PM	33	330	29	0	33	60	12	0	77	310	2	0	26	105	125	3	1145
04:45 PM	32	441	27	0	41	47	17	0	82	374	5	4	41	102	105	4	1322
Total	129	1453	118	5	122	222	57	4	279	1318	18	7	122	365	432	13	4664
05:00 PM	35	349	24	2	39	76	11	3	94	321	5	2	49	76	87	0	1173
05:15 PM	16	387	31	4	32	77	16	4	80	373	5	4	30	89	73	0	1221
05:30 PM	28	341	22	1	34	58	8	1	61	316	6	1	46	89	84	0	1096
05:45 PM	25	421	24	0	26	40	17	1	55	334	4	0	29	72	71	1	1120
Total	104	1498	101	7	131	251	52	9	290	1344	20	7	154	326	315	1	4610
Grand Total	233	2951	219	12	253	473	109	13	569	2662	38	14	276	691	747	14	9274
Apprch %	6.8	86.4	6.4	0.4	29.8	55.8	12.9	1.5	17.3	81.1	1.2	0.4	16	40	43.2	0.8	
Total %	2.5	31.8	2.4	0.1	2.7	5.1	1.2	0.1	6.1	28.7	0.4	0.2	3	7.5	8.1	0.2	



All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : 28TH&COLORADOPM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 2

	28TH Southbound					COLORADO Westbound					28TH Northbound					COLORADO Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	33	330	29	0	392	33	60	12	0	105	77	310	2	0	389	26	105	125	3	259	1145
04:45 PM	32	441	27	0	500	41	47	17	0	105	82	374	5	4	465	41	102	105	4	252	1322
05:00 PM	35	349	24	2	410	39	76	11	3	129	94	321	5	2	422	49	76	87	0	212	1173
05:15 PM	16	387	31	4	438	32	77	16	4	129	80	373	5	4	462	30	89	73	0	192	1221
Total Volume	116	1507	111	6	1740	145	260	56	7	468	333	1378	17	10	1738	146	372	390	7	915	4861
% App. Total	6.7	86.6	6.4	0.3		31	55.6	12	1.5		19.2	79.3	1	0.6		16	40.7	42.6	0.8		
PHF	.829	.854	.895	.375	.870	.884	.844	.824	.438	.907	.886	.921	.850	.625	.934	.745	.886	.780	.438	.883	.919

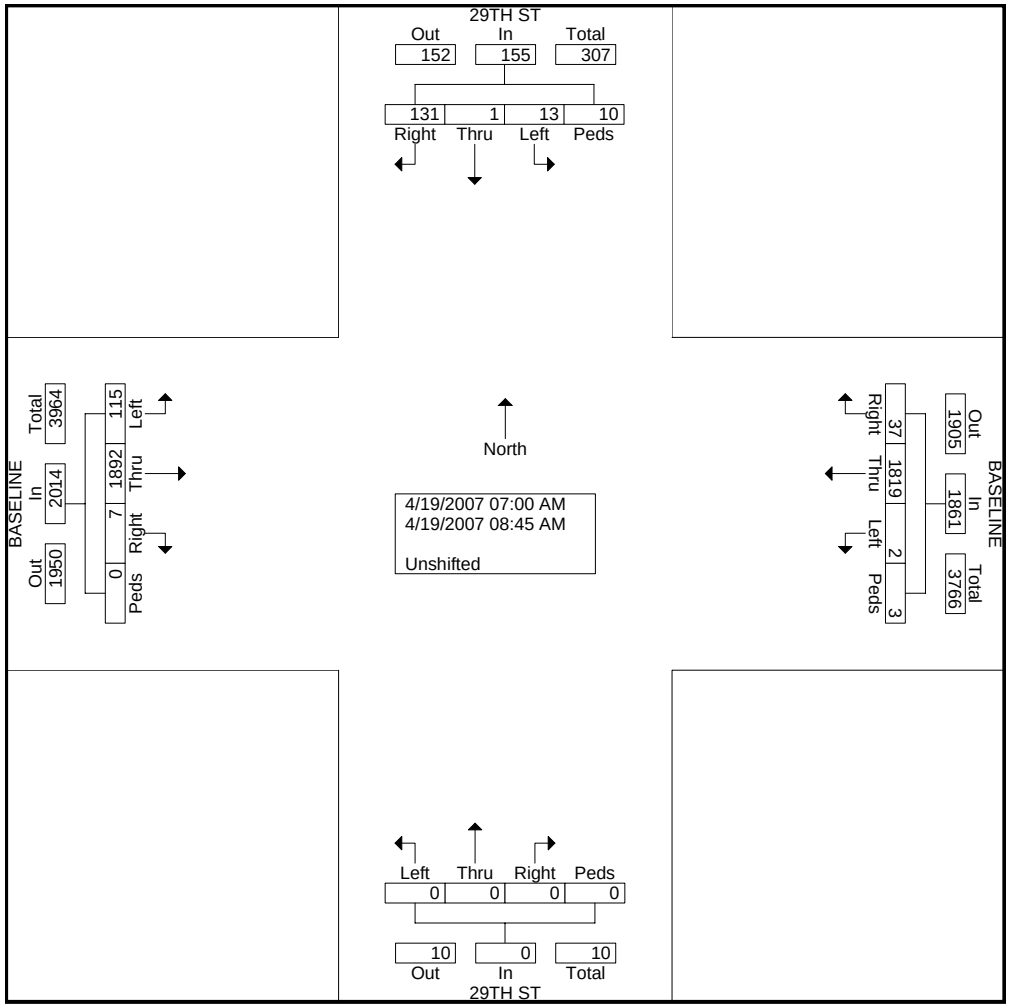


All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : 29TH&BASELINEAM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 1

Groups Printed- Unshifted

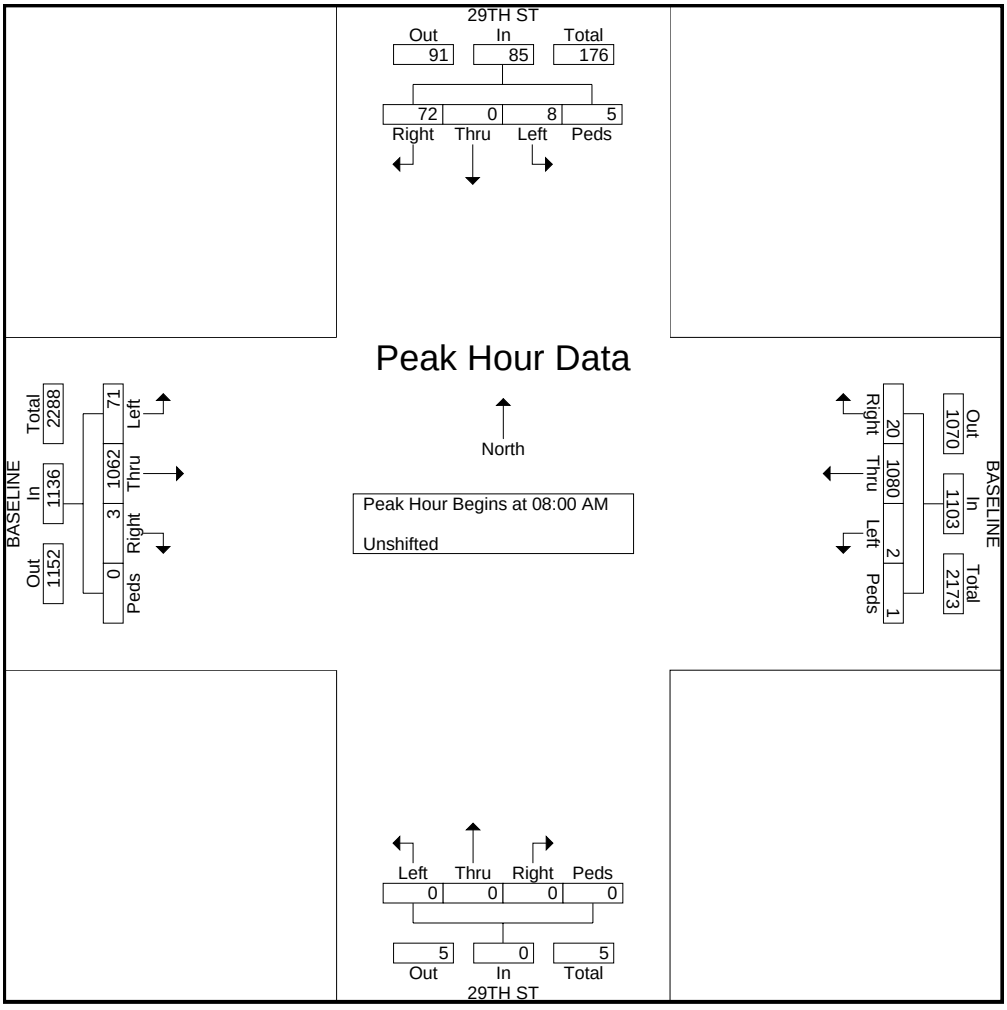
	29TH ST Southbound				BASELINE Westbound				29TH ST Northbound				BASELINE Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	2	1	10	2	0	111	4	0	0	0	0	0	6	136	0	0	272
07:15 AM	2	0	9	2	0	150	3	0	0	0	0	0	10	188	1	0	365
07:30 AM	0	0	19	0	0	220	6	1	0	0	0	0	10	225	0	0	481
07:45 AM	1	0	21	1	0	258	4	1	0	0	0	0	18	281	3	0	588
Total	5	1	59	5	0	739	17	2	0	0	0	0	44	830	4	0	1706
08:00 AM	1	0	15	2	0	232	6	0	0	0	0	0	14	271	2	0	543
08:15 AM	3	0	19	2	2	270	4	0	0	0	0	0	17	262	0	0	579
08:30 AM	0	0	17	0	0	303	2	0	0	0	0	0	18	267	1	0	608
08:45 AM	4	0	21	1	0	275	8	1	0	0	0	0	22	262	0	0	594
Total	8	0	72	5	2	1080	20	1	0	0	0	0	71	1062	3	0	2324
Grand Total	13	1	131	10	2	1819	37	3	0	0	0	0	115	1892	7	0	4030
Apprch %	8.4	0.6	84.5	6.5	0.1	97.7	2	0.2	0	0	0	0	5.7	93.9	0.3	0	
Total %	0.3	0	3.3	0.2	0	45.1	0.9	0.1	0	0	0	0	2.9	46.9	0.2	0	



All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : 29TH&BASELINEAM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 2

	29TH ST Southbound					BASELINE Westbound					29TH ST Northbound					BASELINE Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	1	0	15	2	18	0	232	6	0	238	0	0	0	0	0	14	271	2	0	287	543
08:15 AM	3	0	19	2	24	2	270	4	0	276	0	0	0	0	0	17	262	0	0	279	579
08:30 AM	0	0	17	0	17	0	303	2	0	305	0	0	0	0	0	18	267	1	0	286	608
08:45 AM	4	0	21	1	26	0	275	8	1	284	0	0	0	0	0	22	262	0	0	284	594
Total Volume	8	0	72	5	85	2	1080	20	1	1103	0	0	0	0	0	71	1062	3	0	1136	2324
% App. Total	9.4	0	84.7	5.9		0.2	97.9	1.8	0.1		0	0	0	0		6.2	93.5	0.3	0		
PHF	.500	.000	.857	.625	.817	.250	.891	.625	.250	.904	.000	.000	.000	.000	.000	.807	.980	.375	.000	.990	.956

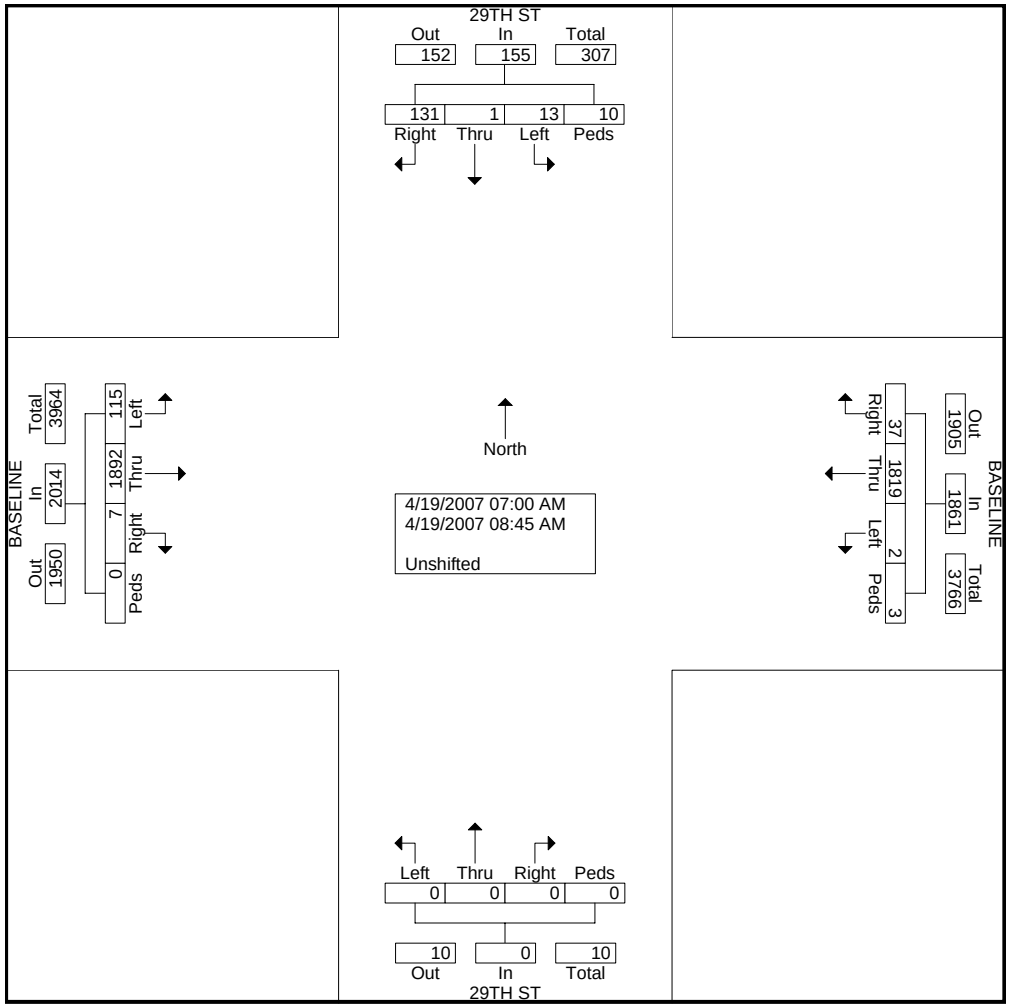


All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : 29TH&BASELINEAM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 1

Groups Printed- Unshifted

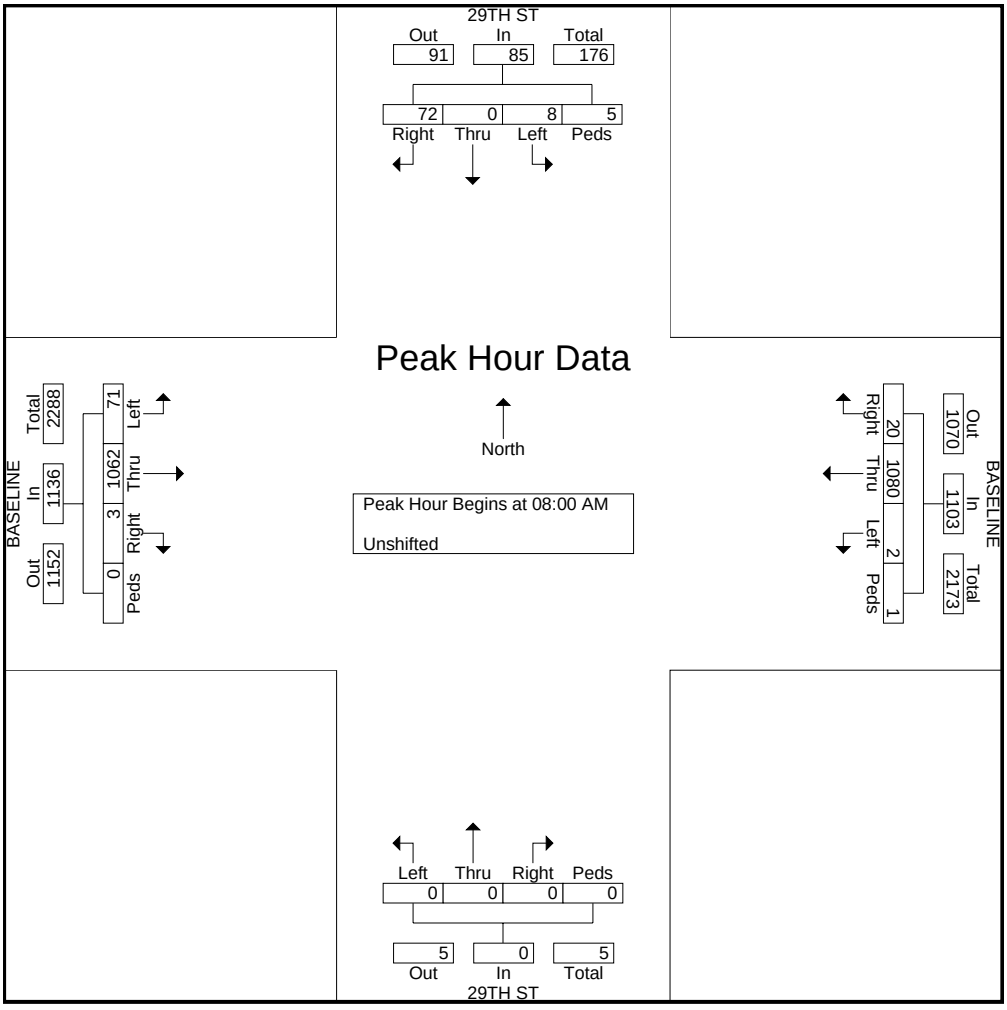
	29TH ST Southbound				BASELINE Westbound				29TH ST Northbound				BASELINE Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	2	1	10	2	0	111	4	0	0	0	0	0	6	136	0	0	272
07:15 AM	2	0	9	2	0	150	3	0	0	0	0	0	10	188	1	0	365
07:30 AM	0	0	19	0	0	220	6	1	0	0	0	0	10	225	0	0	481
07:45 AM	1	0	21	1	0	258	4	1	0	0	0	0	18	281	3	0	588
Total	5	1	59	5	0	739	17	2	0	0	0	0	44	830	4	0	1706
08:00 AM	1	0	15	2	0	232	6	0	0	0	0	0	14	271	2	0	543
08:15 AM	3	0	19	2	2	270	4	0	0	0	0	0	17	262	0	0	579
08:30 AM	0	0	17	0	0	303	2	0	0	0	0	0	18	267	1	0	608
08:45 AM	4	0	21	1	0	275	8	1	0	0	0	0	22	262	0	0	594
Total	8	0	72	5	2	1080	20	1	0	0	0	0	71	1062	3	0	2324
Grand Total	13	1	131	10	2	1819	37	3	0	0	0	0	115	1892	7	0	4030
Apprch %	8.4	0.6	84.5	6.5	0.1	97.7	2	0.2	0	0	0	0	5.7	93.9	0.3	0	
Total %	0.3	0	3.3	0.2	0	45.1	0.9	0.1	0	0	0	0	2.9	46.9	0.2	0	



All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : 29TH&BASELINEAM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 2

	29TH ST Southbound					BASELINE Westbound					29TH ST Northbound					BASELINE Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	1	0	15	2	18	0	232	6	0	238	0	0	0	0	0	14	271	2	0	287	543
08:15 AM	3	0	19	2	24	2	270	4	0	276	0	0	0	0	0	17	262	0	0	279	579
08:30 AM	0	0	17	0	17	0	303	2	0	305	0	0	0	0	0	18	267	1	0	286	608
08:45 AM	4	0	21	1	26	0	275	8	1	284	0	0	0	0	0	22	262	0	0	284	594
Total Volume	8	0	72	5	85	2	1080	20	1	1103	0	0	0	0	0	71	1062	3	0	1136	2324
% App. Total	9.4	0	84.7	5.9		0.2	97.9	1.8	0.1		0	0	0	0		6.2	93.5	0.3	0		
PHF	.500	.000	.857	.625	.817	.250	.891	.625	.250	.904	.000	.000	.000	.000	.000	.807	.980	.375	.000	.990	.956

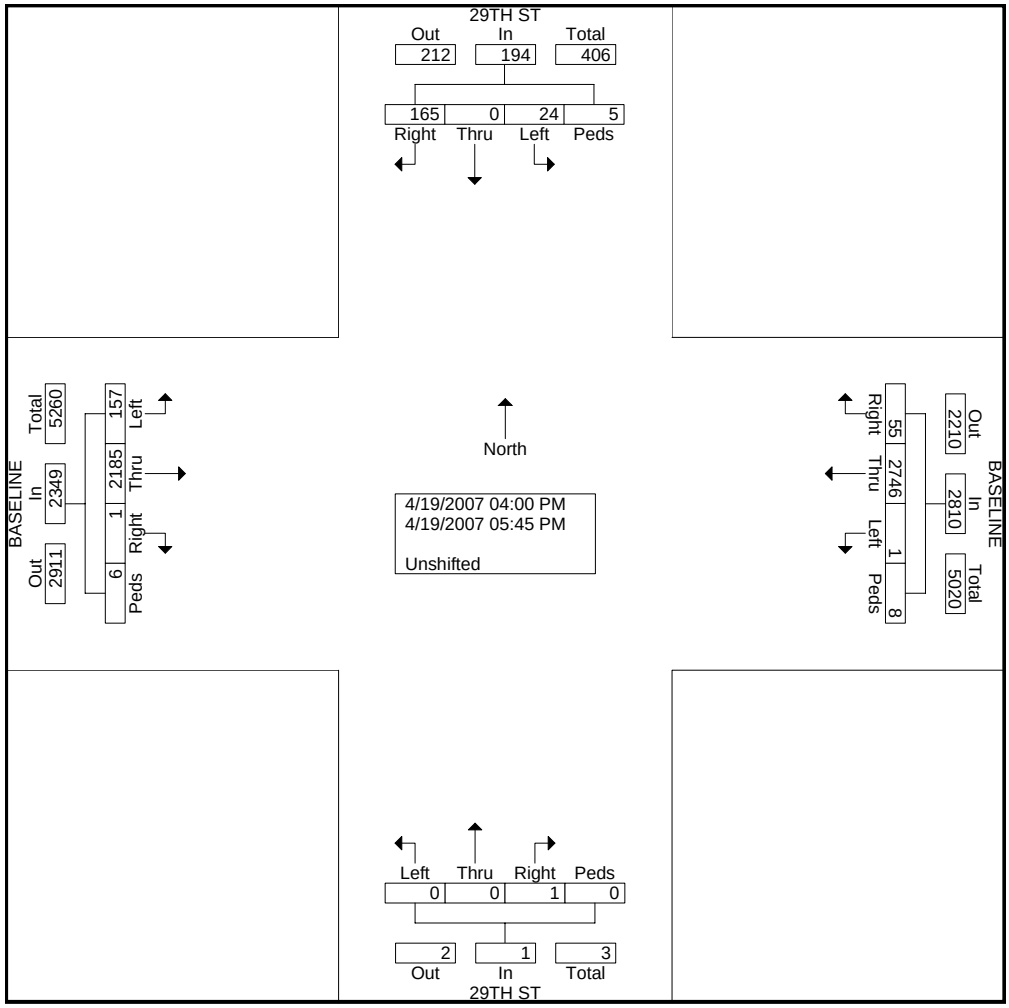


All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : 29TH&BASELINEPM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 1

Groups Printed- Unshifted

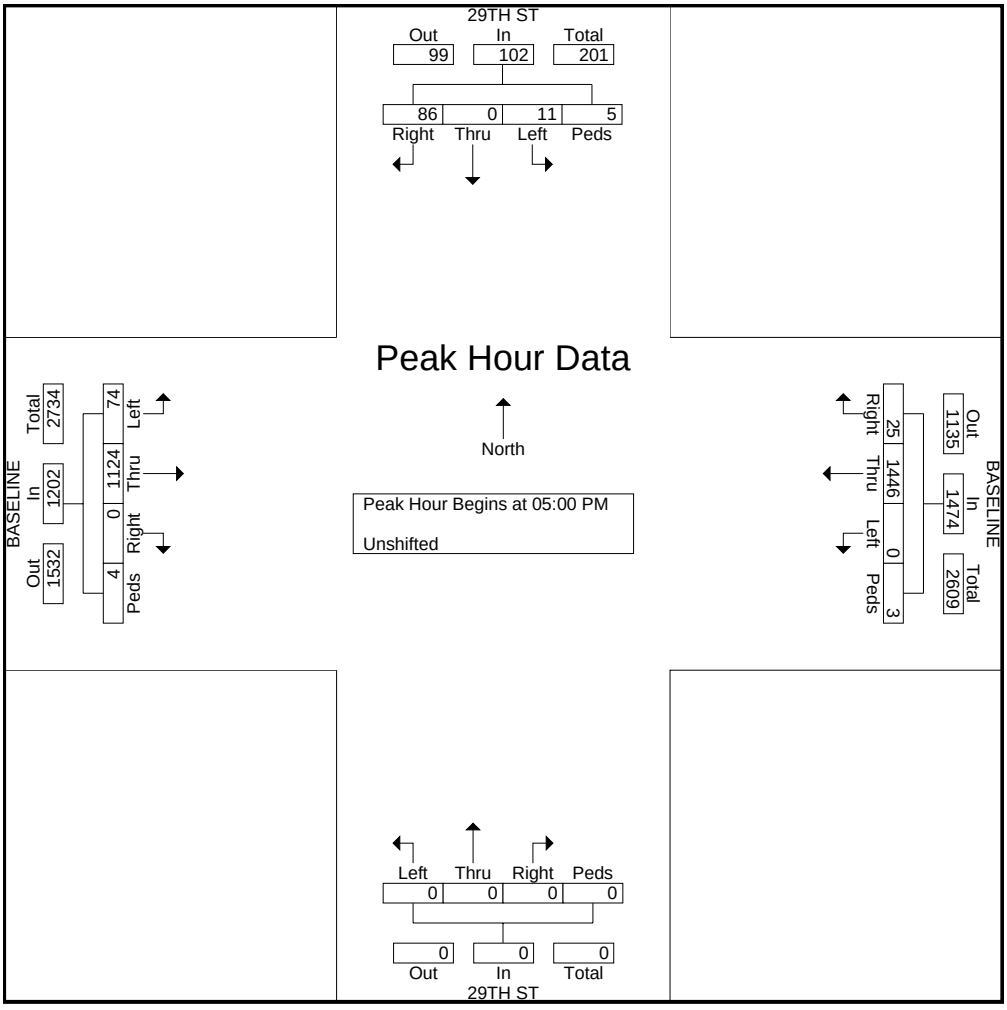
	29TH ST Southbound				BASELINE Westbound				29TH ST Northbound				BASELINE Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
04:00 PM	0	0	17	0	0	266	4	0	0	0	1	0	34	222	0	0	544
04:15 PM	1	0	20	0	0	330	8	0	0	0	0	0	17	293	0	1	670
04:30 PM	5	0	16	0	0	336	10	2	0	0	0	0	19	288	0	1	677
04:45 PM	7	0	26	0	1	368	8	3	0	0	0	0	13	258	1	0	685
Total	13	0	79	0	1	1300	30	5	0	0	1	0	83	1061	1	2	2576
05:00 PM	1	0	31	1	0	352	4	0	0	0	0	0	16	256	0	0	661
05:15 PM	1	0	20	1	0	308	9	2	0	0	0	0	16	265	0	2	624
05:30 PM	2	0	14	1	0	394	6	0	0	0	0	0	26	293	0	2	738
05:45 PM	7	0	21	2	0	392	6	1	0	0	0	0	16	310	0	0	755
Total	11	0	86	5	0	1446	25	3	0	0	0	0	74	1124	0	4	2778
Grand Total	24	0	165	5	1	2746	55	8	0	0	1	0	157	2185	1	6	5354
Apprch %	12.4	0	85.1	2.6	0	97.7	2	0.3	0	0	100	0	6.7	93	0	0.3	
Total %	0.4	0	3.1	0.1	0	51.3	1	0.1	0	0	0	0	2.9	40.8	0	0.1	



All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : 29TH&BASELINEPM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 2

