TRAFFIC IMPACT DATA

For

Dillons #98
On-Site Relocation

COMMERCIAL DEVELOPMENT

1740 Massachusetts Street
Lawrence, KS

Revised April 6, 2011

Prepared by:
Pickering Firm, Inc.

Introduction

The project site consists of the existing Dillons grocery located at 1740 Massachusetts Street and two attached retail spaces in Lawrence, Douglas County, KS.

Methodology

The Traffic Impact Study Analysis was performed in accordance with Article 11, Requirements For Traffic Impact Study as outlined in the ***Code of the City of Lawrence, Kansas.*** Based upon the specified minimum traffic impact data requirements, Items 1-7 were conducted for the Traffic Impact Study Analysis.

Item 1 – Identify Development Plan

The existing 2.58-acre shopping center site is bounded by Massachusetts Street on the west, New Hampshire Street on the east, commercial uses on the south, and a multi-family residential on the north. The site contains 32,089 SF of existing buildings with a variety of shopping center uses including a 30,295 SF grocery store, a retail shop, and a beauty salon. The existing shopping center building faces toward Massachusetts Street with on-site parking between Massachusetts Street and the buildings and service access from New Hampshire in the rear of the building. See Appendix A for the Existing Conditions Plan.

The proposed development will include the demolition of 32,089 SF of existing building and redevelopment of a new 44,770 SF Dillons grocery store, on the south portion of the site, facing north. The parking field will be located north of the store with delivery access on the rear from both Massachusetts and New Hampshire. See Appendix B for the Proposed Site Plan.

The existing site is accessed from Massachusetts Street on the west by three full-access driveways. Access from New Hampshire Street on the east is by three curb cuts, which provide access to loading areas and include a one-way exit from the parking lot. Even though the only existing access to New Hampshire from the parking lot is a one-way exit drive and is combined with a truck entrance, vehicles often enter the site via that drive, causing an unsafe condition.

The existing site is abutted to the south by a retail store which is situated in the northeast corner of the lot, facing Massachusetts Street. Parking is provided west and south of the store with access to the parking on the project site. To the north of the project site is the Babcock Place apartment building which is situated on the southeast corner of E 17th Street and Massachusetts Street with access from E 17th Street and New Hampshire Street. A parking lot for the property is provided along New Hampshire Street. Across New Hampshire Street, to the east of the project site, is single family residential with access from New Hampshire Street. To the west, across Massachusetts Street are a variety of retail uses and an apartment building with parking and access along Massachusetts Street.

Items 2 and 3 – Identify Land Use and Functional Classification of Bordering Streets

The project site will be developed as a Neighborhood Commercial Center as shown in Horizon 2020. The proposed Dillons grocery store facing north will provide a greater aesthetic appeal from the existing layout as a strip development, offering more landscaping within the parking area and around the perimeter of the site. The redevelopment will also provide a safer circulation pattern for car traffic with separation from truck traffic.

The project site is located on Massachusetts Street and north of 19th Street which function as minor arterial roads. The nearest collector streets in the vicinity of project site are Barker Avenue to the east and 15th Street to the north. New Hampshire is classified a street/rural road. The following figure from the City of Lawrence, Horizon 2020 shows the project site and surrounding arterial and collector streets.

Access shall be provided to the project site from Massachusetts Street by two full-access, stop controlled driveways serving the parking lot and one existing driveway at the rear of the store and adjoining the adjacent retail lot. Access from New Hampshire Street is provided by one inbound driveway serving the parking lot, a one-way north-bound pharmacy drive-thru entrance, and a truck unloading area. There will also be a restricted, emergency-only truck access with mountable curbs and grass pavers.

Item 4 – Identify Allowable Access per Criteria of Adopted Access Management Plans

The project site does not adjoin arterial or collector streets with Access Management Plans for the City of Lawrence.

Item 5 – Current Public Street Characteristics

Massachusetts Street: Massachusetts Street is a four lane (two lanes in each direction) minor arterial street running north and south along the west side of the project site. It has an urban cross section with twelve foot wide lanes, curb and gutter, a 9½ foot wide on-street parallel parking lane, and a posted speed of 30 mph in the project vicinity.

New Hampshire Street: New Hampshire Street is a two lane (one lane in each direction) street running north-south along the east side of the project site. It has an urban cross section with fifteen foot wide lanes, curb and gutter, and a posted speed of 30 mph in the project vicinity.

Sight Distance: Based upon a site visit and field survey data, adequate sight distance exists for all access points.

Task 6 –Proposed Access and AASHTO Design Comparison

Massachusetts Street: The ***City of Lawrence Land Development Code*** driveway criteria states:

> *All Driveways providing Access to Arterial Streets shall be constructed so that the point of tangency of the curb return radius closest to all nonsignalized Street or Driveway intersections is at least 300 feet from the perpendicular curb face of the intersecting Street or Driveway.*

The existing site is accessed at three points, all within 502 feet, along Massachusetts Street frontage. The spacing between the southernmost and the center access point is 306 feet meeting the minimum 300 feet spacing requirement. The southernmost access point to the project site is also spaced 96 feet from the access point to the abutting lot to the south, which does not meet the 300 feet spacing requirement. The spacing between the center and northernmost access point on the project site is 90 feet, which is less than the 300 feet minimum spacing requirement.

The proposed project site will be accessed at three points along the Massachusetts Street frontage. The existing southernmost access point will remain and continue to provide access to the abutting retail to the south. The existing center access point will be removed and a new access point will be installed 169 feet north from the southernmost access point. The existing northernmost access point will be shifted to the north; resulting in a spacing of 202 feet from the center access point. All spacing of the proposed access points is less than the 300 feet minimum spacing requirement. However, the proposed access points and revised parking layout will provide better access for traffic entering and exiting the project site from Massachusetts Street.

The center access point is stop controlled and is 36 feet wide with a 12 foot wide right turn lane, a 12 foot wide left turn lane, and a12 foot wide lane for inbound traffic. The northernmost access point is stop controlled and is 36 feet wide with a 12 wide right turn lane, a 12 foot wide left turn lane, and a 12 foot wide inbound lane. The existing southernmost access point is 30 feet wide with a 15 foot inbound lane and a 15 outbound lane.

New Hampshire Street:

The existing site is accessed at three points, all within 339 feet, along the New Hampshire Street frontage. The spacing between the southernmost and center access point is 57 feet. The spacing between the center and northernmost access point is 167 feet. The northernmost access point also provides a one-way exit from the parking lot in addition to truck unloading areas. All of the existing access points provide access to the rear of the existing shopping center.

The proposed project site will be accessed at three points along the New Hampshire Street frontage. These access points include a delivery truck driveway, a one-way northbound pharmacy drive-thru entrance, and an inbound access driveway for the parking field. There will also be a restricted, emergency-only truck access with mountable curbs and grass pavers. The

pharmacy drive-thru lane provides for stacking for four cars which is adequate based upon Dillons' requirements.

The delivery truck access point is the southernmost access point and is spaced 23 feet from the pharmacy entrance. The pharmacy drive-thru entrance is spaced 243 feet from the inbound parking lot access driveway.

The delivery truck driveway is 47.3 feet wide and provides access for two trucks to back into the loading docks of the Dillons grocery store. The drive-thru lane is 10 feet wide. The 9-ft wide inbound access driveway is the northernmost access point. Even thought the new access points are less than the 300 feet minimum spacing requirement, the separation of truck traffic from the parking lot traffic and the addition of an entrance-only access point to the parking lot greatly improve safety.

Item 7 – Existing and Proposed Trips Generated

The number of trips generated by the existing and proposed development were calculated for the typical weekday and weekday peak hours using the Trip Generation Manual, 8th Edition, published by the Institute of Transportation Engineers. The "Supermarket" Category 850 was utilized for the PM Peak for the entire development due to the fact that the primary use of the site consists of a Dillons grocery store. However, the Average Vehicle Trip Ends on a Weekday and AM Peak were not calculated due to the "Small Sample Size" of each study.

Based upon the data provided in the Trip Generation Manual, a 44,770 SF supermarket will generate 528 trips in the PM Peak. The definition of the Supermarket Land Use Category includes ancillary services such as pharmacies, banks, and ATMs. See Appendix C for the Trip Generation Manual data. Further analysis was performed to estimate the number of pass-by trips to account for the portion of the site-destined traffic that is already in the adjacent street traffic stream. Based upon the Trip Generation Handbook, 2nd Edition, Figure 5.8, Average Pass-By Trip Percentage for a Supermarket in the Weekday PM Peak, an average of twenty-nine percent of site-destined traffic can be expected from vehicles already on adjacent streets. The following table shows the findings of the Trip Generation analysis:

	Supermarket Category 850 (Total SF)	Trips Generated in PM Peak
Existing Development	32,089	431
Proposed Development	44,770	528
	Subtotal	+97
Pass-By Reduction	29%	-28
	Net New Vehicle Trips	**+69 trips**

The Existing and Proposed Trips generated were then distributed throughout the driveways as indicated in Drawing C1.0, Appendix D.

In the existing conditions of 431 total trips, 337 trips (78%) were from Massachusetts and 94 trips (22%) were from New Hampshire. In the proposed conditions, the same percentages were used to distribute the 528 total trips: 412 trips (78%) from Massachusetts and 116 trips (22%) from New Hampshire.

The total number of Massachusetts trips in the PM peak hour increased from 337 in the existing conditions to 412 in the proposed conditions which is a 22% increase. The total number of New Hampshire trips in the PM peak hour increased from 94 in the existing conditions to 116 in the proposed conditions which is a 23% increase.

In response to the concerns of the adjoining neighborhood to the east of the site, the New Hampshire parking lot access drive is designed for entrance only traffic. If the New Hampshire drive were allowed to be utilized as a two-way access point, it is estimated that the percentage of trips accessing New Hampshire would increase from 23% to 30% in the peak hour. Therefore, the total number of trips accessing New Hampshire would increase from 94 in the existing conditions to 158 in the proposed conditions, which equates to a 59% increase.

Because of the Small Sample Size for the “Supermarket” Category, the “Shopping Center” Category 820 was utilized for Weekday and AM Peak for the purposes of comparison. The following table shows the findings of the Trip Generation analysis:

	Shopping Center Category 820 (Total SF)	Trips Generated in Typical Weekday	Trips Generated in AM Peak
Existing Development	32,089	3,244	79
Proposed Development	44,770	4,028	96
New Vehicle Trips		**+784 trips**	**+17 trips**

Parking

Existing:

The existing development has a total of 149 parking spaces to serve the existing 32,089 SF of development. These spaces are designed on 60-degree angles and accessed via a series of one-way drives aisles. This parking pattern is often confusing and results in vehicles going the wrong way on drive aisles. This parking configuration can be seen on the Existing Conditions Plan located in Appendix A.

Proposed:

The redevelopment of the project site will include the redesign/relocation of the parking field. The 60-degree parking spaces and one-way drive aisles will be eliminated. Parking on the site will be 90-degree spaces accessed via two-way drive aisles. A total of 129 parking spaces will be provided for the 44,770 SF Dillons grocery store. The spaces meet the design requirements of Article 9, Section 20-913 of the City of Lawrence Planning & Development Code. Article 9, Section 20-902 of the City of Lawrence Planning & Development Code requires a parking ratio of 1 space per every 300 SF of floor area. The post redevelopment of the site will provide a ratio of 1 space per 347 SF. The reduction in parking spaces provided is based upon the following:

1. Best Planning: The "Land Use 850: Supermarkets" category of the publication Parking Generation 3rd Edition published by the Institute of Transportation Engineers (p 208) contains studies of similar urban sites showing the average peak period for weekday parking demands. Using the fitted curve equation provided by the source data, the redeveloped 44,770 SF store would require 118 spaces providing a ratio of 1 space per 380 SF.

2. Pedestrian and Bike Traffic: Pedestrian and bike linkages are provided to the north and south, and to the adjacent residential areas surrounding the site. Bicycle racks and scooter parking will be provided to accommodate those cycling to the store. Also, the close proximity of single family housing and the Babcock apartments provides the site with ample pedestrian traffic, thus reducing the demand for parking. A safer access route for Babcock residents will be provided through the site from the north. New sidewalks and landscaped buffers along street rights-of-way provide pedestrians with a safe and attractive corridor to and from the site. A wide sidewalk on the west side of the building along Massachusetts Street provides an area for outdoor seating and dining for local residents. These additions encourage more pedestrian traffic and promote the already existing urban environment that Massachusetts Street is recognized for.

3. Drive-Thru Pharmacy: A drive-thru will be provided for the Dillons pharmacy. This service will eliminate the need for pharmacy customers to park and go inside the store.

4. Experience: Dillons operates hundreds of neighborhood grocery stores across the Mid-West and their experience of operating such store provides them with the knowledge that the parking ratio of 1 space per 357 SF will work for this site. Dillons would not make the investment to redevelop the existing site only to be short on parking.

Truck Traffic

The existing truck access for the site is from New Hampshire Street and consists of dedicated Dillons delivery trucks along with daily service delivery trucks and trash container pick-up trucks. In the proposed plan, the dedicated Dillons delivery trucks will continue to access the site from New Hampshire along with trash container pick-up trucks. However, the daily service delivery trucks will now access the site from Massachusetts, thereby reducing the amount of truck traffic on New Hampshire by more than half.

The increase in store size will not result in a significant increase in the number of delivery vehicles. Delivery truck-loads typically contain products for more than one store. Therefore, the increase in store size will result in a larger portion of each delivery truck being dedicated to this new store.

The New Hampshire emergency-only truck drive with mountable curbs and grass pavers will be used only in situations where the normal truck delivery routes are not available. In the instance where normal truck delivery routes are not available, typical numbers of delivery trucks will utilize this truck drive.

