

ATTACHMENT C-1

Compliance with Section 15-176.2 of the Town of Carrboro Land Use Ordinance

Section 15-176.2 of the Town of Carrboro Land Use Ordinance (LUO) includes provisions specifically intended to guide the design and development of a Village Mixed Use (VMU) project. Section 15-176.2(a)(1) and Section 15-176.2(b) both provide some degree of flexibility for the design of a VMU development with relation to both the provisions contained in Section 15-176.2 and the general provisions of the LUO outside of 15-176.2. The staff report for the project (Attachment B) outlines areas of the LUO outside of Section 15-176.2 where this flexibility may be necessary for the Winmore project. The information below outlines such information within Section 15-176.2.

Some provisions within Section 15-176.2 are open to a degree of interpretation, while other provisions are more clear. In any event, when there is a question about whether the project would otherwise comply with one or more of the provisions of 15-176.2, staff will reference 'condition #1,' which is contained in the staff report (Attachment B). Condition # 1 reads as follows: "That the Board of Aldermen hereby approves the development as presented, per Sections 15-176.2(a)(1) and 15-176.2(b) of the Land Use Ordinance."

If a specific section of 15-176.2 is not mentioned in this document, then the plans do comply with the language of that section.

Section 15-176.2 Village Mixed Use Developments (AMENDED 05/25/99; 05/28/02)

(e) The open space provided within a village mixed use development pursuant to Section 15-198 shall include areas known as "village conservancy use areas " and "greens, parks, and squares."

- (3) There shall be a main village green, which shall be centrally located in close proximity to the storefront area as described in subsection (a)(2). Other, smaller greens shall be dispersed throughout the remainder of the village center in such a way that no lot is more than a walking distance of 1,320 feet from a green, square or park. The main village green shall be designed to a pedestrian scale and shall be no less than 30,000 square feet in size, *while the other, smaller greens, squares and parks shall be no less than 10,000 square feet in size.*

Response: The applicant has included one public green that is only 5,810 square feet (sf) in size. Specifically, it is the public green between lots 53 and 53, north of Della Street and south of Zacman Lane. Should the Board choose to allow this, the matter would be addressed by attaching 'condition # 1' to the CUP.

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(f) Village Mixed Use Developments shall meet the following objectives with regard to land use arrangement and design criteria:

(2) Spatial Relationships of Various Use Areas and Open Space.

- a. The common, peripheral open space shall surround the village unless explicitly modified upon a finding that unique topographical or other natural features or preexisting boundary conditions require an alternative arrangement.

Response: In a response letter to the Zoning Division, the applicant requested that the Board find the proposed site design as acceptable. The applicant pointed out that the property is constrained by Bolin Creek, a tributary creek on the site, as well as slopes and other constraints. Should the Board agree that the site design is acceptable, the Board may either make an explicit finding as described above, or the Board may include 'condition # 1' on the CUP.

(4) Storefront and Townhouse use Area Design Components

- c. Minimum street frontage is 25 feet.

Response: The Zoning Division has found that the design is some measure short of the 25-foot minimum that would otherwise seem to be required. It is not entirely clear whether this standard was intended to require no 'buildings' less than 25-feet wide or no 'individual units' less than 25-feet wide. Staff is of the opinion that the Board of Aldermen should find the proposed designs, which include townhomes of approximately 18-21 feet each, as acceptable. If the Board agrees that this is reasonable, then 'condition # 1' would need to be attached to the CUP.

- d. Setback regulations are as follows: Front = no minimum required; maximum is 15 feet; Rear = 20 feet minimum; Side = Zero minimum lot lines are allowed, except at block ends or adjacent to alleys or pedestrian walks as required under block design requirements.

Response: It is not possible for some of the proposed townhomes to meet the rear setback minimum of 20 feet. Specifically, in all situation where townhomes are designed on, in, or around a corner or intersection, the rear lot lines would run into to one another at less than 20 feet. In example, please note that townhomes are proposed on two sides of the roundabout opposite one another. As the site plan illustrates, these 'corner units' essentially run into each other if you follow their

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property lines. Staff considered the matter and felt that this design should work well in the context of the proposed roundabout. If the Board agrees, then it would be necessary to include 'condition # 1' on the CUP.

(7) Parking.

- c. Any off street parking space or parking lot in a storefront, townhouse, or civic area which abuts a street right-of-way shall be buffered from the right-of-way by a landscaped area no less than 4 feet wide in which is located a continuous row of shrubs no less than 3 1/2 feet high, or by a wall no less than 4 feet and no more than 6 feet high.

Response: There are two (2) locations where it is not possible to install the landscaped area mentioned. Specifically, behind the proposed 'civic use' lot, and on the south side of the affordable apartment building, it would not be possible. In both cases, the landscaping specifically mentioned would obstruct sight triangle easements, which are specific areas at intersections that must remain clear of obstructions so that vehicles are able to see oncoming traffic and pedestrians. If the Board agrees that it would not be appropriate to put landscaping in place at either location, then 'condition # 1' will need to be attached to the CUP.