	29TH ST Southbound					BASELINE Westbound					29TH ST Northbound					BASELINE Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	1	0	31	1	33	0	352	4	0	356	0	0	0	0	0	16	256	0	0	272	661
05:15 PM	1	0	20	1	22	0	308	9	2	319	0	0	0	0	0	16	265	0	2	283	624
05:30 PM	2	0	14	1	17	0	394	6	0	400	0	0	0	0	0	26	293	0	2	321	738
05:45 PM	7	0	21	2	30	0	392	6	1	399	0	0	0	0	0	16	310	0	0	326	755
Total Volume	11	0	86	5	102	0	1446	25	3	1474	0	0	0	0	0	74	1124	0	4	1202	2778
% App. Total	10.8	0	84.3	4.9		0	98.1	1.7	0.2		0	0	0	0		6.2	93.5	0	0.3		
PHF	.393	.000	.694	.625	.773	.000	.918	.694	.375	.921	.000	.000	.000	.000	.000	.712	.906	.000	.500	.922	.920

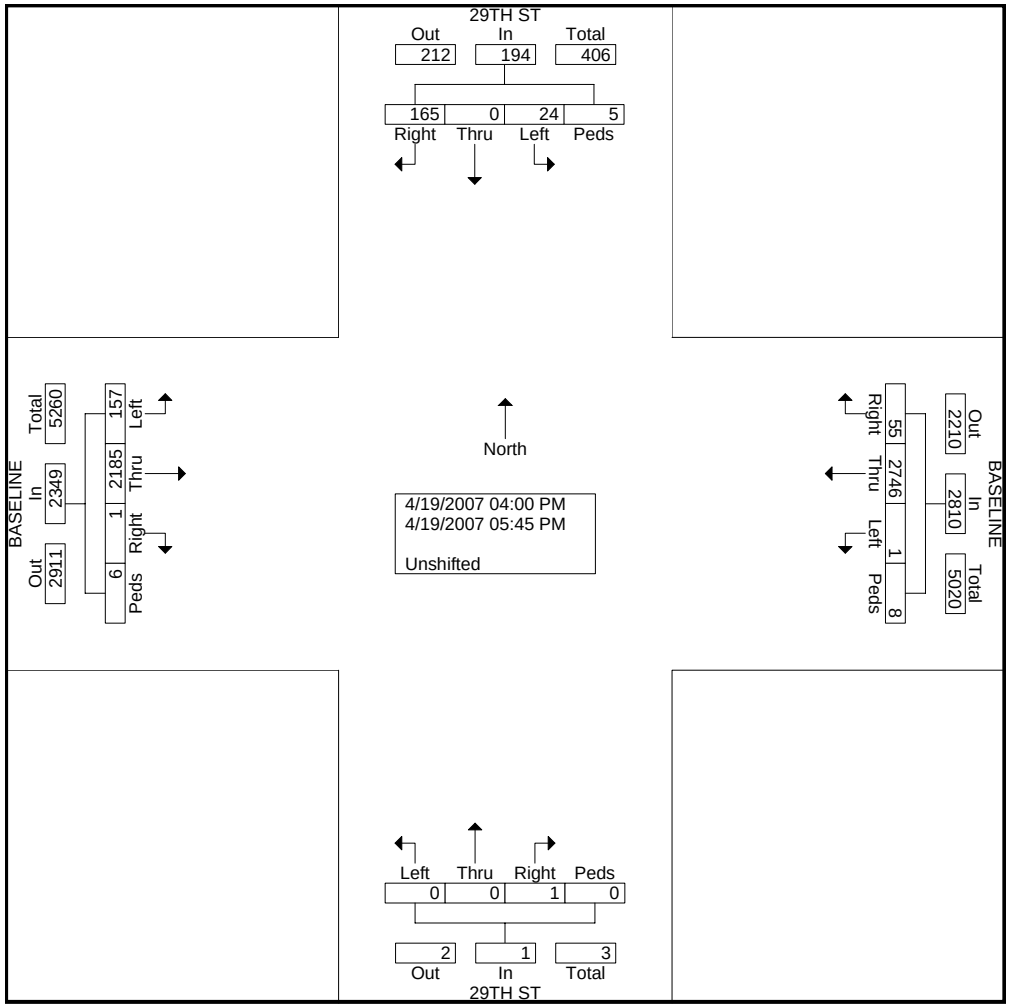


All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : 29TH&BASELINEPM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 1

Groups Printed- Unshifted

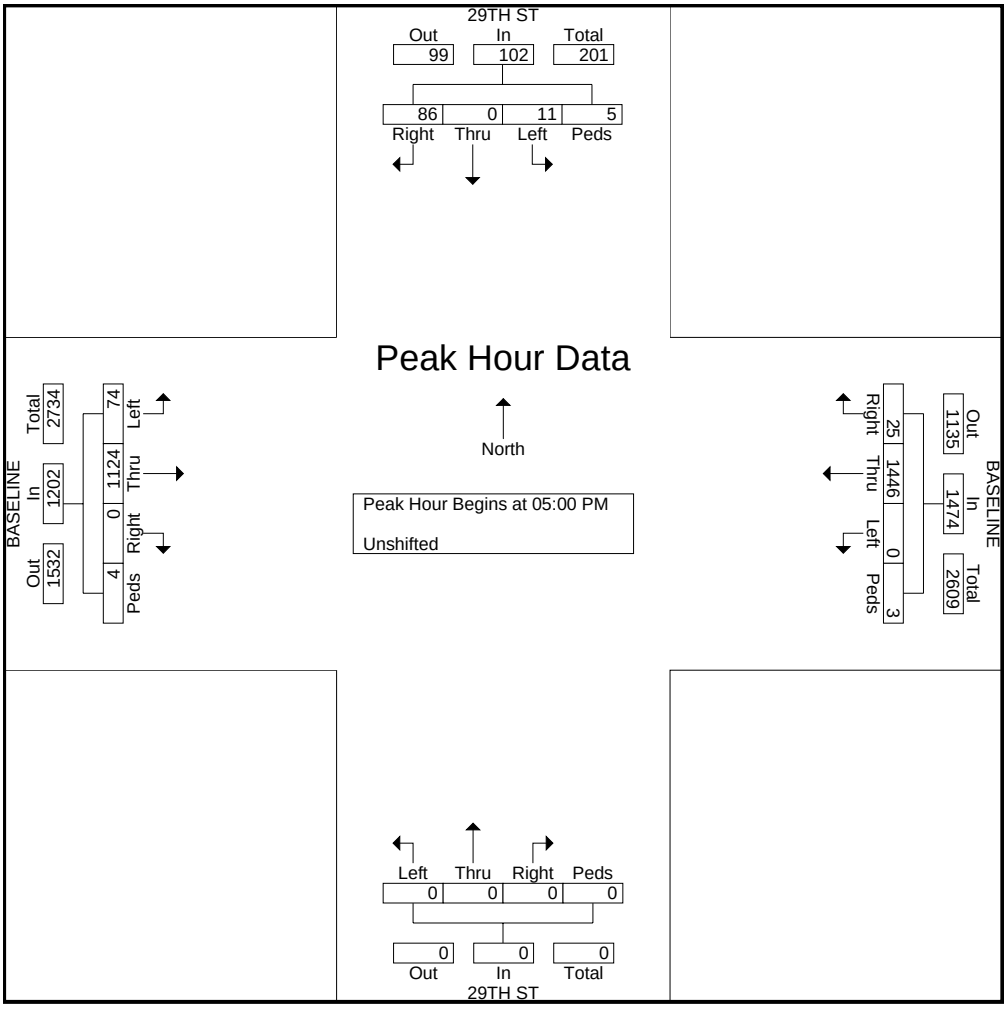
	29TH ST Southbound				BASELINE Westbound				29TH ST Northbound				BASELINE Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
04:00 PM	0	0	17	0	0	266	4	0	0	0	1	0	34	222	0	0	544
04:15 PM	1	0	20	0	0	330	8	0	0	0	0	0	17	293	0	1	670
04:30 PM	5	0	16	0	0	336	10	2	0	0	0	0	19	288	0	1	677
04:45 PM	7	0	26	0	1	368	8	3	0	0	0	0	13	258	1	0	685
Total	13	0	79	0	1	1300	30	5	0	0	1	0	83	1061	1	2	2576
05:00 PM	1	0	31	1	0	352	4	0	0	0	0	0	16	256	0	0	661
05:15 PM	1	0	20	1	0	308	9	2	0	0	0	0	16	265	0	2	624
05:30 PM	2	0	14	1	0	394	6	0	0	0	0	0	26	293	0	2	738
05:45 PM	7	0	21	2	0	392	6	1	0	0	0	0	16	310	0	0	755
Total	11	0	86	5	0	1446	25	3	0	0	0	0	74	1124	0	4	2778
Grand Total	24	0	165	5	1	2746	55	8	0	0	1	0	157	2185	1	6	5354
Apprch %	12.4	0	85.1	2.6	0	97.7	2	0.3	0	0	100	0	6.7	93	0	0.3	
Total %	0.4	0	3.1	0.1	0	51.3	1	0.1	0	0	0	0	2.9	40.8	0	0.1	



All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : 29TH&BASELINEPM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 2

	29TH ST Southbound					BASELINE Westbound					29TH ST Northbound					BASELINE Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	1	0	31	1	33	0	352	4	0	356	0	0	0	0	0	16	256	0	0	272	661
05:15 PM	1	0	20	1	22	0	308	9	2	319	0	0	0	0	0	16	265	0	2	283	624
05:30 PM	2	0	14	1	17	0	394	6	0	400	0	0	0	0	0	26	293	0	2	321	738
05:45 PM	7	0	21	2	30	0	392	6	1	399	0	0	0	0	0	16	310	0	0	326	755
Total Volume	11	0	86	5	102	0	1446	25	3	1474	0	0	0	0	0	74	1124	0	4	1202	2778
% App. Total	10.8	0	84.3	4.9		0	98.1	1.7	0.2		0	0	0	0		6.2	93.5	0	0.3		
PHF	.393	.000	.694	.625	.773	.000	.918	.694	.375	.921	.000	.000	.000	.000	.000	.712	.906	.000	.500	.922	.920



All Traffic Data Services, Inc
9660 W 44th Ave
Wheat Ridge, CO 80033
www.alltrafficdata.net

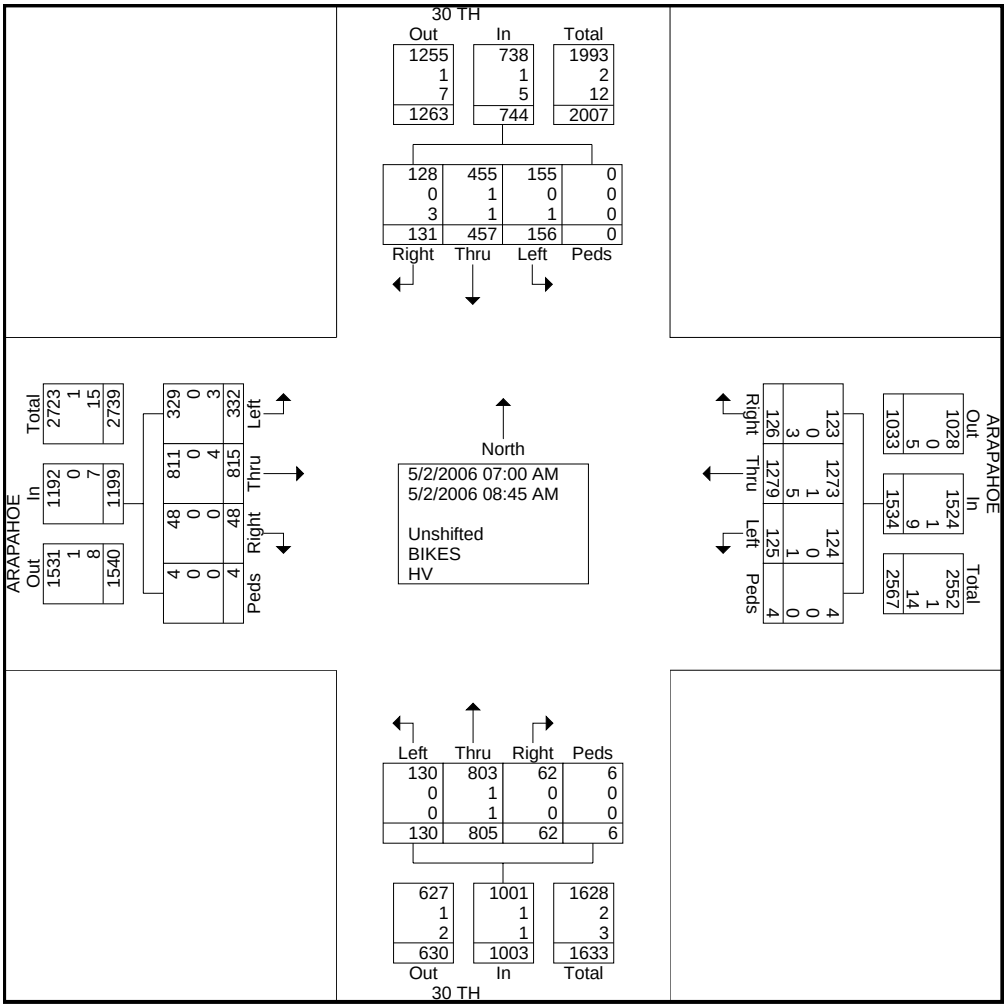
File Name : 30TH&ARAPAHOEAM
Site Code : 00000000
Start Date : 5/2/2006
Page No : 1

Groups Printed- Unshifted - BIKES - HV

	30 TH Southbound				ARAPAHOE Westbound				30 TH Northbound				ARAPAHOE Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	14	14	18	0	14	118	8	0	9	56	2	0	23	81	6	0	363
07:15 AM	11	35	18	0	13	143	9	1	8	66	2	6	45	92	5	0	454
07:30 AM	14	53	11	0	20	172	12	3	19	100	4	0	49	152	5	0	614
07:45 AM	14	80	16	0	23	168	22	0	15	105	10	0	30	108	7	0	598
Total	53	182	63	0	70	601	51	4	51	327	18	6	147	433	23	0	2029
08:00 AM	17	69	18	0	9	190	22	0	13	138	13	0	42	77	12	0	620
08:15 AM	27	87	15	0	15	161	20	0	25	128	9	0	49	116	8	0	660
08:30 AM	24	71	14	0	17	139	18	0	24	112	13	0	53	105	4	4	598
08:45 AM	35	48	21	0	14	188	15	0	17	100	9	0	41	84	1	0	573
Total	103	275	68	0	55	678	75	0	79	478	44	0	185	382	25	4	2451
Grand Total	156	457	131	0	125	1279	126	4	130	805	62	6	332	815	48	4	4480
Apprch %	21	61.4	17.6	0	8.1	83.4	8.2	0.3	13	80.3	6.2	0.6	27.7	68	4	0.3	
Total %	3.5	10.2	2.9	0	2.8	28.5	2.8	0.1	2.9	18	1.4	0.1	7.4	18.2	1.1	0.1	
Unshifted	155	455	128	0	124	1273	123	4	130	803	62	6	329	811	48	4	4455
% Unshifted	99.4	99.6	97.7	0	99.2	99.5	97.6	100	100	99.8	100	100	99.1	99.5	100	100	99.4
BIKES	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	3
% BIKES	0	0.2	0	0	0	0.1	0	0	0	0.1	0	0	0	0	0	0	0.1
HV	1	1	3	0	1	5	3	0	0	1	0	0	3	4	0	0	22
% HV	0.6	0.2	2.3	0	0.8	0.4	2.4	0	0	0.1	0	0	0.9	0.5	0	0	0.5

All Traffic Data Services, Inc
9660 W 44th Ave
Wheat Ridge, CO 80033
www.alltrafficdata.net

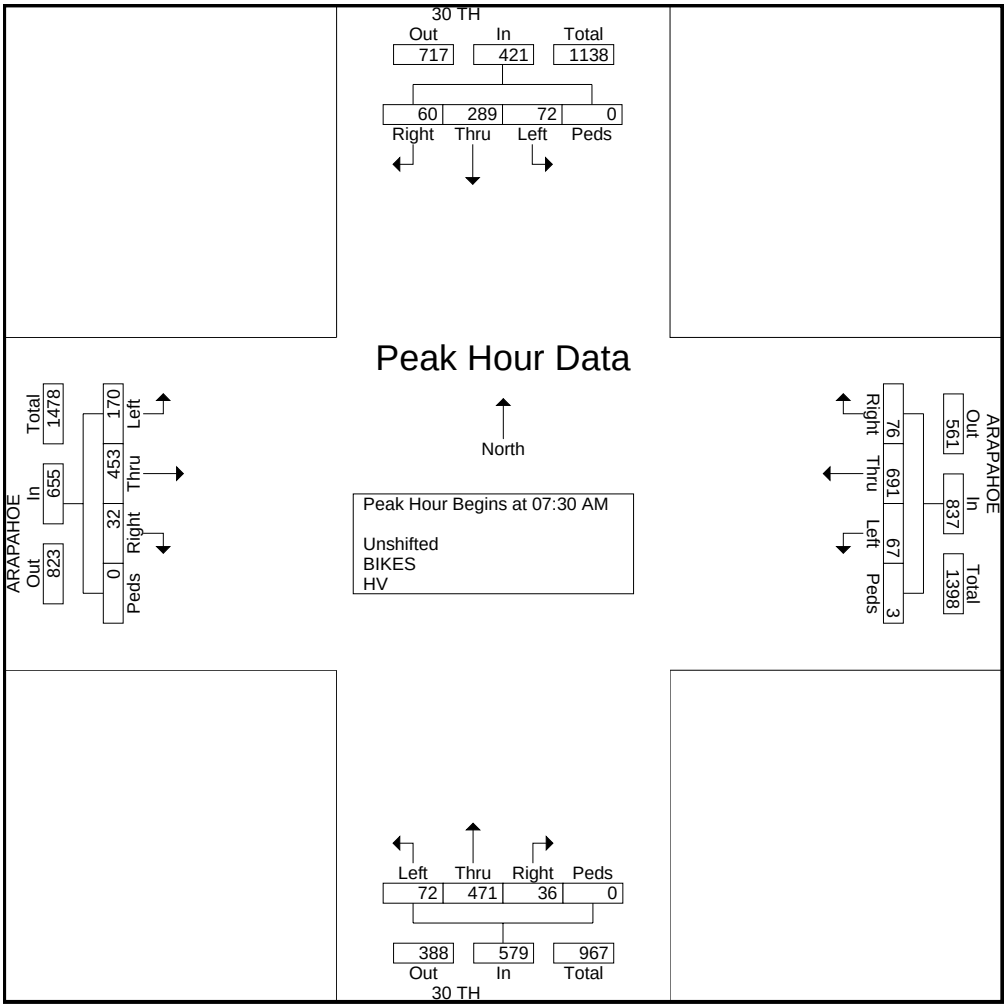
File Name : 30TH&ARAPAHOEAM
Site Code : 00000000
Start Date : 5/2/2006
Page No : 2



	30 TH Southbound					ARAPAHOE Westbound					30 TH Northbound					ARAPAHOE Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	14	53	11	0	78	20	172	12	**3**	207	19	100	4	0	123	**49**	**152**	5	0	**206**	614
07:45 AM	14	80	16	0	110	**23**	168	**22**	0	213	15	105	10	0	130	30	108	7	0	145	598
08:00 AM	17	69	**18**	0	104	9	**190**	22	0	**221**	13	**138**	**13**	0	**164**	42	77	**12**	0	131	620
08:15 AM	**27**	**87**	15	0	**129**	15	161	20	0	196	**25**	128	9	0	162	49	116	8	0	173	**660**
Total Volume	72	289	60	0	421	67	691	76	3	837	72	471	36	0	579	170	453	32	0	655	2492
% App. Total	17.1	68.6	14.3	0		8	82.6	9.1	0.4		12.4	81.3	6.2	0		26	69.2	4.9	0		
PHF	.667	.830	.833	.000	.816	.728	.909	.864	.250	.947	.720	.853	.692	.000	.883	.867	.745	.667	.000	.795	.944

All Traffic Data Services, Inc
9660 W 44th Ave
Wheat Ridge, CO 80033
www.alltrafficdata.net

File Name : 30TH&ARAPAHOEAM
Site Code : 00000000
Start Date : 5/2/2006
Page No : 3



All Traffic Data Services, Inc
9660 W 44th Ave
Wheat Ridge, CO 80033
www.alltrafficdata.net

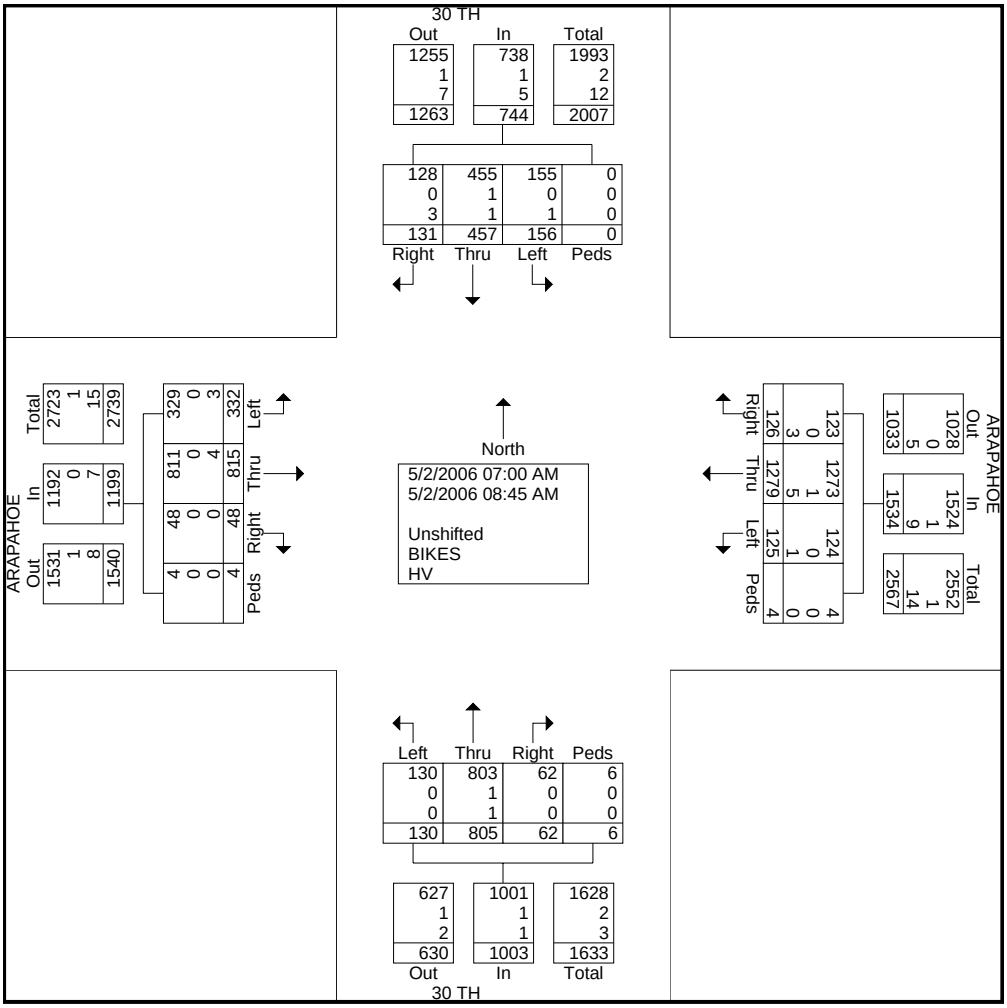
File Name : 30TH&ARAPAHOEAM
Site Code : 00000000
Start Date : 5/2/2006
Page No : 1

Groups Printed- Unshifted - BIKES - HV

	30 TH Southbound				ARAPAHOE Westbound				30 TH Northbound				ARAPAHOE Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	14	14	18	0	14	118	8	0	9	56	2	0	23	81	6	0	363
07:15 AM	11	35	18	0	13	143	9	1	8	66	2	6	45	92	5	0	454
07:30 AM	14	53	11	0	20	172	12	3	19	100	4	0	49	152	5	0	614
07:45 AM	14	80	16	0	23	168	22	0	15	105	10	0	30	108	7	0	598
Total	53	182	63	0	70	601	51	4	51	327	18	6	147	433	23	0	2029
08:00 AM	17	69	18	0	9	190	22	0	13	138	13	0	42	77	12	0	620
08:15 AM	27	87	15	0	15	161	20	0	25	128	9	0	49	116	8	0	660
08:30 AM	24	71	14	0	17	139	18	0	24	112	13	0	53	105	4	4	598
08:45 AM	35	48	21	0	14	188	15	0	17	100	9	0	41	84	1	0	573
Total	103	275	68	0	55	678	75	0	79	478	44	0	185	382	25	4	2451
Grand Total	156	457	131	0	125	1279	126	4	130	805	62	6	332	815	48	4	4480
Apprch %	21	61.4	17.6	0	8.1	83.4	8.2	0.3	13	80.3	6.2	0.6	27.7	68	4	0.3	
Total %	3.5	10.2	2.9	0	2.8	28.5	2.8	0.1	2.9	18	1.4	0.1	7.4	18.2	1.1	0.1	
Unshifted	155	455	128	0	124	1273	123	4	130	803	62	6	329	811	48	4	4455
% Unshifted	99.4	99.6	97.7	0	99.2	99.5	97.6	100	100	99.8	100	100	99.1	99.5	100	100	99.4
BIKES	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	3
% BIKES	0	0.2	0	0	0	0.1	0	0	0	0.1	0	0	0	0	0	0	0.1
HV	1	1	3	0	1	5	3	0	0	1	0	0	3	4	0	0	22
% HV	0.6	0.2	2.3	0	0.8	0.4	2.4	0	0	0.1	0	0	0.9	0.5	0	0	0.5

All Traffic Data Services, Inc
9660 W 44th Ave
Wheat Ridge, CO 80033
www.alltrafficdata.net

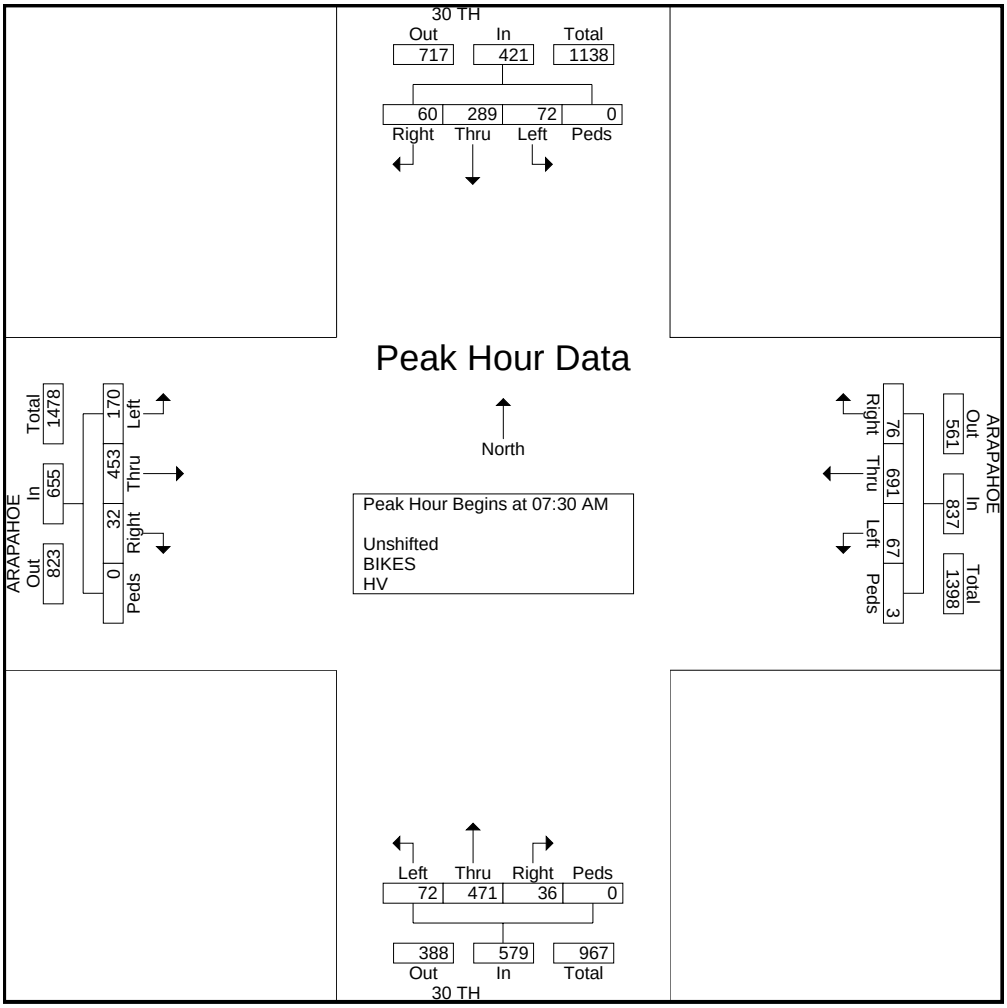
File Name : 30TH&ARAPAHOEAM
Site Code : 00000000
Start Date : 5/2/2006
Page No : 2