Pharmacy Drive-Thru

The pharmacy will operate generally between the hours of 8 am and 9 pm, Monday through Friday and 9 am to 6 pm Saturday and Sunday. The actual hours have not yet been set; however, it is anticipated that the pharmacy will operate for a total of 78 hours per week. Based upon actual customer sales data at the existing Dillons pharmacy, 320 customers per week are anticipated at the drive-thru which equates to an average of 4 drive-thru customers per hour. In the peak hour, it is estimated that 8 customers will utilize the drive-thru pharmacy. The 70-foot available queue length of the drive-thru lane will allow four vehicles at 17.5 foot average to queue at one time. Eight vehicles in a one-hour period equates to 7.5 minutes per customer. Based upon a three-minute typical turn at the drive-thru window, it is estimated that the four vehicle queue length is adequate.

Traffic Calming

In accordance with the City of Lawrence ***Traffic Calming Policy*** dated August 23, 2005, an analysis was performed for New Hampshire and East 17th Terrace utilizing the traffic count data gathered by the City of Lawrence Engineering department, see Appendix E. The Policy includes four criteria for "local" streets. If any one of the criterion is satisfied, traffic-calming devices may be permitted.

A. The 85th percentile speed of traffic is 5 mph or greater over the speed limit, or

B. The 24-hour two-way traffic volume is greater than 1000, or

C. Cut-through traffic comprises more than 50% of the traffic during the peak hour of the day, or

D. Where no single condition is satisfied, but where any two of A, B, or C above are satisfied to the extent of 80 percent or more of the stated values.

New Hampshire – Posted Speed 30 mph

A. The collected traffic data:

i. Northbound – 675 total vehicles with 85th percentile speed of 33.29

ii. Southbound – 219 total vehicles with 85th percentile speed of 36.43

iii. Northbound – 375 total vehicles with 85th percentile speed of 36.33

iv. Southbound – 729 total vehicles with 85th percentile speed of 29.20

The combined 85th percentile speed was calculated to be 32.71, which is 2.71 mph over the posted speed of 30 mph. Therefore, this criterion **is not** met.

B. The 24-hour two-way traffic volume is greater than 1000:
The 24-hour two-way traffic volumes were calculated to be 894 and 1,104; therefore, this criterion **is** met.

C. Cut-through traffic comprises more than 50% of the traffic during the peak hour of the day:
The Cut-Through Traffic data collected indicates 105 total vehicles in the peak hour including 21 cut-through vehicles which equates to 20% of the traffic in the peak hour being cut-through traffic; therefore, this criterion **is not** met.

D. Where no single condition is satisfied, but where any two of A, B, or C above are satisfied to the extent of 80 percent or more of the stated values.

The policy requires only one of the criteria to be satisfied. Because the 24-hour volume criterion is satisfied, traffic calming measures **are permitted** on New Hampshire.

East 17th Terrace – Posted Speed 30 mph

A. The collected traffic data:
   i. Eastbound – 81 total vehicles with 85th percentile speed of 27.65
   ii. Westbound – 128 total vehicles with 85th percentile speed of 27.20

   The 85th percentile speeds were less than the posted speed of 30 mph. Therefore, this criterion **is not** met.

B. The 24-hour two-way traffic volume is greater than 1,000:
   i. The 24-hour two-way traffic volume was calculated to be 209; therefore, this criterion **is not** met.

C. Cut-through traffic comprises more than 50% of the traffic during the peak hour of the day:

   The Cut-Through Traffic data collected indicates 15 total vehicles in the peak hour including 10 cut-through vehicles which equates to 66.7% of the traffic in the peak hour being cut-through traffic; therefore, this criterion **is** met.

D. Where no single condition is satisfied, but where any two of A, B, or C above are satisfied to the extent of 80 percent or more of the stated values.

The policy requires only one of the criteria to be satisfied. Because the Cut-through traffic criterion is satisfied, traffic calming measures **are permitted** on East 17th Terrace.

Appendix A

Existing Conditions Plan

Site Data:

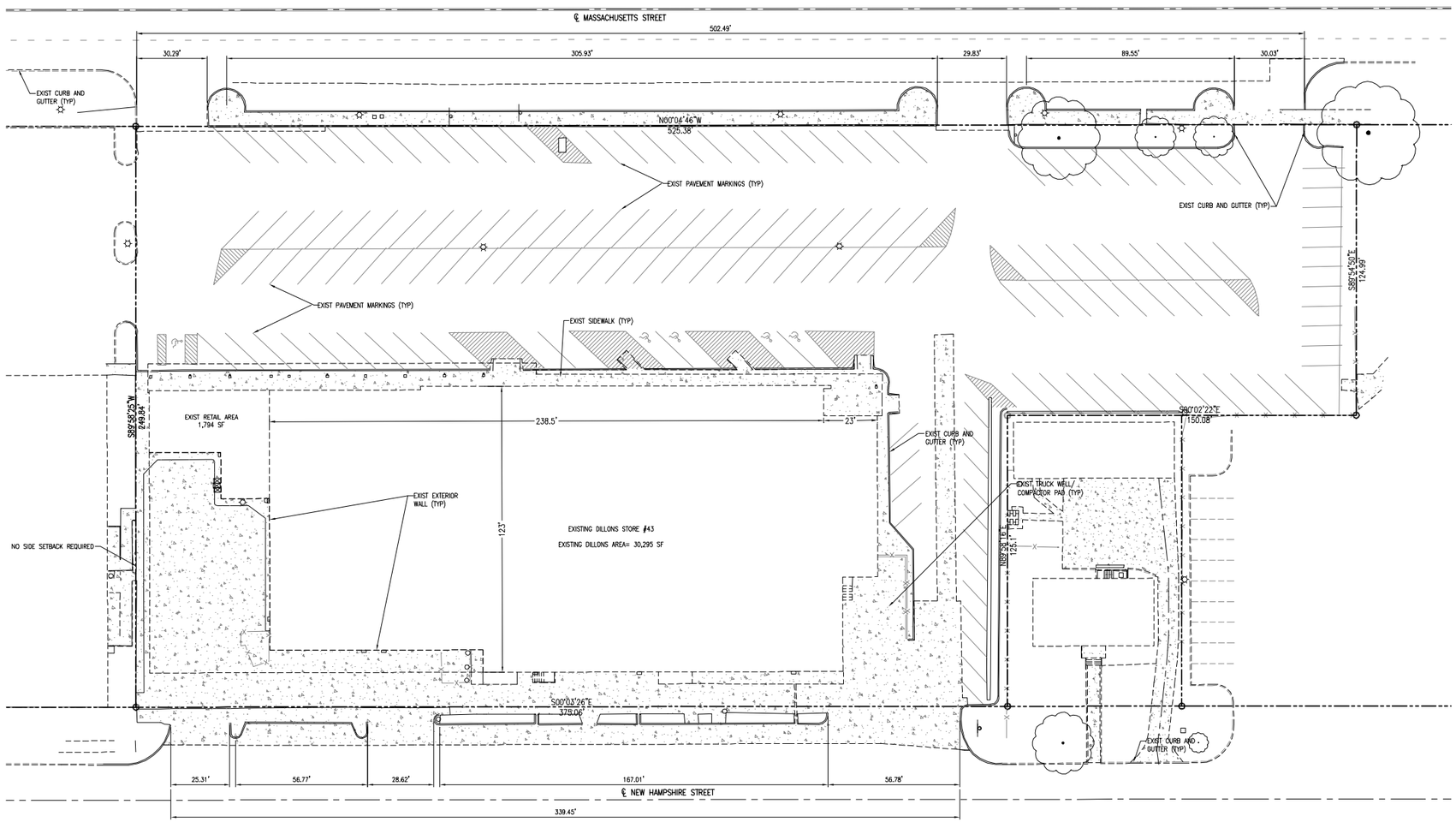
DILLONS STORE #43
1740 MASSACHUSETTS STREET
LAWRENCE, KS 66044

ZONING: "CS" COMMERCIAL STRIP

PARCEL SIZE: 2.58 ACRES

NORTH

0 10 20 40
1 INCH = 20 FT



REVISIONS:

1		
2		
3		
4		
5		

PROJECT #: 21047-11
DATE: JULY 23, 2010
DRAWN BY: CLM
DESIGNER: CLM
CHECKED BY: CLM

Pickering
Pickering Firm, Inc.
Architecture + Engineering
Planning / Surveying
6715 Lenexa Center Court, Suite 300
Lenexa, Kansas 66219
913.726.0810

Dillons
2700 E. 4TH
HUTCHINSON, KS 67501

DILLONS STORE #43
ON-SITE RELOCATION
1740 MASSACHUSETTS STREET
LAWRENCE, KS 66044

THE KROGER CO.
GENERAL OFFICE
1014 VINE STREET
CINCINNATI, OHIO 45202

SEAL:

PRELIMINARY - NOT FOR CONSTRUCTION

SHEET NUMBER:

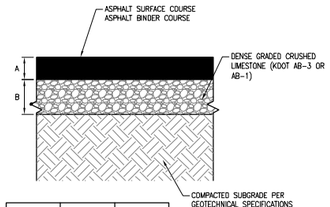
CD1

DESCRIPTION:
EXISTING CONDITIONS

K:\21047-11\PLANS\EXISTING SITE LAYOUT.DWG – July 23, 2010

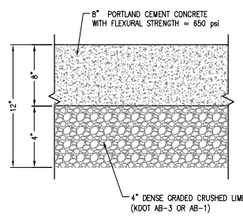
Appendix B

Proposed Site Plan

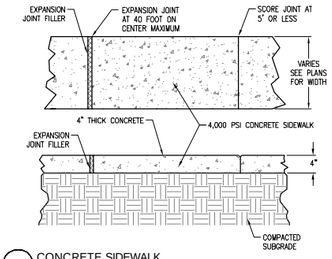


	LIGHT DUTY	HEAVY DUTY
SURFACE COURSE (A)	2"	2"
BINDER COURSE (A)	2"	2"
BASE COURSE (B)	6"	10"

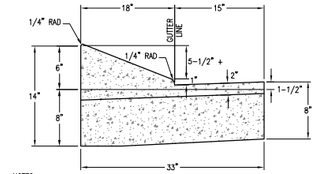
1E ASPHALT PAVING
NOT TO SCALE



2E CONCRETE PAVEMENT
NTS



3E CONCRETE SIDEWALK
NOT TO SCALE



NOTES:
1. PRE-MOLDED FIBER EXPANSION JOINT MATERIAL SHALL BE USED IN ALL EXPANSION JOINTS.
2. DUMMY JOINTS SHALL BE INSTALLED AT 10 FOOT CENTERS MAXIMUM.
3. EXPANSION JOINTS SHALL BE INSTALLED AT 40 FOOT CENTERS MAXIMUM.
4. EXPANSION JOINTS SHALL BE INSTALLED AT ENDS OF RADIUS.
5. EXPANSION JOINTS SHALL BE LOCATED A MINIMUM OF 5 FEET FROM INLET STRUCTURES.
6. CONCRETE TO BE 3,500 P.S.I.

4E 6" MOUNTABLE CURB
NOT TO SCALE

PAVEMENT HATCH LEGEND	
	HEAVY-DUTY ASPHALT PAVEMENT
	CONCRETE PAVEMENT
	HEAVY DUTY CONCRETE SIDEWALK
	GRASS PAVERS
	GRASS SEEDED AREA

NOTE

THIS SITE HAS BEEN DESIGNED TO COMPLY WITH THE PROVISIONS OF THE AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES (ADAAG) FOR BUILDING AND FACILITIES, APPENDIX A TO 28 CFR PART 36.

NOTE

RECYCLING OR OTHER KIOSKS ARE PROHIBITED FROM BEING PLACED IN THE PARKING LOT.