TOWN OF CARRBORO



LAND USE PERMIT APPLICATION

ATTACHMENT "D"



DATE: MARCH 8, 2002

FEE: _____

APPLICANT: <u>WINDYMOORE LAND MANAGEMENT</u>		OWNER: <u>BRYAN R. YATES, ALLEN HOGAN YATES</u>	
ADDRESS: <u>310 1/2 W FRANKLIN STREET</u>		ADDRESS: <u>HOMESTEAD ROAD</u>	
CITY/STATE/ZIP: <u>CHAPEL HILL NC 27514</u>		CITY/STATE/ZIP: <u>CARRBORO NC 27510</u>	
TELEPHONE/FAX: <u>PHONE: (919) 929-5244 FAX: (919) 960-7967</u>		TELEPHONE/FAX: _____	
LEGAL RELATIONSHIP OF APPLICANT TO PROPERTY OWNER: <u>CONTRACT PURCHASER</u>		TAX MAP(S), BLOCK(S), LOT(S): <u>9779-39-7553, (7.107-.113)</u>	
PROPERTY ADDRESS: <u>HOMESTEAD ROAD</u>		PROPOSED LAND USE & USE CLASSIFICATION: <u>VMU</u>	
PRESENT LAND USE & USE CLASSIFICATION: <u>RESIDENTIAL / AGRICULTURAL</u>		LOT AREA: <u>165.85</u> Acres <u>2,868,220</u> Square Feet	
ZONING DISTRICT(S) AND AREA WITHIN EACH (Including Overlay Districts): <u>R-20</u>		GROSS FLOOR AREA: <u>UNDETERMINED</u> square feet	
# OF BUILDINGS TO REMAIN: <u>1</u>		GROSS FLOOR AREA (of proposed building or proposed addition): <u>UNDETERMINED</u> square feet	
# OF BUILDINGS PROPOSED: <u>213</u>			

NAME OF PROJECT/DEVELOPMENT: _____

TYPE OF REQUEST	INFORMATION REQUESTED (Refer to Attached Key)
SUBDIV. FINAL PLAT	1, 18, 19, 21, 23, 31, 33, 34, 36
✓ CONDITIONAL USE PERMIT (CUP)	1, 2, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 32, 34, 35, 36
CUP MODIFICATION	SAME AS CONDITIONAL USE PERMIT (CUP)
SPECIAL USE PERMIT (SUP)	1, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 32, 34, 35, 36
SUP MODIFICATION	SAME AS SPECIAL USE PERMIT (SUP)
ZONING PERMIT (Project)	1, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 22, 23, 24, 25, 26, 27, 29, 30, 32, 34, 35, 36
ZONING PERMIT (Building)	9, 10, 22, 24, 34, 36 (also see "Building Permit Review - Residences Only" checklist)
Residential Infill & Additions	
SIGN PERMIT	1, 10, 13, 14, 17, 20, 36
VARIANCE	4, 5, 10, 20, 29, 34, 36 Attachment A
APPEAL	4, 5, 36, Attachment B
SPECIAL EXCEPTION	1, 4, 5, 8, 10, 20, 35, Attachment C

APPLICANT: P. S. Smith

DATE: 3-14-2002

OWNER: Allen H. Yates for all owners

DATE: 7/15/02

7/22/02

Bryan R. Yates
Fay H. Daniel
Annie H. Collins by Fay H. Daniel P.O.A.

Winmore Land Management LLC also resubmits the following responses to Carrboro Development Ordinance:

1. The concept plan for the *Winmore* neighborhood protects and preserves all floodplains, wetlands, and steep slopes from clearing, grading, filling, or construction except as may be required for essential infrastructure or active or passive recreation amenities by limiting developable areas to areas outside of the primary constraint areas listed above.
2. The concept plan for the *Winmore* neighborhood preserves and maintains mature woodlands and existing fields and meadows, and creates sufficient buffer areas to minimize conflicts between residential and agricultural uses by limiting most of the developable areas to areas of mixed hardwoods and pine stands.
3. There are no areas of open fields or pastures.
4. The *Winmore* neighborhood will maintain or create an upland buffer of natural native species vegetation of at least 100 feet in depth adjacent to wetlands and surface waters, including creeks, streams, springs, lakes and ponds.
5. The *Winmore* neighborhood will minimize impacts on large woodlands (greater than five acres), especially those containing many mature trees or a significant wildlife habitat, or those not degraded by invasive vines. To identify suitable locations for residential development, we will concentrate on woodlands in poor condition with limited management potential. Great care will be taken to design all disturbed areas (for buildings, roads, yards, septic disposal field, etc.) in locations where there are no large trees or obvious wildlife areas, to the fullest extent that is practical.
6. *Winmore* will enhance the scenic views and vistas, particularly as seen from public roadways. For example, areas adjacent to Homestead Road will remain as unbuilt scenic buffers. In other wooded areas where the sense of enclosure is a feature that should be maintained, a deep "no-build, no-cut" buffer will be respected, to preserve existing vegetation.
7. The concept plan for the *Winmore* neighborhood seeks to avoid siting new construction on prominent hilltops or ridges, by preserving the wooded knoll as part of the "village green".
8. The concept plan for the *Winmore* neighborhood protects wildlife habitat areas by linking protective buffers and open space into a common and continuous open space plan that limits any construction or development.
9. The *Winmore* neighborhood does not contain any areas of historic, archaeological, or cultural value.
10. The concept plan for the *Winmore* neighborhood protects rural roadside character and improves public safety and vehicular carrying capacity by avoiding development fronting onto existing public roads. In addition, the neighborhood plan establishes buffer zones along the scenic corridor of Homestead Road.
11. *Winmore* will landscape common areas such as the "village greens", and both sides of new streets with native species shade trees and flowering shrubs with high wildlife conservation value.

12. *Winmore* provides active recreational areas in suitable locations offering convenient access by residents, and adequately screened from nearby houses.

13. The *Winmore* neighborhood concept plan includes a pedestrian circulation and trail system. It is designed to assure that pedestrians can walk safely and easily on the site, between properties and activities or special features within the neighborhood open space system. All roadside footpaths will connect with off-road trails, which in turn will link with open space on adjoining undeveloped parcels.

14. *Winmore* provides open space that is contiguous, and whose configuration is in accordance with the guidelines contained in the Design and Management Handbook for Preservation Areas, produced by the Natural Lands Trust. The open space abuts existing or potential open space land on adjacent parcels, and is designed as part of larger, contiguous, and integrated greenway systems, as per the policies in the Open Space and Recreation section of the Town's Ordinance.