	30 TH Southbound					ARAPAHOE Westbound					30 TH Northbound					ARAPAHOE Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	14	53	11	0	78	20	172	12	**3**	207	19	100	4	0	123	**49**	**152**	5	0	**206**	614
07:45 AM	14	80	16	0	110	**23**	168	**22**	0	213	15	105	10	0	130	30	108	7	0	145	598
08:00 AM	17	69	**18**	0	104	9	**190**	22	0	**221**	13	**138**	**13**	0	**164**	42	77	**12**	0	131	620
08:15 AM	**27**	**87**	15	0	**129**	15	161	20	0	196	**25**	128	9	0	162	49	116	8	0	173	**660**
Total Volume	72	289	60	0	421	67	691	76	3	837	72	471	36	0	579	170	453	32	0	655	2492
% App. Total	17.1	68.6	14.3	0		8	82.6	9.1	0.4		12.4	81.3	6.2	0		26	69.2	4.9	0		
PHF	.667	.830	.833	.000	.816	.728	.909	.864	.250	.947	.720	.853	.692	.000	.883	.867	.745	.667	.000	.795	.944

All Traffic Data Services, Inc
9660 W 44th Ave
Wheat Ridge, CO 80033
www.alltrafficdata.net

File Name : 30TH&ARAPAHOEAM
Site Code : 00000000
Start Date : 5/2/2006
Page No : 3



All Traffic Data Services, Inc
9660 W 44th Ave
Wheat Ridge, CO 80033
www.alltrafficdata.net

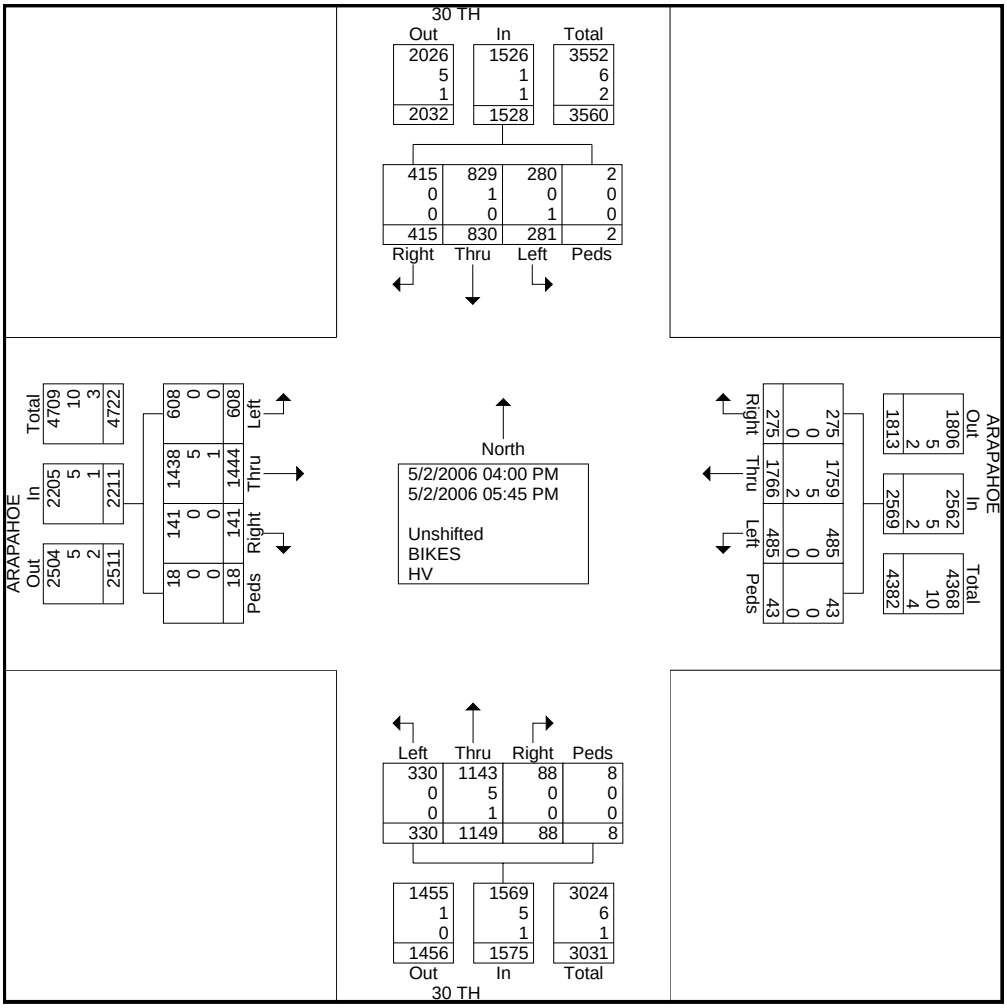
File Name : 30TH&ARAPAHOEPM
Site Code : 00000000
Start Date : 5/2/2006
Page No : 1

Groups Printed- Unshifted - BIKES - HV

	30 TH Southbound				ARAPAHOE Westbound				30 TH Northbound				ARAPAHOE Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
04:00 PM	43	88	35	0	45	238	28	3	31	104	12	0	70	150	13	0	860
04:15 PM	30	78	49	0	54	231	34	8	38	118	10	0	72	202	14	1	939
04:30 PM	31	90	41	0	43	213	36	4	37	122	13	0	67	167	19	2	885
04:45 PM	39	74	57	0	60	232	43	4	33	125	9	0	90	202	25	0	993
Total	143	330	182	0	202	914	141	19	139	469	44	0	299	721	71	3	3677
05:00 PM	35	138	79	2	83	198	29	10	42	171	12	3	76	175	20	7	1080
05:15 PM	42	129	56	0	62	274	36	5	53	165	14	1	83	211	27	4	1162
05:30 PM	32	144	50	0	80	187	30	6	60	151	13	0	82	176	4	2	1017
05:45 PM	29	89	48	0	58	193	39	3	36	193	5	4	68	161	19	2	947
Total	138	500	233	2	283	852	134	24	191	680	44	8	309	723	70	15	4206
Grand Total	281	830	415	2	485	1766	275	43	330	1149	88	8	608	1444	141	18	7883
Apprch %	18.4	54.3	27.2	0.1	18.9	68.7	10.7	1.7	21	73	5.6	0.5	27.5	65.3	6.4	0.8	
Total %	3.6	10.5	5.3	0	6.2	22.4	3.5	0.5	4.2	14.6	1.1	0.1	7.7	18.3	1.8	0.2	
Unshifted	280	829	415	2	485	1759	275	43	330	1143	88	8	608	1438	141	18	7862
% Unshifted	99.6	99.9	100	100	100	99.6	100	100	100	99.5	100	100	100	99.6	100	100	99.7
BIKES	0	1	0	0	0	5	0	0	0	5	0	0	0	5	0	0	16
% BIKES	0	0.1	0	0	0	0.3	0	0	0	0.4	0	0	0	0.3	0	0	0.2
HV	1	0	0	0	0	2	0	0	0	1	0	0	0	1	0	0	5
% HV	0.4	0	0	0	0	0.1	0	0	0	0.1	0	0	0	0.1	0	0	0.1

All Traffic Data Services, Inc
9660 W 44th Ave
Wheat Ridge, CO 80033
www.alltrafficdata.net

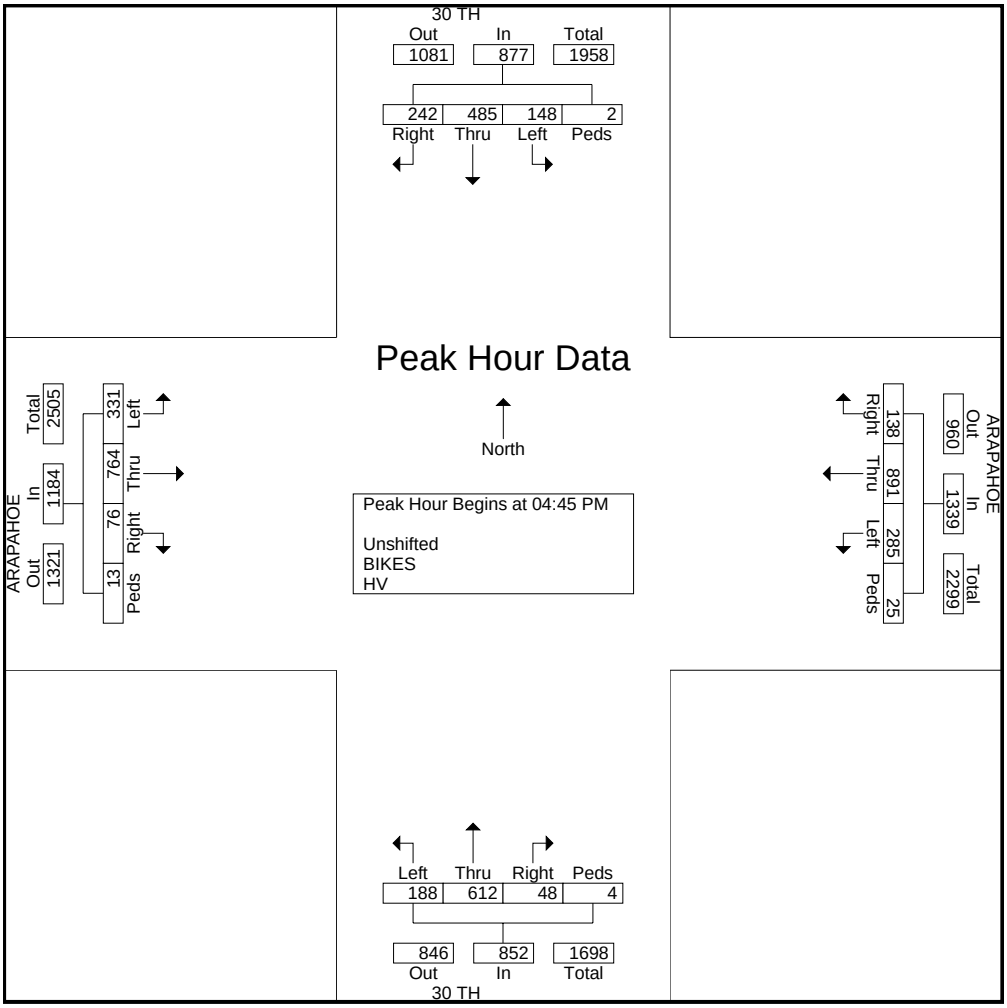
File Name : 30TH&ARAPAHOEPM
Site Code : 00000000
Start Date : 5/2/2006
Page No : 2



	30 TH Southbound					ARAPAHOE Westbound					30 TH Northbound					ARAPAHOE Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	39	74	57	0	170	60	232	**43**	4	339	33	125	9	0	167	**90**	202	25	0	317	993
05:00 PM	35	138	**79**	**2**	**254**	**83**	198	29	**10**	320	42	**171**	12	**3**	228	76	175	20	**7**	278	1080
05:15 PM	**42**	129	56	0	227	62	**274**	36	5	**377**	53	165	**14**	1	**233**	83	**211**	**27**	4	**325**	**1162**
05:30 PM	32	**144**	50	0	226	80	187	30	6	303	**60**	151	13	0	224	82	176	4	2	264	1017
Total Volume	148	485	242	2	877	285	891	138	25	1339	188	612	48	4	852	331	764	76	13	1184	4252
% App. Total	16.9	55.3	27.6	0.2		21.3	66.5	10.3	1.9		22.1	71.8	5.6	0.5		28	64.5	6.4	1.1		
PHF	.881	.842	.766	.250	.863	.858	.813	.802	.625	.888	.783	.895	.857	.333	.914	.919	.905	.704	.464	.911	.915

All Traffic Data Services, Inc
9660 W 44th Ave
Wheat Ridge, CO 80033
www.alltrafficdata.net

File Name : 30TH&ARAPAHOEPM
Site Code : 00000000
Start Date : 5/2/2006
Page No : 3

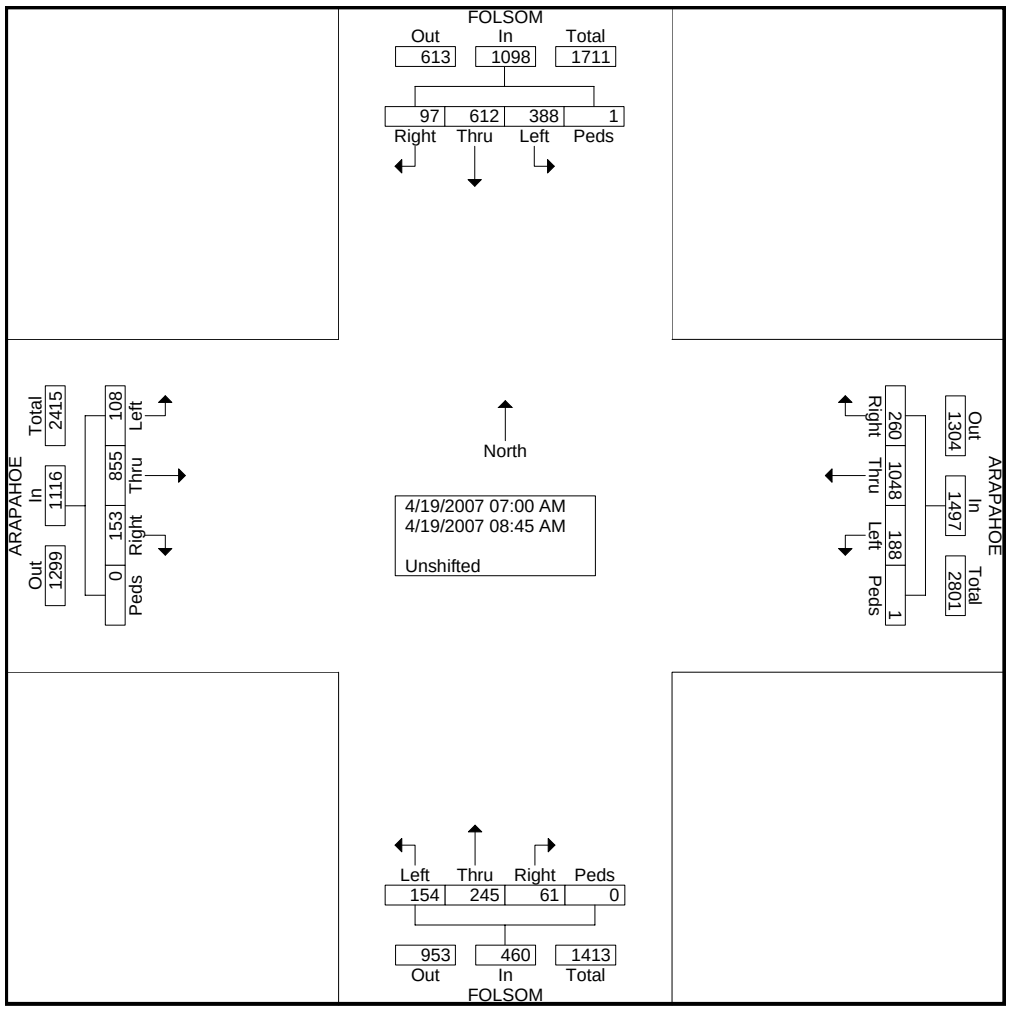


All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : ARAPAHOE&FOLSOMAM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 1

Groups Printed- Unshifted

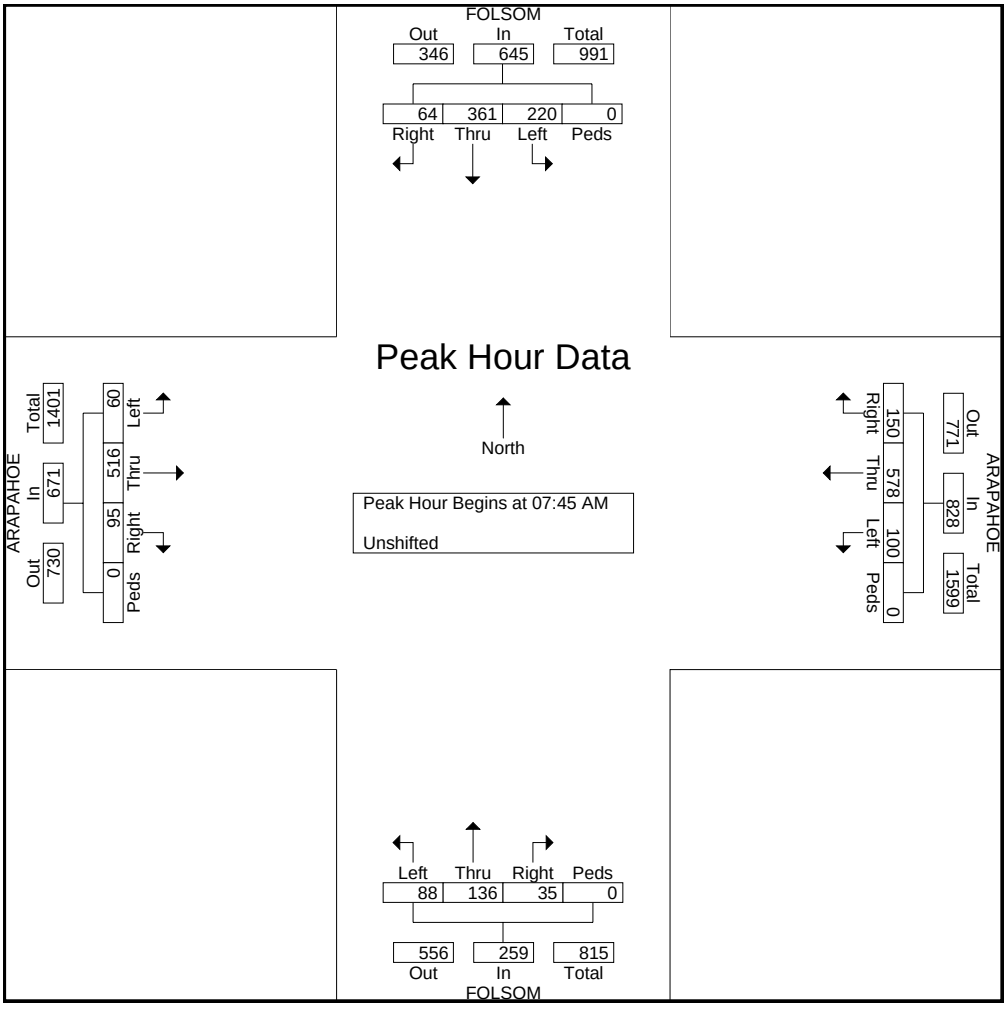
	FOLSOM Southbound				ARAPAHOE Westbound				FOLSOM Northbound				ARAPAHOE Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	22	33	5	1	17	96	28	0	6	18	7	0	11	62	6	0	312
07:15 AM	39	66	12	0	18	103	28	0	11	20	5	0	17	77	17	0	413
07:30 AM	40	60	6	0	18	140	35	1	17	34	8	0	10	76	16	0	461
07:45 AM	79	107	13	0	22	155	36	0	31	30	5	0	17	124	30	0	649
Total	180	266	36	1	75	494	127	1	65	102	25	0	55	339	69	0	1835
08:00 AM	53	89	16	0	34	139	30	0	15	41	6	0	8	116	38	0	585
08:15 AM	40	79	17	0	24	136	38	0	19	34	13	0	15	139	11	0	565
08:30 AM	48	86	18	0	20	148	46	0	23	31	11	0	20	137	16	0	604
08:45 AM	67	92	10	0	35	131	19	0	32	37	6	0	10	124	19	0	582
Total	208	346	61	0	113	554	133	0	89	143	36	0	53	516	84	0	2336
Grand Total	388	612	97	1	188	1048	260	1	154	245	61	0	108	855	153	0	4171
Apprch %	35.3	55.7	8.8	0.1	12.6	70	17.4	0.1	33.5	53.3	13.3	0	9.7	76.6	13.7	0	
Total %	9.3	14.7	2.3	0	4.5	25.1	6.2	0	3.7	5.9	1.5	0	2.6	20.5	3.7	0	



All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : ARAPAHOE&FOLSOMAM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 2

	FOLSOM Southbound					ARAPAHOE Westbound					FOLSOM Northbound					ARAPAHOE Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	79	107	13	0	199	22	155	36	0	213	31	30	5	0	66	17	124	30	0	171	649
08:00 AM	53	89	16	0	158	34	139	30	0	203	15	41	6	0	62	8	116	38	0	162	585
08:15 AM	40	79	17	0	136	24	136	38	0	198	19	34	13	0	66	15	139	11	0	165	565
08:30 AM	48	86	18	0	152	20	148	46	0	214	23	31	11	0	65	20	137	16	0	173	604
Total Volume	220	361	64	0	645	100	578	150	0	828	88	136	35	0	259	60	516	95	0	671	2403
% App. Total	34.1	56	9.9	0		12.1	69.8	18.1	0		34	52.5	13.5	0		8.9	76.9	14.2	0		
PHF	.696	.843	.889	.000	.810	.735	.932	.815	.000	.967	.710	.829	.673	.000	.981	.750	.928	.625	.000	.970	.926

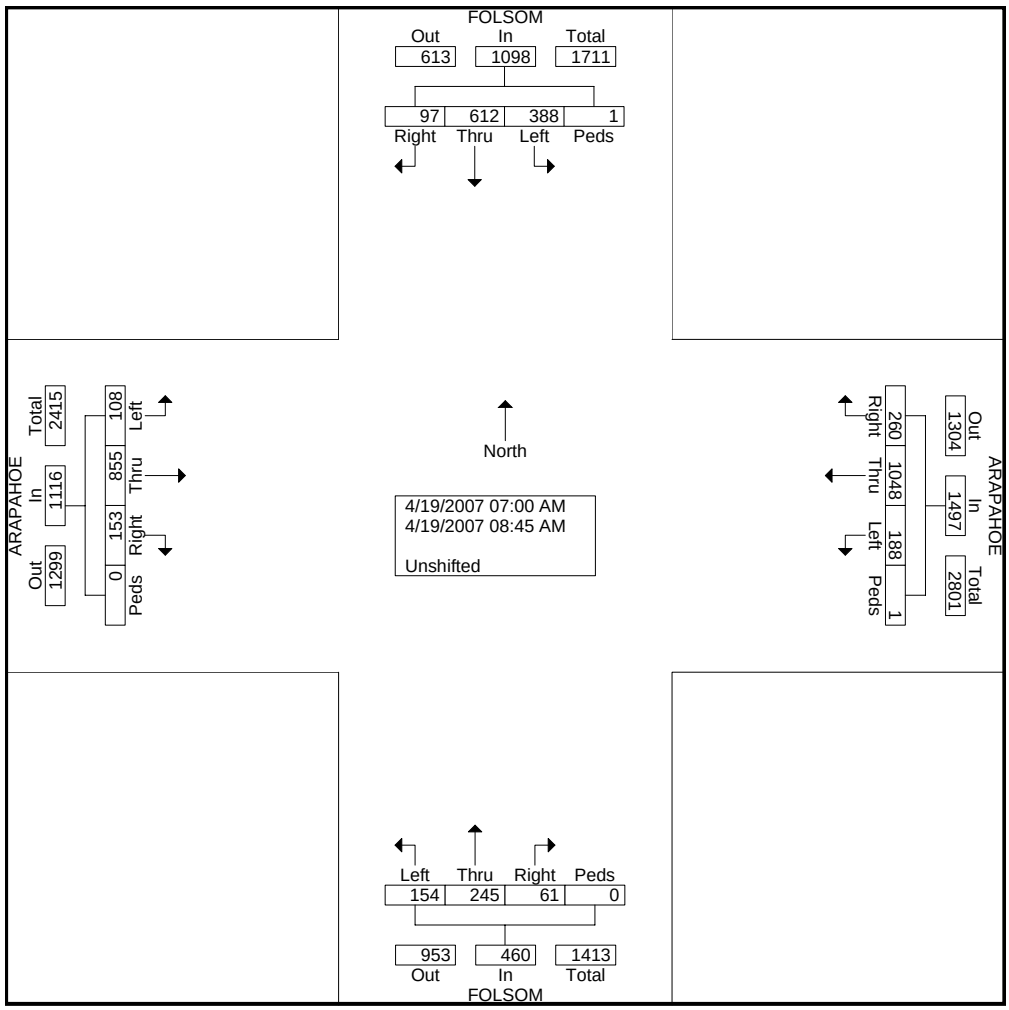


All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : ARAPAHOE&FOLSOMAM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 1

Groups Printed- Unshifted

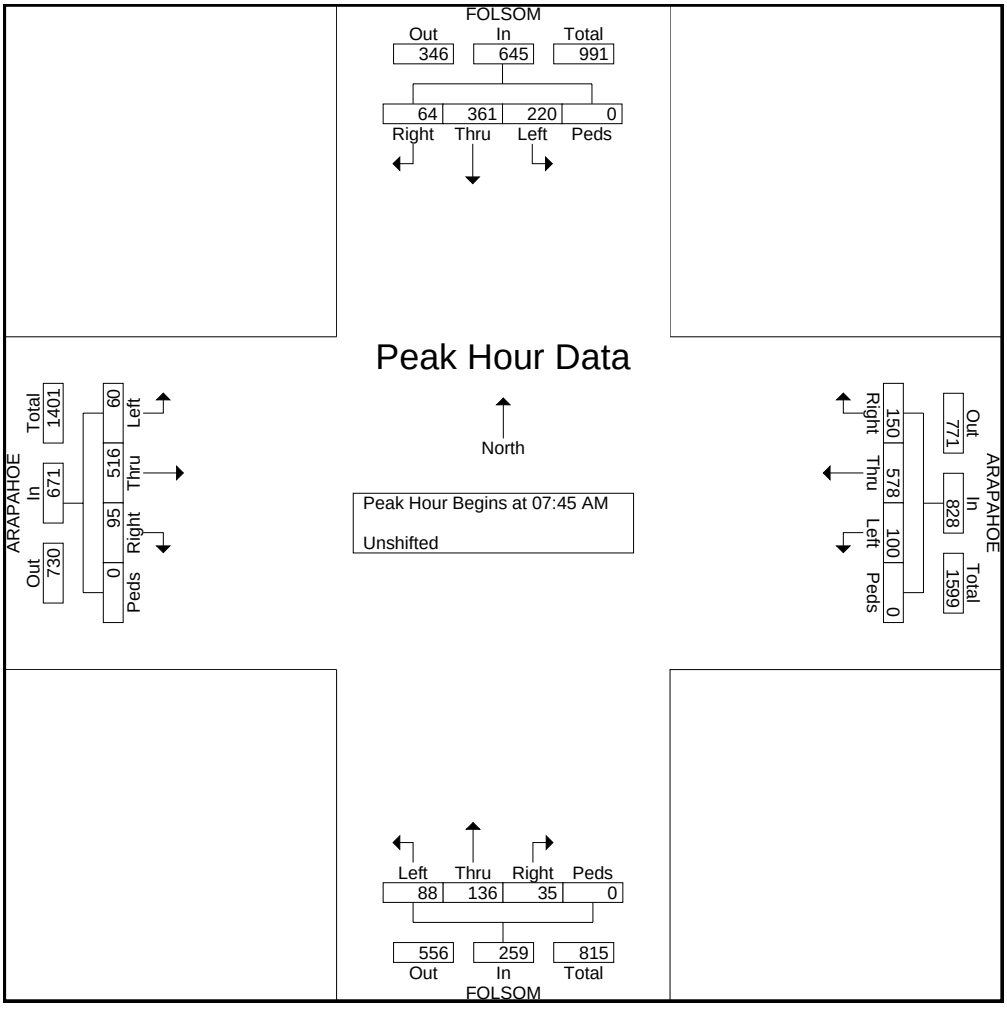
	FOLSOM Southbound				ARAPAHOE Westbound				FOLSOM Northbound				ARAPAHOE Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	22	33	5	1	17	96	28	0	6	18	7	0	11	62	6	0	312
07:15 AM	39	66	12	0	18	103	28	0	11	20	5	0	17	77	17	0	413
07:30 AM	40	60	6	0	18	140	35	1	17	34	8	0	10	76	16	0	461
07:45 AM	79	107	13	0	22	155	36	0	31	30	5	0	17	124	30	0	649
Total	180	266	36	1	75	494	127	1	65	102	25	0	55	339	69	0	1835
08:00 AM	53	89	16	0	34	139	30	0	15	41	6	0	8	116	38	0	585
08:15 AM	40	79	17	0	24	136	38	0	19	34	13	0	15	139	11	0	565
08:30 AM	48	86	18	0	20	148	46	0	23	31	11	0	20	137	16	0	604
08:45 AM	67	92	10	0	35	131	19	0	32	37	6	0	10	124	19	0	582
Total	208	346	61	0	113	554	133	0	89	143	36	0	53	516	84	0	2336
Grand Total	388	612	97	1	188	1048	260	1	154	245	61	0	108	855	153	0	4171
Apprch %	35.3	55.7	8.8	0.1	12.6	70	17.4	0.1	33.5	53.3	13.3	0	9.7	76.6	13.7	0	
Total %	9.3	14.7	2.3	0	4.5	25.1	6.2	0	3.7	5.9	1.5	0	2.6	20.5	3.7	0	