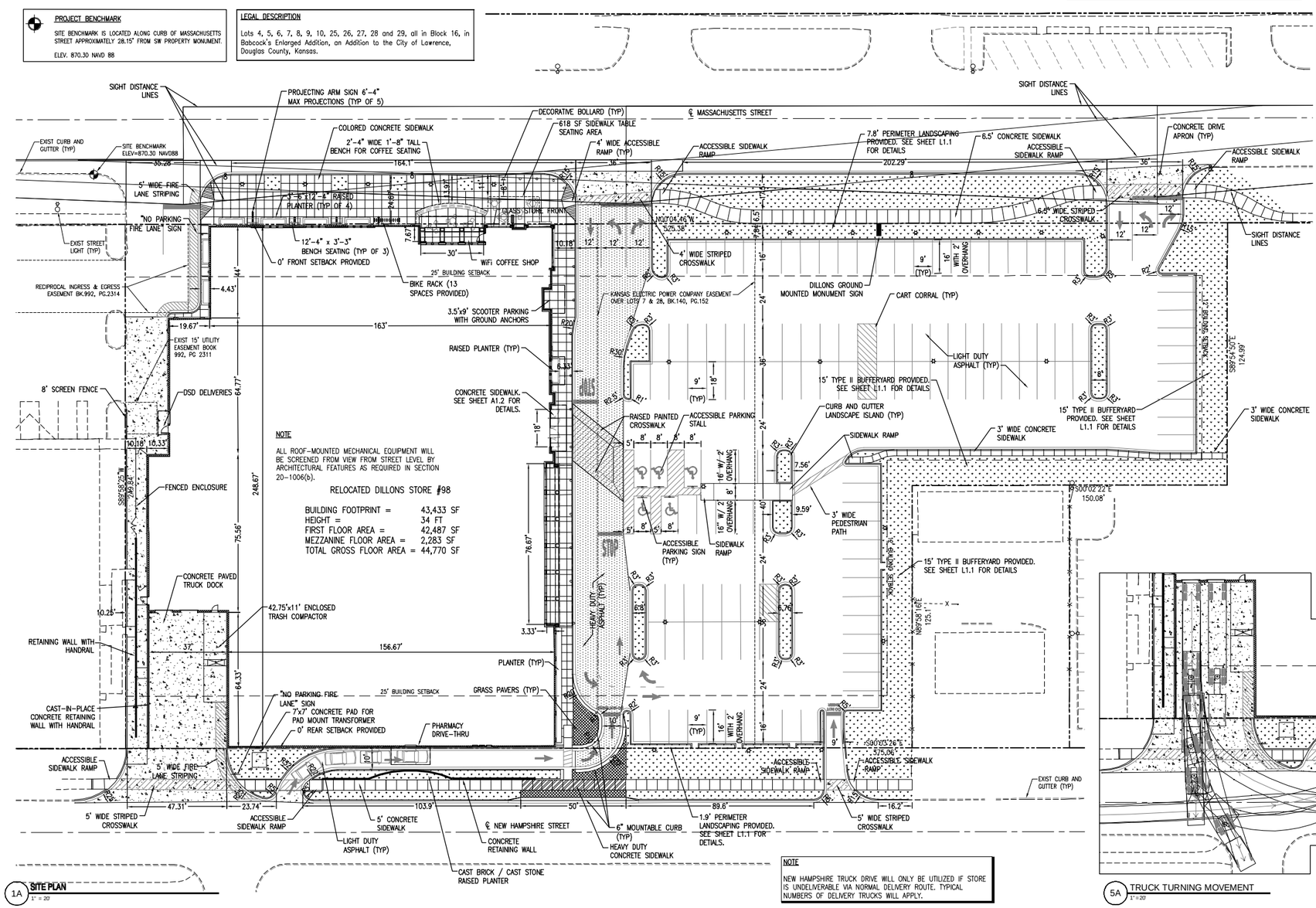
PROJECT BENCHMARK

SITE BENCHMARK IS LOCATED ALONG CURB OF MASSACHUSETTS STREET APPROXIMATELY 28.15' FROM SW PROPERTY MONUMENT.

ELEV. 870.30 NAVD 88

LEGAL DESCRIPTION

Lots 4, 5, 6, 7, 8, 9, 10, 25, 26, 27, 28 and 29, all in Block 16, in Babcock's Enlarged Addition, an Addition to the City of Lawrence, Douglas County, Kansas.



NOTE

ALL ROOF-MOUNTED MECHANICAL EQUIPMENT WILL BE SCREENED FROM VIEW FROM STREET LEVEL BY ARCHITECTURAL FEATURES AS REQUIRED IN SECTION 20-1006(b).

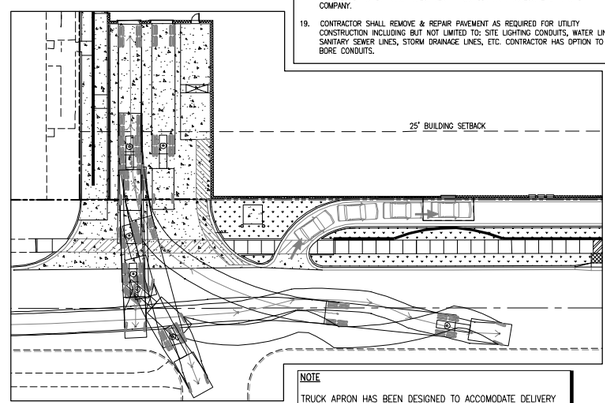
RELOCATED DILLONS STORE #98

BUILDING FOOTPRINT =	43,433 SF
HEIGHT =	34 FT
FIRST FLOOR AREA =	42,487 SF
MEZZANINE FLOOR AREA =	2,283 SF
TOTAL GROSS FLOOR AREA =	44,770 SF

1A SITE PLAN
1" = 20'

NOTE

NEW HAMPSHIRE TRUCK DRIVE WILL ONLY BE UTILIZED IF STORE IS UNDELIVERABLE VIA NORMAL DELIVERY ROUTE. TYPICAL NUMBERS OF DELIVERY TRUCKS WILL APPLY.



5A TRUCK TURNING MOVEMENT
1" = 20'

NOTE

TRUCK APRON HAS BEEN DESIGNED TO ACCOMODATE DELIVERY TRUCK WITHOUT ENCROACHING ON NEW HAMPSHIRE CURB. IF DELIVERY TRUCKS ENCROACH ON NEW HAMPSHIRE CURB DILLONS AND THE CITY OF LAWRENCE WILL WORK TO FIND A SOLUTION.

SITE DATA

DILLONS #98
1740 MASSACHUSETTS ST
LAWRENCE, KS 66044

ZONING: "CS" COMMERCIAL STRIP

PROPOSED USE: FOOD AND BEVERAGE SALES

TOTAL SITE AREA = 2.58 AC

INTERIOR LANDSCAPING REQUIRED = 5,160 SF (40 SF PER STALL)
INTERIOR LANDSCAPING PROVIDED = 2,241 SF (17 SF PER STALL)
PERIMETER LANDSCAPING PROVIDED = 15,784 SF (INCL. 8,368 IN ROW)
TOTAL LANDSCAPING PROVIDED = 18,025 SF

PROPOSED DILLONS TOTAL FLOOR AREA = 44,770 SF

PARKING REQUIRED = 1 STALL/300 SF = 150 STALLS
TOTAL PARKING PROVIDED = 129 STALLS

NORTH
0 10 20 40
1 INCH = 20 FT

GENERAL SITE NOTES:

1. BEFORE COMMENCING ANY ACTIVITY UNDER OR PERTAINING TO THIS CONTRACT, THE CONTRACTOR SHALL:
   - 1.1 OBTAIN ALL BUILDING AND CONSTRUCTION PERMITS AS REQUIRED BY PERTINENT REGULATORY AND GOVERNMENTAL AGENCIES.
   - 1.2 CONTACT THE CITY OF LAWRENCE CONSTRUCTION INSPECTION OFFICE.
   - 1.3 CONTACT UNDERGROUND UTILITIES LOCATING SERVICE.
   - 1.4 NOTIFY UTILITY COMPANIES MAINTAINING UTILITY LINES OR EASEMENTS WITHIN THE LIMITS OF CONSTRUCTION, OR IN PUBLIC RIGHTS-OF-WAY ADJACENT TO THE PROJECT.
   - 1.5 BECOME KNOWLEDGEABLE OF EXISTING UTILITIES AND PROTECT SAME WHERE NECESSARY. THIS SHALL INCLUDE UTILITIES SHOWN AND NOT SHOWN ON THE PLANS.
   - 1.6 THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.
2. THE CONTRACTOR SHALL VERIFY EXISTING DATA AND REPORT ANY SIGNIFICANT DISCREPANCIES TO THE ENGINEER.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING ANY UTILITY COMPANY WHICH MAINTAINS A UTILITY LINE WITHIN THE BOUNDARIES OF THE PROJECT BEFORE THE INITIATION OF ANY CONSTRUCTION ON THE PROJECT OR IN THE STREETS BORDERING THE PROJECT. THE CONTRACTOR SHALL ALSO ASSUME RESPONSIBILITY FOR ANY DAMAGE INCURRED BY ANY UTILITY COMPANY TO THEIR UTILITY LINES WHETHER SHOWN ON THE CONSTRUCTION PLANS OR NOT, DURING WORK ON THE PROJECT.
4. THE CONTRACTOR SHALL AT ALL TIMES EMPLOY ADEQUATE EROSION AND SEDIMENTATION CONTROL MEASURES TO PREVENT DAMAGE TO THE PROPERTY, ADJACENT PROPERTIES, PUBLIC RIGHTS-OF WAY, AND PUBLIC OR PRIVATE DRAINAGE SYSTEMS. ALL NEWLY CUT AND/OR FILLED AREAS LACKING ADEQUATE VEGETATION SHALL BE SEEDED, FERTILIZED, & MULCHED AS REQUIRED TO EFFECTIVELY PREVENT SOIL EROSION PER CITY OF LAWRENCE AND STATE REGULATIONS.
5. ALL CONSTRUCTION SHALL MEET THE CITY OF LAWRENCE TECHNICAL SPECIFICATIONS.
6. THE CONTRACTOR MUST HAVE WRITTEN APPROVAL FROM THE CITY ENGINEER AND THE PROJECT ENGINEER BEFORE ANY CHANGE IN DESIGN IS MADE.
7. SEVENTY-TWO (72) HOURS BEFORE BEGINNING ANY EXCAVATION, THE CONTRACTOR SHALL CALL KANSAS ONE CALL AT 1-800-344-7233 FOR THE LOCATION OF UNDERGROUND UTILITIES.
8. THE CONTRACTOR AT NO TIME SHALL ENCROACH UPON OR CAUSE DISRUPTION TO TRAFFIC FLOW ON ADJACENT PUBLIC RIGHTS-OF-WAY WITHOUT SECURING THE PROPER PERMITS PRIOR TO COMMENCING OPERATIONS. THE CONTRACTOR SHALL ERECT THE PROPER TRAFFIC CONTROL DEVICES ACCORDING TO THE LATEST EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", AND SHALL PROTECT THE PUBLIC FROM HAZARD OR INJURY BY ERECTING BARRICADES WHERE APPROPRIATE, I.E., AROUND EXCAVATIONS OR OPERATING EQUIPMENT. THE CONTRACTOR SHALL NOT ENTER NOR CAUSE DAMAGE TO ANY ADJACENT PROPERTIES WITHOUT WRITTEN PERMISSION FROM SAID PROPERTY OWNERS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.
9. ALL SITE RELATED CONCRETE UNLESS SPECIFIED OTHERWISE SHALL BE 4,000 PSI.
10. EXISTING UTILITIES REQUIRING RELOCATION SHALL BE THE CONTRACTOR'S RESPONSIBILITY. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING WORKING UTILITY SERVICES TO ADJACENT BUILDINGS DURING DEMOLITION AND CONSTRUCTION. COORDINATE PLANNED SERVICE OUTAGES OR EMERGENCIES WITH THE OWNER.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING UTILITY COMPANIES WHICH MAINTAIN A UTILITY LINE WITHIN THE BOUNDARIES OF THE PROJECT BEFORE THE INITIATION OF CONSTRUCTION ON THE PROJECT OR IN THE STREETS BORDERING THE PROJECT. THE CONTRACTOR SHALL ALSO ASSUME RESPONSIBILITY FOR DAMAGE INCURRED BY ANY UTILITY COMPANY TO THEIR UTILITY LINES WHETHER SHOWN ON THE CONSTRUCTION PLANS OR NOT, DURING WORK ON THE PROJECT.
12. NEWLY CUT OR FILL AREAS LACKING ADEQUATE VEGETATION SHALL BE FERTILIZED AND SEEDED AS SOON AS POSSIBLE TO LIMIT SOIL EROSION. ALL SLOPES 3:1 OR GREATER SHALL BE PERMANENTLY STABILIZED WITH SOLID SOD OR AN EROSION CONTROL MAT WITH SEEDING.
13. FIELD STAKING IS TO BE PROVIDED BY THE CONTRACTOR.
14. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE LOCAL AND STATE REQUIREMENTS INCLUDING THE LOCAL NOISE ORDINANCE.
15. ANY FENCING, SIDEWALK, CURB AND GUTTER, CURB CUT ETC., DAMAGED BY CONSTRUCTION SHALL BE REPLACED AND RESTORED TO ITS ORIGINAL CONDITION AT NO ADDITIONAL COST TO THE OWNER.
16. ALL UTILITY LINES ENTERING THE BUILDING SHALL BE SEALED TO PREVENT MIGRATION OF SURFACE AND SUBSURFACE WATER AND SUBSEQUENT WETTING OF THE SUBGRADE SOILS. THE UTILITY LINES SHALL BE SEALED FROM THE BUILDING FOUNDATION TO A MINIMUM OF 3 FEET OUTSIDE THE BUILDING FOUNDATION. THE SEAL MAY CONSIST OF CLAYEY SOILS WITH A MINIMUM PLASTICITY INDEX OF 25 OR WITH LEAN CONCRETE.
17. CONTRACTOR SHALL FIELD VERIFY LOCATION OF EXIST NATURAL GAS, WATER, AND SEWER LINES WHERE CROSSING PROPOSED UTILITIES' CONSTRUCTION. CONTRACTOR SHALL PROVIDE ELEVATIONS OF EXIST UTILITIES TO THE ENGINEER TO VERIFY ADEQUATE CLEARANCE.
18. CONTRACTOR SHALL SUPPLY AND INSTALL ALL ITEMS AND PERFORM ALL WORK NOT COVERED BY UTILITY COMPANIES. VERIFY INSTALLATION PROCEDURE WITH UTILITY COMPANY.
19. CONTRACTOR SHALL REMOVE & REPAIR PAVEMENT AS REQUIRED FOR UTILITY CONSTRUCTION INCLUDING BUT NOT LIMITED TO: SITE LIGHTING CONDUITS, WATER LINES, SANITARY SEWER LINES, STORM DRAINAGE LINES, ETC. CONTRACTOR HAS OPTION TO BORE CONDUITS.

