

WALGREENS PHARMACY at E. FRANKLIN STREET
TRAFFIC IMPACT STUDY
EXECUTIVE SUMMARY



Prepared for:

The Town of Chapel Hill
Engineering Department

Prepared by:

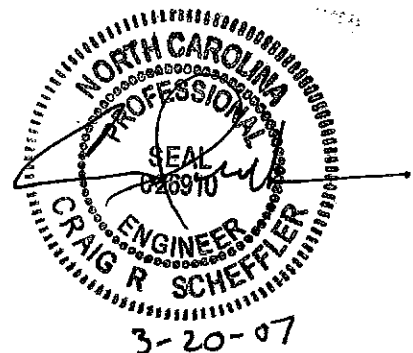
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EXECUTIVE SUMMARY

Project Overview

Redevelopment of the existing gas station located on the northeast corner of the E. Franklin Street and Estes Drive intersection is being proposed in Chapel Hill. The new development on this property will be a Walgreens Pharmacy. **Figure ES-1** shows the general site location of the site. The project is anticipated to be complete by 2010. This report analyzes the full build-out scenario for the year 2011 (one year after full build out), the no-build scenario for 2011, as well as 2007 existing year traffic conditions.

The proposed site redevelopment will have limited right-turn in/right-turn out only access to E. Franklin Street and Estes Drive via two redesigned driveways. There are currently two full access driveways for the existing site on both E. Franklin Street and Estes Drive. **Figure ES-2** displays the preliminary site plan of the proposed Walgreens and nearby roadways. As part of the project, renovation of the existing on-site gas station building will occur, the underground fuel pumps/equipment will be removed and remediated, and the existing surface parking lot will be reconstructed and is projected to contain 30 parking spaces.

Existing Conditions

Study Area

The site is located just to the west of the existing University Mall area and is currently a full service gas station. The study area is basically the immediate vicinity of the E. Franklin Street intersection with Estes Drive and the driveways serving the gas station/proposed Walgreens. Site traffic currently uses one of two driveways to access Estes Drive or E. Franklin Street. E. Franklin Street is a major arterial providing connectivity between US 15-501 and downtown Chapel Hill. Estes Drive is a minor arterial street that connects to US 15-501 to the east and traverses the Town in an east-west direction into Carrboro.

This report analyzes and presents the transportation impacts that the Walgreens Pharmacy site will have on the following intersections in the project study area:

- E. Franklin Street and Estes Drive
- E. Franklin Street and North Site Driveway #1 (Full Access)
- E. Franklin Street and North Site Driveway #2 (Full Access)
- E. Franklin Street and Proposed North Site Driveway (RIRO)
- Estes Drive and East Site Driveway #1 (Full Access)
- Estes Drive and East Site Driveway #2 (Full Access)
- Estes Drive and East Site Driveway (RIRO)



All of the analyzed intersections currently serve study area traffic. The Estes Drive intersection with E. Franklin Street is currently signalized. The four driveway intersections are currently unsignalized with each experiencing the stop-controlled condition.

Site Traffic Generation

With the addition of new site-generated trips during the AM, noon, and PM peak hours, there are potential site traffic impacts to the study area intersections. **Table ES-1** shows the site trip generation details, with generation rates taken from the *ITE Trip Generation Manual, Volume 7*. This site will likely generate a trip type known as “pass by” trips. These trips are not considered to be added to the design year traffic flow, but simply are a diverted trip that is analyzed at the driveway entrances and exits of the proposed site. Per ITE methodology, it was assumed 53 percent of all trips will be of the pass-by type for this analysis in the PM peak hour. No ITE data is available in the AM or noon peak hours for pass-by trip making, so it was conservatively assumed that no pass-by trips would occur during these periods.

Table ES-1
Weekday Vehicle Trip Generation Summary
Proposed Walgreens Pharmacy

Scenario	Development Density	Generation Rate	% Traffic Entering	% Traffic Exiting	TRIPS		Trips Generated
					IN	OUT	
Daily Traffic	12,000 sq ft	90.06	50%	50%	540	541	1081
AM Peak	12,000 sq ft	3.20	59%	41%	23	16	39
Noon Peak	12,000 sq ft	5.92	52%	48%	37	34	71
PM Peak	12,000 sq ft	8.42	50%	50%	51 (27)	51 (27)	102 (54)

(##) New Trips = Total Trips – Pass-bys (53% of total trips)

Table ES-2, on the next page, shows original trip generation rates for the existing land use on the Walgreens site – a gasoline/service station with convenience market and car wash with three pump islands (six fueling positions). The number of pump islands is a usable trip generation variable for ITE Land Use Code 946. As **Table ES-2** shows, the current land use has higher trip generation rates, per ITE methodology, during the weekday and peak periods than the proposed development. No ITE noon peak data was available for gas stations, so an average of the AM and PM peak generation rate was used for estimation purposes. **Table ES-2** is included for comparison purposes only, actual field counted trip generation data was collected during this study.