All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : ARAPAHOE&FOLSOMAM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 2

	FOLSOM Southbound					ARAPAHOE Westbound					FOLSOM Northbound					ARAPAHOE Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	79	107	13	0	199	22	155	36	0	213	31	30	5	0	66	17	124	30	0	171	649
08:00 AM	53	89	16	0	158	34	139	30	0	203	15	41	6	0	62	8	116	38	0	162	585
08:15 AM	40	79	17	0	136	24	136	38	0	198	19	34	13	0	66	15	139	11	0	165	565
08:30 AM	48	86	18	0	152	20	148	46	0	214	23	31	11	0	65	20	137	16	0	173	604
Total Volume	220	361	64	0	645	100	578	150	0	828	88	136	35	0	259	60	516	95	0	671	2403
% App. Total	34.1	56	9.9	0		12.1	69.8	18.1	0		34	52.5	13.5	0		8.9	76.9	14.2	0		
PHF	.696	.843	.889	.000	.810	.735	.932	.815	.000	.967	.710	.829	.673	.000	.981	.750	.928	.625	.000	.970	.926

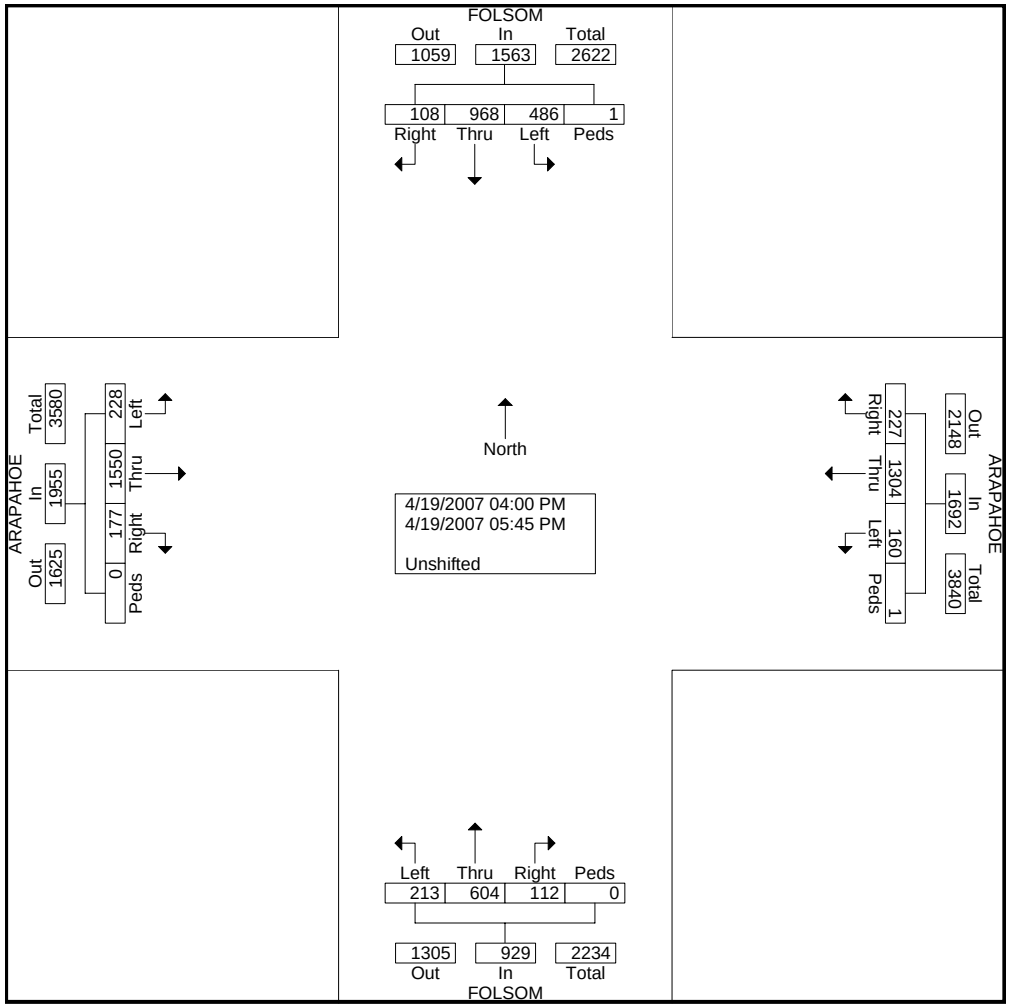


All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : ARAPAHOE&FOLSOMPM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 1

Groups Printed- Unshifted

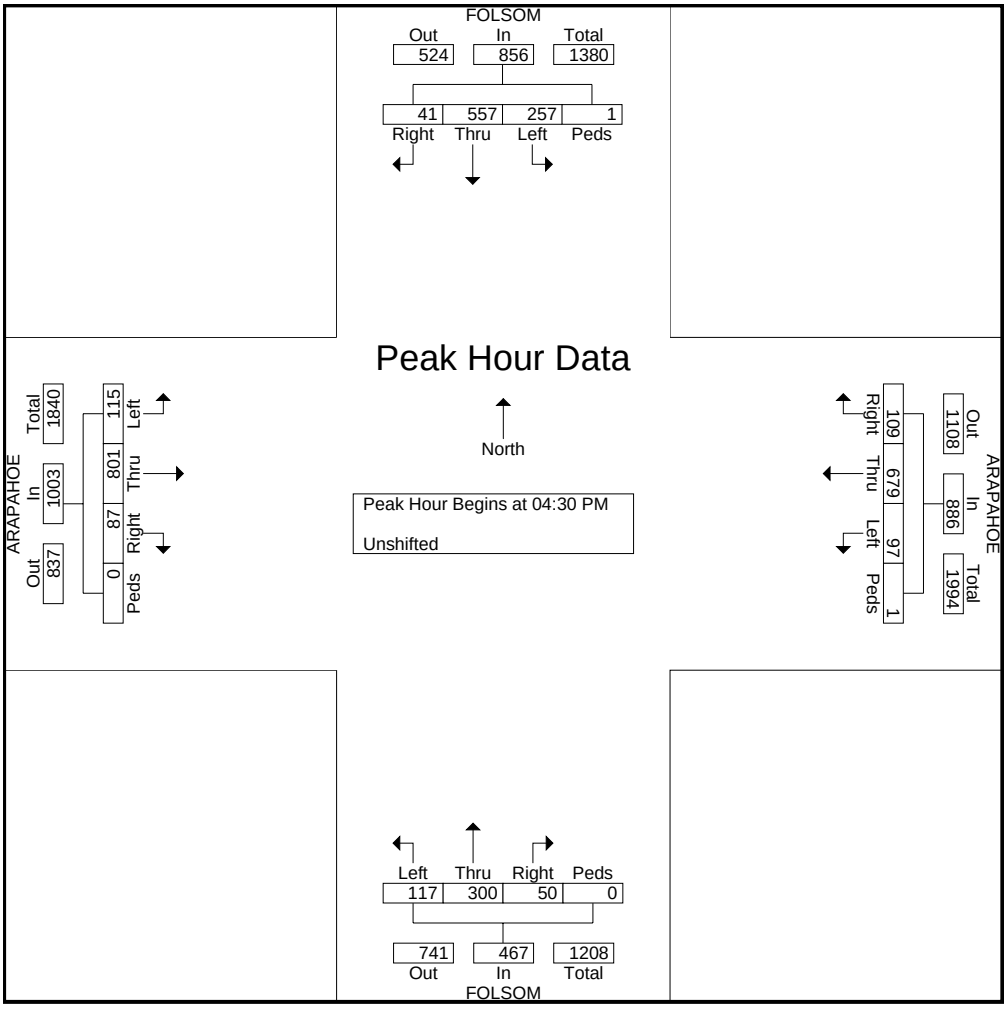
	FOLSOM Southbound				ARAPAHOE Westbound				FOLSOM Northbound				ARAPAHOE Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
04:00 PM	52	88	9	0	18	151	37	0	24	80	19	0	40	198	17	0	733
04:15 PM	59	99	18	0	14	165	24	0	20	78	18	0	23	189	13	0	720
04:30 PM	54	143	10	0	19	165	20	0	27	84	12	0	20	186	18	0	758
04:45 PM	61	109	8	1	28	177	40	1	30	60	11	0	33	213	24	0	796
Total	226	439	45	1	79	658	121	1	101	302	60	0	116	786	72	0	3007
05:00 PM	78	168	10	0	29	174	29	0	28	96	12	0	29	196	27	0	876
05:15 PM	64	137	13	0	21	163	20	0	32	60	15	0	33	206	18	0	782
05:30 PM	63	119	16	0	19	156	28	0	16	75	11	0	28	171	19	0	721
05:45 PM	55	105	24	0	12	153	29	0	36	71	14	0	22	191	41	0	753
Total	260	529	63	0	81	646	106	0	112	302	52	0	112	764	105	0	3132
Grand Total	486	968	108	1	160	1304	227	1	213	604	112	0	228	1550	177	0	6139
Apprch %	31.1	61.9	6.9	0.1	9.5	77.1	13.4	0.1	22.9	65	12.1	0	11.7	79.3	9.1	0	
Total %	7.9	15.8	1.8	0	2.6	21.2	3.7	0	3.5	9.8	1.8	0	3.7	25.2	2.9	0	



All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : ARAPAHOE&FOLSOMPM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 2

	FOLSOM Southbound					ARAPAHOE Westbound					FOLSOM Northbound					ARAPAHOE Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	54	143	10	0	207	19	165	20	0	204	27	84	12	0	123	20	186	18	0	224	758
04:45 PM	61	109	8	1	179	28	177	40	1	246	30	60	11	0	101	33	213	24	0	270	796
05:00 PM	78	168	10	0	256	29	174	29	0	232	28	96	12	0	136	29	196	27	0	252	876
05:15 PM	64	137	13	0	214	21	163	20	0	204	32	60	15	0	107	33	206	18	0	257	782
Total Volume	257	557	41	1	856	97	679	109	1	886	117	300	50	0	467	115	801	87	0	1003	3212
% App. Total	30	65.1	4.8	0.1		10.9	76.6	12.3	0.1		25.1	64.2	10.7	0		11.5	79.9	8.7	0		
PHF	.824	.829	.788	.250	.836	.836	.959	.681	.250	.900	.914	.781	.833	.000	.858	.871	.940	.806	.000	.929	.917



All Traffic Data Services, Inc
9660 W 44th Ave
Wheat Ridge, CO 80033
www.alltrafficdata.net

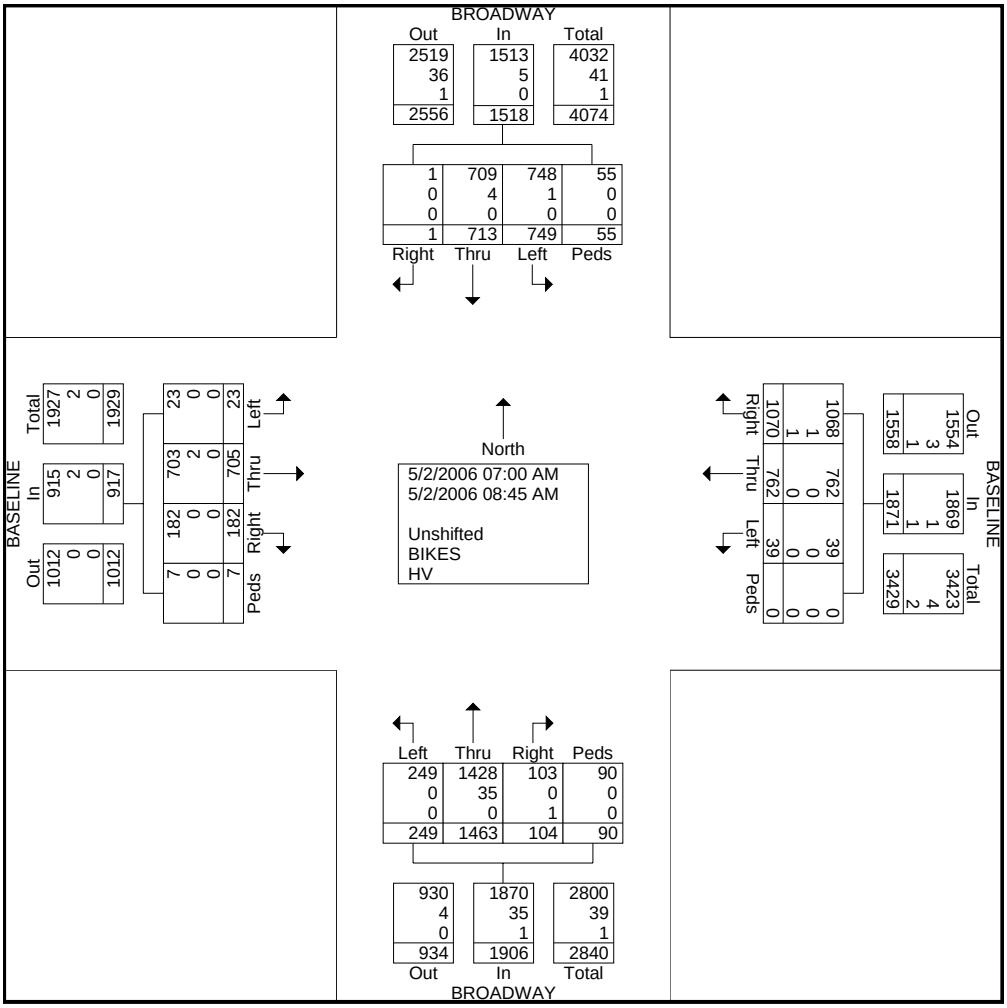
File Name : BROADWAY&BASELINEAM
Site Code : 00000000
Start Date : 5/2/2006
Page No : 1

Groups Printed- Unshifted - BIKES - HV

	BROADWAY Southbound				BASELINE Westbound				BROADWAY Northbound				BASELINE Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	54	63	0	2	1	20	59	0	14	92	6	2	3	53	14	0	383
07:15 AM	74	91	0	2	3	54	80	0	26	115	3	0	4	85	22	0	559
07:30 AM	103	82	0	7	4	69	121	0	28	158	14	6	1	100	16	0	709
07:45 AM	95	82	1	8	7	116	205	0	23	236	14	11	3	111	34	0	946
Total	326	318	1	19	15	259	465	0	91	601	37	19	11	349	86	0	2597
08:00 AM	96	114	0	15	5	111	143	0	41	218	14	3	4	91	24	2	881
08:15 AM	108	108	0	5	6	98	161	0	35	207	16	19	4	93	24	3	887
08:30 AM	118	89	0	5	6	130	135	0	48	205	25	29	1	84	17	0	892
08:45 AM	101	84	0	11	7	164	166	0	34	232	12	20	3	88	31	2	955
Total	423	395	0	36	24	503	605	0	158	862	67	71	12	356	96	7	3615
Grand Total	749	713	1	55	39	762	1070	0	249	1463	104	90	23	705	182	7	6212
Apprch %	49.3	47	0.1	3.6	2.1	40.7	57.2	0	13.1	76.8	5.5	4.7	2.5	76.9	19.8	0.8	
Total %	12.1	11.5	0	0.9	0.6	12.3	17.2	0	4	23.6	1.7	1.4	0.4	11.3	2.9	0.1	
Unshifted	748	709	1	55	39	762	1068	0	249	1428	103	90	23	703	182	7	6167
% Unshifted	99.9	99.4	100	100	100	100	99.8	0	100	97.6	99	100	100	99.7	100	100	99.3
BIKES	1	4	0	0	0	0	1	0	0	35	0	0	0	2	0	0	43
% BIKES	0.1	0.6	0	0	0	0	0.1	0	0	2.4	0	0	0	0.3	0	0	0.7
HV	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2
% HV	0	0	0	0	0	0	0.1	0	0	0	1	0	0	0	0	0	0

All Traffic Data Services, Inc
9660 W 44th Ave
Wheat Ridge, CO 80033
www.alltrafficdata.net

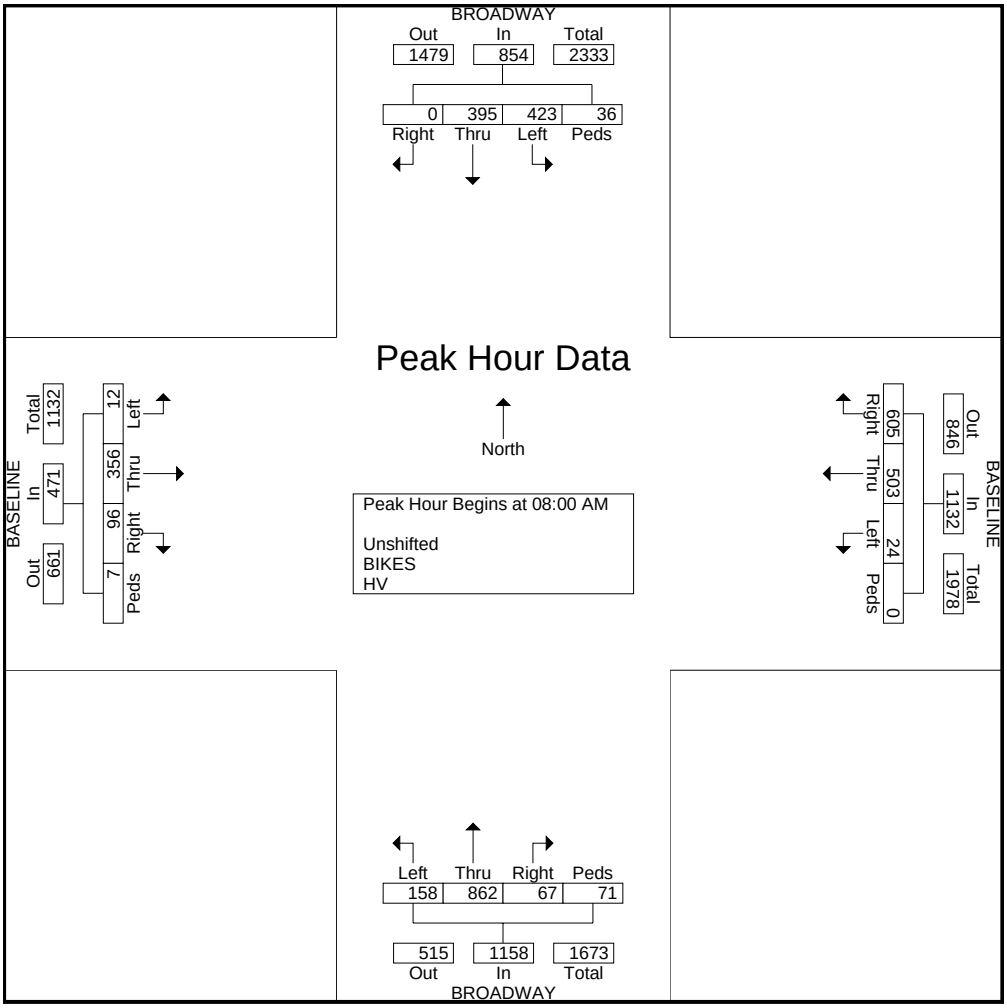
File Name : BROADWAY&BASELINEAM
Site Code : 00000000
Start Date : 5/2/2006
Page No : 2



	BROADWAY Southbound					BASELINE Westbound					BROADWAY Northbound					BASELINE Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	96	**114**	0	**15**	**225**	5	111	143	0	259	41	218	14	3	276	**4**	91	24	2	121	881
08:15 AM	108	108	0	5	221	6	98	161	0	265	35	207	16	19	277	4	**93**	24	**3**	**124**	887
08:30 AM	**118**	89	0	5	212	6	130	135	0	271	**48**	205	**25**	**29**	**307**	1	84	17	0	102	892
08:45 AM	101	84	0	11	196	**7**	**164**	**166**	0	**337**	34	**232**	12	20	298	3	88	**31**	2	124	**955**
Total Volume	423	395	0	36	854	24	503	605	0	1132	158	862	67	71	1158	12	356	96	7	471	3615
% App. Total	49.5	46.3	0	4.2		2.1	44.4	53.4	0		13.6	74.4	5.8	6.1		2.5	75.6	20.4	1.5		
PHF	.896	.866	.000	.600	.949	.857	.767	.911	.000	.840	.823	.929	.670	.612	.943	.750	.957	.774	.583	.950	.946

All Traffic Data Services, Inc
9660 W 44th Ave
Wheat Ridge, CO 80033
www.alltrafficdata.net

File Name : BROADWAY&BASELINEAM
Site Code : 00000000
Start Date : 5/2/2006
Page No : 3



All Traffic Data Services, Inc
9660 W 44th Ave
Wheat Ridge, CO 80033
www.alltrafficdata.net

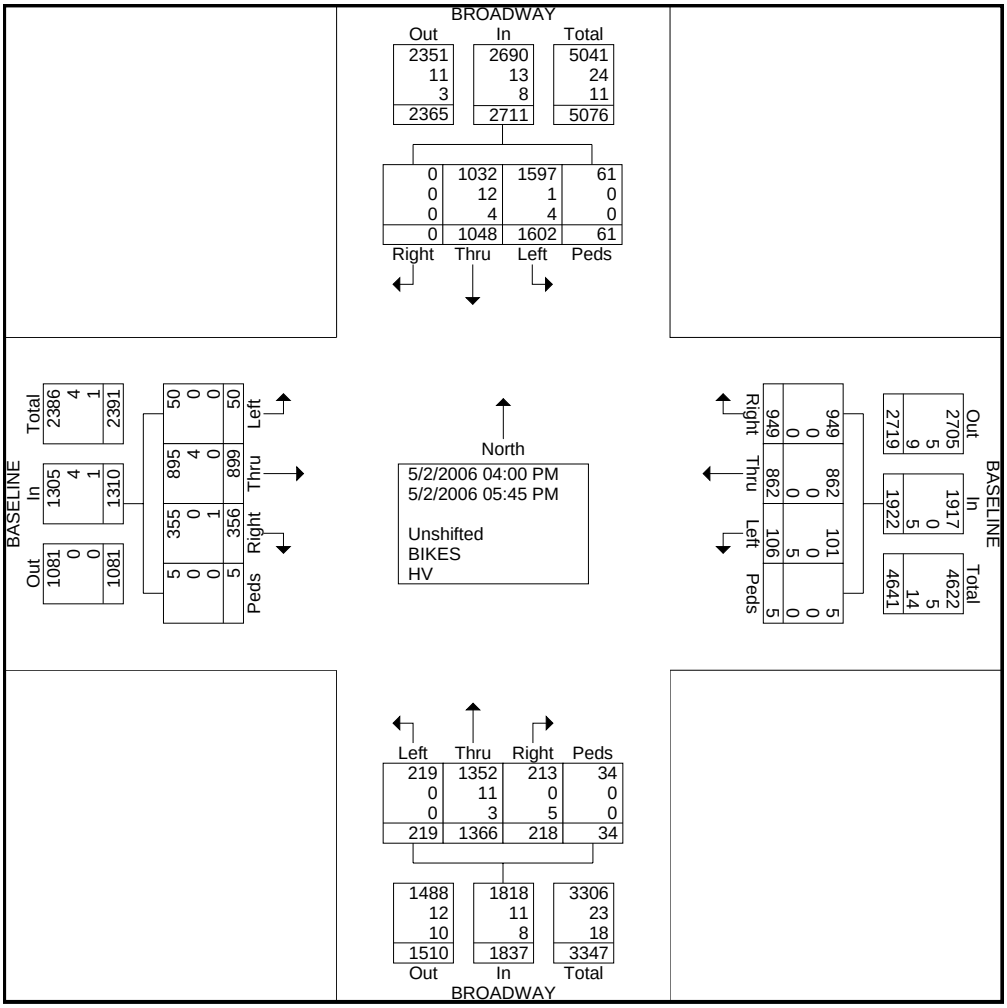
File Name : BROADWAY&BASELINEPM
Site Code : 00000000
Start Date : 5/2/2006
Page No : 1

Groups Printed- Unshifted - BIKES - HV

	BROADWAY Southbound				BASELINE Westbound				BROADWAY Northbound				BASELINE Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
04:00 PM	176	100	0	1	16	132	126	0	26	186	31	6	8	97	49	0	954
04:15 PM	182	119	0	3	16	75	132	3	21	153	20	1	9	106	38	2	880
04:30 PM	182	140	0	6	8	77	124	0	28	176	27	2	3	101	42	0	916
04:45 PM	237	124	0	14	12	100	104	0	20	168	25	3	4	104	37	0	952
Total	777	483	0	24	52	384	486	3	95	683	103	12	24	408	166	2	3702
05:00 PM	225	146	0	24	9	100	142	2	28	158	26	14	4	133	47	1	1059
05:15 PM	229	163	0	2	13	98	84	0	18	171	29	5	7	133	65	0	1017
05:30 PM	194	145	0	5	17	137	112	0	47	183	34	1	5	112	40	1	1033
05:45 PM	177	111	0	6	15	143	125	0	31	171	26	2	10	113	38	1	969
Total	825	565	0	37	54	478	463	2	124	683	115	22	26	491	190	3	4078
Grand Total	1602	1048	0	61	106	862	949	5	219	1366	218	34	50	899	356	5	7780
Apprch %	59.1	38.7	0	2.3	5.5	44.8	49.4	0.3	11.9	74.4	11.9	1.9	3.8	68.6	27.2	0.4	
Total %	20.6	13.5	0	0.8	1.4	11.1	12.2	0.1	2.8	17.6	2.8	0.4	0.6	11.6	4.6	0.1	
Unshifted	1597	1032	0	61	101	862	949	5	219	1352	213	34	50	895	355	5	7730
% Unshifted	99.7	98.5	0	100	95.3	100	100	100	100	99	97.7	100	100	99.6	99.7	100	99.4
BIKES	1	12	0	0	0	0	0	0	0	11	0	0	0	4	0	0	28
% BIKES	0.1	1.1	0	0	0	0	0	0	0	0.8	0	0	0	0.4	0	0	0.4
HV	4	4	0	0	5	0	0	0	0	3	5	0	0	0	1	0	22
% HV	0.2	0.4	0	0	4.7	0	0	0	0	0.2	2.3	0	0	0	0.3	0	0.3

All Traffic Data Services, Inc
9660 W 44th Ave
Wheat Ridge, CO 80033
www.alltrafficdata.net