REVISIONS:

1		
2		
3		
4		
5		

PROJECT #: 21047-11
DATE: APRIL 2011
DRAWN BY: JML
DESIGNER: JML
CHECKED BY: CLM

Pickering
Pickering Firm, Inc.
Architecture • Engineering
Planning • Surveying
6775 Lenexa Center Court, Suite 300
Lenexa, Kansas 66214
913.726.0810

Dillons
2700 E. 4TH
HUTCHINSON, KS 67501

DILLONS STORE #98
ON-SITE RELOCATION
1740 MASSACHUSETTS STREET
LAWRENCE, KS 66044

THE KROGER CO.
GENERAL OFFICE
1014 VINE STREET
CINCINNATI, OHIO 45202

SEAL:
CARA L. MARTIN
LICENSED
17642
KANSAS
PROFESSIONAL ENGINEER

SHEET NUMBER:
C1.1

DESCRIPTION:
SITE PLAN

K:\21047-11\PLANS\C1.1 SITE LAYOUT PLAN.DWG – April 6, 2011

Appendix C

ITE Trip Generation Manual Data

Land Use: 850
Supermarket

Description

Supermarkets are free-standing retail stores selling a complete assortment of food; food preparation and wrapping materials; and household cleaning items. Supermarkets may also contain the following products and services: ATMs, automobile supplies, bakeries, books and magazines, dry cleaning, floral arrangements, greeting cards, limited-service banks, photo centers, pharmacies and video rental areas. Some facilities may be open 24 hours a day. Discount supermarket (Land Use 854) is a related use.

Additional Data

Caution should be used when applying daily trip generation rates for supermarkets, as the database contains a mixture of facilities with varying hours of operation. Future data submissions should specify a site's hours of operation.

The sites were surveyed between the 1960s and the 2000s throughout the United States.

Source Numbers

2, 4, 5, 72, 98, 203, 213, 251, 273, 305, 359, 365, 438, 442, 447, 448, 514, 520, 552, 577, 610

Land Use: 850
Supermarket
Independent Variables with One Observation

The following trip generation data are for independent variables with only one observation. This information is shown in this table only; there are no related plots for these data.

Users are cautioned to use data with care because of the small sample size.

Independent Variable	Trip Generation Rate	Size of Independent Variable	Number of Studies	Directional Distribution
Employees				
Weekday	87.82	44	1	50% entering, 50% exiting

Supermarket
(850)

Average Vehicle Trip Ends vs: 1000 Sq. Feet Gross Floor Area
On a: Weekday

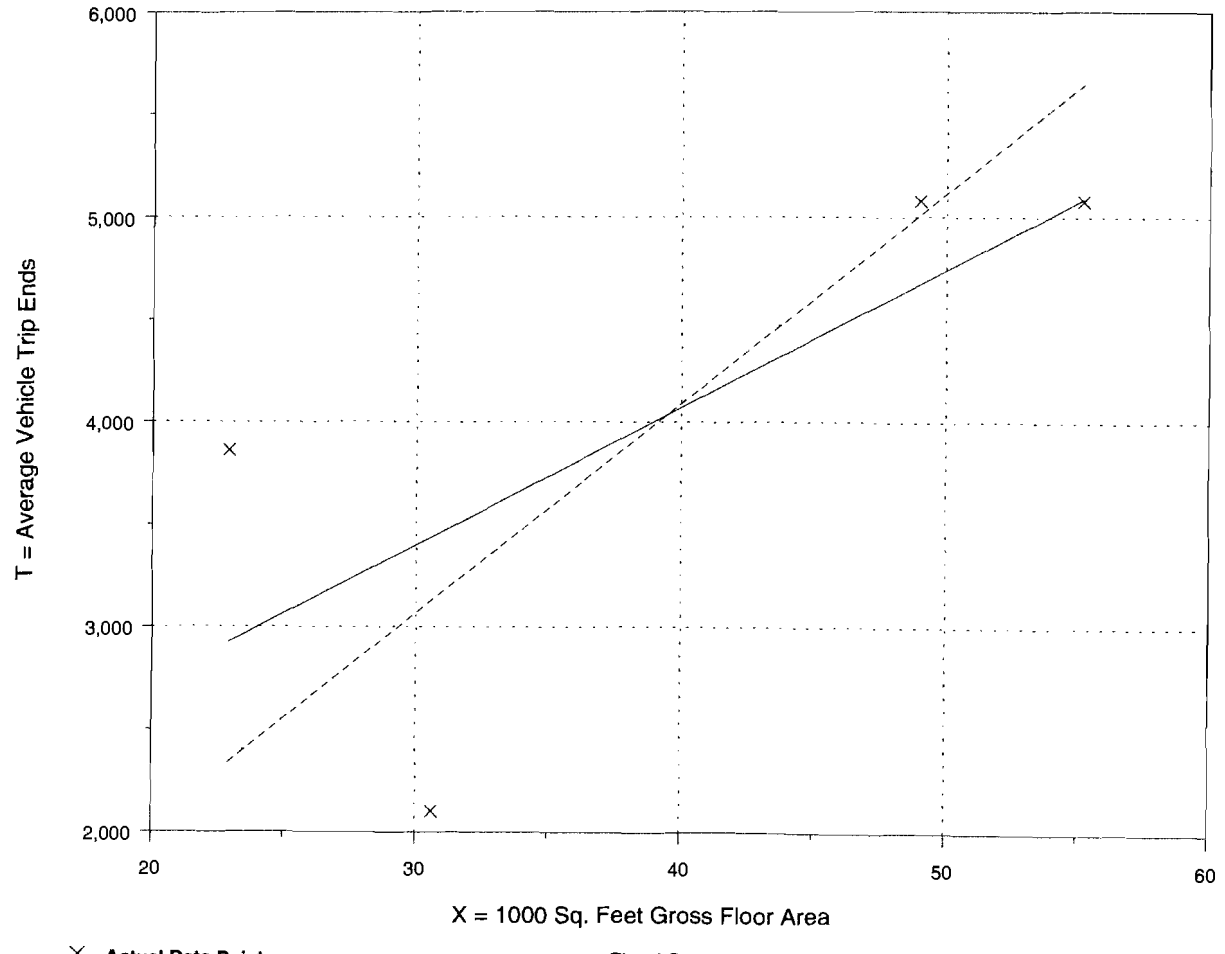
Number of Studies: 4
Average 1000 Sq. Feet GFA: 39
Directional Distribution: 50% entering, 50% exiting

Trip Generation per 1000 Sq. Feet Gross Floor Area

Average Rate	Range of Rates	Standard Deviation
102.24	68.65 - 168.88	31.73

Data Plot and Equation

Caution - Use Carefully - Small Sample Size



Fitted Curve Equation: T = 66.95(X) + 1391.56

R^2 = 0.52

Supermarket
(850)

Average Vehicle Trip Ends vs: **1000 Sq. Feet Gross Floor Area**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

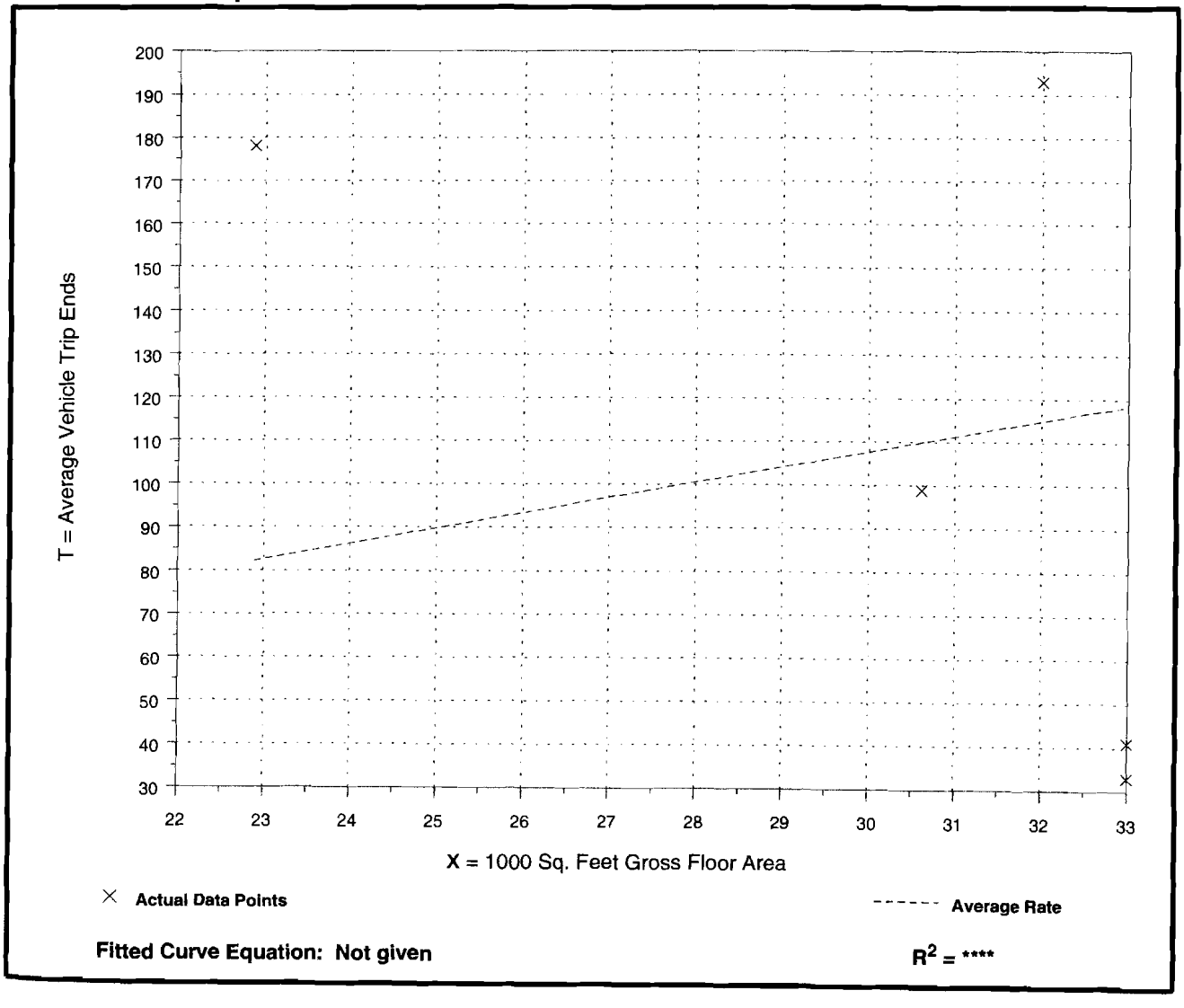
Number of Studies: 5
Average 1000 Sq. Feet GFA: 30
Directional Distribution: 61% entering, 39% exiting

Trip Generation per 1000 Sq. Feet Gross Floor Area

Average Rate	Range of Rates	Standard Deviation
3.59	1.00 - 7.78	3.18

Data Plot and Equation

Caution - Use Carefully - Small Sample Size



Fitted Curve Equation: Not given

R^2 = ****

Supermarket
(850)

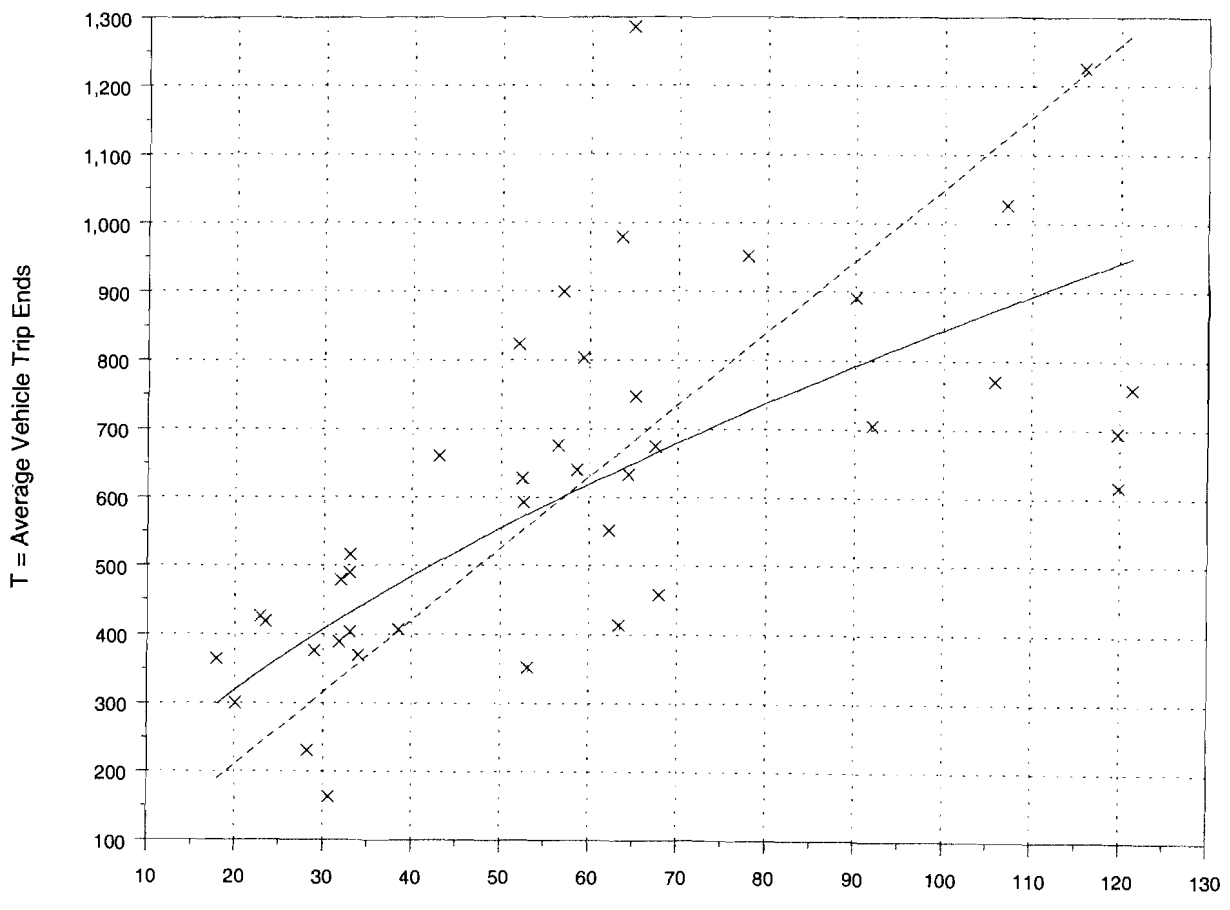
Average Vehicle Trip Ends vs: **1000 Sq. Feet Gross Floor Area**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Number of Studies: 40
Average 1000 Sq. Feet GFA: 59
Directional Distribution: 51% entering, 49% exiting