Table ES-2
Weekday Vehicle Trip Generation Summary
Gas/Service Station with Convenience Market and Car Wash (L.U. Code 946)

Scenario	Development Density	Generation Rate	% Traffic Entering	% Traffic Exiting	TRIPS		Trips Generated
					IN	OUT	
Daily Traffic	6 pumps	152.84	50%	50%	458	459	917
AM Peak	6 pumps	10.64	51%	49%	33 (13)	31 (11)	64 (24)
Noon Peak	6 pumps	11.99	50%	50%	36	36	72
PM Peak	6 pumps	13.33	50%	50%	40 (18)	40 (17)	80 (35)

(##) AM Peak New Trips = Total Trips – Pass-bys (62% of total trips)

(##) PM Peak New Trips = Total Trips – Pass-bys (56% of total trips)

Background Traffic

Two Town of Chapel Hill approved background traffic generators are located in the study area and are listed below:

- Franklin Grove Townhomes
- Starbucks at Eastgate

Background traffic methodologies and trip generation/distribution/assignment were made using information contained in previous traffic impact studies and existing traffic patterns. In general, few background trips would be expected from the town home development, since it is nearly complete and fully occupied. Site trips from the Starbucks at Eastgate, located several blocks to the north on E. Franklin Street, were added to the 2011 design year no-build and build analyses.

An ambient area-wide traffic growth percentage of three percent per year was applied to existing traffic volumes based on information from previous traffic impact studies in the area and information obtained from the NCDOT Traffic Survey Unit.

Impact Analysis

Peak Hour Intersection Level of Service

The intersection of E. Franklin Street and Estes Drive is currently over capacity in the PM peak hour. The addition of background traffic growth will exacerbate delays at this intersection in the 2011 analysis year. The addition of site-related traffic will only marginally affect traffic operations at the intersection, since it is assumed that the existing BP gas station would still be operating in the 2011 No-Build scenario. A summary of the traffic operations for each intersection, related to vehicular delays



(intersection average as a whole if signalized, critical movement if stop-controlled) and the corresponding Level-of-Service (LOS) is shown in **Table ES-3** below.

Table ES-3 LOS and Delay Summary

Intersections	Time Period	2007 Existing		2011 No-Build		2011 Build		2011 Mitigated	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Estes Drive and E. Franklin Street	AM	38.6	D	42.7	D	43.2	D	36.8	D
	NOON	43.3	D	51.1	D	51.8	D	41.4	D
	PM	64.6	E	85.4	F	85.6	F	54.1	D
Estes Drive and East Site Driveway #1	AM	8.3	A	8.4	A	N/A	N/A	N/A	N/A
	NOON	10.9	B	11.5	B	N/A	N/A	N/A	N/A
	PM	11.4	B	12.3	B	N/A	N/A	N/A	N/A
Estes Drive and East Site Driveway #2	AM	13.5	B	14.5	B	N/A	N/A	N/A	N/A
	NOON	16.5	C	19.3	C	N/A	N/A	N/A	N/A
	PM	11.4	B	12.3	B	N/A	N/A	N/A	N/A
E. Franklin Street and North Site Driveway #1	AM	16.0	C	17.5	C	N/A	N/A	N/A	N/A
	NOON	12.6	B	14.1	B	N/A	N/A	N/A	N/A
	PM	14.4	B	16.5	C	N/A	N/A	N/A	N/A
E. Franklin Street and North Site Driveway #2	AM	11.7	B	12.4	B	N/A	N/A	N/A	N/A
	NOON	16.1	C	19.9	C	N/A	N/A	N/A	N/A
	PM	19.3	C	25.0	C	N/A	N/A	N/A	N/A
Franklin Street and North Site Driveway RIRO	AM	N/A	N/A	N/A	N/A	12.5	B	N/A	N/A
	NOON	N/A	N/A	N/A	N/A	14.5	B	N/A	N/A
	PM	N/A	N/A	N/A	N/A	17.7	C	N/A	N/A
Estes Drive and East Site Driveway RIRO	AM	N/A	N/A	N/A	N/A	9.9	A	N/A	N/A
	NOON	N/A	N/A	N/A	N/A	11.6	B	N/A	N/A
	PM	N/A	N/A	N/A	N/A	12.5	B	N/A	N/A