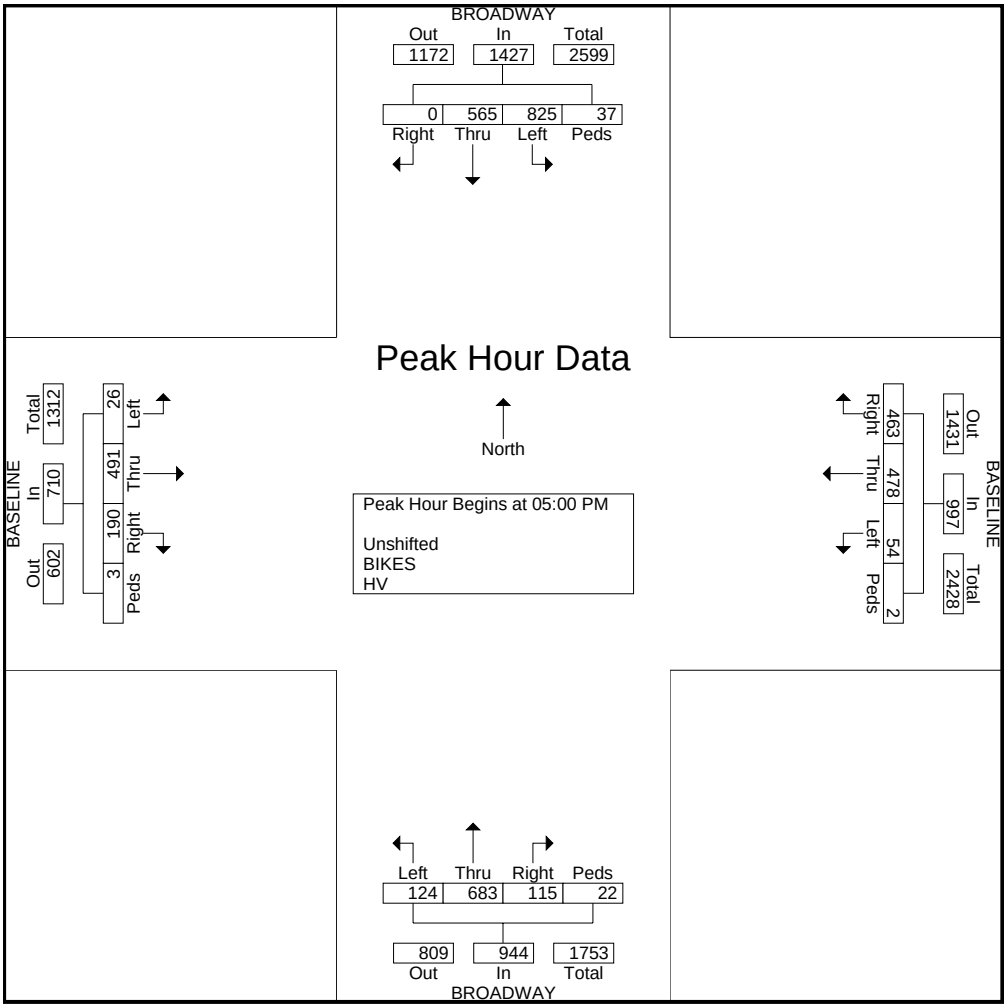
File Name : BROADWAY&BASELINEPM
Site Code : 00000000
Start Date : 5/2/2006
Page No : 2



	BROADWAY Southbound					BASELINE Westbound					BROADWAY Northbound					BASELINE Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	225	146	0	**24**	**395**	9	100	**142**	**2**	253	28	158	26	**14**	226	4	**133**	47	**1**	185	**1059**
05:15 PM	**229**	**163**	0	2	394	13	98	84	0	195	18	171	29	5	223	7	133	**65**	0	**205**	1017
05:30 PM	194	145	0	5	344	**17**	137	112	0	266	**47**	**183**	**34**	1	**265**	5	112	40	1	158	1033
05:45 PM	177	111	0	6	294	15	**143**	125	0	**283**	31	171	26	2	230	**10**	113	38	1	162	969
Total Volume	825	565	0	37	1427	54	478	463	2	997	124	683	115	22	944	26	491	190	3	710	4078
% App. Total	57.8	39.6	0	2.6		5.4	47.9	46.4	0.2		13.1	72.4	12.2	2.3		3.7	69.2	26.8	0.4		
PHF	.901	.867	.000	.385	.903	.794	.836	.815	.250	.881	.660	.933	.846	.393	.891	.650	.923	.731	.750	.866	.963

All Traffic Data Services, Inc
9660 W 44th Ave
Wheat Ridge, CO 80033
www.alltrafficdata.net

File Name : BROADWAY&BASELINEPM
Site Code : 00000000
Start Date : 5/2/2006
Page No : 3



All Traffic Data Services, Inc
9660 W 44th Ave
Wheat Ridge, CO 80033
www.alltrafficdata.net

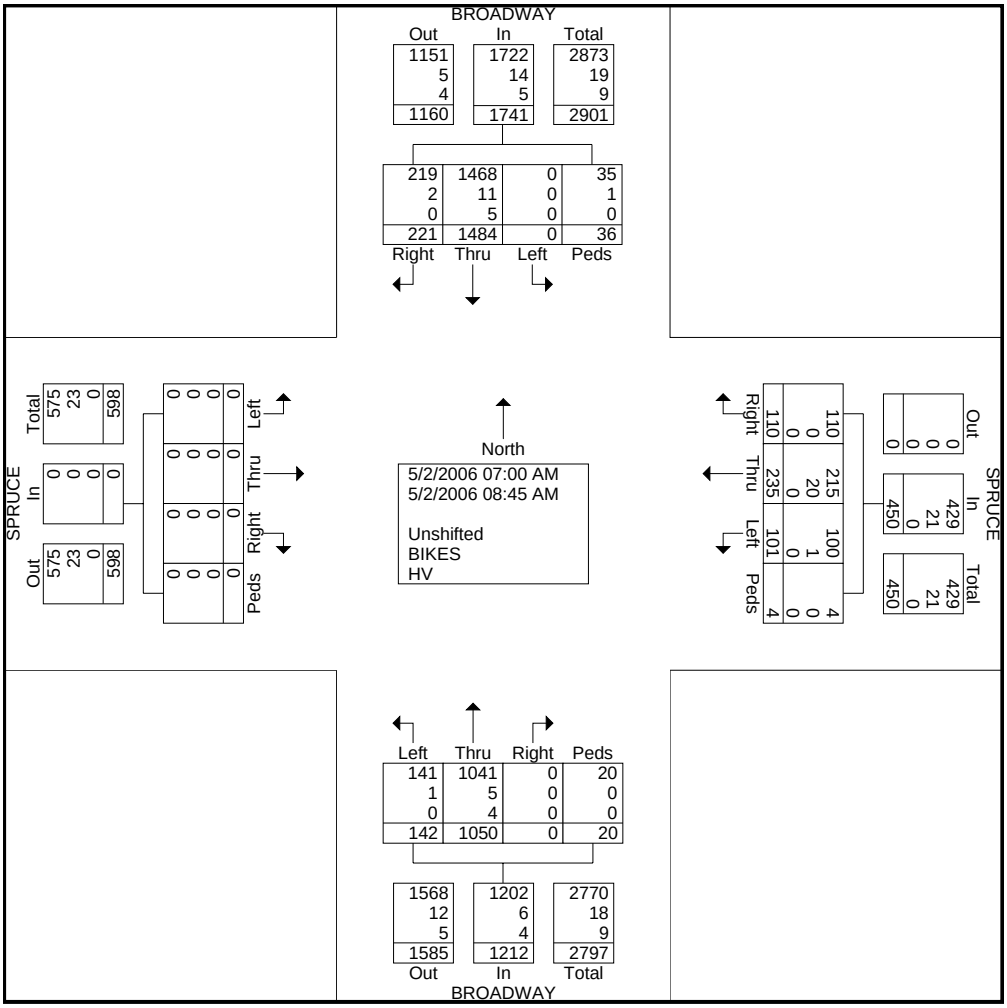
File Name : BROADWAY&SPRUCEAM
Site Code : 00000000
Start Date : 5/2/2006
Page No : 1

Groups Printed- Unshifted - BIKES - HV

	BROADWAY Southbound				SPRUCE Westbound				BROADWAY Northbound				SPRUCE Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	161	10	3	7	10	4	0	10	86	0	1	0	0	0	0	292
07:15 AM	0	244	20	8	4	13	6	0	11	107	0	2	0	0	0	0	415
07:30 AM	0	163	29	2	12	19	17	1	18	135	0	5	0	0	0	0	401
07:45 AM	0	183	26	5	13	34	9	3	16	145	0	2	0	0	0	0	436
Total	0	751	85	18	36	76	36	4	55	473	0	10	0	0	0	0	1544
08:00 AM	0	175	41	3	21	39	19	0	20	125	0	2	0	0	0	0	445
08:15 AM	0	186	35	1	9	35	15	0	21	171	0	1	0	0	0	0	474
08:30 AM	0	204	28	3	17	49	16	0	24	151	0	5	0	0	0	0	497
08:45 AM	0	168	32	11	18	36	24	0	22	130	0	2	0	0	0	0	443
Total	0	733	136	18	65	159	74	0	87	577	0	10	0	0	0	0	1859
Grand Total	0	1484	221	36	101	235	110	4	142	1050	0	20	0	0	0	0	3403
Apprch %	0	85.2	12.7	2.1	22.4	52.2	24.4	0.9	11.7	86.6	0	1.7	0	0	0	0	
Total %	0	43.6	6.5	1.1	3	6.9	3.2	0.1	4.2	30.9	0	0.6	0	0	0	0	
Unshifted	0	1468	219	35	100	215	110	4	141	1041	0	20	0	0	0	0	3353
% Unshifted	0	98.9	99.1	97.2	99	91.5	100	100	99.3	99.1	0	100	0	0	0	0	98.5
BIKES	0	11	2	1	1	20	0	0	1	5	0	0	0	0	0	0	41
% BIKES	0	0.7	0.9	2.8	1	8.5	0	0	0.7	0.5	0	0	0	0	0	0	1.2
HV	0	5	0	0	0	0	0	0	0	4	0	0	0	0	0	0	9
% HV	0	0.3	0	0	0	0	0	0	0	0.4	0	0	0	0	0	0	0.3

All Traffic Data Services, Inc
9660 W 44th Ave
Wheat Ridge, CO 80033
www.alltrafficdata.net

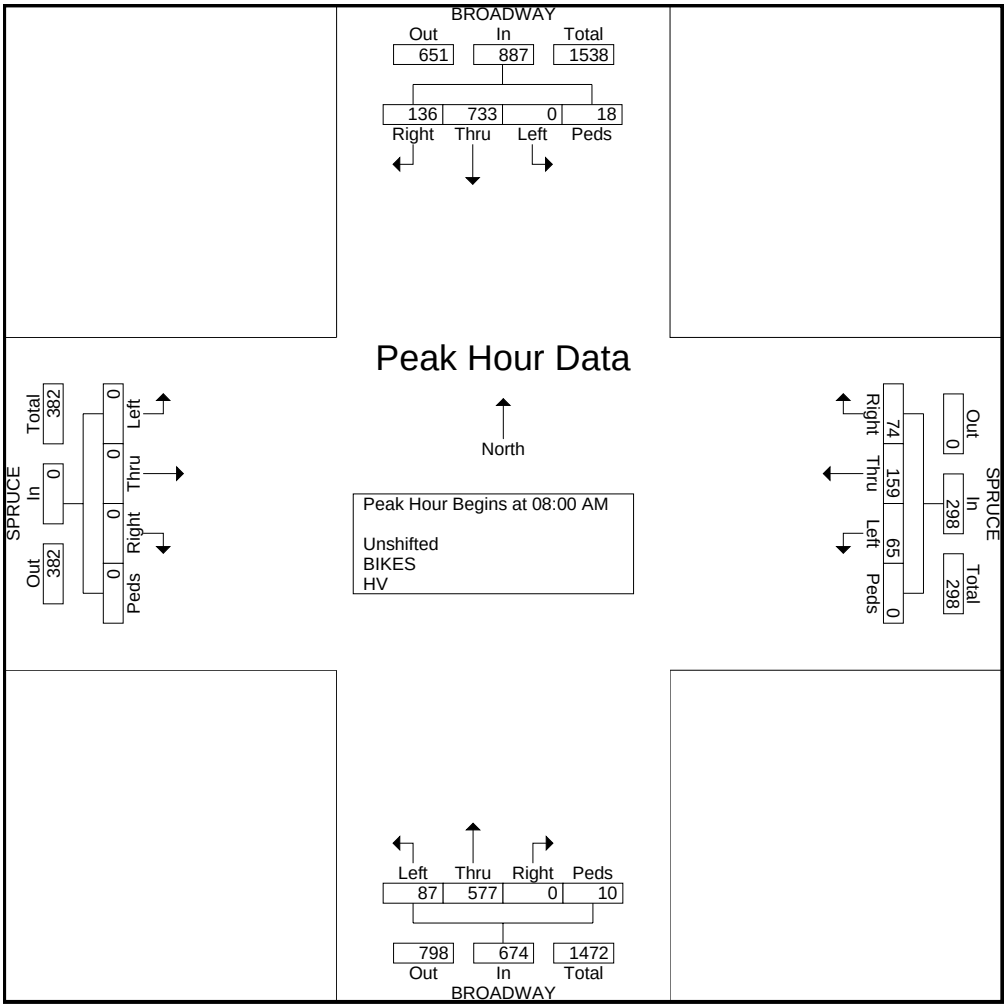
File Name : BROADWAY&SPRUCEAM
Site Code : 00000000
Start Date : 5/2/2006
Page No : 2



	BROADWAY Southbound					SPRUCE Westbound					BROADWAY Northbound					SPRUCE Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	175	**41**	3	219	**21**	39	19	0	79	20	125	0	2	147	0	0	0	0	0	445
08:15 AM	0	186	35	1	222	9	35	15	0	59	21	**171**	0	1	**193**	0	0	0	0	0	474
08:30 AM	0	**204**	28	3	**235**	17	**49**	16	0	**82**	**24**	151	0	**5**	180	0	0	0	0	0	**497**
08:45 AM	0	168	32	**11**	211	18	36	**24**	0	78	22	130	0	2	154	0	0	0	0	0	443
Total Volume	0	733	136	18	887	65	159	74	0	298	87	577	0	10	674	0	0	0	0	0	1859
% App. Total	0	82.6	15.3	2		21.8	53.4	24.8	0		12.9	85.6	0	1.5		0	0	0	0		
PHF	.000	.898	.829	.409	.944	.774	.811	.771	.000	.909	.906	.844	.000	.500	.873	.000	.000	.000	.000	.000	.935

All Traffic Data Services, Inc
9660 W 44th Ave
Wheat Ridge, CO 80033
www.alltrafficdata.net

File Name : BROADWAY&SPRUCEAM
Site Code : 00000000
Start Date : 5/2/2006
Page No : 3



All Traffic Data Services, Inc
9660 W 44th Ave
Wheat Ridge, CO 80033
www.alltrafficdata.net

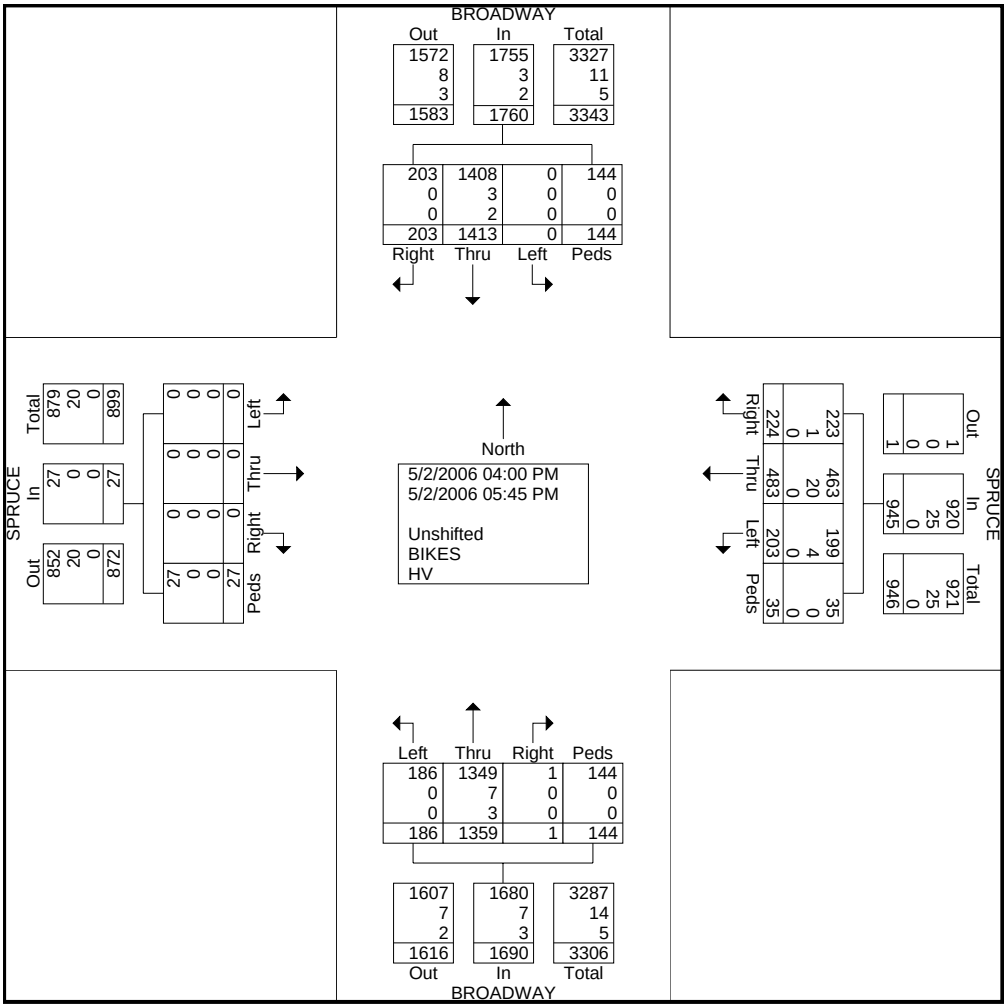
File Name : BROADWAY&SPRUCEPM
Site Code : 00000000
Start Date : 5/2/2006
Page No : 1

Groups Printed- Unshifted - BIKES - HV

	BROADWAY Southbound				SPRUCE Westbound				BROADWAY Northbound				SPRUCE Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
04:00 PM	0	166	22	24	23	41	32	4	18	191	0	10	0	0	0	4	535
04:15 PM	0	177	16	13	31	51	26	2	15	180	0	12	0	0	0	1	524
04:30 PM	0	164	26	14	22	54	29	7	23	168	0	20	0	0	0	0	527
04:45 PM	0	193	30	9	16	60	22	8	26	152	1	24	0	0	0	4	545
Total	0	700	94	60	92	206	109	21	82	691	1	66	0	0	0	9	2131
05:00 PM	0	209	21	14	28	60	38	4	23	182	0	30	0	0	0	5	614
05:15 PM	0	190	26	32	32	76	29	2	23	183	0	13	0	0	0	7	613
05:30 PM	0	171	35	19	32	72	28	5	24	151	0	13	0	0	0	6	556
05:45 PM	0	143	27	19	19	69	20	3	34	152	0	22	0	0	0	0	508
Total	0	713	109	84	111	277	115	14	104	668	0	78	0	0	0	18	2291
Grand Total	0	1413	203	144	203	483	224	35	186	1359	1	144	0	0	0	27	4422
Apprch %	0	80.3	11.5	8.2	21.5	51.1	23.7	3.7	11	80.4	0.1	8.5	0	0	0	100	
Total %	0	32	4.6	3.3	4.6	10.9	5.1	0.8	4.2	30.7	0	3.3	0	0	0	0.6	
Unshifted	0	1408	203	144	199	463	223	35	186	1349	1	144	0	0	0	27	4382
% Unshifted	0	99.6	100	100	98	95.9	99.6	100	100	99.3	100	100	0	0	0	100	99.1
BIKES	0	3	0	0	4	20	1	0	0	7	0	0	0	0	0	0	35
% BIKES	0	0.2	0	0	2	4.1	0.4	0	0	0.5	0	0	0	0	0	0	0.8
HV	0	2	0	0	0	0	0	0	0	3	0	0	0	0	0	0	5
% HV	0	0.1	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0.1

All Traffic Data Services, Inc
9660 W 44th Ave
Wheat Ridge, CO 80033
www.alltrafficdata.net

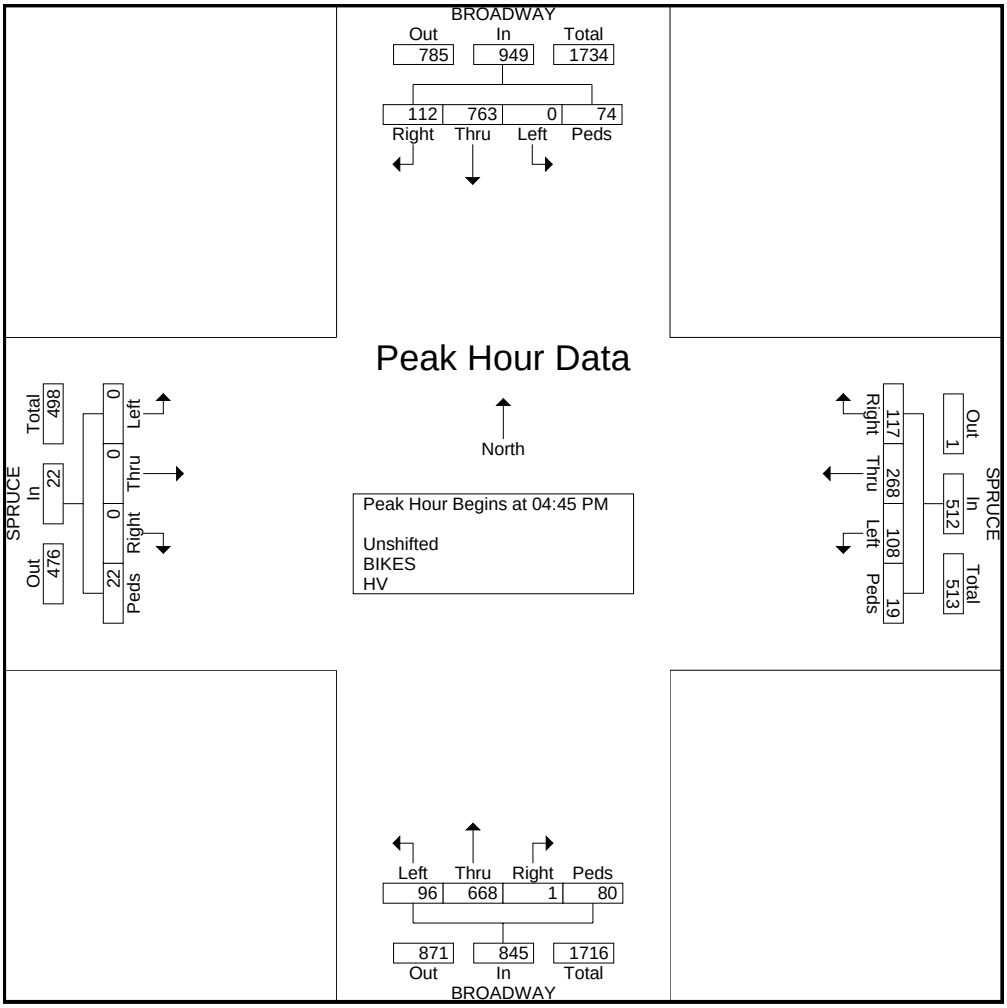
File Name : BROADWAY&SPRUCEPM
Site Code : 00000000
Start Date : 5/2/2006
Page No : 2



	BROADWAY Southbound					SPRUCE Westbound					BROADWAY Northbound					SPRUCE Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	193	30	9	232	16	60	22	**8**	106	**26**	152	**1**	24	203	0	0	0	4	4	545
05:00 PM	0	**209**	21	14	244	28	60	**38**	4	130	23	182	0	**30**	**235**	0	0	0	5	5	**614**
05:15 PM	0	190	26	**32**	**248**	**32**	**76**	29	2	**139**	23	**183**	0	13	219	0	0	0	**7**	**7**	613
05:30 PM	0	171	**35**	19	225	32	72	28	5	137	24	151	0	13	188	0	0	0	6	6	556
Total Volume	0	763	112	74	949	108	268	117	19	512	96	668	1	80	845	0	0	0	22	22	2328
% App. Total	0	80.4	11.8	7.8		21.1	52.3	22.9	3.7		11.4	79.1	0.1	9.5		0	0	0	100		
PHF	.000	.913	.800	.578	.957	.844	.882	.770	.594	.921	.923	.913	.250	.667	.899	.000	.000	.000	.786	.786	.948

All Traffic Data Services, Inc
9660 W 44th Ave
Wheat Ridge, CO 80033
www.alltrafficdata.net

File Name : BROADWAY&SPRUCEPM
Site Code : 00000000
Start Date : 5/2/2006
Page No : 3

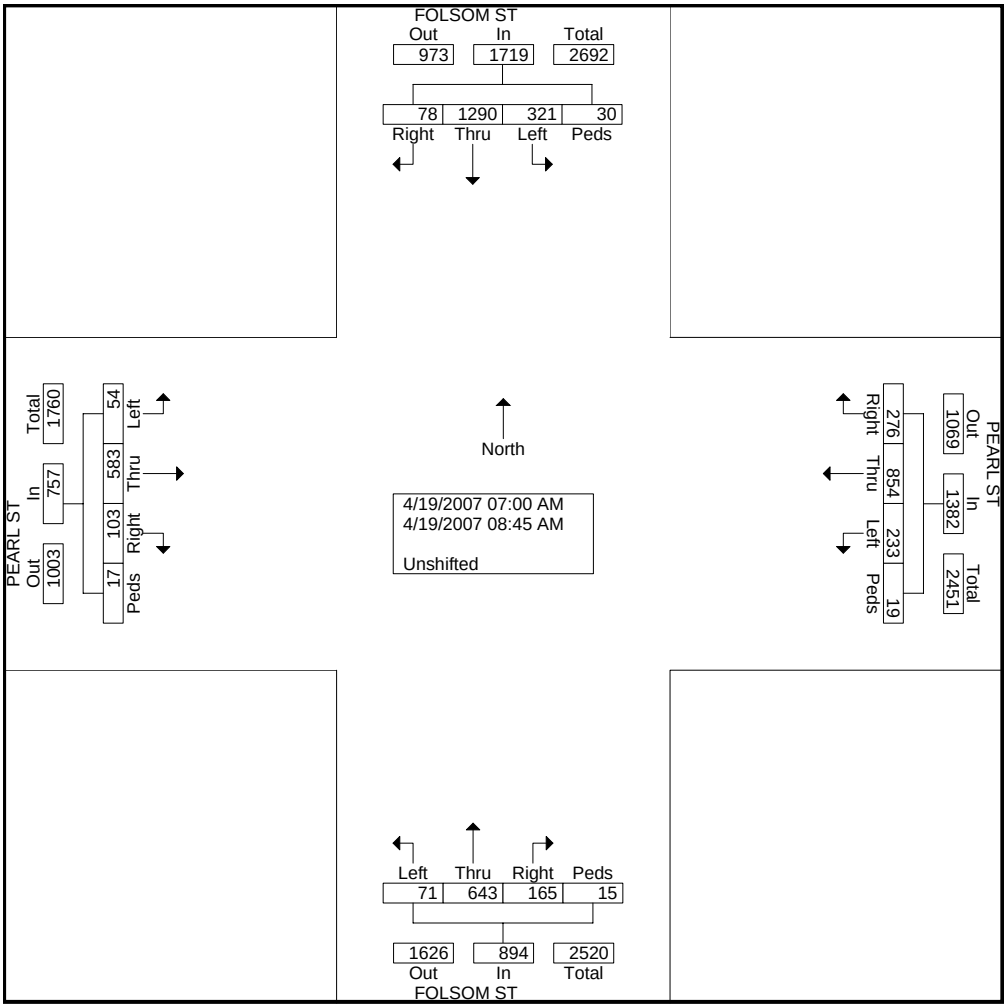


All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : FOLSOM&PEARLAM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 1