Trip Generation per 1000 Sq. Feet Gross Floor Area

Average Rate	Range of Rates	Standard Deviation
10.50	5.15 - 20.29	4.97

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.61 Ln(X) + 3.95

R^2 = 0.52

Supermarket
(850)

Average Vehicle Trip Ends vs: 1000 Sq. Feet Gross Floor Area
On a: Weekday,
A.M. Peak Hour of Generator

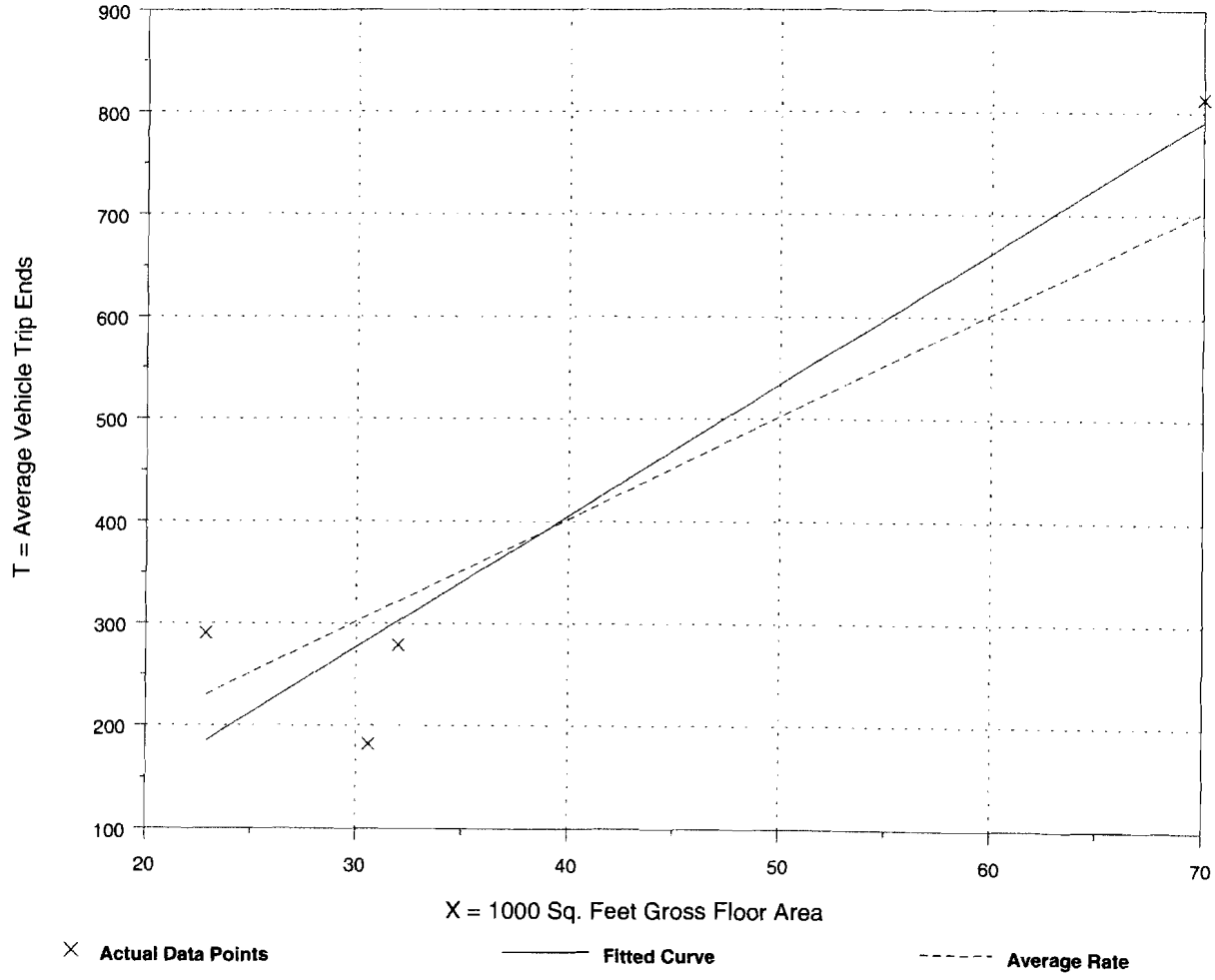
Number of Studies: 4
Average 1000 Sq. Feet GFA: 39
Directional Distribution: 49% entering, 51% exiting

Trip Generation per 1000 Sq. Feet Gross Floor Area

Average Rate	Range of Rates	Standard Deviation
10.05	5.94 - 12.67	3.96

Data Plot and Equation

Caution - Use Carefully - Small Sample Size



Fitted Curve Equation: T = 12.87(X) - 109.76

R^2 = 0.91

Supermarket
(850)

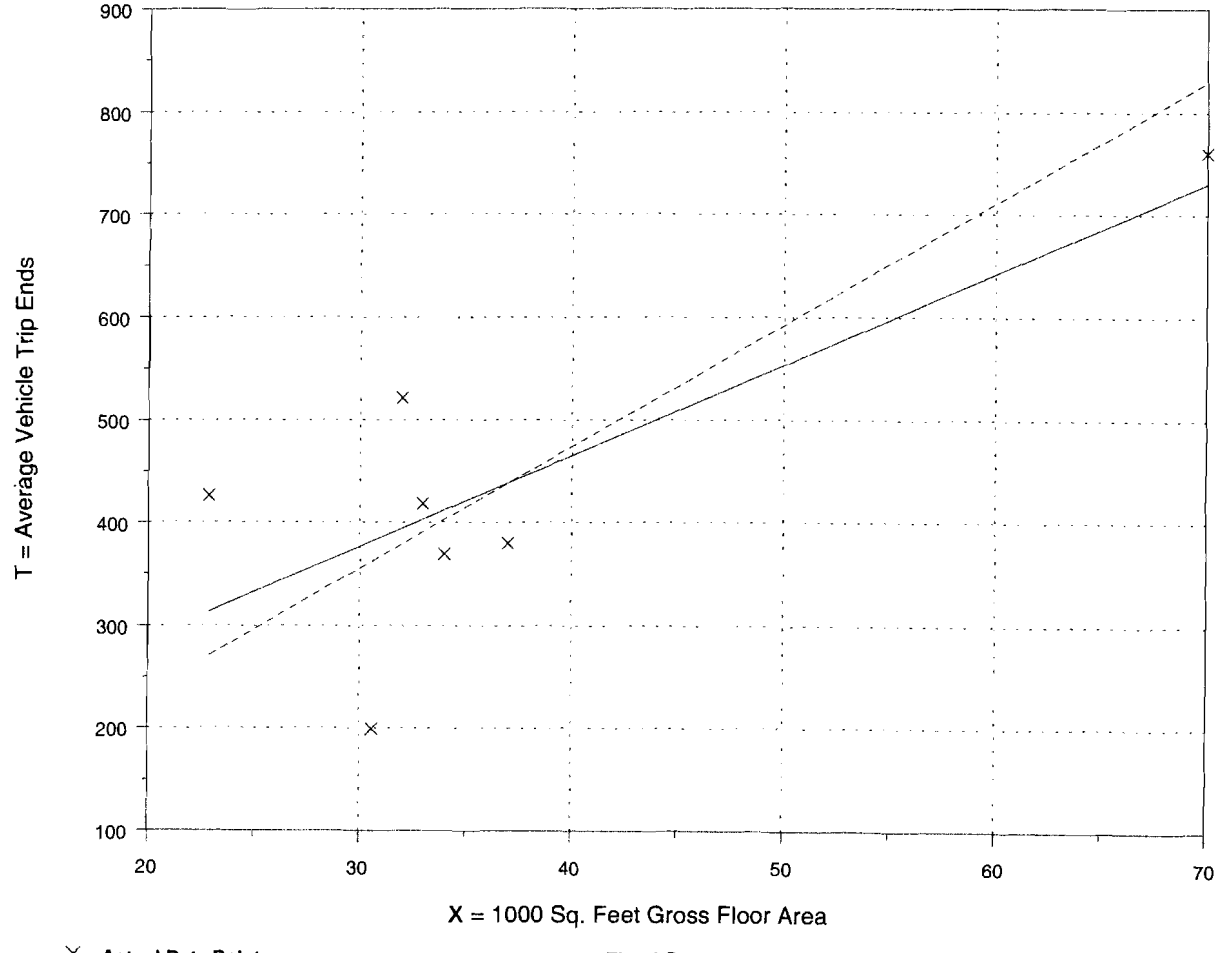
Average Vehicle Trip Ends vs: 1000 Sq. Feet Gross Floor Area
On a: Weekday,
P.M. Peak Hour of Generator

Number of Studies: 7
Average 1000 Sq. Feet GFA: 37
Directional Distribution: 53% entering, 47% exiting

Trip Generation per 1000 Sq. Feet Gross Floor Area

Average Rate	Range of Rates	Standard Deviation
11.85	6.50 - 18.62	4.72

Data Plot and Equation



Fitted Curve Equation: T = 8.84(X) + 111.54

R^2 = 0.61

Supermarket
(850)

Average Vehicle Trip Ends vs: 1000 Sq. Feet Gross Floor Area
On a: Saturday

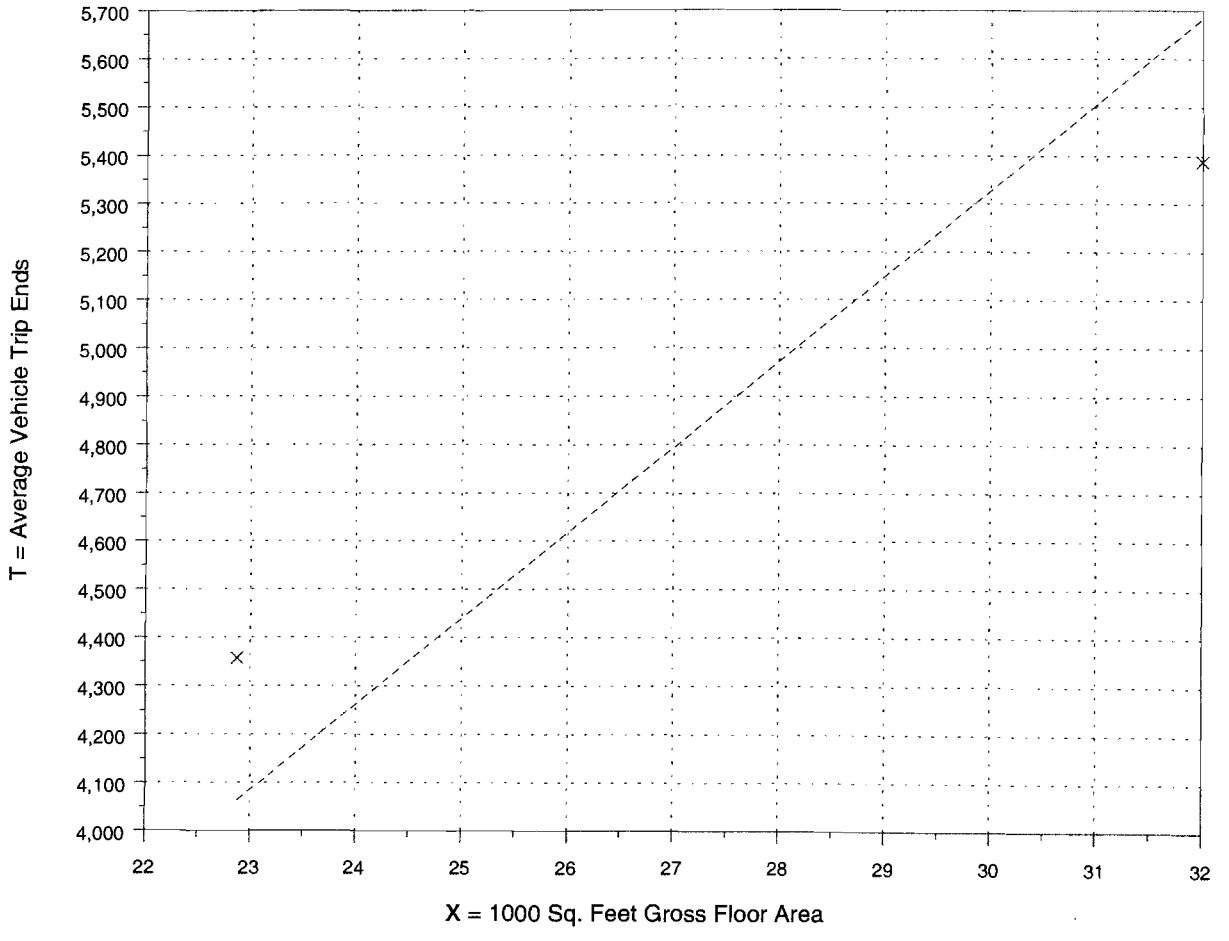
Number of Studies: 2
Average 1000 Sq. Feet GFA: 27
Directional Distribution: 50% entering, 50% exiting