N/A – Not Applicable or No Improvements Necessary

Access Analysis

Vehicular site access is to be accommodated via two site driveways connecting to Estes Drive and E. Franklin Street, respectively. Both driveways are shown on the site plan to be right-turn in/right-turn out (RIRO) only, with "pork chop" median islands that will contain sidewalk and landscaping. This limitation in access will necessitate rerouting of site-related trips to and from certain locations external to the immediate Walgreens site. For example, traffic heading south on E. Franklin Street cannot directly



access the site. These vehicles will either have to complete a u-turn maneuver downstream of the proposed site entrances or choose a different route to access the site beyond the study area (in this case, vehicles could use 15-501 to Estes Drive). For the purposes of the operations analysis, it was assumed that site-generated traffic would use these alternate routes and not attempt u-turn maneuvers.

Driveway throat lengths as shown on the proposed site redevelopment plans are adequate for the driveway access to E. Franklin Street for projected 2011 with site traffic conditions. Estimated queues should never exceed the 125 foot throat length for this driveway. The proposed RIRO driveway on Estes Drive is shown on the concept plan to have an approximately 50 foot driveway throat. Less than 25 feet of queue storage is needed at this access point in the worst-case 2011 build-out scenario, so the lack of throat length should not hinder parking lot circulation to any significant degree.

Driveway distances from the signalized intersection at E. Franklin Street and Estes Drive are acceptable, based on recommendations of 100 foot minimum corner clearance as set forth in the 2003 *NCDOT Policy on Street and Driveway Access to North Carolina Highways* and the 2005 *Town of Chapel Hill Design Manual*. The Town Design Manual recommends 250 foot minimum spacing between an intersection and driveway along an arterial. The proposed north site driveway is only about 170 feet from the Estes Drive intersection with E. Franklin Street, and the proposed east site driveway is only 135 feet from the intersection. However, these driveway locations are set back as far as possible, given the constraints of the existing property lines. Removing or prohibiting access for this site based on non-conformance to this 250 foot standard would leave the site with no direct access to external streets, which is not feasible or recommended in this instance.

Internal circulation is well designed on the site plan. Traffic can use internal driveway connections to directly access either study area thoroughfare. Sidewalks are linked directly to building entrances and bike racks are very accessible at the entrances.

Access for pedestrians and bicyclists is currently acceptable. As previously discussed, there is good sidewalk connectivity, at least in the local study area. Bicycle access is possible to and from the site, although no specific bicycle amenities are provided on local roadways. The Lower Booker Creek Greenway to the north and east of the Walgreens site provides some additional external connectivity for non-motorized transportation.

**Sight Distance Analysis**

In general sight distance issues entering and exiting the driveways are minimal from a vertical and/or horizontal geometric perspective. Approaches on E. Franklin Street and Estes Drive feature fairly tangent horizontal geometry and only slight vertical curvature immediately adjacent to the site. Sight distance problems at the E. Franklin Street/Estes Drive intersection are related to existing peak hour vehicular congestion in and around the actual site driveway entrances. Vehicles may become trapped in the center left-turn lane on E. Franklin Street, or may block through traffic heading eastbound on Estes Drive when attempting to enter the site. Similarly, vehicle queues and congestion around the intersection may prevent vehicles turning left and exiting the existing site from recognizing acceptable gaps in traffic. Limiting left-turn access into and out of the site would eliminate some of the sight distance issues related to driveway access as described above.

Intersection Accident Analysis

Data from the NCDOT Traffic Safety Systems Branch was provided for the period 11/1/2003 to 10/31/2006 for the E. Franklin Street/Estes Drive intersection. All crashes reported 200 feet upstream of this intersection for each approach was included in the analysis.