Groups Printed- Unshifted

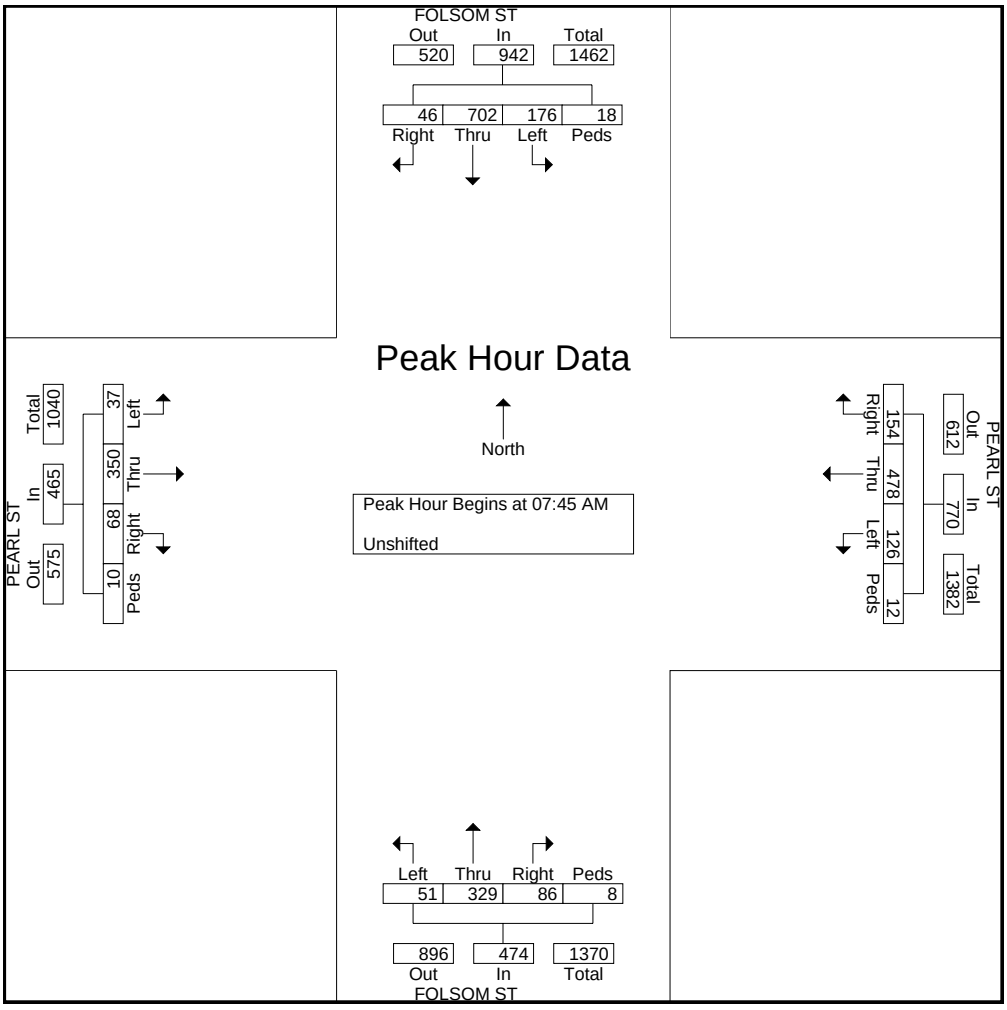
	FOLSOM ST Southbound				PEARL ST Westbound				FOLSOM ST Northbound				PEARL ST Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	22	126	8	2	22	84	26	2	0	61	15	2	3	39	9	2	423
07:15 AM	28	176	5	6	29	88	23	2	8	70	20	1	1	54	8	2	521
07:30 AM	35	122	8	2	27	95	31	1	4	89	20	2	4	66	4	1	511
07:45 AM	54	205	12	5	34	112	35	2	13	75	22	1	6	73	14	2	665
Total	139	629	33	15	112	379	115	7	25	295	77	6	14	232	35	7	2120
08:00 AM	36	184	11	3	21	114	45	2	12	91	23	2	8	89	15	2	658
08:15 AM	45	168	14	5	36	124	36	3	11	85	22	2	12	88	18	3	672
08:30 AM	41	145	9	5	35	128	38	5	15	78	19	3	11	100	21	3	656
08:45 AM	60	164	11	2	29	109	42	2	8	94	24	2	9	74	14	2	646
Total	182	661	45	15	121	475	161	12	46	348	88	9	40	351	68	10	2632
Grand Total	321	1290	78	30	233	854	276	19	71	643	165	15	54	583	103	17	4752
Apprch %	18.7	75	4.5	1.7	16.9	61.8	20	1.4	7.9	71.9	18.5	1.7	7.1	77	13.6	2.2	
Total %	6.8	27.1	1.6	0.6	4.9	18	5.8	0.4	1.5	13.5	3.5	0.3	1.1	12.3	2.2	0.4	



All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : FOLSOM&PEARLAM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 2

	FOLSOM ST Southbound					PEARL ST Westbound					FOLSOM ST Northbound					PEARL ST Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	54	205	12	5	276	34	112	35	2	183	13	75	22	1	111	6	73	14	2	95	665
08:00 AM	36	184	11	3	234	21	114	45	2	182	12	91	23	2	128	8	89	15	2	114	658
08:15 AM	45	168	14	5	232	36	124	36	3	199	11	85	22	2	120	12	88	18	3	121	672
08:30 AM	41	145	9	5	200	35	128	38	5	206	15	78	19	3	115	11	100	21	3	135	656
Total Volume	176	702	46	18	942	126	478	154	12	770	51	329	86	8	474	37	350	68	10	465	2651
% App. Total	18.7	74.5	4.9	1.9		16.4	62.1	20	1.6		10.8	69.4	18.1	1.7		8	75.3	14.6	2.2		
PHF	.815	.856	.821	.900	.853	.875	.934	.856	.600	.934	.850	.904	.935	.667	.926	.771	.875	.810	.833	.861	.986

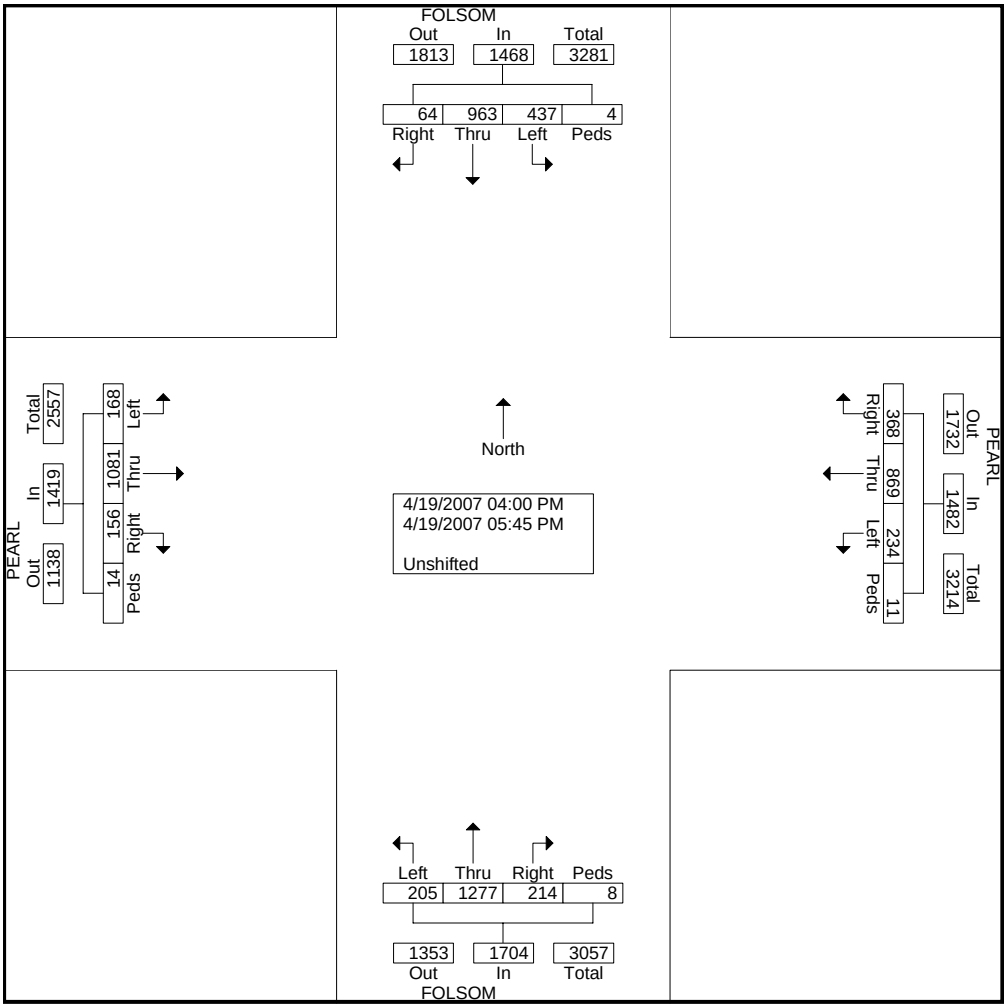


All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : FOLSOM&PEARLPM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 1

Groups Printed- Unshifted

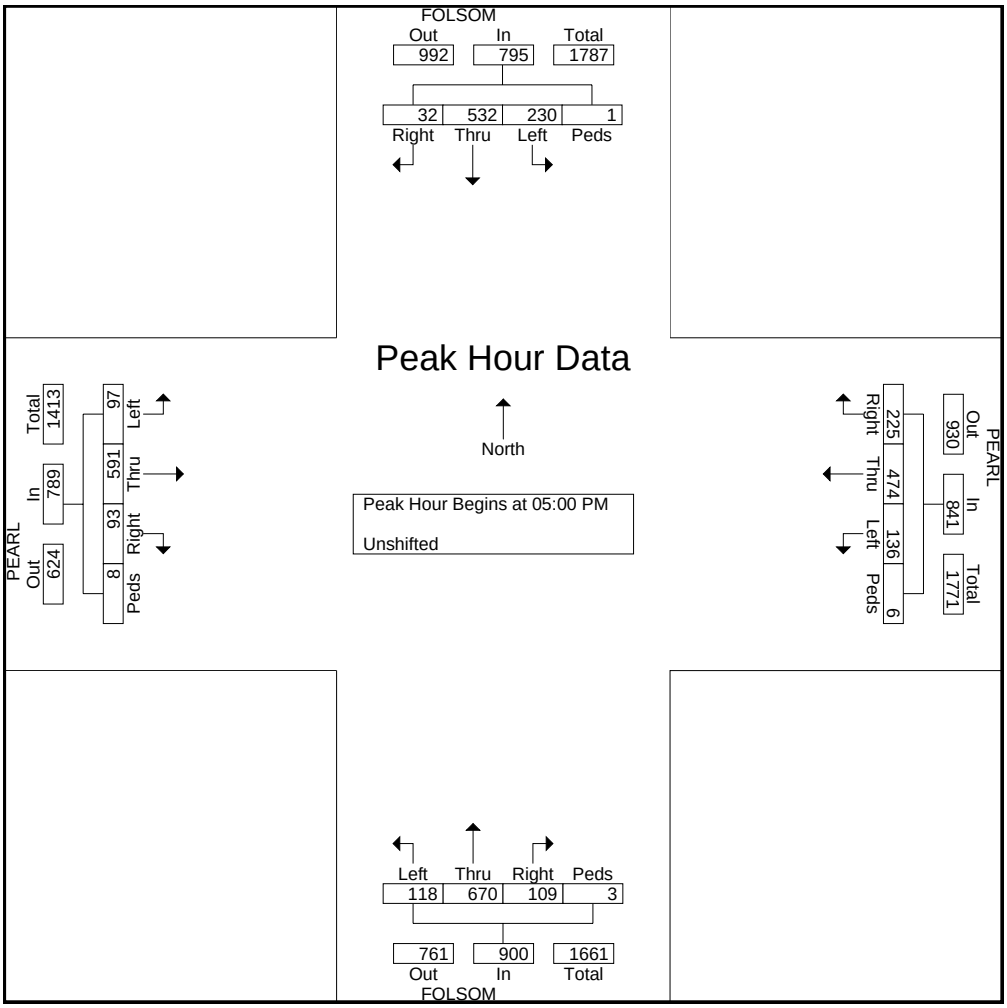
	FOLSOM Southbound				PEARL Westbound				FOLSOM Northbound				PEARL Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
04:00 PM	54	106	8	0	24	98	32	1	20	143	23	0	16	111	15	0	651
04:15 PM	44	87	10	0	19	97	35	1	13	149	25	2	14	126	15	4	641
04:30 PM	53	121	6	2	25	85	40	2	32	143	30	3	19	127	14	1	703
04:45 PM	56	117	8	1	30	115	36	1	22	172	27	0	22	126	19	1	753
Total	207	431	32	3	98	395	143	5	87	607	105	5	71	490	63	6	2748
05:00 PM	53	130	5	0	28	109	74	2	32	191	26	0	32	179	24	3	888
05:15 PM	55	136	6	0	26	118	52	2	31	174	36	2	36	136	23	5	838
05:30 PM	54	104	10	1	36	144	46	1	23	151	21	0	15	160	28	0	794
05:45 PM	68	162	11	0	46	103	53	1	32	154	26	1	14	116	18	0	805
Total	230	532	32	1	136	474	225	6	118	670	109	3	97	591	93	8	3325
Grand Total	437	963	64	4	234	869	368	11	205	1277	214	8	168	1081	156	14	6073
Apprch %	29.8	65.6	4.4	0.3	15.8	58.6	24.8	0.7	12	74.9	12.6	0.5	11.8	76.2	11	1	
Total %	7.2	15.9	1.1	0.1	3.9	14.3	6.1	0.2	3.4	21	3.5	0.1	2.8	17.8	2.6	0.2	



All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : FOLSOM&PEARLPM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 2

	FOLSOM Southbound					PEARL Westbound					FOLSOM Northbound					PEARL Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	53	130	5	0	188	28	109	74	2	213	32	191	26	0	249	32	179	24	3	238	888
05:15 PM	55	136	6	0	197	26	118	52	2	198	31	174	36	2	243	36	136	23	5	200	838
05:30 PM	54	104	10	1	169	36	144	46	1	227	23	151	21	0	195	15	160	28	0	203	794
05:45 PM	68	162	11	0	241	46	103	53	1	203	32	154	26	1	213	14	116	18	0	148	805
Total Volume	230	532	32	1	795	136	474	225	6	841	118	670	109	3	900	97	591	93	8	789	3325
% App. Total	28.9	66.9	4	0.1		16.2	56.4	26.8	0.7		13.1	74.4	12.1	0.3		12.3	74.9	11.8	1		
PHF	.846	.821	.727	.250	.825	.739	.823	.760	.750	.926	.922	.877	.757	.375	.904	.674	.825	.830	.400	.829	.936

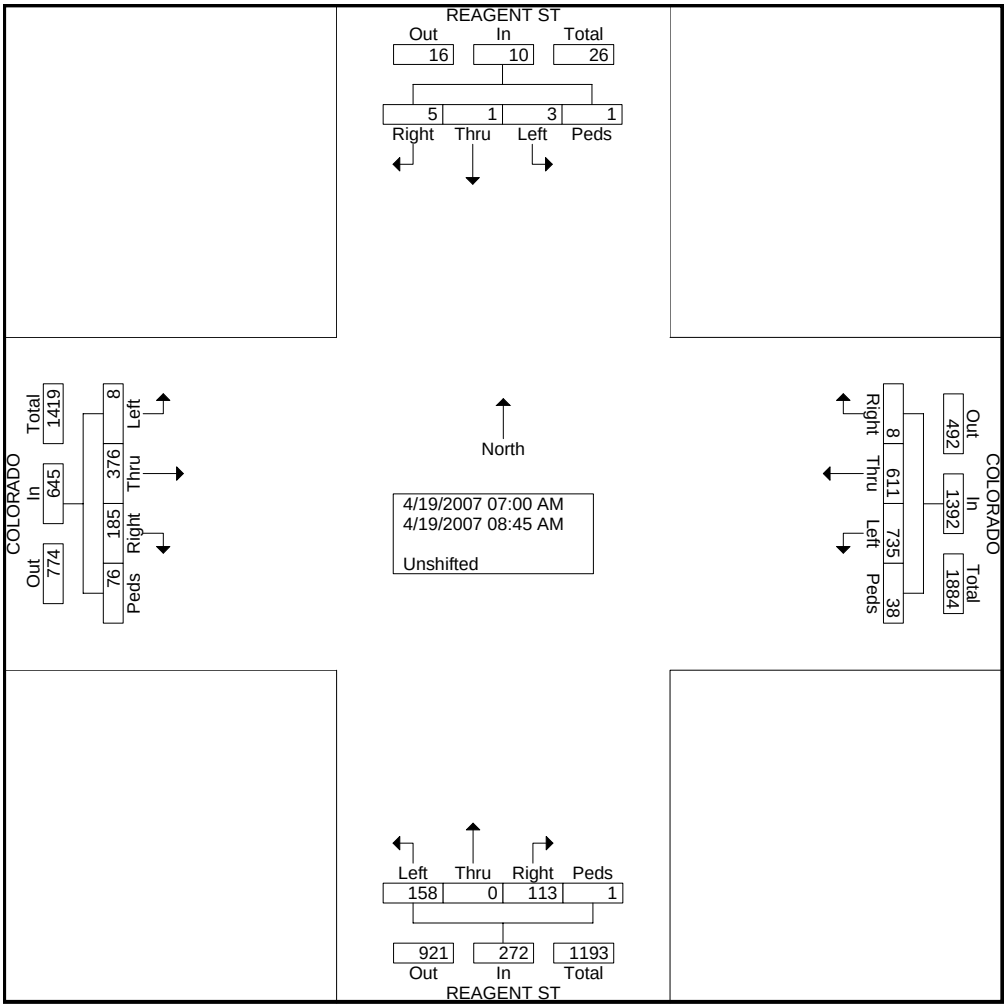


All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : REAGENT&COLORADOAM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 1

Groups Printed- Unshifted

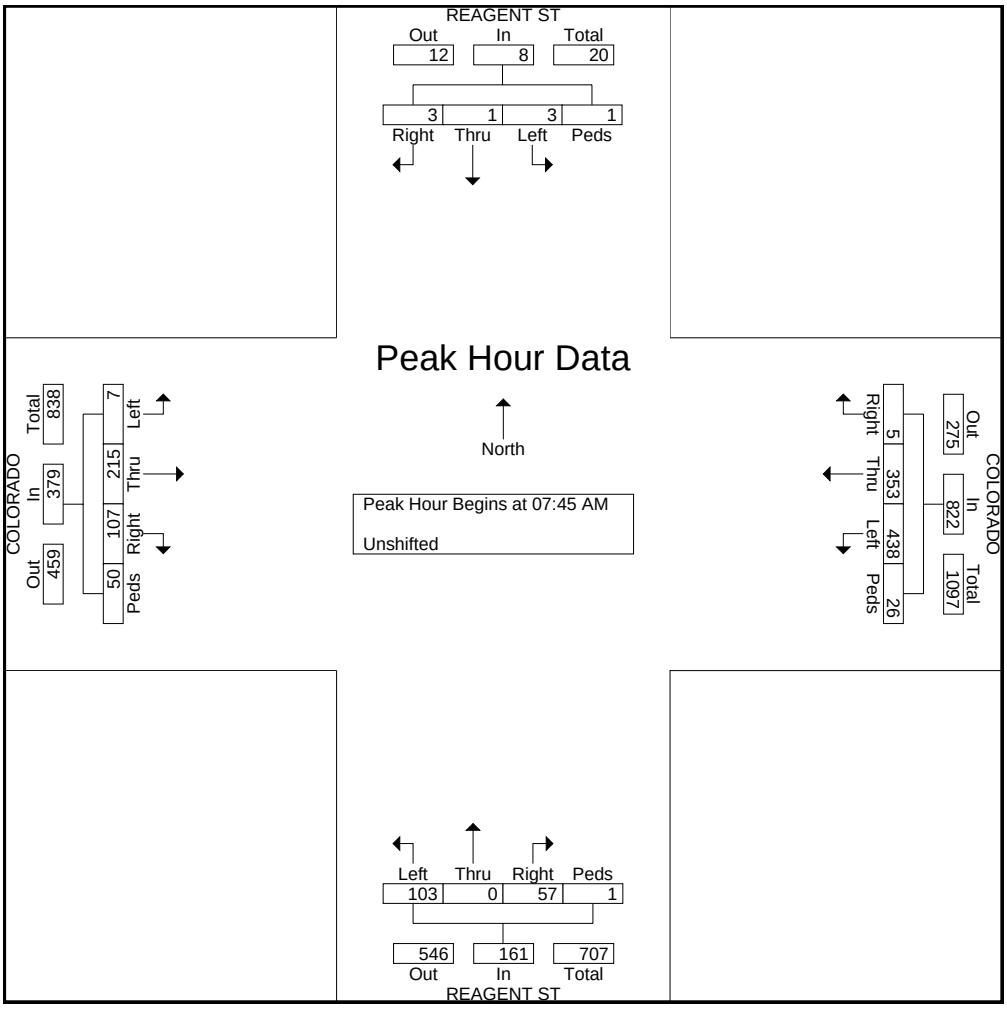
	REAGENT ST Southbound				COLORADO Westbound				REAGENT ST Northbound				COLORADO Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	0	0	1	0	38	39	0	2	9	0	11	0	0	34	13	3	150
07:15 AM	0	0	1	0	53	60	1	2	11	0	11	0	0	38	12	8	197
07:30 AM	0	0	0	0	88	66	0	2	13	0	15	0	1	50	13	6	254
07:45 AM	2	1	0	0	132	87	3	11	18	0	5	0	4	46	24	17	350
Total	2	1	2	0	311	252	4	17	51	0	42	0	5	168	62	34	951
08:00 AM	0	0	1	1	107	82	0	7	36	0	12	1	3	53	36	11	350
08:15 AM	0	0	1	0	92	81	1	1	34	0	26	0	0	63	21	8	328
08:30 AM	1	0	1	0	107	103	1	7	15	0	14	0	0	53	26	14	342
08:45 AM	0	0	0	0	118	93	2	6	22	0	19	0	0	39	40	9	348
Total	1	0	3	1	424	359	4	21	107	0	71	1	3	208	123	42	1368
Grand Total	3	1	5	1	735	611	8	38	158	0	113	1	8	376	185	76	2319
Apprch %	30	10	50	10	52.8	43.9	0.6	2.7	58.1	0	41.5	0.4	1.2	58.3	28.7	11.8	
Total %	0.1	0	0.2	0	31.7	26.3	0.3	1.6	6.8	0	4.9	0	0.3	16.2	8	3.3	



All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : REAGENT&COLORADOAM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 2

	REAGENT ST Southbound					COLORADO Westbound					REAGENT ST Northbound					COLORADO Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	2	1	0	0	3	132	87	3	11	233	18	0	5	0	23	4	46	24	17	91	350
08:00 AM	0	0	1	1	2	107	82	0	7	196	36	0	12	1	49	3	53	36	11	103	350
08:15 AM	0	0	1	0	1	92	81	1	1	175	34	0	26	0	60	0	63	21	8	92	328
08:30 AM	1	0	1	0	2	107	103	1	7	218	15	0	14	0	29	0	53	26	14	93	342
Total Volume	3	1	3	1	8	438	353	5	26	822	103	0	57	1	161	7	215	107	50	379	1370
% App. Total	37.5	12.5	37.5	12.5		53.3	42.9	0.6	3.2		64	0	35.4	0.6		1.8	56.7	28.2	13.2		
PHF	.375	.250	.750	.250	.667	.830	.857	.417	.591	.882	.715	.000	.548	.250	.671	.438	.853	.743	.735	.920	.979

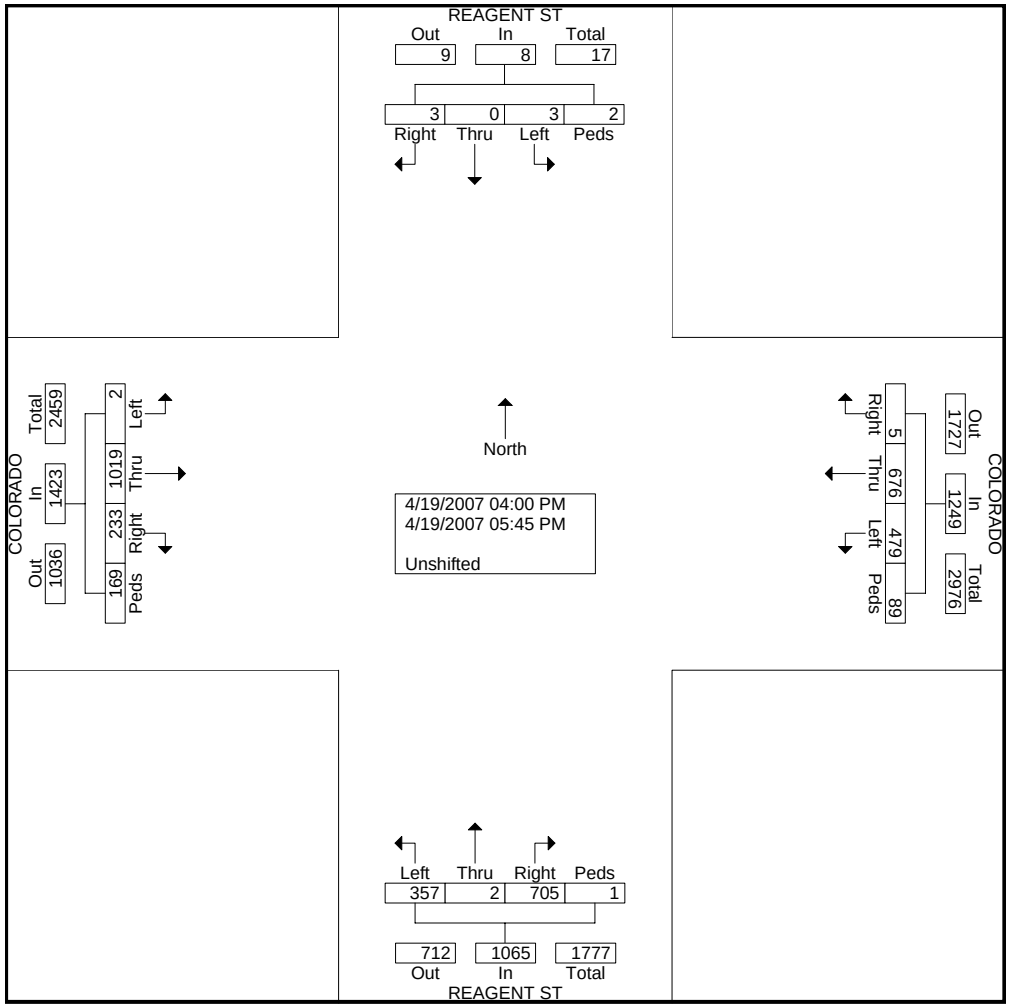


All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : REAGENT&COLORADOPM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 1

Groups Printed- Unshifted

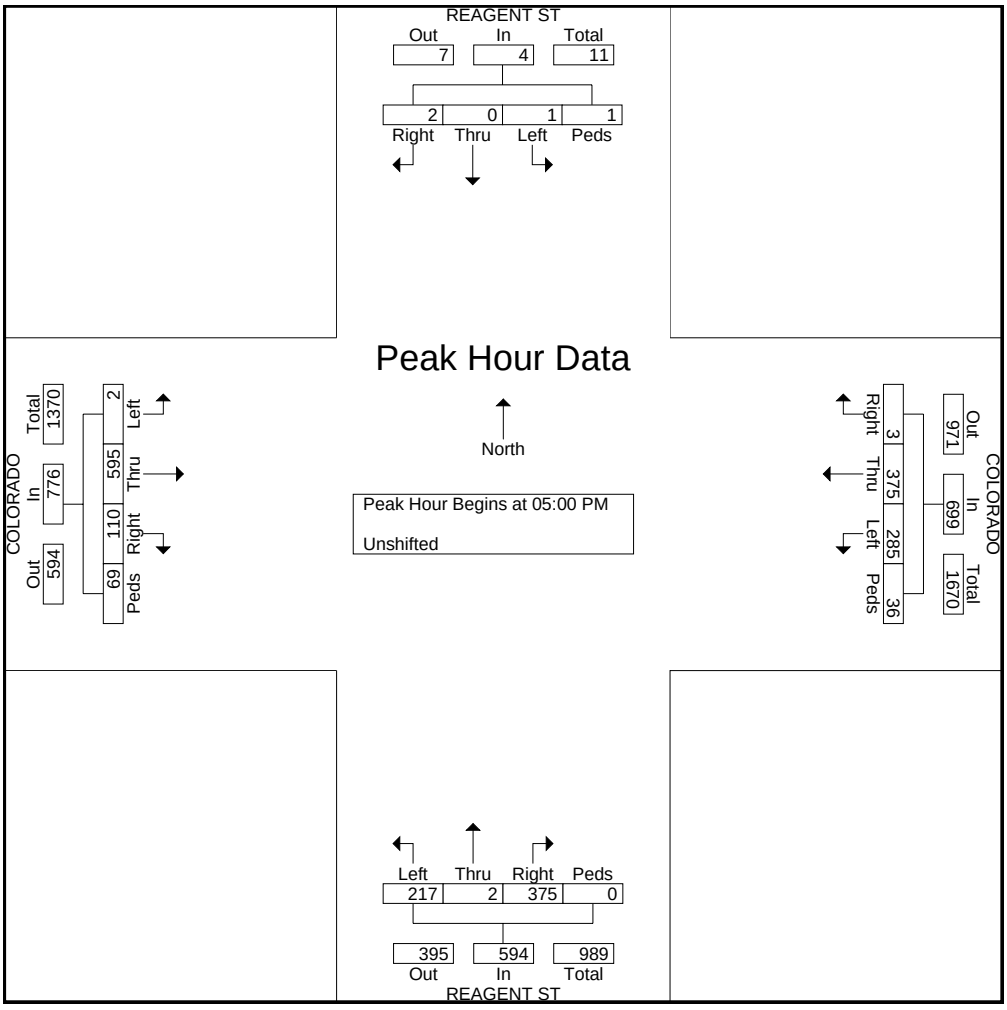
	REAGENT ST Southbound				COLORADO Westbound				REAGENT ST Northbound				COLORADO Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
04:00 PM	0	0	0	1	49	80	0	15	30	0	88	1	0	116	28	36	444
04:15 PM	0	0	1	0	50	50	0	20	44	0	86	0	0	108	34	33	426
04:30 PM	1	0	0	0	36	82	1	12	38	0	68	0	0	90	30	18	376
04:45 PM	1	0	0	0	59	89	1	6	28	0	88	0	0	110	31	13	426
Total	2	0	1	1	194	301	2	53	140	0	330	1	0	424	123	100	1672
05:00 PM	0	0	0	0	83	97	1	7	66	0	108	0	0	169	29	24	584
05:15 PM	0	0	0	0	50	74	1	11	58	2	105	0	1	165	28	22	517
05:30 PM	0	0	1	0	74	76	0	6	44	0	102	0	0	140	20	9	472
05:45 PM	1	0	1	1	78	128	1	12	49	0	60	0	1	121	33	14	500
Total	1	0	2	1	285	375	3	36	217	2	375	0	2	595	110	69	2073
Grand Total	3	0	3	2	479	676	5	89	357	2	705	1	2	1019	233	169	3745
Apprch %	37.5	0	37.5	25	38.4	54.1	0.4	7.1	33.5	0.2	66.2	0.1	0.1	71.6	16.4	11.9	
Total %	0.1	0	0.1	0.1	12.8	18.1	0.1	2.4	9.5	0.1	18.8	0	0.1	27.2	6.2	4.5	