Trip Generation per 1000 Sq. Feet Gross Floor Area

Average Rate	Range of Rates	Standard Deviation
177.59	168.41 - 190.43	*

Data Plot and Equation

Caution - Use Carefully - Small Sample Size



Fitted Curve Equation: Not given

R^2 = ****

Supermarket
(850)

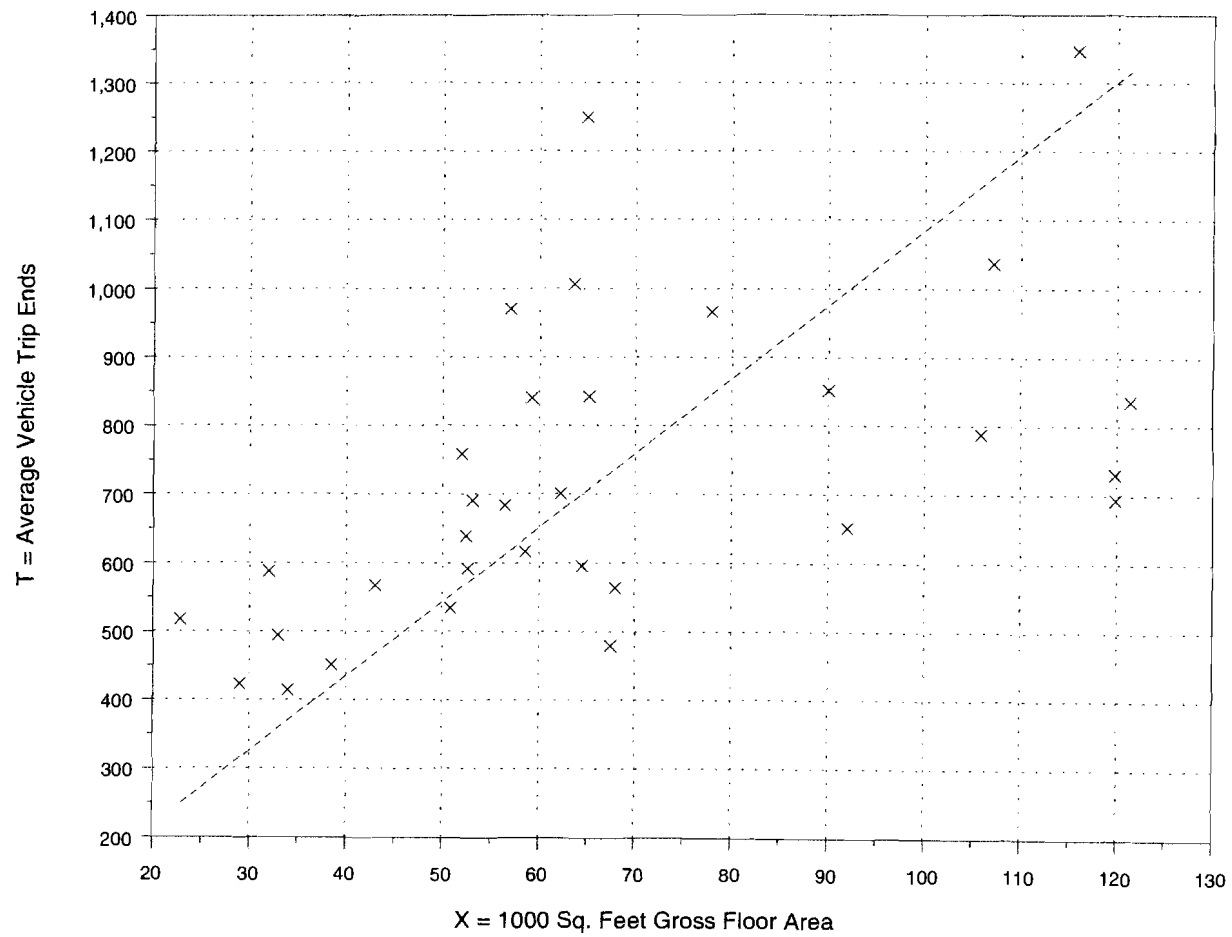
Average Vehicle Trip Ends vs: **1000 Sq. Feet Gross Floor Area**
On a: **Saturday,**
Peak Hour of Generator

Number of Studies: 32
Average 1000 Sq. Feet GFA: 67
Directional Distribution: 51% entering, 49% exiting

Trip Generation per 1000 Sq. Feet Gross Floor Area

Average Rate	Range of Rates	Standard Deviation
10.85	5.78 - 22.60	4.93

Data Plot and Equation



Fitted Curve Equation: Not given

R^2 = ****

Supermarket
(850)

Average Vehicle Trip Ends vs: 1000 Sq. Feet Gross Floor Area
On a: Sunday

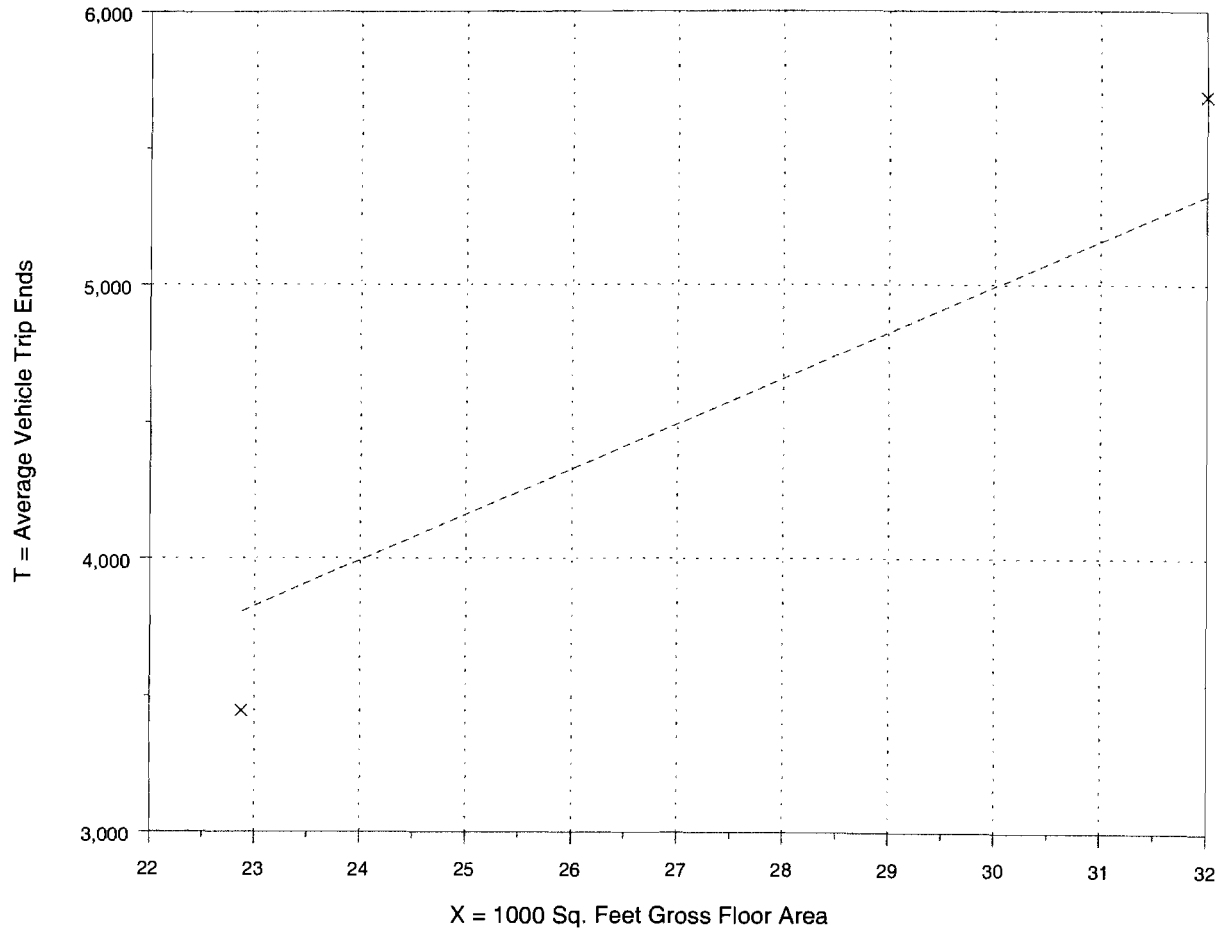
Number of Studies: 2
Average 1000 Sq. Feet GFA: 27
Directional Distribution: 50% entering, 50% exiting

Trip Generation per 1000 Sq. Feet Gross Floor Area

Average Rate	Range of Rates	Standard Deviation
166.44	150.52 - 177.81	*

Data Plot and Equation

Caution - Use Carefully - Small Sample Size



Fitted Curve Equation: Not given

R^2 = ****

Supermarket
(850)

Average Vehicle Trip Ends vs: **1000 Sq. Feet Gross Floor Area**
On a: **Sunday,**
Peak Hour of Generator

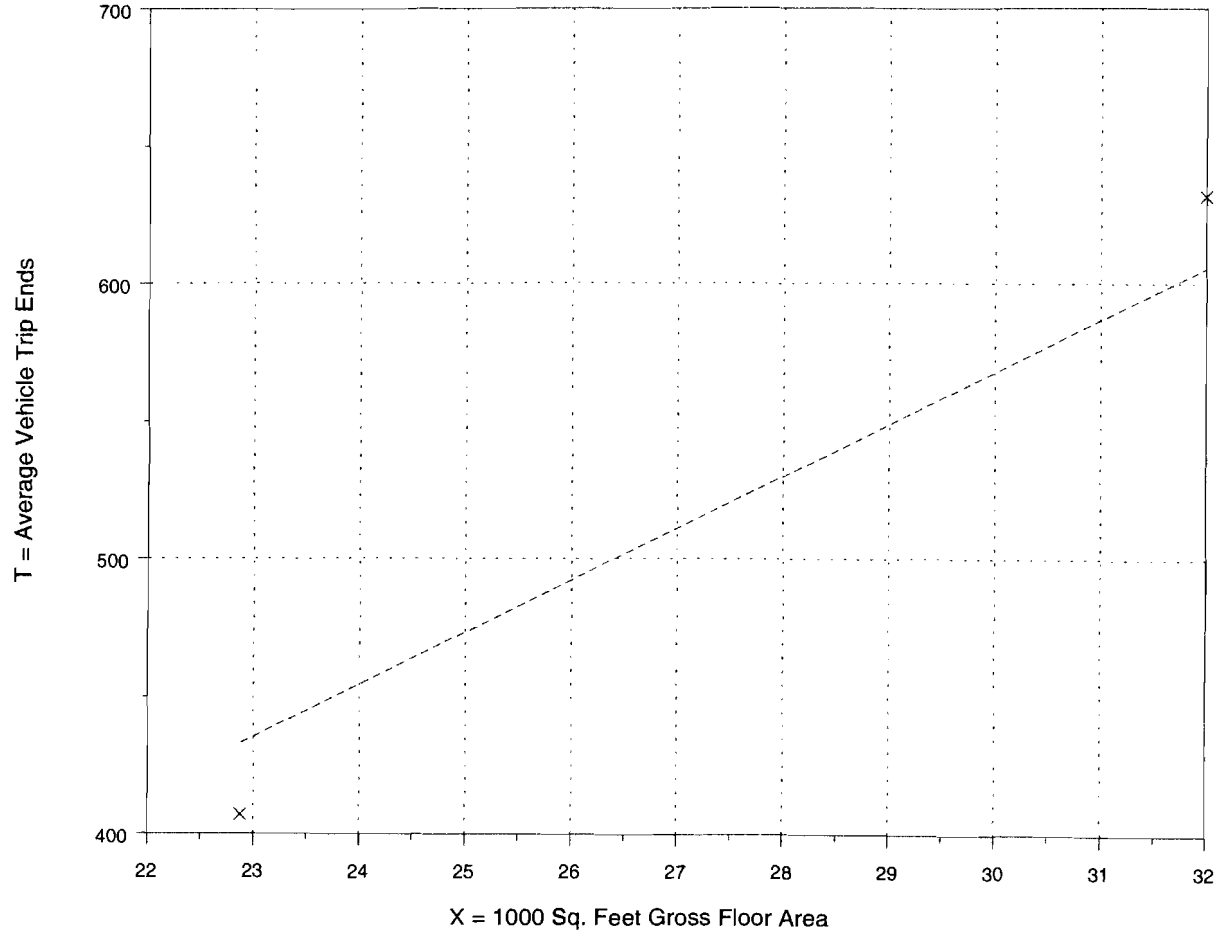
Number of Studies: 2
Average 1000 Sq. Feet GFA: 27
Directional Distribution: Not available