Uses Allowed in the B3T Zoning District

Category	Land Use
1.111	Single Family Detached (1unit/Lot)
1.121	Single Family Detached 1-4 units (site built/modular)
1.1211	Single Family Detached 5-12 units (site built/modular)
1.1212	Single Family Detached 13+ units (site built/modular)
1.21	2 Family Conversion 1-4 units
1.2101	2 Family Conversion 5-12 units
1.2102	2 Family Conversion 13 + units
1.22	Primary w/Assessory Apartment 1-4 units
1.2201	Primary w/Assessory Apartment 5-12 units
1.2202	Primary w/Assessory Apartment 13+ units
1.231	Duplex 1-4 units (Maximum 20% w/> 3 bedrooms)
1.2311	Duplex 5-12 units (Maximum 20% w/> 3 bedrooms)
1.2312	Duplex 13 + units (Maximum 20% w/> 3 bedrooms)
1.241	2 Family Apartment 1-4 units (Maximum 20% w/> 3 bedrooms)
1.2411	2 Family Apartment 5-12 units (Maximum 20% w/> 3 bedrooms)
1.2412	2 Family Apartment 13+ units (Maximum 20% w/> 3 bedrooms)
1.31	Multi Family Conversion 3-4 units
1.3101	Multi Family Conversion 5-12 units
1.3102	Multi Family Conversion 13+ units
1.321	Multi Family Townhouse 3-4 units (Maximum 20% w/> 3 bedrooms)
1.3211	Multi Family Townhouse 3-12 units (Maximum 20% w/> 3 bedrooms)
1.3212	Multi Family Townhouse 13+ units (Maximum 20% w/> 3 bedrooms)
1.331	Multi Family Apartments 3-4 units (Maximum 20% w/> 3 bedrooms)
1.3311	Multi Family Apartments 5-12 units (Maximum 20% w/> 3 bedrooms)
1.3312	Multi Family Apartments 13+ units (Maximum 20% w/> 3 bedrooms)
1.64	Temporary Homes for the Homeless
1.65	Overnight Shelters for the Homeless
1.9	Home Occupation
2.11	Sales & Rental\ No Outside Storage\High-Vol
2.111	ABC Stores
2.12	Sales & Rental\ No Outside Storage\Low-Vol
2.14	Drive-In Windows\ No Outside Storage

2.23	Wholesale Sales\ With Outside Display
3.15	Copy Centers/Printing Operations
3.23	Banks with Drive -In Windows
5.2	Churches (2 acres or less lot size)
6.14	Community Ctr.(public/ non-profit)
9.3	Gas Sales Operation
9.4	Automobile repair or body shop
13.1	Police Stations
13.2	Fire Stations
13.3	Rescue, or Ambulance Service
13.4	Civil Defense Operation
15.1	Post Office
15.8	Town-Owned Facilities and Services
16.1	Dry Cleaner/ Laundromat w/ drive-in windows
16.2	Dry Cleaner/ Laundromat w/out drive-in windows
17.1	Utility Facility-Neighborhood
17.3	Cable Television Satellite Station
18.1	Towers & Antennas < 50 ft. tall
18.2	Towers & Antennas > 50 ft. tall & Satellite Dish
18.3	Antennas >50 ft.on structures other than towers [Not accessory15-150(c)5]
19.1	Open Air Markets
19.2	Horticultural Sales w/ outdoor display
19.3	Christmas tree or pumpkin seasonal sales
22.1	Child Day Care Home
22.2	Child Day Care Facility
22.3	Senior Citizens Day Care
23.1	Temporary Construction. Structures/ parking on site
26.1	Major Subdivisions 5-12 Lots
26.1001	Major Subdivisions 13+ Lots
26.2	Minor Subdivisions 2-4 Lots
27	Combination Uses
29	Special Events

Uses Allowed in the OA Zoning District

Category	Land Use
1.111	Single Family Detached (1unit/Lot)
1.121	Single Family Detached 1-4 units (site built/modular)

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1.1211	Single Family Detached 5-12 units (site built/modular)
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1.21	2 Family Conversion 1-4 units
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1.2102	2 Family Conversion 13+ units
1.22	Primary w/Assessory Apartment 1-4 units
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1.321	Multi Family Townhouse 3-4 units (Maximum 20% w/> 3 bedrooms)
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1.3212	Multi Family Townhouse 13+ units (Maximum 20% w/> 3 bedrooms)
1.331	Multi Family Apartments 3-4 units (Maximum 20% w/> 3 bedrooms)
1.3311	Multi Family Apartments 5-12 units (Maximum 20% w/> 3 bedrooms)
1.3312	Multi Family Apartments 13+ units (Maximum 20% w/> 3 bedrooms)
1.51	Hotels and Motels
1.9	Home Occupation
2.13	Wholesale Sales\ No Outside Storage
3.11	Office serving clients on premises
3.12	Office attracting little or no clients
3.13	Medical Offices < 10,000 sq. ft.
3.21	Office serving clients on premises (operations in or outside)
3.22	Office attracting little or no clients (operations in or outside)
3.25	ATM freestanding
4.1	Manufacturing within fully enclosed bldg.
5.2	Churches (2 acres or less lot size)
5.31	Libraries cultural ctrs. in resi bldg. < 3,500 sf.