All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : REAGENT&COLORADOPM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 2

	REAGENT ST Southbound					COLORADO Westbound					REAGENT ST Northbound					COLORADO Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	0	0	0	0	83	97	1	7	188	66	0	108	0	174	0	169	29	24	222	584
05:15 PM	0	0	0	0	0	50	74	1	11	136	58	2	105	0	165	1	165	28	22	216	517
05:30 PM	0	0	1	0	1	74	76	0	6	156	44	0	102	0	146	0	140	20	9	169	472
05:45 PM	1	0	1	1	3	78	128	1	12	219	49	0	60	0	109	1	121	33	14	169	500
Total Volume	1	0	2	1	4	285	375	3	36	699	217	2	375	0	594	2	595	110	69	776	2073
% App. Total	25	0	50	25		40.8	53.6	0.4	5.2		36.5	0.3	63.1	0		0.3	76.7	14.2	8.9		
PHF	.250	.000	.500	.250	.333	.858	.732	.750	.750	.798	.822	.250	.868	.000	.853	.500	.880	.833	.719	.874	.887

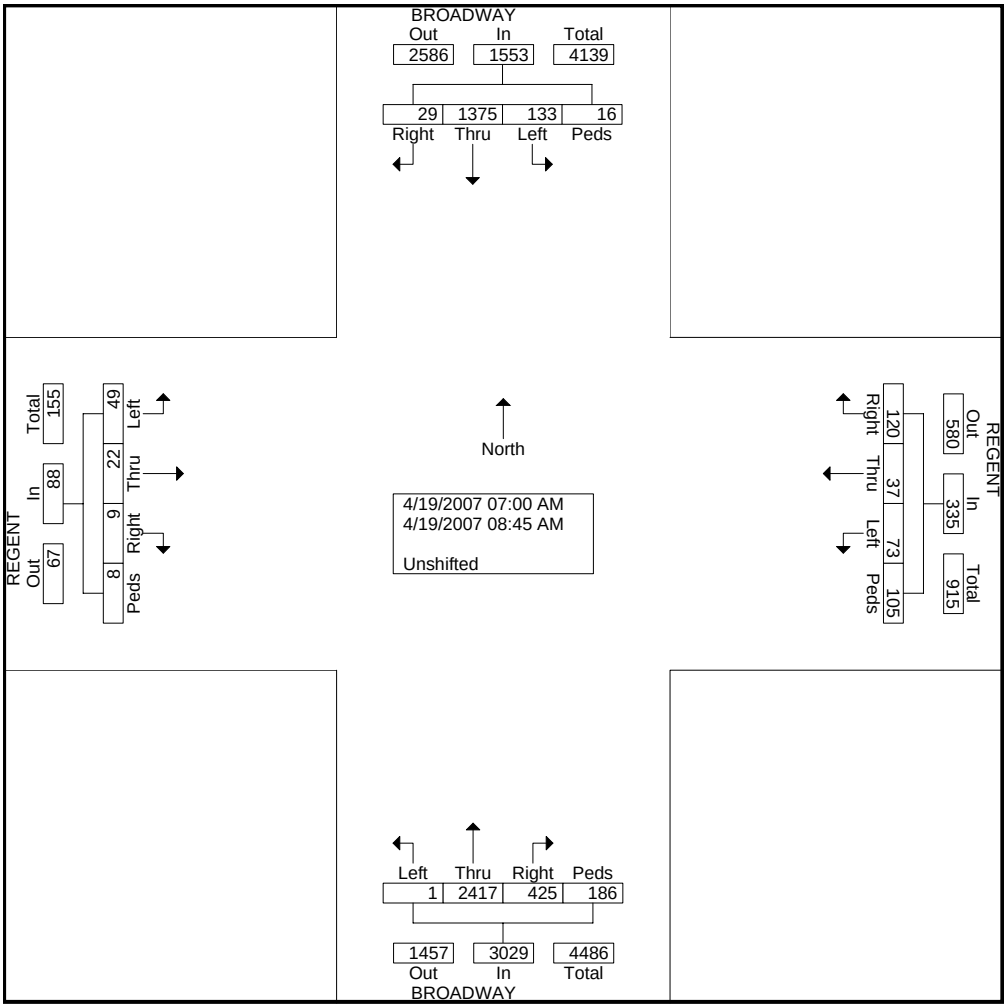


All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : REGENT&BROADWAYAM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 1

Groups Printed- Unshifted

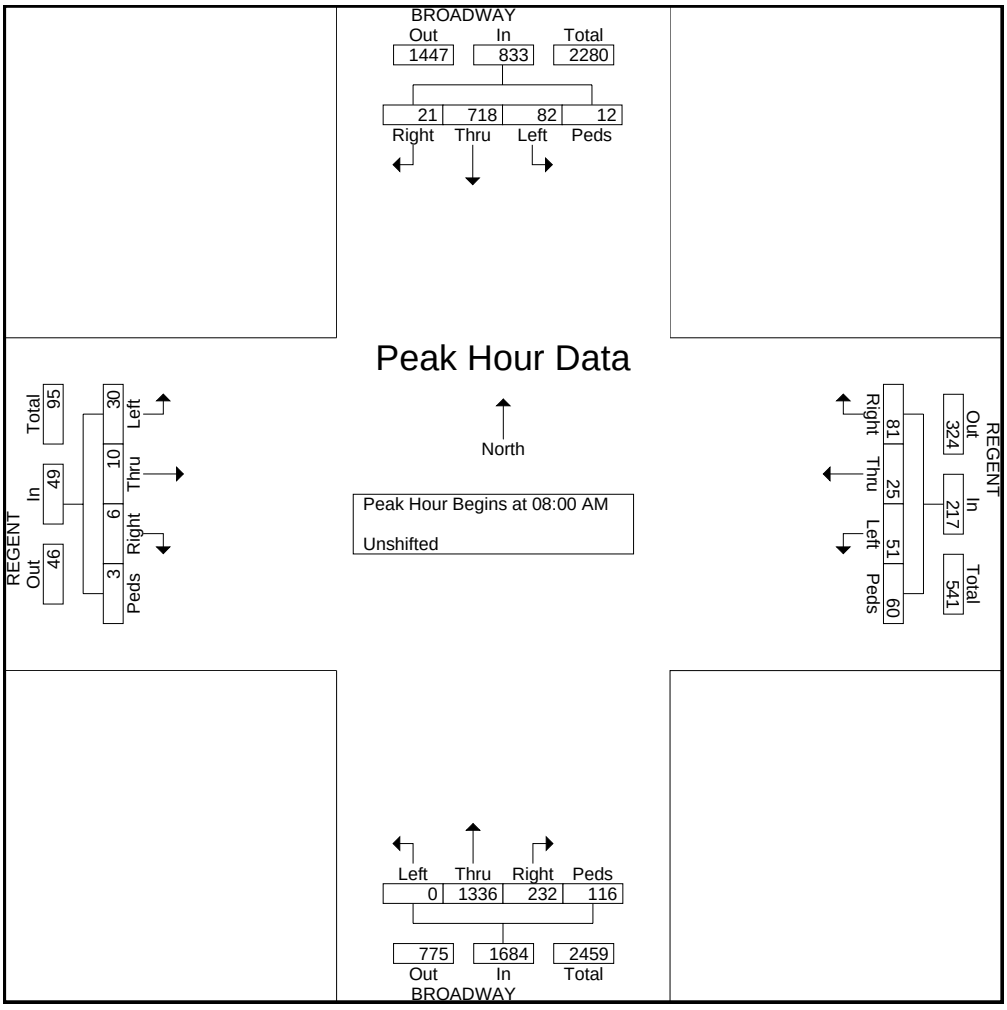
	BROADWAY Southbound				REGENT Westbound				BROADWAY Northbound				REGENT Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	4	146	1	1	7	2	1	3	0	191	32	9	2	1	1	0	401
07:15 AM	11	152	3	1	5	2	12	4	1	231	44	14	5	2	2	3	492
07:30 AM	12	185	2	2	5	3	11	26	0	325	68	32	4	4	0	1	680
07:45 AM	24	174	2	0	5	5	15	12	0	334	49	15	8	5	0	1	649
Total	51	657	8	4	22	12	39	45	1	1081	193	70	19	12	3	5	2222
08:00 AM	16	176	4	2	8	6	10	6	0	328	46	18	7	5	3	0	635
08:15 AM	13	192	4	1	10	8	18	9	0	306	67	18	4	0	1	0	651
08:30 AM	29	179	7	5	17	5	29	28	0	388	74	50	9	3	1	0	824
08:45 AM	24	171	6	4	16	6	24	17	0	314	45	30	10	2	1	3	673
Total	82	718	21	12	51	25	81	60	0	1336	232	116	30	10	6	3	2783
Grand Total	133	1375	29	16	73	37	120	105	1	2417	425	186	49	22	9	8	5005
Apprch %	8.6	88.5	1.9	1	21.8	11	35.8	31.3	0	79.8	14	6.1	55.7	25	10.2	9.1	
Total %	2.7	27.5	0.6	0.3	1.5	0.7	2.4	2.1	0	48.3	8.5	3.7	1	0.4	0.2	0.2	



All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : REGENT&BROADWAYAM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 2

	BROADWAY Southbound					REGENT Westbound					BROADWAY Northbound					REGENT Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	16	176	4	2	198	8	6	10	6	30	0	328	46	18	392	7	5	3	0	15	635
08:15 AM	13	192	4	1	210	10	8	18	9	45	0	306	67	18	391	4	0	1	0	5	651
08:30 AM	29	179	7	5	220	17	5	29	28	79	0	388	74	50	512	9	3	1	0	13	824
08:45 AM	24	171	6	4	205	16	6	24	17	63	0	314	45	30	389	10	2	1	3	16	673
Total Volume	82	718	21	12	833	51	25	81	60	217	0	1336	232	116	1684	30	10	6	3	49	2783
% App. Total	9.8	86.2	2.5	1.4		23.5	11.5	37.3	27.6		0	79.3	13.8	6.9		61.2	20.4	12.2	6.1		
PHF	.707	.935	.750	.600	.947	.750	.781	.698	.536	.687	.000	.861	.784	.580	.822	.750	.500	.500	.250	.766	.844

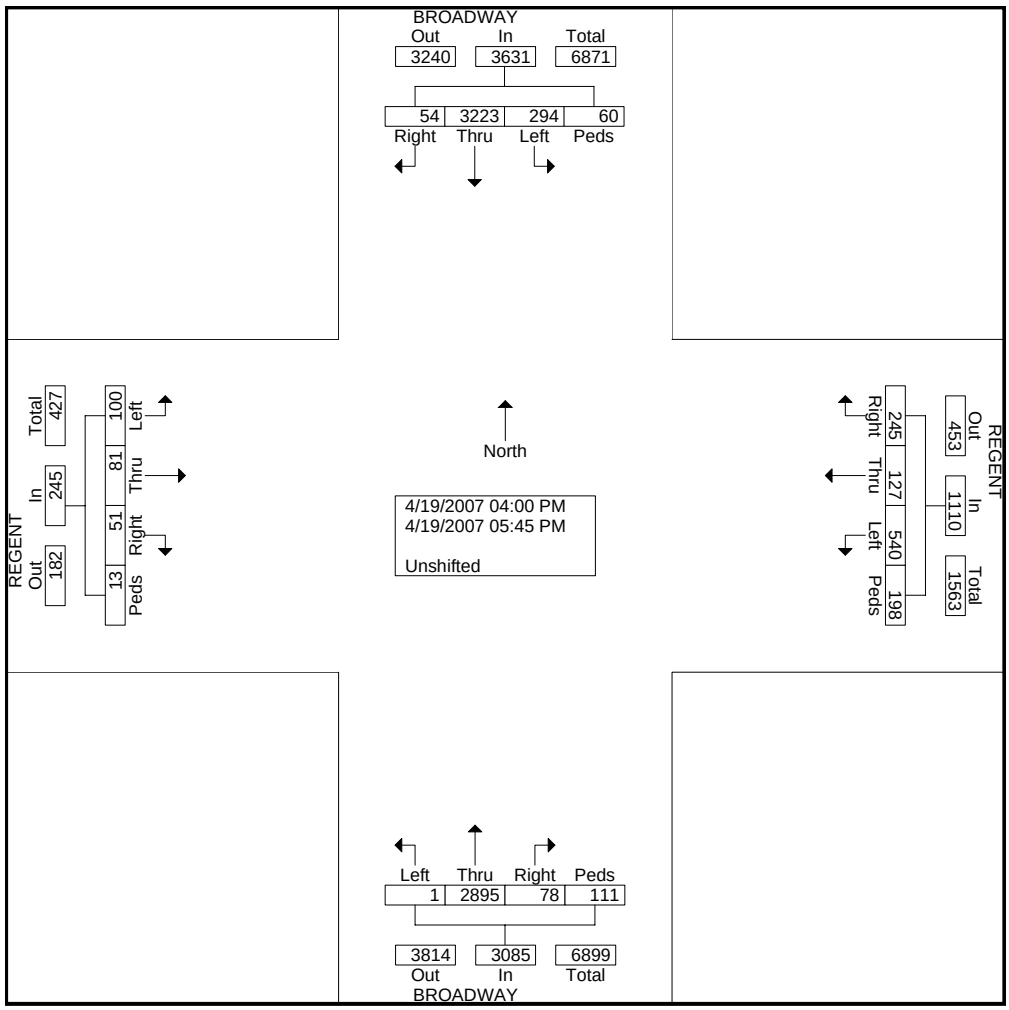


All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : REGENT&BROADWAYPM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 1

Groups Printed- Unshifted

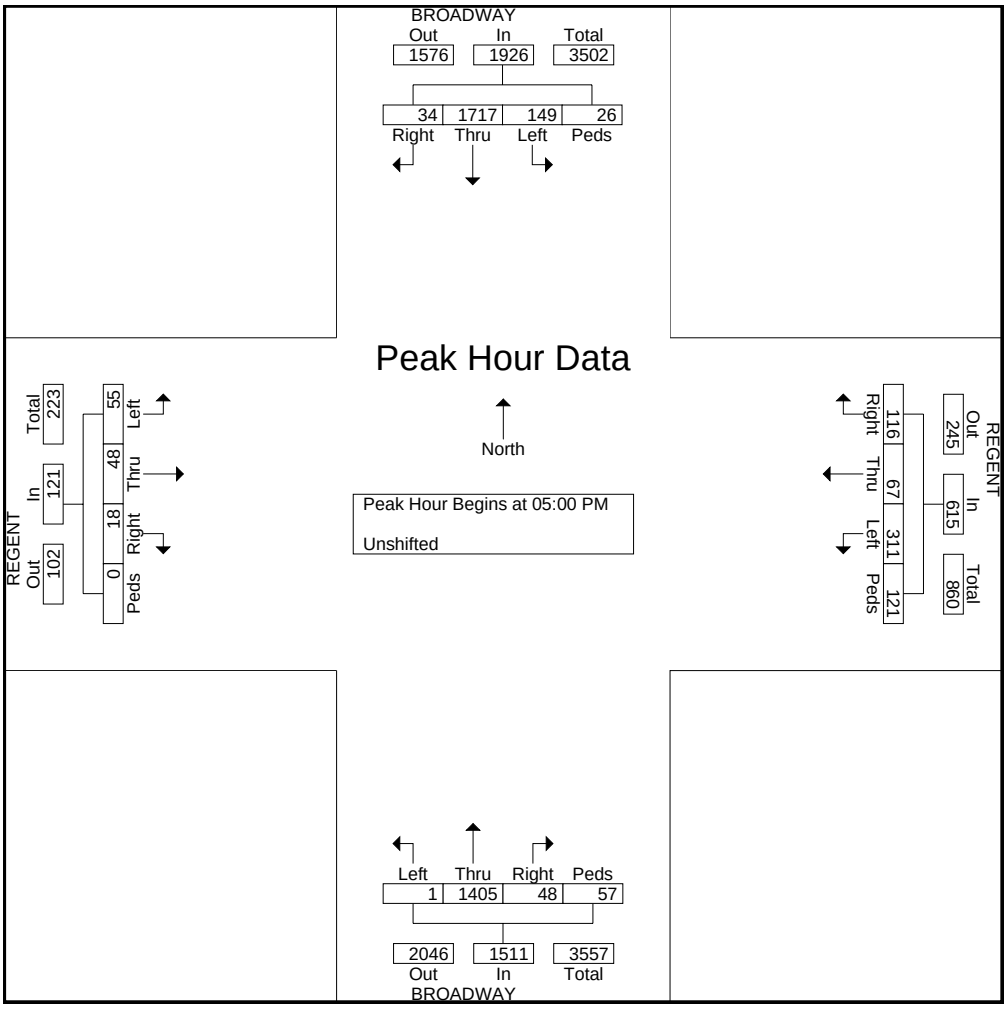
	BROADWAY Southbound				REGENT Westbound				BROADWAY Northbound				REGENT Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
04:00 PM	44	368	2	2	54	19	19	14	0	396	13	10	9	8	6	0	964
04:15 PM	39	374	7	4	63	17	37	35	0	382	5	9	6	10	6	8	1002
04:30 PM	20	375	5	15	54	7	38	8	0	383	7	9	12	8	9	0	950
04:45 PM	42	389	6	13	58	17	35	20	0	329	5	26	18	7	12	5	982
Total	145	1506	20	34	229	60	129	77	0	1490	30	54	45	33	33	13	3898
05:00 PM	42	433	11	10	70	27	30	49	0	378	8	8	10	4	5	0	1085
05:15 PM	24	411	8	9	104	7	33	19	0	314	16	9	9	20	4	0	987
05:30 PM	28	461	6	1	71	9	31	22	1	349	10	14	13	7	6	0	1029
05:45 PM	55	412	9	6	66	24	22	31	0	364	14	26	23	17	3	0	1072
Total	149	1717	34	26	311	67	116	121	1	1405	48	57	55	48	18	0	4173
Grand Total	294	3223	54	60	540	127	245	198	1	2895	78	111	100	81	51	13	8071
Apprch %	8.1	88.8	1.5	1.7	48.6	11.4	22.1	17.8	0	93.8	2.5	3.6	40.8	33.1	20.8	5.3	
Total %	3.6	39.9	0.7	0.7	6.7	1.6	3	2.5	0	35.9	1	1.4	1.2	1	0.6	0.2	



All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : REGENT&BROADWAYPM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 2

	BROADWAY Southbound					REGENT Westbound					BROADWAY Northbound					REGENT Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	42	433	11	10	496	70	27	30	49	176	0	378	8	8	394	10	4	5	0	19	1085
05:15 PM	24	411	8	9	452	104	7	33	19	163	0	314	16	9	339	9	20	4	0	33	987
05:30 PM	28	461	6	1	496	71	9	31	22	133	1	349	10	14	374	13	7	6	0	26	1029
05:45 PM	55	412	9	6	482	66	24	22	31	143	0	364	14	26	404	23	17	3	0	43	1072
Total Volume	149	1717	34	26	1926	311	67	116	121	615	1	1405	48	57	1511	55	48	18	0	121	4173
% App. Total	7.7	89.1	1.8	1.3		50.6	10.9	18.9	19.7		0.1	93	3.2	3.8		45.5	39.7	14.9	0		
PHF	.677	.931	.773	.650	.971	.748	.620	.879	.617	.874	.250	.929	.750	.548	.935	.598	.600	.750	.000	.703	.962

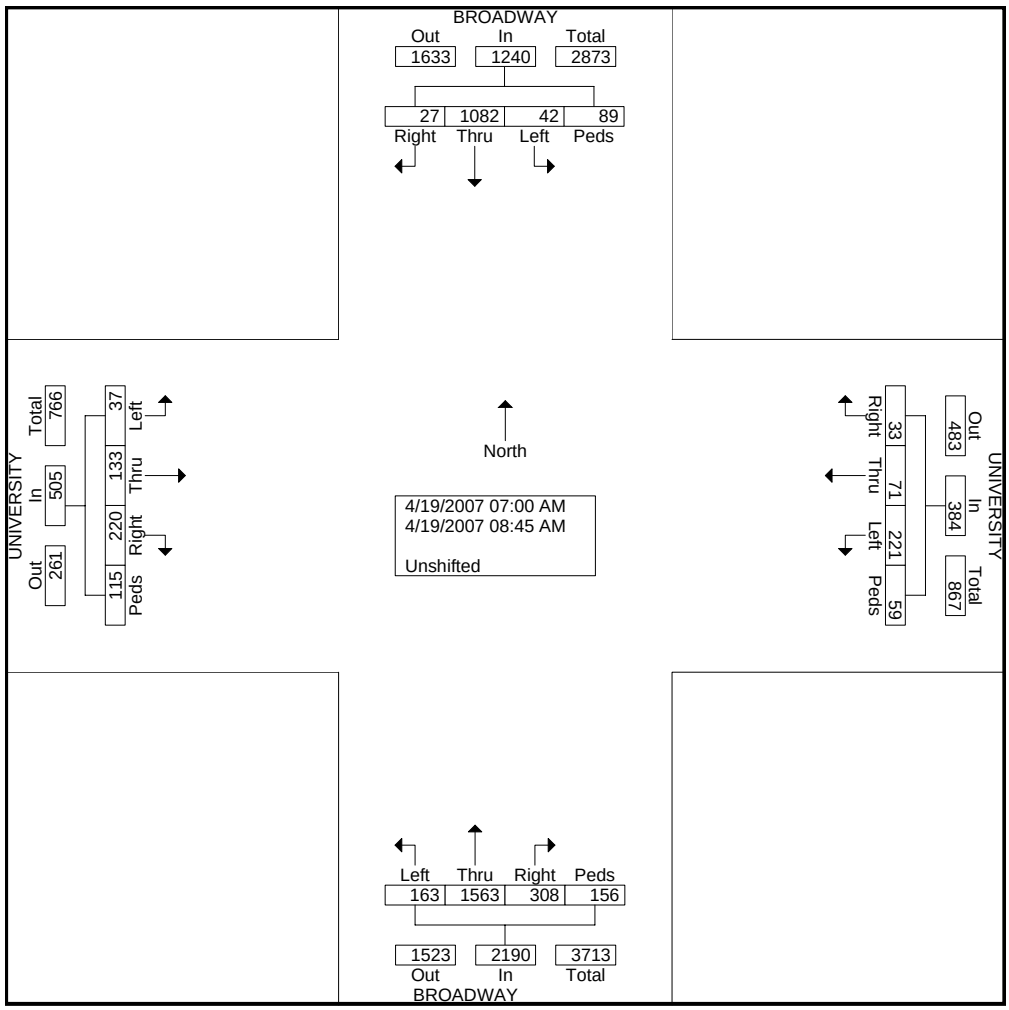


All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : UNIVERSITY&BROADWAYAM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 1

Groups Printed- Unshifted

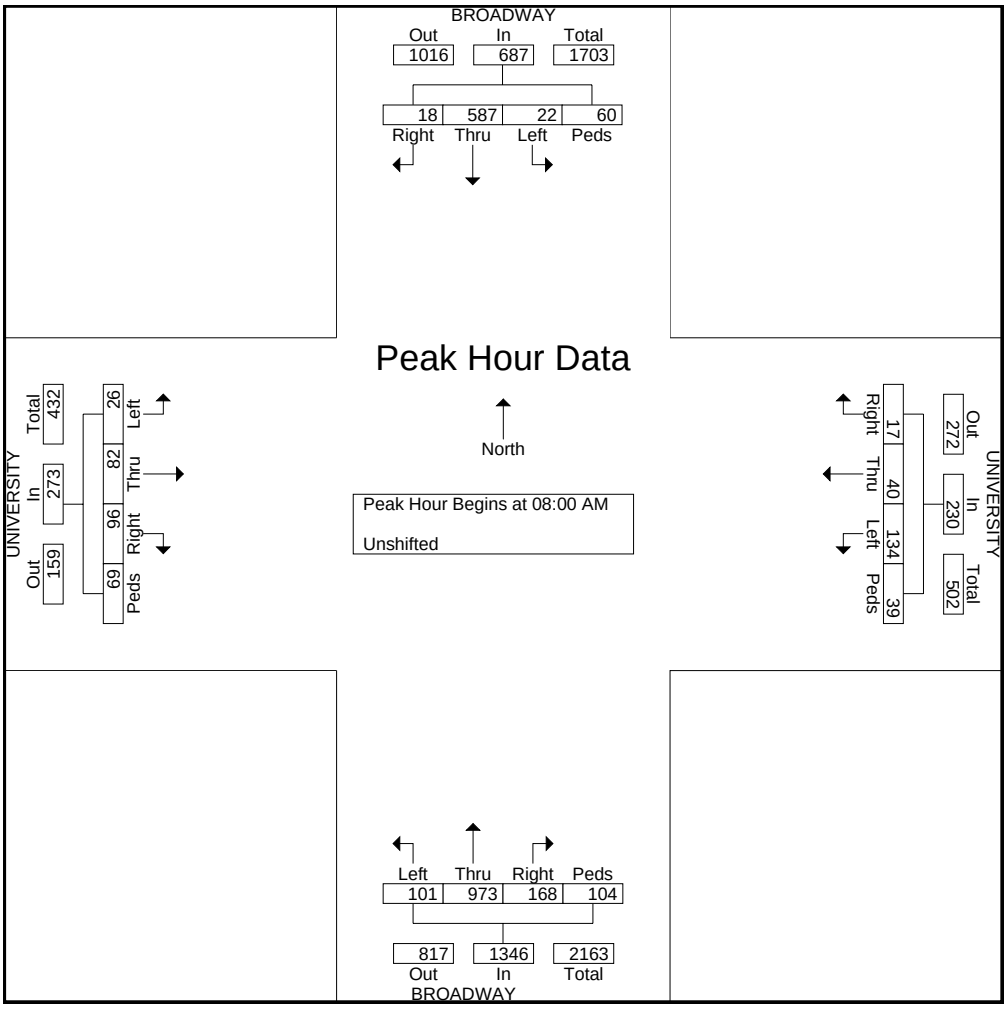
	BROADWAY Southbound				UNIVERSITY Westbound				BROADWAY Northbound				UNIVERSITY Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	2	108	1	1	9	5	5	2	14	104	15	3	1	6	25	3	304
07:15 AM	2	121	3	1	18	10	5	0	8	133	33	7	3	15	25	4	388
07:30 AM	6	122	2	5	27	5	2	2	14	163	43	4	1	8	40	7	451
07:45 AM	10	144	3	22	33	11	4	16	26	190	49	38	6	22	34	32	640
Total	20	495	9	29	87	31	16	20	62	590	140	52	11	51	124	46	1783
08:00 AM	6	151	0	4	21	8	2	4	27	247	48	17	6	15	22	21	599
08:15 AM	7	133	7	22	40	9	4	5	22	246	41	27	5	24	22	20	634
08:30 AM	4	154	3	20	31	12	4	19	24	231	29	37	5	23	22	14	632
08:45 AM	5	149	8	14	42	11	7	11	28	249	50	23	10	20	30	14	671
Total	22	587	18	60	134	40	17	39	101	973	168	104	26	82	96	69	2536
Grand Total	42	1082	27	89	221	71	33	59	163	1563	308	156	37	133	220	115	4319
Apprch %	3.4	87.3	2.2	7.2	57.6	18.5	8.6	15.4	7.4	71.4	14.1	7.1	7.3	26.3	43.6	22.8	
Total %	1	25.1	0.6	2.1	5.1	1.6	0.8	1.4	3.8	36.2	7.1	3.6	0.9	3.1	5.1	2.7	