Crash information for the E. Franklin Street/Estes Drive intersection exhibits a high number of rear-end accidents commonly associated with congested conditions on high volume arterial roadways. 58 accidents were reported at this intersection over the three year period, a number that is extremely high compared to other intersections in the Town of Chapel Hill with similar traffic volumes. Rear-end crashes are particularly frequent in the northbound, southbound and westbound directions (31 total). There was also a discernable pattern of left-turn crashes in the southbound and westbound directions (12 total). These, too, are likely the result of congestion at the intersection causing vehicles to attempt turning maneuvers with small or non-existent gaps or possibly having limitation on sight distance due to the presence of queued traffic. 17 crashes caused injuries and one was pedestrian was struck over the three year period.

No specific crash information was available for the existing site driveways and maneuvers entering/exiting the gas station. The crash analysis accounts for incidents 200 feet from the E. Franklin Street/Estes Drive intersection, but does not differentiate for specific lanes the crashes occurred in or if a nearby driveway was a contributing factor.

The proposed access improvements for the Walgreens Pharmacy should improve overall vehicular safety in the immediate vicinity of the E. Franklin Street/Estes Drive intersection, for a number of reasons. First, the limitations on left-turn access into and out of the site should eliminate the potential for left-turn type crashes at the driveways. Reducing the number of driveways from four to two will also serve to better organize traffic flow into and out of the site. Ultimately, the number of potential vehicular conflict points will be reduced from an existing 54 for the four full access driveways to 16 with



the two RIRO driveways. Since overall traffic volumes in the 2011 Build Condition are essentially the same as the 2011 No-Build Condition (with the existing gas station still in operation), levels of traffic congestion will not be a factor in traffic safety at the intersection, regardless of whether or not the Walgreens is built or not.

Other Transportation-Related Analyses

Other transportation-related analyses relevant to the 2001 Town of Chapel Hill Guidelines for the preparation of Traffic Impact Studies were completed as appropriate. The following topics listed in **Table ES-4** are germane to the scope of this study.

Table ES-4. Other Transportation-Related Analyses

Analysis	Comment
Generalized Peak Hour and/or Daily LOS Analysis	Planning-level corridor LOS Analyses are not necessary for this study. The size of the study area does not encompass any significant length of arterial corridors.
Signal Phasing Analysis	Signal phasing for existing and future conditions produces optimal traffic operations at the signalized intersection under study. The use of lagging left-turn phases at the E. Franklin Street/Estes Drive signal is necessary for optimal coordination along E. Franklin Street and safe movements at the side street approaches.
Progression Analysis	The existing Franklin Street/Estes Drive signal is currently integrated into a coordinated signal system. Modifications to the signal cycle offset for this intersection will need to be made if timing plans for the corridor are changes in the future, regardless of the site traffic impact.
Turn Lane Storage Requirements	Most storage lanes adequately meet the traffic demands for existing and future traffic. Storage for queues at the E. Franklin Street/Estes Drive intersection may pose an issue, as the intersection is over capacity in the PM peak in existing and future analysis years. Signal timing plans need to be monitored, regardless of site traffic impact to avoid queue spillbacks.
Appropriateness of Acceleration/Deceleration Lanes	Given the proposed configuration of site driveways, the lane geometrics and traffic patterns and posted speeds on Franklin Street and Estes Drive, no special acceleration or deceleration lanes are required due to the proposed Walgreens development.
Pedestrian and Bicycle Analysis	Existing pedestrian access and connectivity is excellent through the study area. There are three signalized crosswalks serving the site and continuous sidewalk on at least one side of the street radiating in all directions. No specific bicycle amenities are provided on existing streets. The Bolin and Booker Creek Greenways are nearby.
Public Transportation Analysis	Public transportation service to the site is excellent, with on-street bus stops immediately adjacent to the site.



IV. MITIGATION MEASURES/RECOMMENDATIONS

A.) Planned Improvements

Neither the Town of Chapel Hill nor the North Carolina Department of Transportation are expected to make any significant planned improvement projects for study area facilities studied within the design year timeframe of 2007-2011.

B.) Background Committed Improvements

No background improvements are committed by other area project developments.