5.32	Libraries cultural ctrs. in any other bldg.
6.121	Movie Theaters w/ < 301 capacity
6.14	Community Ctr.(public/ non-profit)
8.1	Restaurants, Bars, Night Clubs inside service
8.2	Restaurants, Bars, Night Clubs outside service
10.21	Storage, enclosed
10.22	Storage, inside or outside
13.1	Police Stations
13.2	Fire Stations
13.3	Rescue, or Ambulance Service
13.4	Civil Defense Operation
15.2	Airport
15.7	Cable Television Signal Distribution Center
15.8	Town-Owned Facilities and Services
16.1	Dry Cleaner/ Laundromat w/ drive-in windows
16.2	Dry Cleaner/ Laundromat w/out drive-in windows
17.1	Utility Facility-Neighborhood
17.2	Utility Facility-Community or Regional
17.3	Cable Television Satellite Station
18.1	Towers & Antennas < 50 ft. tall
18.3	Antennas >50 ft.on structures other than towers [Not accessory15-150(c)5]
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26.1001	Major Subdivisions 13+ Lots
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27	Combination Uses
29	Special Events

WINMORE
Winmore Land Management, LLC

February 18, 2003

Mr. Marty Roupe
Development Review Administrator
Town of Carrboro
Carrboro, NC 27510

Dear Marty:

This letter concerns permissible uses in Townhouses. The following language will be included in the *Winmore* Townhouse Neighborhood Association CC&Rs (homeowner's association codes, covenants and restrictions) to provide a mechanism for possible restriction of such uses.

As a Village Mixed Use Development, *Winmore* requested approval from the Board of Aldermen for the following uses within the Townhouse Use area:

1. Personal or business services
2. Office
3. Private club
4. Restaurant
5. Artist studio
6. A maximum of 4 guestrooms for lodging
7. Medical clinic or facility
8. Retail sales, if in conjunction and on the same lot as a home occupation

The Winmore Townhouse Neighborhood Association governing documents hereby restrict the initiation or resumption by a townhouse owner of uses 3, 4, 6, 7, or 8 to situations in which the owner has obtained written permission from the owner(s) of the immediately adjoining townhouse unit(s).

We believe this is a positive requirement and appreciate your putting this issue on the table for discussion.

Sincerely,



Robert L. Chapman, III
WINMORE LAND MANAGEMENT, LLC

RLC:ae

Cc: Phil Szostak, Herman Greene, Alison Steele



May 16, 2003

Mr. Robert Chapman, III
Winmore Land Management, LLC
310 ½ West Franklin Street
Chapel Hill, NC 27514

RE: Winmore (Carrboro, NC) – Phase I traffic analysis

Dear Mr. Chapman:

HPE has completed revisions to the Winmore Development project traffic analysis. In summary, we conclude the following:

Phase I (Southern Tract: 2003 – 2005)

Based on Weekday, PM peak hour, and AM peak hour peak direction trip generation and distribution analysis results, the Winmore project will not cause the maximum service volume of Homestead Road to be exceeded. Therefore, Winmore Phase I can be implemented, based on the project assumptions used in this analysis.

High School Road Intersection Impact

When Phase II is approved, due to the additional residential trips generated, Winmore should contribute its fair share of necessary High School Road intersection improvement costs at that time.

Project Description

The Winmore development project is located in Carrboro, NC (Orange County). This analysis is based on the following assumptions:

Access Assumptions

- Primary arterial access to the site is via Homestead Road (currently two-lanes; 2004 – 2010 Transportation Improvement Program [draft] includes a project to widen Homestead Road to a "three lane shoulder section" [Project U-2805; Orange County])

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- Several roadways access Homestead Road, helping to alleviate traffic volumes along the primary roadway. These include:
 - Seawell School Road
 - Rogers Road
 - High School Road
 - Stratford Drive
 - Lake Hogan Farm Road

Development Assumptions

The following Winmore development program was used in this analysis:

Land Use	Phase I (Southern) 2003 – 2005
<u>Residential (units)</u>	
Single Family	97 units
Townhouses	86 units
Condominiums	0 units
Co-op Apartments	24 units
Apartments	24 units
Garage Apartments	69 units
Total	300 units
<u>Non-Residential (sf)</u>	
General Office	7,100 sf
Sales Office	1,238 sf
TND Retail	7,105 sf
Civic Center	10,000 sf
Post Office	765 sf
Total	26,208 sf

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Intersections Primarily Affected by New Project Trips

The traffic analysis study area includes the following Homestead Road intersections:

- Seawell School Road (signalized)
- Rogers Road (unsignalized)
- High School Road (unsignalized)
- Stratford Road (unsignalized)
- Lake Hogan Farm Road (unsignalized)
- Old NC 86 (signalized)

Background Traffic

Average Annual Daily Traffic

Average annual daily traffic data for 2001 was obtained from the North Carolina Department of Transportation.

AM and PM Peak Hour Traffic

The following Homestead Road intersection traffic counts were used in this analysis:

- December 13, 2001 (Hall Planning & Engineering, Inc.): Rogers Road, High School Road, Stratford Road, Lake Hogan Farm Road, and Old NC 86.
- November 7, 2001 (Greater Traffic Company): Seawell School Road

Background Traffic Growth During Project Development

This analysis is based on 3% average annual Homestead Road traffic growth from 2001 (current base counts) through Phase I project buildout in 2005. According to the Orange County Economic Development Commission, between 1990 and 2000, the population of Chapel Hill Township (which includes this study area) grew at a compounded annual rate of 2.07%. This growth rate is conservatively reflected in the 3% average annual Homestead Road growth rate.

Short term, Homestead Road has exhibited a higher rate of trip growth. Over the two year period from 1999 to 2001, Homestead Road traffic increased from 5,100 vehicles per day to 6,600 vehicles per day--an annual average increase of 14.2% per year. It is probable a significant portion of this growth was due to two new facilities which opened during the period:

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- Smith Middle School (opened August, 2001)
- Harris-Teeter grocery store (opened October, 1998)

Homestead Road Maximum Service Volume

HighPlan software (based on HCM 2000) was used to determine Homestead Road maximum service volume at level of service "C". Based on the HighPlan model run, the weekday capacity of Homestead Road (modeled at two lanes) is **15,700** vehicles per day; **800** vehicles in the peak hour and peak direction.