All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : UNIVERSITY&BROADWAYAM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 2

	BROADWAY Southbound					UNIVERSITY Westbound					BROADWAY Northbound					UNIVERSITY Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	6	151	0	4	161	21	8	2	4	35	27	247	48	17	339	6	15	22	21	64	599
08:15 AM	7	133	7	22	169	40	9	4	5	58	22	246	41	27	336	5	24	22	20	71	634
08:30 AM	4	154	3	20	181	31	12	4	19	66	24	231	29	37	321	5	23	22	14	64	632
08:45 AM	5	149	8	14	176	42	11	7	11	71	28	249	50	23	350	10	20	30	14	74	671
Total Volume	22	587	18	60	687	134	40	17	39	230	101	973	168	104	1346	26	82	96	69	273	2536
% App. Total	3.2	85.4	2.6	8.7		58.3	17.4	7.4	17		7.5	72.3	12.5	7.7		9.5	30	35.2	25.3		
PHF	.786	.953	.563	.682	.949	.798	.833	.607	.513	.810	.902	.977	.840	.703	.961	.650	.854	.800	.821	.922	.945

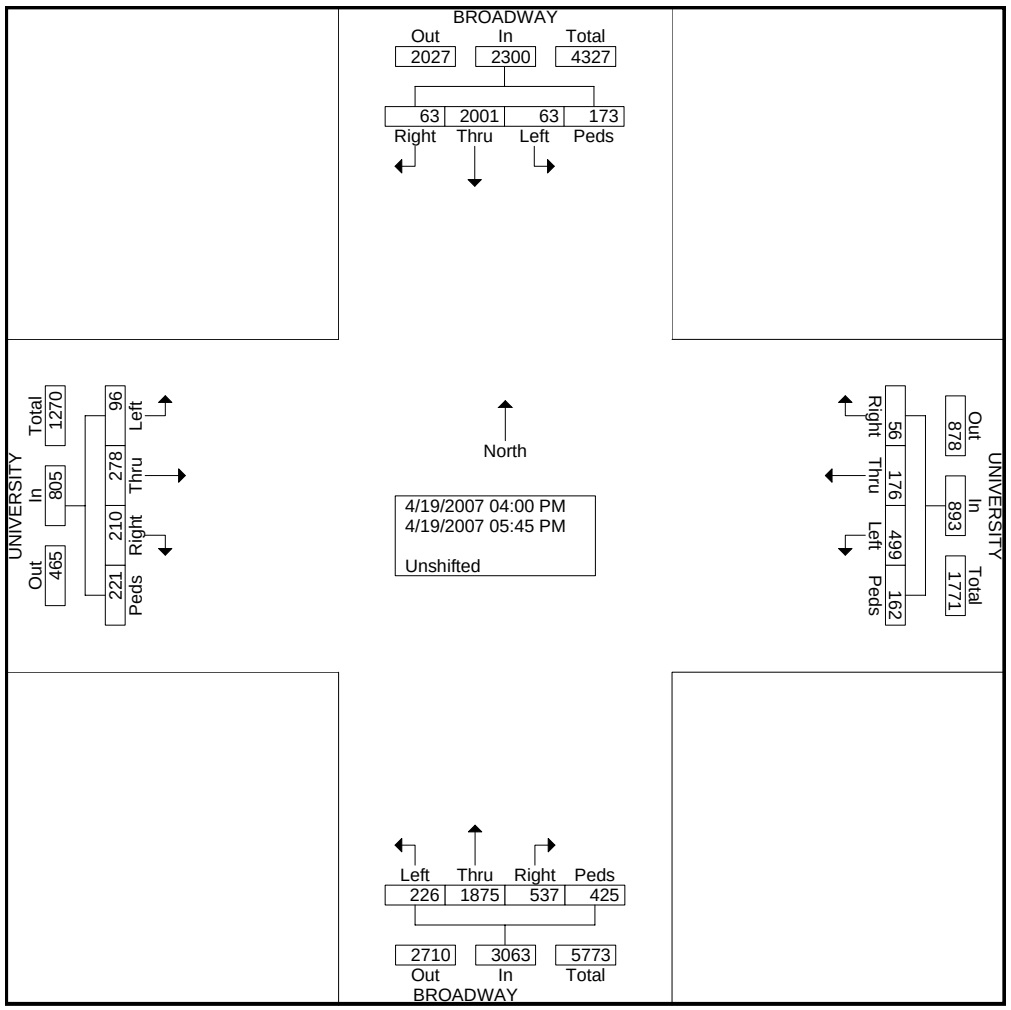


All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : UNIVERSITY&BROADWAYPM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 1

Groups Printed- Unshifted

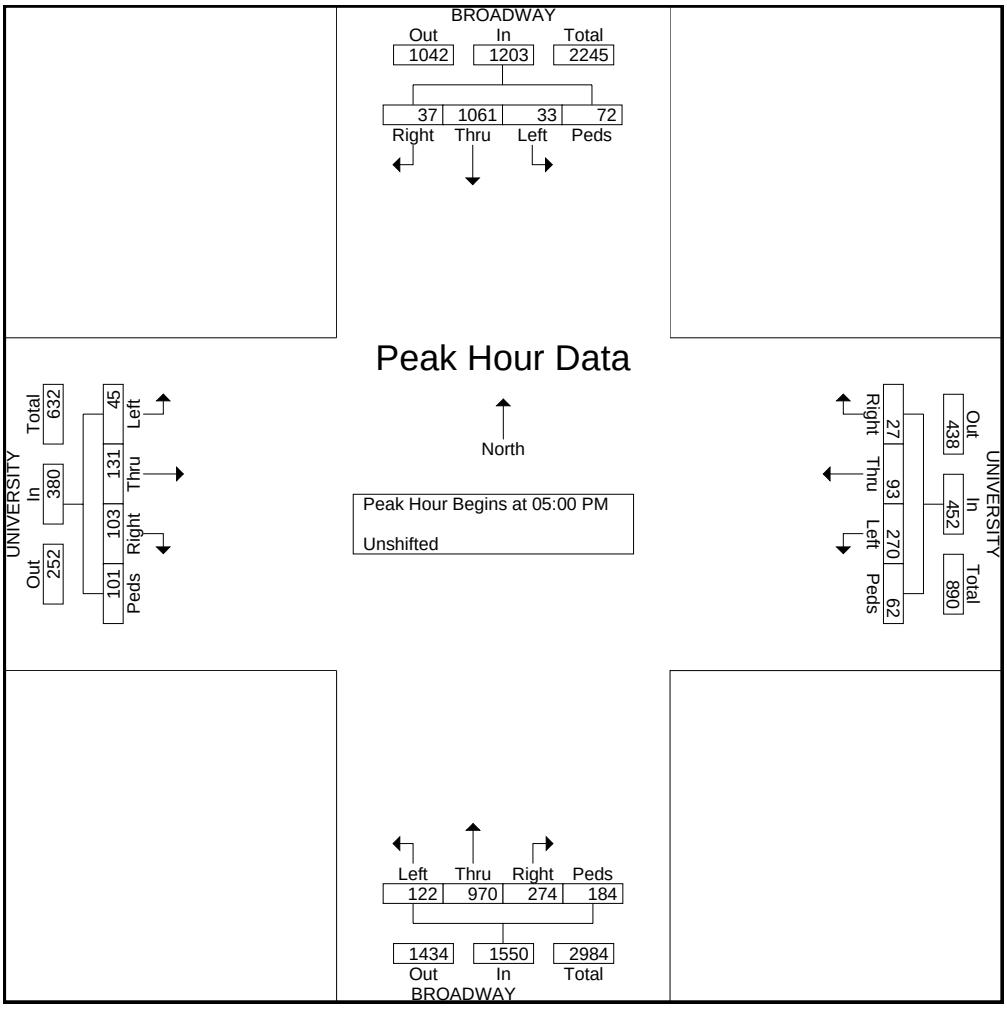
	BROADWAY Southbound				UNIVERSITY Westbound				BROADWAY Northbound				UNIVERSITY Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
04:00 PM	10	245	8	27	53	18	9	30	17	218	73	62	14	39	24	47	894
04:15 PM	4	243	3	23	54	19	7	27	27	229	67	64	7	32	24	21	851
04:30 PM	11	212	7	24	68	28	5	19	31	231	42	58	16	38	20	38	848
04:45 PM	5	240	8	27	54	18	8	24	29	227	81	57	14	38	39	14	883
Total	30	940	26	101	229	83	29	100	104	905	263	241	51	147	107	120	3476
05:00 PM	9	262	12	18	66	19	2	24	37	231	76	57	13	26	26	24	902
05:15 PM	6	304	10	15	74	20	13	12	31	272	60	47	14	35	28	9	950
05:30 PM	5	224	7	23	62	26	4	12	26	230	76	41	8	29	19	33	825
05:45 PM	13	271	8	16	68	28	8	14	28	237	62	39	10	41	30	35	908
Total	33	1061	37	72	270	93	27	62	122	970	274	184	45	131	103	101	3585
Grand Total	63	2001	63	173	499	176	56	162	226	1875	537	425	96	278	210	221	7061
Apprch %	2.7	87	2.7	7.5	55.9	19.7	6.3	18.1	7.4	61.2	17.5	13.9	11.9	34.5	26.1	27.5	
Total %	0.9	28.3	0.9	2.5	7.1	2.5	0.8	2.3	3.2	26.6	7.6	6	1.4	3.9	3	3.1	



All Traffic Data Services, Inc.
9660 W. 44th Ave.
Wheat Ridge, CO 80033

File Name : UNIVERSITY&BROADWAYPM
Site Code : 00000000
Start Date : 4/19/2007
Page No : 2

	BROADWAY Southbound					UNIVERSITY Westbound					BROADWAY Northbound					UNIVERSITY Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	9	262	12	18	301	66	19	2	24	111	37	231	76	57	401	13	26	26	24	89	902
05:15 PM	6	304	10	15	335	74	20	13	12	119	31	272	60	47	410	14	35	28	9	86	950
05:30 PM	5	224	7	23	259	62	26	4	12	104	26	230	76	41	373	8	29	19	33	89	825
05:45 PM	13	271	8	16	308	68	28	8	14	118	28	237	62	39	366	10	41	30	35	116	908
Total Volume	33	1061	37	72	1203	270	93	27	62	452	122	970	274	184	1550	45	131	103	101	380	3585
% App. Total	2.7	88.2	3.1	6		59.7	20.6	6	13.7		7.9	62.6	17.7	11.9		11.8	34.5	27.1	26.6		
PHF	.635	.873	.771	.783	.898	.912	.830	.519	.646	.950	.824	.892	.901	.807	.945	.804	.799	.858	.721	.819	.943



All Traffic Data Services, Inc
9660 W 44th Ave
Wheat Ridge, CO 80033
www.alltrafficdata.net

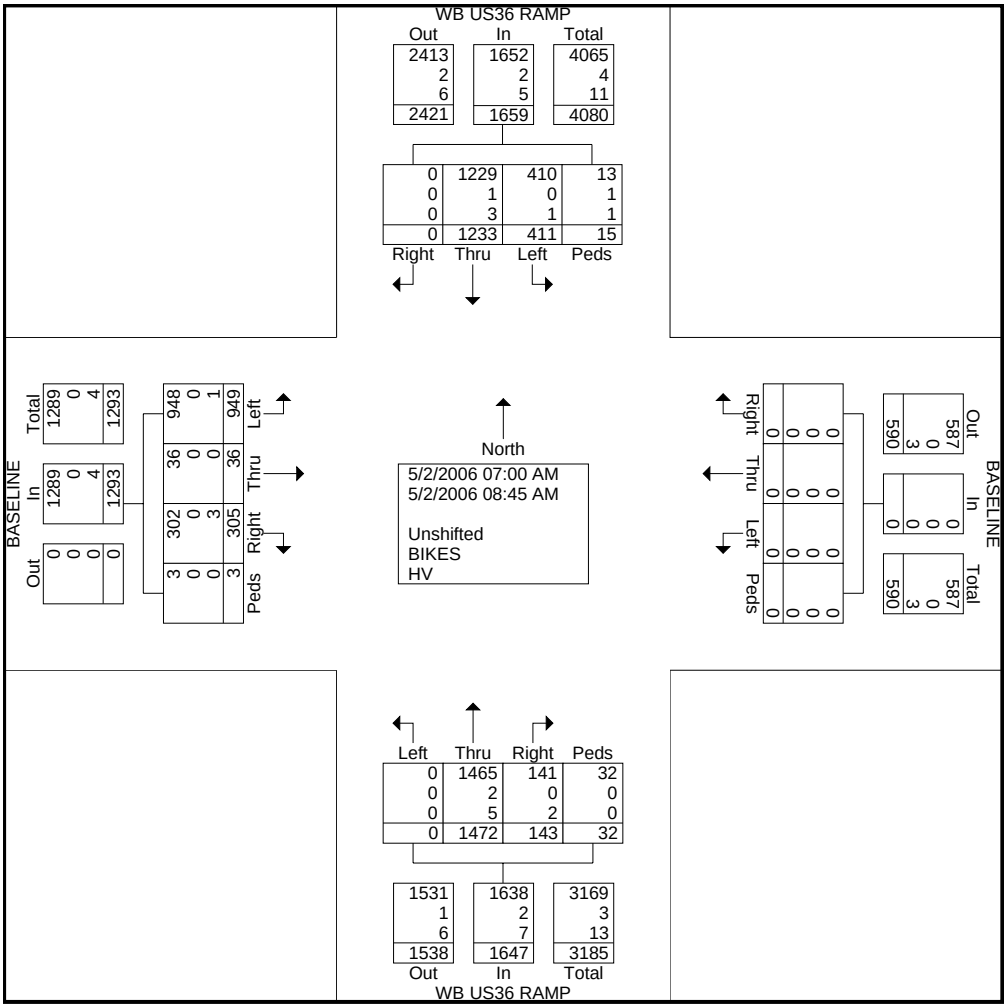
File Name : WBUS36&BASELINEAM
Site Code : 00000000
Start Date : 5/2/2006
Page No : 1

Groups Printed- Unshifted - BIKES - HV

	WB US36 RAMP Southbound				BASELINE Westbound				WB US36 RAMP Northbound				BASELINE Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	18	112	0	2	0	0	0	0	0	111	8	2	100	1	25	0	379
07:15 AM	31	107	0	0	0	0	0	0	0	133	23	7	88	5	39	0	433
07:30 AM	48	150	0	4	0	0	0	0	0	166	16	5	117	1	41	1	549
07:45 AM	65	190	0	0	0	0	0	0	0	220	20	3	135	7	39	0	679
Total	162	559	0	6	0	0	0	0	0	630	67	17	440	14	144	1	2040
08:00 AM	64	178	0	2	0	0	0	0	0	195	15	3	119	3	35	0	614
08:15 AM	54	178	0	3	0	0	0	0	0	214	22	4	134	3	49	0	661
08:30 AM	55	164	0	4	0	0	0	0	0	212	19	5	109	5	39	2	614
08:45 AM	76	154	0	0	0	0	0	0	0	221	20	3	147	11	38	0	670
Total	249	674	0	9	0	0	0	0	0	842	76	15	509	22	161	2	2559
Grand Total	411	1233	0	15	0	0	0	0	0	1472	143	32	949	36	305	3	4599
Apprch %	24.8	74.3	0	0.9	0	0	0	0	0	89.4	8.7	1.9	73.4	2.8	23.6	0.2	
Total %	8.9	26.8	0	0.3	0	0	0	0	0	32	3.1	0.7	20.6	0.8	6.6	0.1	
Unshifted	410	1229	0	13	0	0	0	0	0	1465	141	32	948	36	302	3	4579
% Unshifted	99.8	99.7	0	86.7	0	0	0	0	0	99.5	98.6	100	99.9	100	99	100	99.6
BIKES	0	1	0	1	0	0	0	0	0	2	0	0	0	0	0	0	4
% BIKES	0	0.1	0	6.7	0	0	0	0	0	0.1	0	0	0	0	0	0	0.1
HV	1	3	0	1	0	0	0	0	0	5	2	0	1	0	3	0	16
% HV	0.2	0.2	0	6.7	0	0	0	0	0	0.3	1.4	0	0.1	0	1	0	0.3

All Traffic Data Services, Inc
9660 W 44th Ave
Wheat Ridge, CO 80033
www.alltrafficdata.net

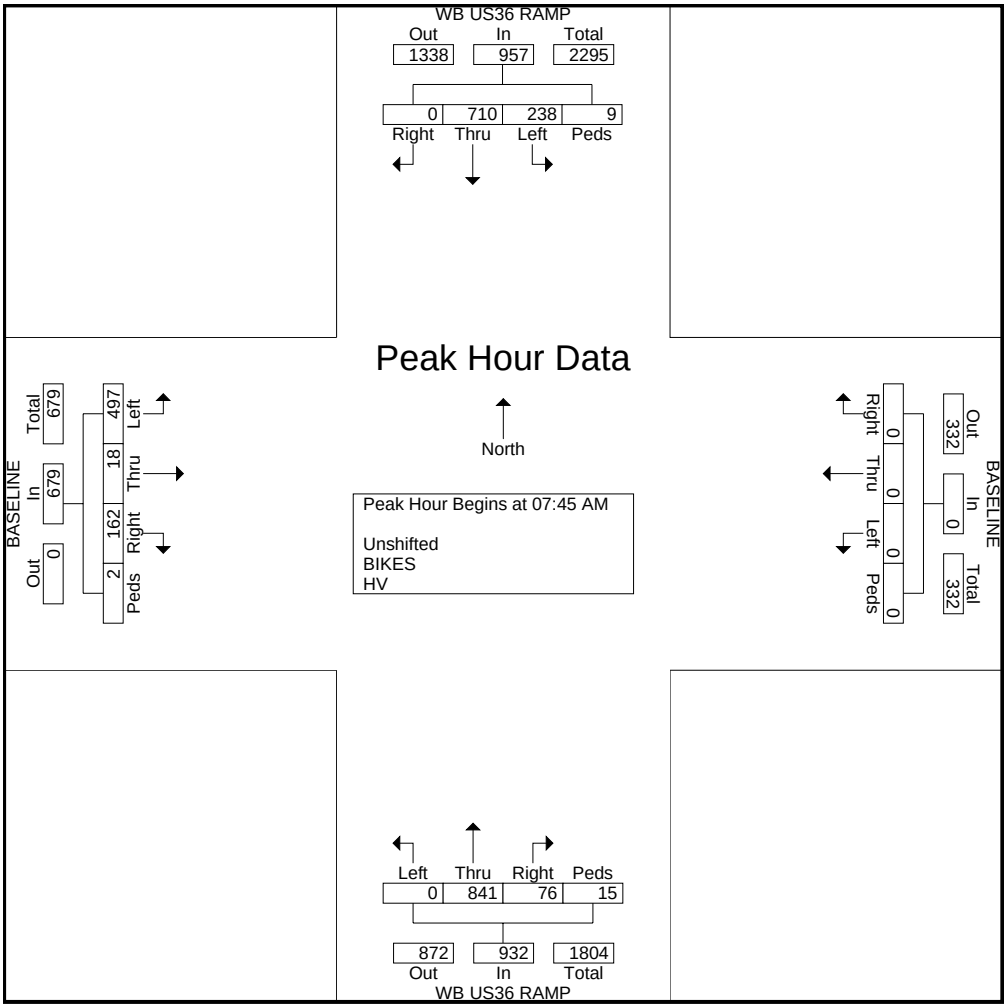
File Name : WBUS36&BASELINEAM
Site Code : 00000000
Start Date : 5/2/2006
Page No : 2



	WB US36 RAMP Southbound					BASELINE Westbound					WB US36 RAMP Northbound					BASELINE Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	**65**	**190**	0	0	**255**	0	0	0	0	0	0	**220**	20	3	**243**	**135**	**7**	39	0	181	**679**
08:00 AM	64	178	0	2	244	0	0	0	0	0	0	195	15	3	213	119	3	35	0	157	614
08:15 AM	54	178	0	3	235	0	0	0	0	0	0	214	**22**	4	240	134	3	**49**	0	**186**	661
08:30 AM	55	164	0	**4**	223	0	0	0	0	0	0	212	19	**5**	236	109	5	39	**2**	155	614
Total Volume	238	710	0	9	957	0	0	0	0	0	0	841	76	15	932	497	18	162	2	679	2568
% App. Total	24.9	74.2	0	0.9		0	0	0	0		0	90.2	8.2	1.6		73.2	2.7	23.9	0.3		
PHF	.915	.934	.000	.563	.938	.000	.000	.000	.000	.000	.000	.956	.864	.750	.959	.920	.643	.827	.250	.913	.946

All Traffic Data Services, Inc
9660 W 44th Ave
Wheat Ridge, CO 80033
www.alltrafficdata.net

File Name : WBUS36&BASELINEAM
Site Code : 00000000
Start Date : 5/2/2006
Page No : 3



All Traffic Data Services, Inc
9660 W 44th Ave
Wheat Ridge, CO 80033
www.alltrafficdata.net

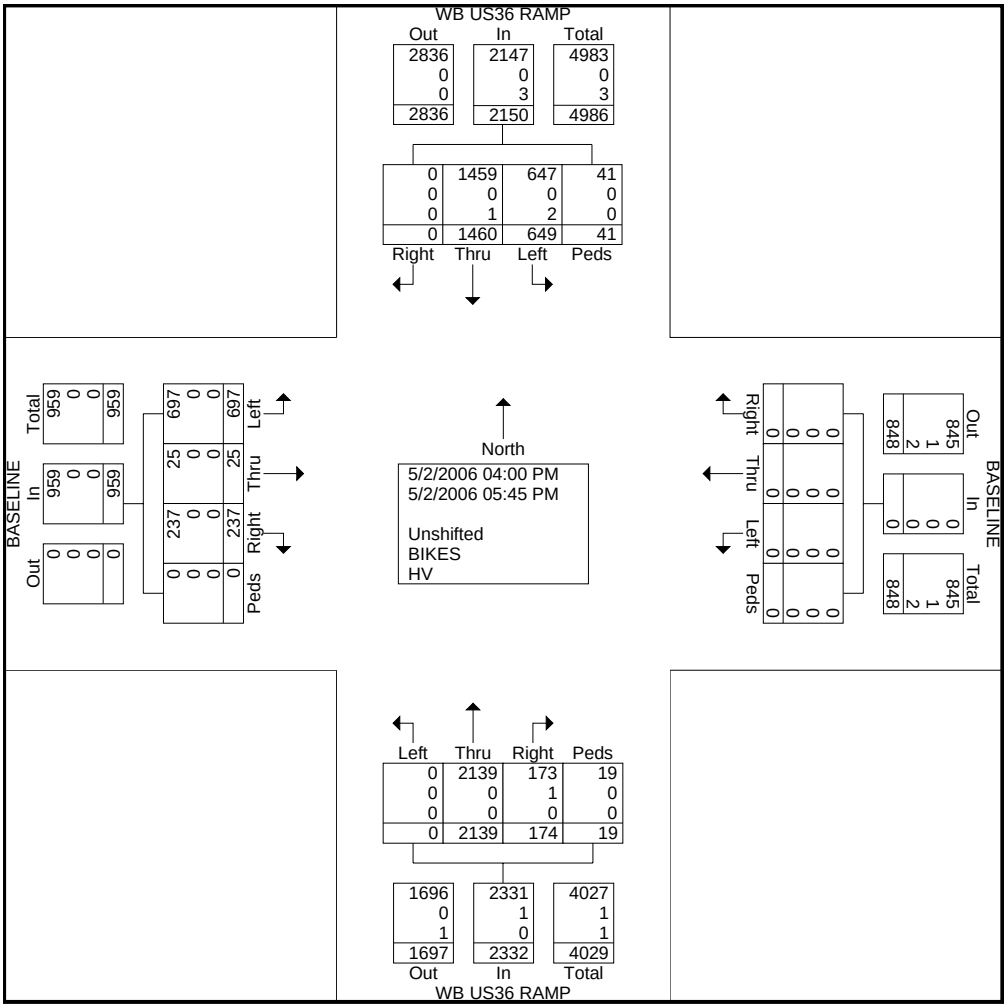
File Name : WBUS36&BASELINEPM
Site Code : 00000000
Start Date : 5/2/2006
Page No : 1

Groups Printed- Unshifted - BIKES - HV

	WB US36 RAMP Southbound				BASELINE Westbound				WB US36 RAMP Northbound				BASELINE Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
04:00 PM	92	191	0	6	0	0	0	0	0	242	18	2	80	1	20	0	652
04:15 PM	76	165	0	12	0	0	0	0	0	235	19	3	116	4	22	0	652
04:30 PM	85	154	0	4	0	0	0	0	0	260	27	0	71	4	32	0	637
04:45 PM	63	176	0	4	0	0	0	0	0	263	24	4	69	2	31	0	636
Total	316	686	0	26	0	0	0	0	0	1000	88	9	336	11	105	0	2577
05:00 PM	93	216	0	5	0	0	0	0	0	286	21	1	87	4	31	0	744
05:15 PM	78	211	0	3	0	0	0	0	0	301	24	5	83	4	39	0	748
05:30 PM	81	171	0	0	0	0	0	0	0	299	24	2	104	5	31	0	717
05:45 PM	81	176	0	7	0	0	0	0	0	253	17	2	87	1	31	0	655
Total	333	774	0	15	0	0	0	0	0	1139	86	10	361	14	132	0	2864
Grand Total	649	1460	0	41	0	0	0	0	0	2139	174	19	697	25	237	0	5441
Apprch %	30.2	67.9	0	1.9	0	0	0	0	0	91.7	7.5	0.8	72.7	2.6	24.7	0	
Total %	11.9	26.8	0	0.8	0	0	0	0	0	39.3	3.2	0.3	12.8	0.5	4.4	0	
Unshifted	647	1459	0	41	0	0	0	0	0	2139	173	19	697	25	237	0	5437
% Unshifted	99.7	99.9	0	100	0	0	0	0	0	100	99.4	100	100	100	100	0	99.9
BIKES	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
% BIKES	0	0	0	0	0	0	0	0	0	0	0.6	0	0	0	0	0	0
HV	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
% HV	0.3	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1

All Traffic Data Services, Inc
9660 W 44th Ave
Wheat Ridge, CO 80033
www.alltrafficdata.net

File Name : WBUS36&BASELINEPM
Site Code : 00000000
Start Date : 5/2/2006
Page No : 2



	WB US36 RAMP Southbound					BASELINE Westbound					WB US36 RAMP Northbound					BASELINE Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	**93**	**216**	0	5	**314**	0	0	0	0	0	0	286	21	1	308	87	4	31	0	122	744
05:15 PM	78	211	0	3	292	0	0	0	0	0	0	**301**	**24**	**5**	**330**	83	4	**39**	0	126	**748**
05:30 PM	81	171	0	0	252	0	0	0	0	0	0	299	24	2	325	**104**	**5**	31	0	**140**	717
05:45 PM	81	176	0	**7**	264	0	0	0	0	0	0	253	17	2	272	87	1	31	0	119	655
Total Volume	333	774	0	15	1122	0	0	0	0	0	0	1139	86	10	1235	361	14	132	0	507	2864
% App. Total	29.7	69	0	1.3		0	0	0	0		0	92.2	7	0.8		71.2	2.8	26	0		
PHF	.895	.896	.000	.536	.893	.000	.000	.000	.000	.000	.000	.946	.896	.500	.936	.868	.700	.846	.000	.905	.957

All Traffic Data Services, Inc
9660 W 44th Ave
Wheat Ridge, CO 80033
www.alltrafficdata.net

File Name : WBUS36&BASELINEPM
Site Code : 00000000
Start Date : 5/2/2006
Page No : 3