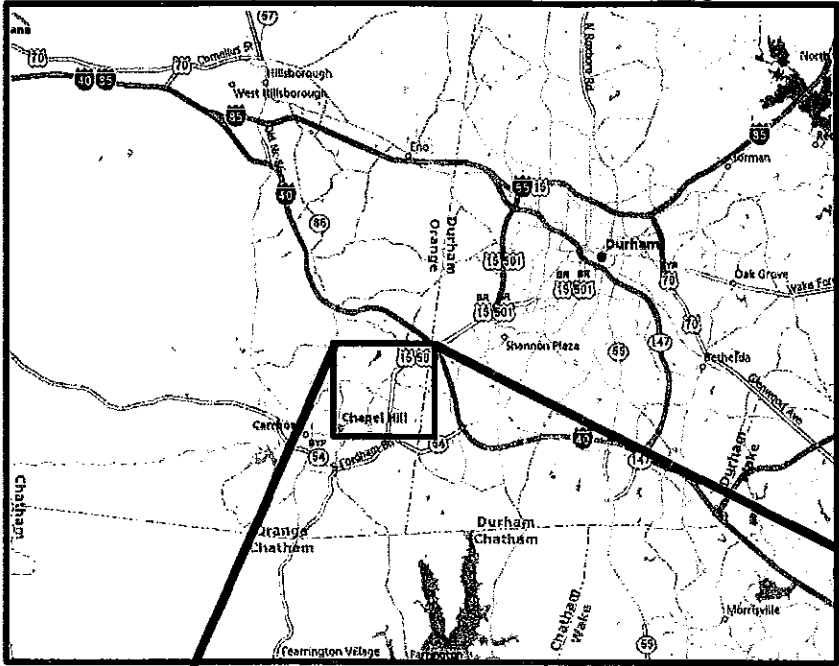
C.) Applicant Committed Improvements

Based on the concept plan provided, there are no transportation-related improvements to be made external to the site property. The concept plans provide improvements to existing site driveway access that will reduce the number of driveways from four to two and reduce the number of vehicular conflicts in the vicinity by eliminating left-turns into and out of the site. The plans also show that the redeveloped site will include continuous sidewalk along both E. Franklin Street and Estes Drive property frontage and include bicycle racks.

D.) Necessary Improvements

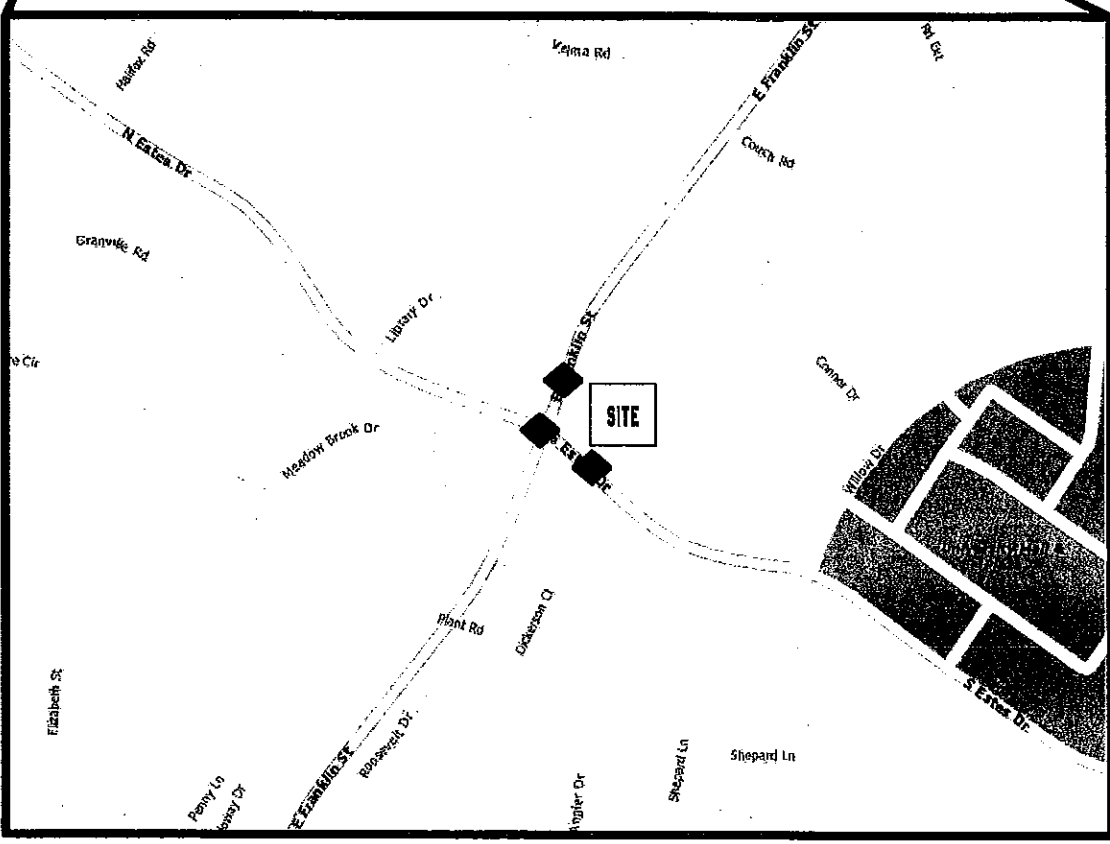
Based on the traffic operations, access, and intersection crash analyses, no additional external roadway improvements are necessary to due to site traffic impacts or the driveway access changes being proposed. The reduction in the number of driveways and vehicular conflict points will serve to improve overall vehicular safety in the vicinity of the E. Franklin Street/Estes Drive intersection. This intersection currently faces peak hour traffic congestion and will experience even higher levels of congestion in the 2011 analysis year with or without the proposed Walgreens site. Since the overall projected peak hour traffic volumes are essentially the same between the 2011 no-build and build conditions, no additional mitigation is required, due to site traffic impacts from the Walgreens redevelopment project.