Trip Generation and Distribution

Based on development plans for Winmore Phases I and II, HPE performed a traffic analysis utilizing estimates of trip generation and distribution, as follows:

Trip Generation

Weekday, PM peak hour, and AM peak hour trip generation analyses were prepared using trip generation rates supplied by the Town of Carrboro Planning Department and rates/equations from *Trip Generation* (Institute of Transportation Engineers; 6th edition; 1997). Variances from normal *Trip Generation* application are as follows:

- There is no ITE trip rate for "garage apartment". Therefore, the rate for "apartment" was used to reflect that fewer occupants and vehicles are expected for a garage apartment than for a single family dwelling.
- There is no ITE trip rate for "specialty retail" in the AM peak hour (when very few retail establishments are open for business. Therefore, the AM peak hour rate was estimated at 27.5% of the PM peak hour rate (the PM to AM peak hour ratio for "shopping center"). Also, the shopping center entering and exiting trip distribution was used.

Appropriate internal capture rates were employed to reflect the portion of new trips generated by the development that will move about the project site only, with no impacts to Homestead Road. These internal capture rates reflect the traditional neighborhood design of the project which emphasizes internal mobility. For example, all non-residential uses are located internal to Winmore, rather than on Homestead Road, and most residential uses will be within a five-minute walk of the nonresidential uses.

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Trip Distribution

Weekday Trips

Phase I

According to the standard trip distribution performed for this analysis (see accompanying Table 1B), adding weekday project trips to background traffic **will not** cause Homestead Road maximum service volume to be exceeded. According to May, 2003, traffic counts by the Town of Carrboro, Homestead Road volume was at the level of 7,400 weekday trips. This 2003 traffic data was projected to 2005 based on 3% average annual growth, yielding a 2005 estimate of 7,851 weekday trips. According to the weekday trip distribution, Winmore will load a maximum 906 weekday trips onto Homestead Road at the completion of Phase I. When projected 2005 background traffic is added to the net new Winmore project trips, Homestead Road link volumes **do not exceed** the Homestead Road maximum service volume at level of service "C".

PM Peak Hour Trips

Phase I

According to the standard trip distribution performed for this analysis (see accompanying Table 2B), adding PM peak hour project trips to background traffic **will not** cause Homestead Road maximum service volume to be exceeded. 2001 intersection traffic counts were used to determine Homestead Road link volumes. To determine weekday background traffic, Homestead Road link volumes were increased at a rate of 3% per year to estimate 2005 PM peak hour background traffic. According to the trip distribution step, a maximum 113 PM peak hour peak direction project trips will be loaded onto Homestead Road by 2005. When these project trips are added to projected background traffic, Homestead Road link traffic volumes are **do not exceed** the Homestead Road maximum service volume at level of service "C".

AM Peak Hour Trips

Phase I

According to the standard trip distribution performed for this analysis (see accompanying Table 3B), adding AM peak hour project trips to background traffic **will not** cause Homestead Road roadway maximum service volume to be exceeded. 2001 intersection traffic counts were used to determine Homestead Road link volumes. As for weekday background traffic and PM peak hour traffic, these link volumes were increased at a rate of 3% per year to estimate AM peak hour background traffic for 2005.

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According to the trip distribution step, a maximum 93 AM peak hour peak direction project trips will be loaded onto Homestead Road by 2005. When these project trips are added to projected background traffic, the total link traffic volumes **do not exceed** the Homestead Road maximum service volume at level of service "C".

High School Road Intersection Impact

During the AM peak hour---when High School Road turns are highest---Winmore Phase I contributes less than 10% of the eastbound or westbound Homestead Road trips approaching the High School Road intersection. However, when Phase II is approved, due to the additional residential trips generated, Winmore should contribute its fair share of necessary intersection improvement costs at that time.

Conclusions

Phase I (Southern Tract: 2003 – 2005)

Based on Weekday, PM peak hour, and AM peak hour peak direction trip generation and distribution analysis results, the Winmore project will not cause the maximum service volume of Homestead Road to be exceeded. Therefore, Winmore Phase I can be implemented, based on the project assumptions used in this analysis.

High School Road Intersection Impact

When Phase II is approved, due to the additional residential trips generated, Winmore should contribute its fair share of necessary High School Road intersection improvement costs at that time.

If you have questions, please do not hesitate to contact me or Ted Mack at (850) 222-2277

Sincerely,



Richard A. Hall, P.E.
President

RAH/lm
Attachments

Winmore Phase I and Phase II Traffic Analysis
May 16, 2003
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ATTACHMENT A
TRIP GENERATION AND DISTRIBUTION ANALYSIS
Phase 1 (2003 – 2005)

Table 1A: Weekday Trips/Generation (Phase I: 2003 - 2005)
Winmore (Carboro, NC)

Hall Planning & Engineering, Inc.
May 16, 2003

The proposed
development generates

2,789 Total weekday trips.
1,394 Entering Trips
1,394 Exiting Trips

Trip Producers	Units	Weekday Trips Rate ¹	Weekday Trips Equation ¹	Calculated Trips by Rate	Calculated Trips by Equation	Weekday Trips Used in Analysis ²	Base Trip Generation				Internal Capture	Adjusted Trips	Pass-by Capture	Net New Trips
							Entering	Exiting	50%	50%				
Single-Family Homes	97	10	$\text{Ln}(T) = 0.820 \text{ Ln}(X) + 2.707$	970	1008	1,008	504	504	11%	11%	449	0%	449	449
ITE Code 210	Dwelling Units	/du												
Townhouses (Residential Condo/Townhouse)	86	5.86	$\text{Ln}(T) = 0.850 \text{ Ln}(X) + 2.564$	504	573	573	286	286	11%	11%	255	0%	255	255
ITE Code 230	Dwelling Units	/du												
Condominiums (Residential Condo/Townhouse)	0	5.86	$\text{Ln}(T) = 0.850 \text{ Ln}(X) + 2.564$	0		0	0	0	11%	11%	0	0%	0	0
ITE Code 230	Dwelling Units	/du												
Co-op Apartments (Apartment)	24	6.63	$T = 5.994(X) + 134.114$	159	278	278	139	139	11%	11%	124	0%	124	124
ITE Code 220	Dwelling Units	/du												
Apartments (Apartment)	24	6.63	$T = 5.994(X) + 134.114$	159	278	278	139	139	11%	11%	124	0%	124	124
ITE Code 220	Dwelling Units	/du												
Garage Apartments (Apartment)	69	6.63	$T = 5.994(X) + 134.114$	457	548	548	274	274	11%	11%	244	0%	244	244
ITE Code 220	Dwelling Units	/du												
Total Dwelling Units - This Phase							1,342	1,342	11%	11%	1,195	0%	1,195	1,195
Total							2,684	2,684	11%	11%	2,390	0%	2,390	2,390