Trip Generation per 1000 Sq. Feet Gross Floor Area

Average Rate	Range of Rates	Standard Deviation
18.93	17.79 - 19.75	*

Data Plot and Equation

Caution - Use Carefully - Small Sample Size

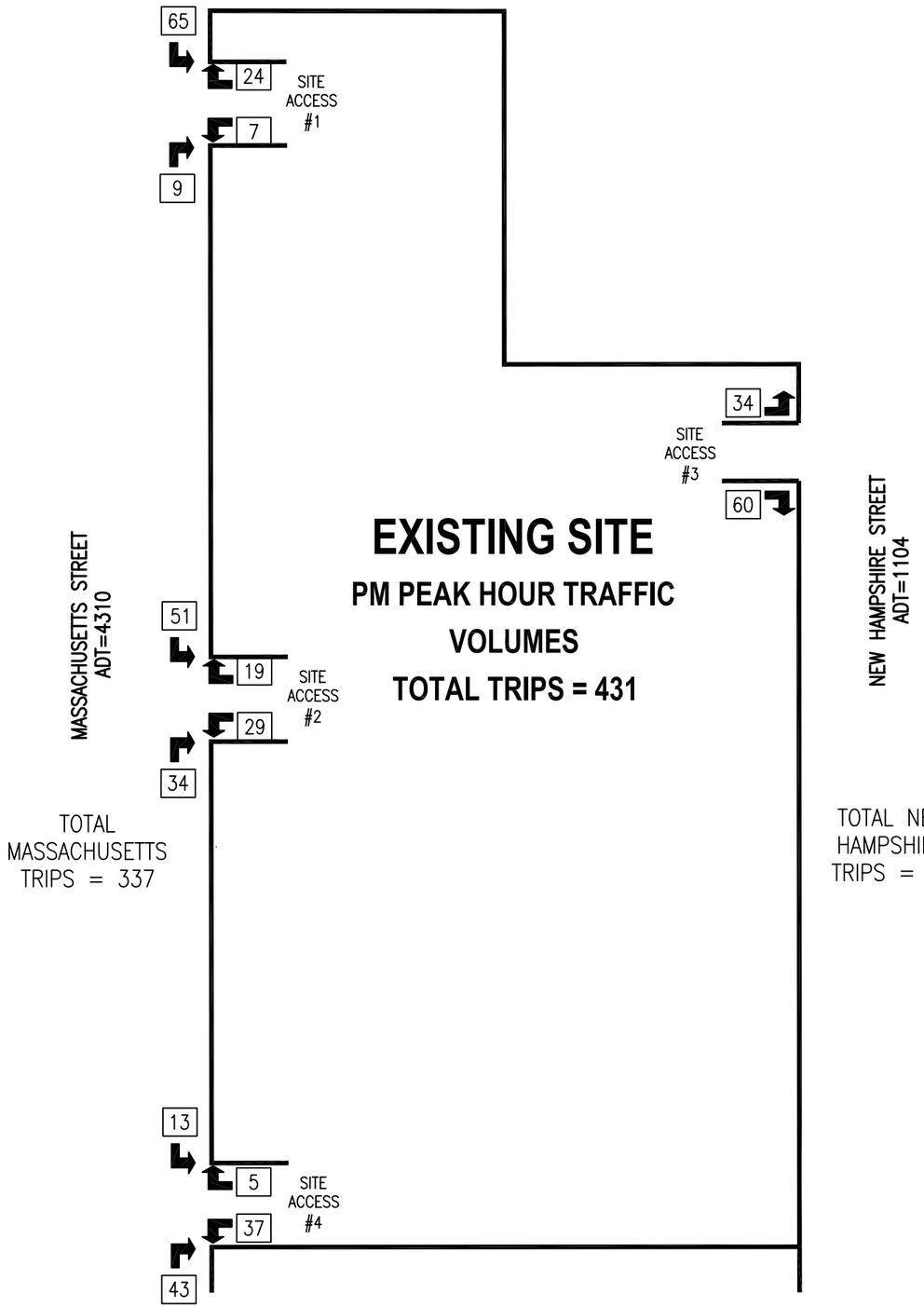


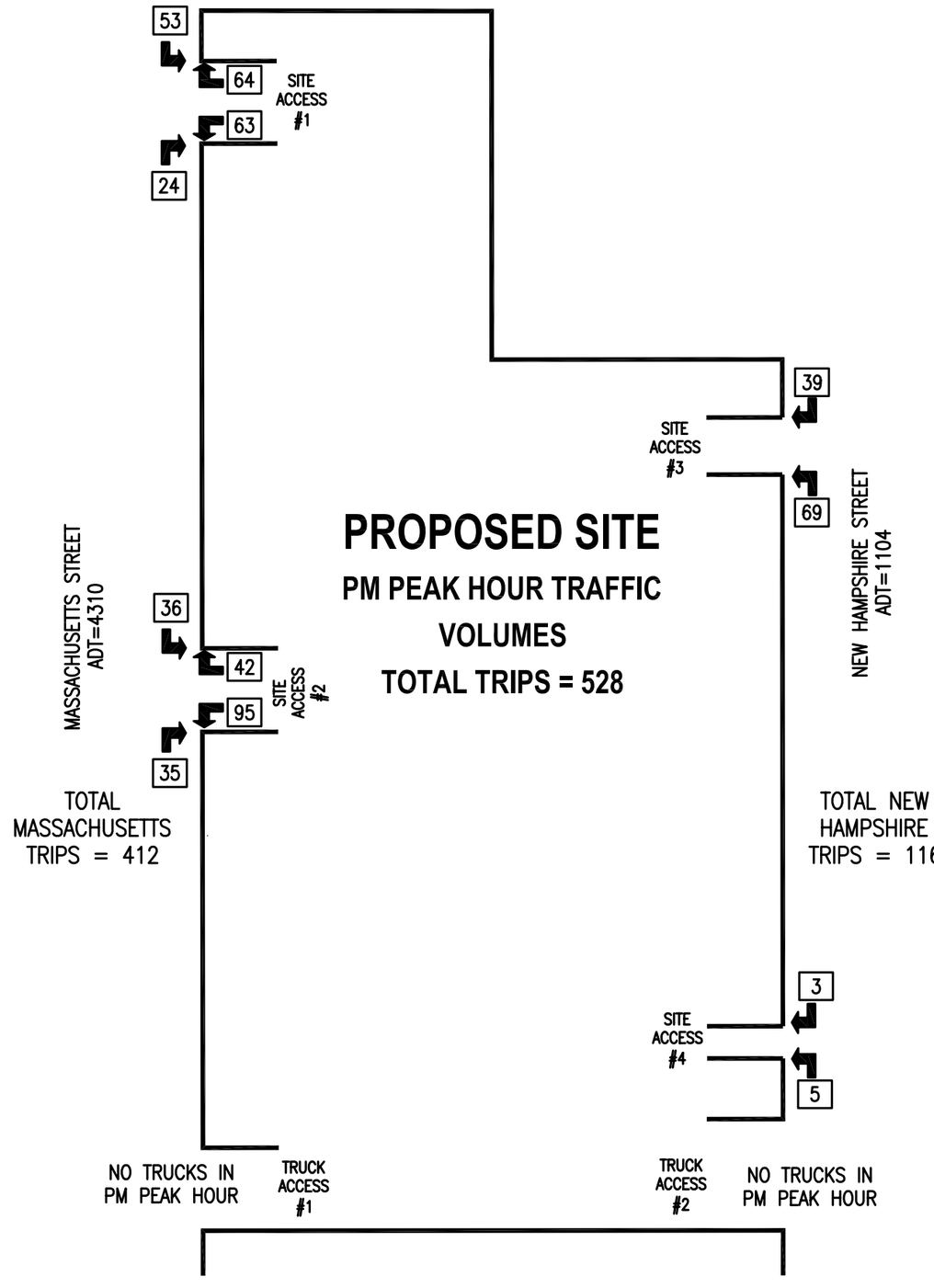
Fitted Curve Equation: Not given

R^2 = ****

Appendix D

Distributed Trips





SEAL

Pickering
Pickering Firm, Inc.
Architecture • Engineering
Planning • Surveying
6775 Lenox Center Court, Suite 300
Memphis, TN 38115
901.726.0810

DILLONS STORE #98
ON-SITE RELOCATION
LAWRENCE, KANSAS

PROJECT # 21047-11

DATE APRIL 2011

DESCRIPTION TRIP GENERATION

SCALE 1" = 60'

DOCUMENT #

SHEET # C1.0

Appendix E

Traffic Count Data

Nu-Metrics Traffic Analyzer Study
Computer Generated Summary Report
City: Lawrence
Street: 1700 N H

A study of vehicle traffic was conducted with HI-STAR unit number 1934. The study was done in the NB lane at 1700 N H in Lawrence, Ks in Douglas county. The study began on Jan/24/11 at 11:00 and concluded on Jan/25/11 at 11:00, lasting a total of 24.00 hours. Traffic statistics were recorded in 15 minute time periods. The total recorded volume showed 675 vehicles passed through the location with a peak volume of 24 on Jan/24/11 at [15:45-16:00] and a minimum volume of 0 on Jan/25/11 at [00:30-00:45]. The AADT count for this study was 675.

SPEED

Chart 1 lists the values of the speed bins and the total traffic volume for each bin. At least half the vehicles were traveling in the 20 - 30 MPH range or lower. The average speed for all classifed vehicles was 22 MPH with 4.54% vehicles exceeding the posted speed of 30 MPH. The HI-STAR found 2.06 percent of the total vehicles were traveling in excess of 55 MPH. The mode speed for this traffic study was 20MPH and the 85th percentile was 33.29 MPH.

< to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 79	80 to 89	90 to 99	100 to >										
171	216	76	12	4	3	3	0	0	0										

CHART 1

CLASSIFICATION

Chart 2 lists the values of the classification bins and the total traffic volume accumulated for each bin.

Most of the vehicles classified during the study were Passenger Vehicles. The number of Passenger Vehicles in the study was 384 which represents 79 percent of the total classified vehicles. The number of Vans & Pickups in the study was 95 which represents 20 percent of the total classified vehicles. The number of Busses & Trucks in the study was 3 which represents 1 percent of the total classified vehicles. The number of Tractor Tailers in the study was 3 which represents 1 percent of the total classified vehicles.

< to 14	15 to 24	25 to 39	40 to 49	50 to 69	70 to 79	80 to 139	140 to >												
384	85	10	3	2	0	1	0												

CHART 2

HEADWAY

During the peak traffic period, on Jan/24/11 at [15:45-16:00] the average headway between vehicles was 36 seconds. During the slowest traffic period, on Jan/25/11 at [00:30-00:45] the average headway between vehicles was 900 seconds.

WEATHER

The roadway surface temperature over the period of the study varied between 25.00 and 48.00 degrees F. The HI-STAR determined that the roadway surface was Dry 27.08% of the time.

Nu-Metrics Traffic Analyzer Study
Computer Generated Summary Report
City: Lawrence
Street: 1700 N H

A study of vehicle traffic was conducted with HI-STAR unit number 8821. The study was done in the SB lane at 1700 N H in Lawrence, Ks in Douglas county. The study began on Jan/24/11 at 11:00 and concluded on Jan/25/11 at 11:00, lasting a total of 24.00 hours. Traffic statistics were recorded in 15 minute time periods. The total recorded volume showed 219 vehicles passed through the location with a peak volume of 11 on Jan/24/11 at [16:45-17:00] and a minimum volume of 0 on Jan/24/11 at [19:15-19:30]. The AADT count for this study was 219.

SPEED

Chart 1 lists the values of the speed bins and the total traffic volume for each bin. At least half the vehicles were traveling in the 20 - 30 MPH range or lower. The average speed for all classifed vehicles was 26 MPH with 9.58% vehicles exceeding the posted speed of 30 MPH. The HI-STAR found 4.79 percent of the total vehicles were traveling in excess of 55 MPH. The mode speed for this traffic study was 20MPH and the 85th percentile was 36.43 MPH.

< to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 79	80 to 89	90 to 99	100 to >										
36	87	28	8	2	3	3	0	0	0										

CHART 1

CLASSIFICATION

Chart 2 lists the values of the classification bins and the total traffic volume accumulated for each bin.

Most of the vehicles classified during the study were Passenger Vehicles. The number of Passenger Vehicles in the study was 120 which represents 72 percent of the total classified vehicles. The number of Vans & Pickups in the study was 45 which represents 27 percent of the total classified vehicles. The number of Busses & Trucks in the study was 2 which represents 1 percent of the total classified vehicles. The number of Tractor Tailers in the study was 0 which represents 0 percent of the total classified vehicles.

< to 14	15 to 24	25 to 39	40 to 49	50 to 69	70 to 79	80 to 139	140 to >												
120	41	4	2	0	0	0	0												

CHART 2

HEADWAY

During the peak traffic period, on Jan/24/11 at [16:45-17:00] the average headway between vehicles was 75 seconds. During the slowest traffic period, on Jan/24/11 at [19:15-19:30] the average headway between vehicles was 900 seconds.

WEATHER

The roadway surface temperature over the period of the study varied between 23.00 and 50.00 degrees F. The HI-STAR determined that the roadway surface was Dry 100.00% of the time.

Nu-Metrics Traffic Analyzer Study
Computer Generated Summary Report
City: Lawrence
Street: 1700 N H

A study of vehicle traffic was conducted with HI-STAR unit number 1929. The study was done in the NB lane at 1700 N H in Lawrence, Ks in Douglas county. The study began on Jan/25/11 at 15:30 and concluded on Jan/26/11 at 15:30, lasting a total of 24.00 hours. Traffic statistics were recorded in 15 minute time periods. The total recorded volume showed 375 vehicles passed through the location with a peak volume of 17 on Jan/25/11 at [18:45-19:00] and a minimum volume of 0 on Jan/25/11 at [20:15-20:30]. The AADT count for this study was 375.

SPEED

Chart 1 lists the values of the speed bins and the total traffic volume for each bin. At least half the vehicles were traveling in the 20 - 30 MPH range or lower. The average speed for all classifed vehicles was 26 MPH with 8.49% vehicles exceeding the posted speed of 30 MPH. The HI-STAR found 4.80 percent of the total vehicles were traveling in excess of 55 MPH. The mode speed for this traffic study was 20MPH and the 85th percentile was 36.33 MPH.

< to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 79	80 to 89	90 to 99	100 to >										
50	149	49	10	5	7	1	0	0	0										

CHART 1

CLASSIFICATION

Chart 2 lists the values of the classification bins and the total traffic volume accumulated for each bin.