To significantly improve the operations at the E. Franklin Street/Estes Drive intersection, additional roadway widening for dual left-turn lanes at the westbound, eastbound, and/or southbound approaches would be necessary. Another potential solution would be to widen Estes Drive to the west of the intersection to a four-lane cross-section, potentially dropping the extra westbound lane at the Chapel Hill Public Library driveway (see **Figure ES-3**). This would provide more optimal traffic signal phasing/operations and would allow more vehicular throughput at the intersections. Due to potential cost, right-of-way, and geometric design issues, these measures may be infeasible. However, to predict the positive impact they would have on traffic operations, a capacity analysis was conducted and results indicate that these improvements would result in LOS D or better operations for the three peak hours studied in this report.



LEGEND

- ◆ Existing Intersection
- ◆ Site
- ◆ Driveways
- SITE** Walgreen's Pharmacy



**Walgreens Pharmacy at E. Franklin
Traffic Impact Study**

SITE LOCATION MAP

DATE: March, 2007

FIGURE ES-1

**NOT
TO
SCALE**





LEGEND

PRELIMINARY PLANS

NOT FOR CONSTRUCTION

Walgreens
Chapel Hill, North Carolina
Illustrative Site Plan



13-251

Site Information:
Address: 1500 East Franklin Street
Tax Map #: 7.47.A.14

The Center Offices

El Rodeo Mexican Restaurant

Kangaroo Gas Station / Convenience Store

Prudential Office Building

Caribou Coffee



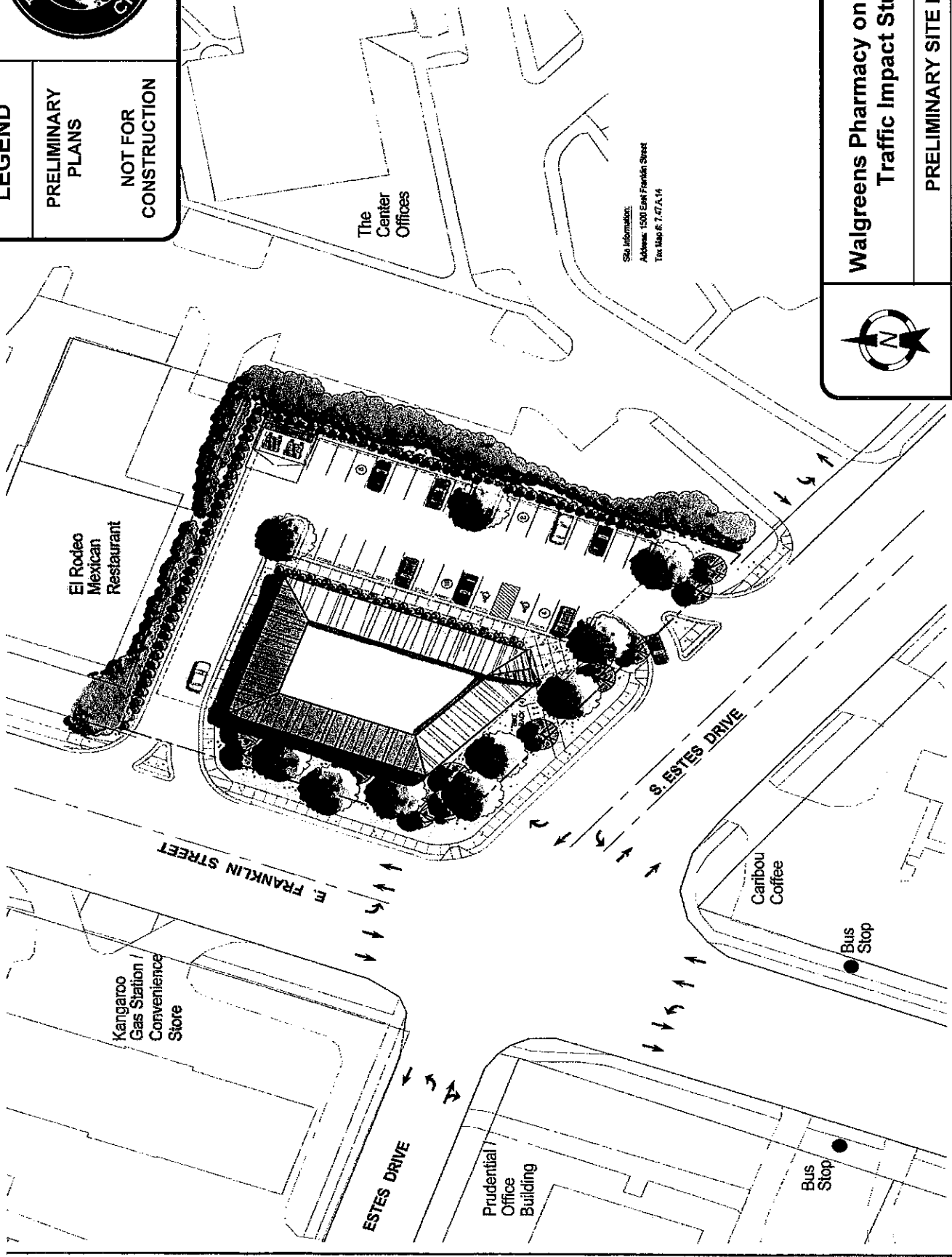
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Walgreens Pharmacy on E. Franklin
Traffic Impact Study


PRELIMINARY SITE PLAN

DATE: March, 2007

FIGURE ES-2

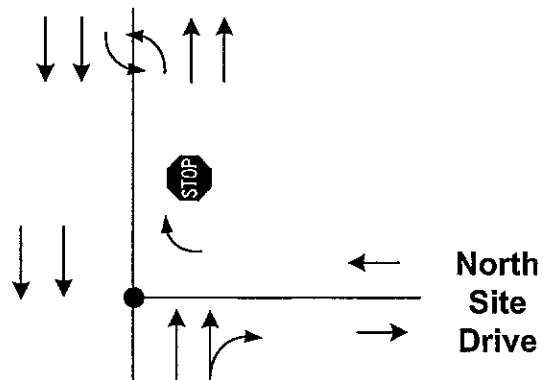


LEGEND

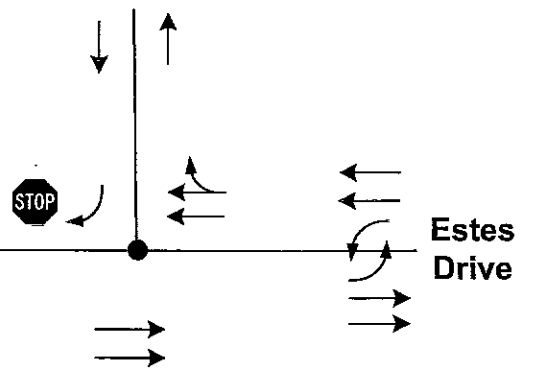
 = Geometric Improvement



E. Franklin Street



East Site Drive



Additional WB Through Travel Lane to drop at Library

Dual Left-Turn Lane with 175' Storage

Dual Left-Turn Lane with 225' Storage

Dual Left-Turn Lane with 275' Storage

E. Franklin Street



Walgreens Pharmacy on E. Franklin Traffic Impact Study

NECESSARY IMPROVEMENTS

DATE: March, 2007

FIGURE ES-3

NOT TO SCALE