Producers

Internal Capture Summary

Entering 147
Exiting 147
Captured 294

11%
(average internal capture)

Trip Attractors	Units	Weekday Trips Rate ¹	Weekday Trips Equation ¹	Calculated Trips by Rate	Calculated Trips by Equation	Weekday Trips Used in Analysis ²	Base Trip Generation				Internal Capture	Adjusted Trips	Pass-by Capture	Net New Trips
							Entering	Exiting	50%	50%				
Post Office	765	108.19	N/A	83	N/A	83	41	41	56%	56%	18	0%	18	18
ITE Code 732	ft^2	/1000 ft^2												
Civic Center (Recreation Community Center)	10,000	22.88	N/A	229	N/A	229	114	114	75%	75%	29	0%	29	29
ITE Code 495	ft^2	/1000 ft^2												
Sales Office (General Office Building)	1,238	11.01	$\text{Ln}(T) = 0.768 \text{ Ln}(X) + 3.654$	14	N/A	14	7	7	20%	20%	5	0%	5	5
ITE Code 710	ft^2	/1000 ft^2												
General Office (General Office Building)	7,100	11.01	$\text{Ln}(T) = 0.768 \text{ Ln}(X) + 3.654$	78	N/A	78	39	39	20%	20%	31	0%	31	31
ITE Code 710	ft^2	/1000 ft^2												
TND Retail (Special Retail)	7,105	40.67	N/A	289	N/A	289	144	144	20%	20%	116	0%	116	116
ITE Code 814	ft^2	/1000 ft^2												
Total							346	346	20%	20%	199	0%	199	199
Total							692	692	20%	20%	399	0%	399	399

¹ Trip generation rates and equations from the Town of Carboro and Trip Generation (ITE, 6th edition, 1997).

trips generated are estimated for a weekday.

² Due to greater accuracy, equation-generated trips are used when available. The one exception is "general office" use. In this case, the equation is not appropriate for small office buildings.

Note: Discrepancies, if any, are due to rounding.

Attractors

Internal Capture Summary

Entering 147
Exiting 147
Captured 294

42%
(average internal capture)

Overall Internal Capture
17%

Table 1B: Weekday Trips/Distribution (Phase I: 2003 - 2005)
Winmore (Carrboro, NC)

Hall Planning & Engineering, Inc.
 May 16, 2003

New Project Trips 2,789
 Entering Trips 1,394
 Exiting Trips 1,394

	No. Lanes	LOS Area Type	Dir	Base Weekday Trips 2003 Data ¹	Background Traffic: 2005 (3%/yr)	K-Factor	D-Factor	Background Traffic	% of New Entering Trips	% of New Exiting Trips	New Project trips	Total Daily Trips	Adversity Test ²		Significance Test ⁴		Significant & Adverse Impact?	
													Service Volume @ Standard ³	Adverse?	5% of Service Volume	% of Project @ Max. Service Volume		Significant?
<u>Homestead Road</u>																		
<u>East of Seawell School Road</u>																		
From the East to Seawell School Road	2L	Urban	WB	7,400	7,851	1	0.5	3,925	60%	0%	435	4,360	7,850	NO	392.5	6%	YES	NO
Seawell School Road to the East			EB				0.5	3,925	0%	60%	435	4,360	7,850	NO	392.5	6%	YES	NO
<u>Seawell Road - North of Site</u>																		
Seawell School Road to Rogers Road	2L	Urban	WB	7,400	7,851	1	0.5	3,925	75%	0%	544	4,469	7,850	NO	392.5	7%	YES	NO
Rogers Road to Seawell School Road			EB				0.5	3,925	0%	75%	544	4,469	7,850	NO	392.5	7%	YES	NO
<u>Rogers Road - North of Site</u>																		
Rogers Road to High School Road	2L	Urban	SB	7,400	7,851	1	0.5	3,925	80%	0%	725	4,650	7,850	NO	392.5	9%	YES	NO
High School Road to Rogers Road			NB				0.5	3,925	0%	80%	725	4,650	7,850	NO	392.5	9%	YES	NO
<u>High School Road - North of Site</u>																		
High School Road to Site	2L	Urban	SB	7,400	7,851	1	0.5	3,925	65%	0%	906	4,832	7,850	NO	392.5	12%	YES	NO
Site to High School Road			NB				0.5	3,925	0%	65%	906	4,832	7,850	NO	392.5	12%	YES	NO
<u>Stratford Drive - West of Site</u>																		
Site to Stratford Drive	2L	Urban	WB	7,400	7,851	1	0.5	3,925	0%	35%	488	4,413	7,850	NO	392.5	6%	YES	NO
Stratford Drive to Site			EB				0.5	3,925	35%	0%	488	4,413	7,850	NO	392.5	6%	YES	NO
<u>Lake Hogan Farm Road - West of Site</u>																		
Stratford Drive to Lake Hogan Farm Road	2L	Urban	WB	7,400	7,851	1	0.5	3,925	0%	98%	478	4,404	7,850	NO	392.5	6%	YES	NO
Lake Hogan Farm Road to Stratford Drive			EB				0.5	3,925	98%	0%	478	4,404	7,850	NO	392.5	6%	YES	NO
<u>Old NC 86 - West of Site</u>																		
Lake Hogan Farm Road to Old NC 86	2L	Urban	WB	7,400	7,851	1	0.5	3,925	0%	96%	459	4,385	7,850	NO	392.5	6%	YES	NO
Old NC 86 to Lake Hogan Farm Road			EB				0.5	3,925	96%	0%	459	4,385	7,850	NO	392.5	6%	YES	NO
<u>West of Old NC 86</u>																		
Old NC 86 to the West	2L	Urban	WB	7,400	7,851	1	0.5	3,925	0%	25%	115	4,040	7,850	NO	392.5	1%	NO	NO
From the West to Old NC 86			EB				0.5	3,925	25%	0%	115	4,040	7,850	NO	392.5	1%	NO	NO