Most of the vehicles classified during the study were Passenger Vehicles. The number of Passenger Vehicles in the study was 192 which represents 71 percent of the total classified vehicles. The number of Vans & Pickups in the study was 76 which represents 28 percent of the total classified vehicles. The number of Busses & Trucks in the study was 1 which represents 0 percent of the total classified vehicles. The number of Tractor Tailers in the study was 2 which represents 1 percent of the total classified vehicles.

< to 14	15 to 24	25 to 39	40 to 49	50 to 69	70 to 79	80 to 139	140 to >												
192	71	5	1	2	0	0	0												

CHART 2

HEADWAY

During the peak traffic period, on Jan/25/11 at [18:45-19:00] the average headway between vehicles was 50 seconds. During the slowest traffic period, on Jan/25/11 at [20:15-20:30] the average headway between vehicles was 900 seconds.

WEATHER

The roadway surface temperature over the period of the study varied between 25.00 and 54.00 degrees F. The HI-STAR determined that the roadway surface was Dry 100.00% of the time.

Nu-Metrics Traffic Analyzer Study
Computer Generated Summary Report
City: Lawrence
Street: 1700 N H

A study of vehicle traffic was conducted with HI-STAR unit number 6982. The study was done in the SB lane at 1700 N H in Lawrence, Ks in Douglas county. The study began on Jan/25/11 at 15:30 and concluded on Jan/26/11 at 15:30, lasting a total of 24.00 hours. Traffic statistics were recorded in 15 minute time periods. The total recorded volume showed 729 vehicles passed through the location with a peak volume of 29 on Jan/25/11 at [18:45-19:00] and a minimum volume of 0 on Jan/25/11 at [23:30-23:45]. The AADT count for this study was 729.

SPEED

Chart 1 lists the values of the speed bins and the total traffic volume for each bin. At least half the vehicles were traveling in the 20 - 30 MPH range or lower. The average speed for all classifed vehicles was 22 MPH with 2.58% vehicles exceeding the posted speed of 30 MPH. The HI-STAR found 0.16 percent of the total vehicles were traveling in excess of 55 MPH. The mode speed for this traffic study was 20MPH and the 85th percentile was 29.20 MPH.

< to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 79	80 to 89	90 to 99	100 to >										
158	400	46	11	4	0	1	0	0	0										

CHART 1

CLASSIFICATION

Chart 2 lists the values of the classification bins and the total traffic volume accumulated for each bin.

Most of the vehicles classified during the study were Passenger Vehicles. The number of Passenger Vehicles in the study was 467 which represents 75 percent of the total classified vehicles. The number of Vans & Pickups in the study was 153 which represents 25 percent of the total classified vehicles. The number of Busses & Trucks in the study was 0 which represents 0 percent of the total classified vehicles. The number of Tractor Tailers in the study was 0 which represents 0 percent of the total classified vehicles.

< to 14	15 to 24	25 to 39	40 to 49	50 to 69	70 to 79	80 to 139	140 to >												
467	148	5	0	0	0	0	0												

CHART 2

HEADWAY

During the peak traffic period, on Jan/25/11 at [18:45-19:00] the average headway between vehicles was 30 seconds. During the slowest traffic period, on Jan/25/11 at [23:30-23:45] the average headway between vehicles was 900 seconds.

WEATHER

The roadway surface temperature over the period of the study varied between 25.00 and 52.00 degrees F. The HI-STAR determined that the roadway surface was Dry 100.00% of the time.

New Hampshire Street
17th Street to 19th Street
Cut-Through Traffic Study
16 March 2011
1600-1700

Time	Destination		Cut-Through		Total
	NB	SB	NB	SB	
1600-1615	10	9	4	2	25
1615-1630	9	12	2	4	27
1630-1645	8	15	3	1	27
1645-1700	15	6	1	4	26
Total	42	42	10	11	105

% Cut-Through = 21/105 = 20.00%

Nu-Metrics Traffic Analyzer Study
Computer Generated Summary Report
City: Lawrence
Street: E 17th Terr

A study of vehicle traffic was conducted with HI-STAR unit number 6981. The study was done in the EB lane at E 17th Terr in Lawrence, Ks in Douglas county. The study began on Jan/24/11 at 11:00 and concluded on Jan/25/11 at 11:00, lasting a total of 24.00 hours. Traffic statistics were recorded in 15 minute time periods. The total recorded volume showed 81 vehicles passed through the location with a peak volume of 5 on Jan/24/11 at [11:00-11:15] and a minimum volume of 0 on Jan/24/11 at [13:15-13:30]. The AADT count for this study was 81.

SPEED

Chart 1 lists the values of the speed bins and the total traffic volume for each bin. At least half the vehicles were traveling in the 19 MPH range or lower. The average speed for all classifed vehicles was 17 MPH with 1.61% vehicles exceeding the posted speed of 30 MPH. The HI-STAR found 1.61 percent of the total vehicles were traveling in excess of 55 MPH. The mode speed for this traffic study was 19MPH and the 85th percentile was 27.65 MPH.

< to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 79	80 to 89	90 to 99	100 to >										
39	17	5	0	0	0	1	0	0	0										

CHART 1

CLASSIFICATION

Chart 2 lists the values of the classification bins and the total traffic volume accumulated for each bin.

Most of the vehicles classified during the study were Passenger Vehicles. The number of Passenger Vehicles in the study was 51 which represents 82 percent of the total classified vehicles. The number of Vans & Pickups in the study was 11 which represents 18 percent of the total classified vehicles. The number of Busses & Trucks in the study was 0 which represents 0 percent of the total classified vehicles. The number of Tractor Tailers in the study was 0 which represents 0 percent of the total classified vehicles.

< to 14	15 to 24	25 to 39	40 to 49	50 to 69	70 to 79	80 to 139	140 to >												
51	10	1	0	0	0	0	0												

CHART 2

HEADWAY

During the peak traffic period, on Jan/24/11 at [11:00-11:15] the average headway between vehicles was 150 seconds. During the slowest traffic period, on Jan/24/11 at [13:15-13:30] the average headway between vehicles was 900 seconds.

WEATHER

The roadway surface temperature over the period of the study varied between 21.00 and 56.00 degrees F. The HI-STAR determined that the roadway surface was Dry 100.00% of the time.

Nu-Metrics Traffic Analyzer Study
Computer Generated Summary Report
City: Lawrence
Street: E 17th Terr

A study of vehicle traffic was conducted with HI-STAR unit number 4522. The study was done in the WB lane at E 17th Terr in Lawrence, Ks in Douglas county. The study began on Jan/24/11 at 11:00 and concluded on Jan/25/11 at 11:00, lasting a total of 24.00 hours. Traffic statistics were recorded in 15 minute time periods. The total recorded volume showed 128 vehicles passed through the location with a peak volume of 8 on Jan/24/11 at [17:00-17:15] and a minimum volume of 0 on Jan/24/11 at [13:00-13:15]. The AADT count for this study was 128.

SPEED

Chart 1 lists the values of the speed bins and the total traffic volume for each bin. At least half the vehicles were traveling in the 20 - 30 MPH range or lower. The average speed for all classifed vehicles was 18 MPH with 0.00% vehicles exceeding the posted speed of 30 MPH. The HI-STAR found 0.00 percent of the total vehicles were traveling in excess of 55 MPH. The mode speed for this traffic study was 20MPH and the 85th percentile was 27.20 MPH.

< to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 79	80 to 89	90 to 99	100 to >										
48	50	2	0	0	0	0	0	0	0										

CHART 1

CLASSIFICATION

Chart 2 lists the values of the classification bins and the total traffic volume accumulated for each bin.

Most of the vehicles classified during the study were Passenger Vehicles. The number of Passenger Vehicles in the study was 77 which represents 77 percent of the total classified vehicles. The number of Vans & Pickups in the study was 23 which represents 23 percent of the total classified vehicles. The number of Busses & Trucks in the study was 0 which represents 0 percent of the total classified vehicles. The number of Tractor Tailers in the study was 0 which represents 0 percent of the total classified vehicles.

< to 14	15 to 24	25 to 39	40 to 49	50 to 69	70 to 79	80 to 139	140 to >												
77	23	0	0	0	0	0	0												

CHART 2

HEADWAY

During the peak traffic period, on Jan/24/11 at [17:00-17:15] the average headway between vehicles was 100 seconds. During the slowest traffic period, on Jan/24/11 at [13:00-13:15] the average headway between vehicles was 900 seconds.

WEATHER

The roadway surface temperature over the period of the study varied between 23.00 and 52.00 degrees F. The HI-STAR determined that the roadway surface was Dry 100.00% of the time.

17th Terrace
Barker Avenue to New Hampshire Street
Cut-Through Traffic Study
10 March 2011
1700-1800

Time	Destination		Cut-Through		Total
	WB	EB	WB	EB	
1700-1715	1			3	4
1715-1730	2	1	2		5
1730-1745	1		1	1	3
1745-1800			1	2	3
Total	4	1	4	6	15

% Cut-Through = 10 / 15 = 0.6667

Nu-Metrics Traffic Analyzer Study
Computer Generated Summary Report
City: Lawrence
Street: E 18th

A study of vehicle traffic was conducted with HI-STAR unit number 8820. The study was done in the EB lane at E 18th in Lawrence, Ks in Douglas county. The study began on Jan/24/11 at 11:00 and concluded on Jan/25/11 at 11:00, lasting a total of 24.00 hours. Traffic statistics were recorded in 15 minute time periods. The total recorded volume showed 131 vehicles passed through the location with a peak volume of 9 on Jan/24/11 at [17:15-17:30] and a minimum volume of 0 on Jan/24/11 at [12:45-13:00]. The AADT count for this study was 131.

SPEED

Chart 1 lists the values of the speed bins and the total traffic volume for each bin. At least half the vehicles were traveling in the 19 MPH range or lower. The average speed for all classifed vehicles was 13 MPH with 1.04% vehicles exceeding the posted speed of 30 MPH. The HI-STAR found 1.04 percent of the total vehicles were traveling in excess of 55 MPH. The mode speed for this traffic study was 19MPH and the 85th percentile was 20.67 MPH.

< to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 79	80 to 89	90 to 99	100 to >										
80	15	0	0	0	1	0	0	0	0										

CHART 1

CLASSIFICATION

Chart 2 lists the values of the classification bins and the total traffic volume accumulated for each bin.

Most of the vehicles classified during the study were Passenger Vehicles. The number of Passenger Vehicles in the study was 84 which represents 88 percent of the total classified vehicles. The number of Vans & Pickups in the study was 12 which represents 13 percent of the total classified vehicles. The number of Busses & Trucks in the study was 0 which represents 0 percent of the total classified vehicles. The number of Tractor Tailers in the study was 0 which represents 0 percent of the total classified vehicles.

< to 14	15 to 24	25 to 39	40 to 49	50 to 69	70 to 79	80 to 139	140 to >												
84	12	0	0	0	0	0	0												

CHART 2

HEADWAY

During the peak traffic period, on Jan/24/11 at [17:15-17:30] the average headway between vehicles was 90 seconds. During the slowest traffic period, on Jan/24/11 at [12:45-13:00] the average headway between vehicles was 900 seconds.

WEATHER

The roadway surface temperature over the period of the study varied between 21.00 and 48.00 degrees F. The HI-STAR determined that the roadway surface was Dry 100.00% of the time.

Nu-Metrics Traffic Analyzer Study
Computer Generated Summary Report
City: Lawrence
Street: E 18th

A study of vehicle traffic was conducted with HI-STAR unit number 6895. The study was done in the WB lane at E 18th in Lawrence, Ks in Douglas county. The study began on Jan/24/11 at 11:00 and concluded on Jan/25/11 at 11:00, lasting a total of 24.00 hours. Traffic statistics were recorded in 15 minute time periods. The total recorded volume showed 137 vehicles passed through the location with a peak volume of 7 on Jan/24/11 at [17:00-17:15] and a minimum volume of 0 on Jan/24/11 at [13:45-14:00]. The AADT count for this study was 137.

SPEED

Chart 1 lists the values of the speed bins and the total traffic volume for each bin. At least half the vehicles were traveling in the 19 MPH range or lower. The average speed for all classifed vehicles was 16 MPH with 1.71% vehicles exceeding the posted speed of 30 MPH. The HI-STAR found 0.00 percent of the total vehicles were traveling in excess of 55 MPH. The mode speed for this traffic study was 19MPH and the 85th percentile was 27.00 MPH.

< to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 79	80 to 89	90 to 99	100 to >										
71	40	4	1	1	0	0	0	0	0										

CHART 1

CLASSIFICATION

Chart 2 lists the values of the classification bins and the total traffic volume accumulated for each bin.

Most of the vehicles classified during the study were Passenger Vehicles. The number of Passenger Vehicles in the study was 79 which represents 68 percent of the total classified vehicles. The number of Vans & Pickups in the study was 38 which represents 32 percent of the total classified vehicles. The number of Busses & Trucks in the study was 0 which represents 0 percent of the total classified vehicles. The number of Tractor Tailers in the study was 0 which represents 0 percent of the total classified vehicles.

< to 14	15 to 24	25 to 39	40 to 49	50 to 69	70 to 79	80 to 139	140 to >												
79	34	4	0	0	0	0	0												

CHART 2

HEADWAY

During the peak traffic period, on Jan/24/11 at [17:00-17:15] the average headway between vehicles was 112.5 seconds. During the slowest traffic period, on Jan/24/11 at [13:45-14:00] the average headway between vehicles was 900 seconds.

WEATHER

The roadway surface temperature over the period of the study varied between 23.00 and 48.00 degrees F. The HI-STAR determined that the roadway surface was Dry 100.00% of the time.