¹ 2003 (5-14-03) Homestead Road traffic count; Town of Carrboro

² Adversity Test: Will project trips + background trips exceed maximum service volume?

³ Daily service volume for a two-lane roadway = 15,700 vehicles per day (7,850 vehicles per day per lane)(Calculated by HighPlan software, based on HCM 2000)

⁴ Significance test: Will project trips exceed 5% of the maximum roadway service volume?

Table 2A: PM Peak Hour Trips/Generation (Phase I: 2003 - 2005)
Winmore (Carrboro, NC)

Hall Planning & Engineering, Inc.
May 16, 2003

The proposed development generates

282 Total pm peak hour trips.
176 Entering Trips
106 Exiting Trips

Trip Producers	Units	PM Peak Hr Trips Rate ¹	PM Peak Hour Trips Equation ¹	Calculated Trips by Rate	Calculated Trips by Equation	PM Peak Hr Trips Used in Analysis ²	Base Trip Generation	Internal Capture	Adjusted Trips	Pass-by Capture	Net New Trips
Single-Family Homes	97	1.01	$\ln(T)=0.901 \ln(X) + 0.527$	98	104	104	Entering 64% Exiting 36%	10%	61	0%	61
ITE Code 210	Dwelling Units	/du									
Townhouses (Residential Condo/Townhouse)	86	0.54	$\ln(T)=0.827 \ln(X) + 0.309$	46	54	54	Entering 67% Exiting 33%	10%	34	0%	34
ITE Code 230	Dwelling Units	/du									
Condominiums (Residential Condo/Townhouse)	0	0.54	$\ln(T)=0.827 \ln(X) + 0.309$	0	0	0	Entering 67% Exiting 33%	10%	0	0%	0
ITE Code 230	Dwelling Units	/du									
Co-op Apartments (Apartment)	24	0.62	$T=0.541(X) + 18.743$	15	32	32	Entering 67% Exiting 33%	10%	19	0%	19
ITE Code 220	Dwelling Units	/du									
Apartments (Apartment)	24	0.62	$T=0.541(X) + 18.743$	15	32	32	Entering 67% Exiting 33%	10%	19	0%	19
ITE Code 220	Dwelling Units	/du									
Garage Apartments (Apartment)	69	0.62	$T=0.541(X) + 18.743$	43	56	56	Entering 67% Exiting 33%	10%	34	0%	34
ITE Code 220	Dwelling Units	/du									
Total Dwelling Units - This Phase							Entering 183 Exiting 95 Total 278	10%	166	86	252

Producers
Internal Capture Summary
Entering 17
Exiting 9
Captured 26
10% (average internal capture)

Trip Attractors	Units	PM Peak Hr Trips Rate ¹	PM Peak Hour Trips Equation ¹	Calculated Trips by Rate	Calculated Trips by Equation	PM Peak Hr Trips Used in Analysis ²	Base Trip Generation	Internal Capture	Adjusted Trips	Pass-by Capture	Net New Trips
Post Office	765	10.79	N/A	8	N/A	8	Entering 51% Exiting 49%	60%	2	0%	2
ITE Code 732	R ²	/1000R ²									
Recreation Community Center	10,000	1.75	N/A	18	N/A	18	Entering 34% Exiting 66%	84%	1	0%	1
ITE Code 495	R ²	/1000R ²									
Sales Office (General Office Building)	1,238	1.49	$T=1.121(X) + 79.295$	2	N/A	2	Entering 17% Exiting 83%	20%	0	0%	0
ITE Code 710	R ²	/1000R ²									
General Office (General Office Building)	7,100	1.49	$T=1.121(X) + 79.295$	11	N/A	11	Entering 17% Exiting 83%	20%	1	0%	1
ITE Code 710	R ²	/1000R ²									
TND Retail (Specialty Retail)	7,105	2.59	N/A	18	N/A	18	Entering 43% Exiting 57%	20%	6	0%	6
ITE Code 814	R ²	/1000R ²									
Total							Entering 20 Exiting 36 Total 57	10%	11	20	31

¹ Rates and equations are from Trip Generation (ITE, 6th edition, 1997).
trips generated are estimated for the peak hour of adjacent street traffic,
one hour between 4 and 6 p.m.

² Due to greater accuracy, equation-generated trips are used when available. The one exception is "general office" use.
In this case, the equation is not appropriate for small office buildings.

Note: Discrepancies, if any, are due to rounding.

Attractors
Internal Capture Summary
Entering 10
Exiting 16
Captured 26
46% (average internal capture)

Overall Internal Capture
16%

Table 2B: PM Peak Hour Trips/Distribution (Phase I: 2003 - 2005)

Winmore (Carrboro, NC)

Hall Planning & Engineering, Inc.

May 16, 2003

New Project Trips
Entering Trips 282
Exiting Trips 176
106

	No. Lanes	LOS Area Type	Dir	Background Traffic: 2001 ¹	Background Traffic: 2005 (3%/yr)	% of New Entering Trips	% of New Exiting Trips	New Project trips	Total PM Peak Hour Trips	Adversity Test ²		Significance Test ⁴			Significant & Adverse Impact?	
										Service Volume @ Standard ³	Adverse?	5% of Service Volume	Project @ Max. Service Volume	Significant?		
<u>Homestead Road</u>																
<u>East of Seawell School Road</u>	2L	Urban	WB EB	474 337	533 379	60% 0%	0% 60%	54 33	588 412	800 800	NO NO	40 40	7% 4%	YES NO	NO NO	
From the East to Seawell School Road																
Seawell School Road to the East																
<u>Seawell Road - North of Site</u>	2L	Urban	WB EB	474 217	533 244	75% 0%	0% 75%	85 51	618 295	800 800	NO NO	40 40	11% 6%	YES YES	NO NO	
Seawell School Road to Rogers Road																
Rogers Road to Seawell School Road																
<u>Rogers Road - North of Site</u>	2L	Urban	SB NB	369 197	415 222	80% 0%	0% 80%	90 54	506 276	800 800	NO NO	40 40	11% 7%	YES YES	NO NO	
Rogers Road to High School Road																
High School Road to Rogers Road																
<u>High School Road - North of Site</u>	2L	Urban	SB NB	343 208	386 234	64% 0%	0% 64%	113 68	499 302	800 800	NO NO	40 40	14% 8%	YES YES	NO NO	
High School Road to Site																
Site to High School Road																
<u>Stratford Drive - West of Site</u>	2L	Urban	WB EB	343 208	386 234	0% 36%	36% 0%	38 64	424 298	800 800	NO NO	40 40	5% 8%	NO YES	NO NO	
Site to Stratford Drive																
Stratford Drive to Site																
<u>Lake Hogan Farm Road - West of Site</u>	2L	Urban	WB EB	320 189	360 213	0% 98%	98% 0%	37 62	398 275	800 800	NO NO	40 40	5% 8%	NO YES	NO NO	
Stratford Drive to Lake Hoagan Farm Road																
Lake Hogan Farm Road to Stratford Drive																
<u>Old NC 86 - West of Site</u>	2L	Urban	WB EB	299 174	337 196	0% 96%	96% 0%	36 60	372 256	800 800	NO NO	40 40	4% 7%	NO YES	NO NO	
Lake Hogan Farm Road to Old NC 86																
Old NC 86 to Lake Hogan Farm Road																
<u>West of Old NC 86</u>	2L	Urban	WB EB	324 165	365 186	0% 25%	25% 0%	9 15	374 201	800 800	NO NO	40 40	1% 2%	NO NO	NO NO	
Old NC 86 to the West																
From the West to Old NC 86																

¹ Hall Planning & Engineering intersection counts: December 13, 2001; Seawell Road intersection counts by Greater Traffic Company: November 7, 2001

² Adversity Test: Will project trips + background trips exceed maximum service volume?

³ Peak Hour service volume for a two-lane roadway = 800 vehicles per hour per lane [Calculated by HighPlan Software, based on HCM 2000]

⁴ Significance test: Will project trips exceed 5% of the maximum roadway service volume?

Table 3A: AM Peak Hour Trips/Generation (Phase I: 2003 - 2005)
Winmore (Carrboro, NC)

Hall Planning & Engineering, Inc.
May 16, 2003

The proposed development generates

192 Total am peak hour trips.
49 Entering Trips
143 Exiting Trips

Trip Producers	Units	AM Peak Hr Trips Rate ¹	AM Peak Hour Trips Equation ¹	Calculated Trips by Rate	Calculated Trips by Equation	AM Peak Hr Trips Used in Analysis ²	Base Trip Generation	Internal Capture	Adjusted Trips	Pass-by Capture	Net New Trips
Single-Family Homes	97	0.75	$T=0.700(X) + 9.477$	73	77	77	Entering 25% Exiting 75%	19 10% 58 10%	18 0% 53 0%	0% 0%	18 0% 53 0%
Townhouses (Residential Condo/Townhouse)	86	0.44	$Ln(T)=0.790 Ln(X) + 0.298$	38	45	45	Entering 17% Exiting 83%	8 10% 36 10%	7 0% 34 0%	0% 0%	7 0% 34 0%
Condominiums (Residential Condo/Townhouse)	0	0.44	$Ln(T)=0.790 Ln(X) + 0.298$	0	0	0	Entering 17% Exiting 83%	0 10% 0 10%	0 0% 0 0%	0% 0%	0 0% 0 0%
Co-Op Apartments (Apartment)	24	0.51	$T=0.497(X) + 3.238$	12	15	15	Entering 16% Exiting 84%	2 10% 13 10%	2 0% 12 0%	0% 0%	2 0% 12 0%
Apartments (Apartment)	24	0.51	$T=0.497(X) + 3.238$	12	15	15	Entering 16% Exiting 84%	2 10% 13 10%	2 0% 12 0%	0% 0%	2 0% 12 0%
Garage Apartments (Apartment)	69	0.51	$T=0.497(X) + 3.238$	35	38	38	Entering 16% Exiting 84%	6 10% 32 10%	5 0% 33 0%	0% 0%	5 0% 33 0%
ITE Code 220	300						Entering 15% Exiting 85%	45 10% 255 10%	45 0% 210 0%	0% 0%	45 0% 210 0%
Total Dwelling Units - This Phase								181 10% 153 10%	173 0% 138 0%		173 0% 138 0%

Producers
Internal Capture Summary
Entering 4
Exiting 15
Captured 18

10%
(average internal capture)

Trip Attractors	Units	AM Peak Hr Trips Rate ¹	AM Peak Hour Trips Equation ¹	Calculated Trips by Rate	Calculated Trips by Equation	AM Peak Hr Trips Used in Analysis ²	Base Trip Generation	Internal Capture	Adjusted Trips	Pass-by Capture	Net New Trips
Post Office	765	8.02 /1000ft ²	N/A	6	N/A	6	Entering 52% Exiting 48%	3 60% 3 60%	1 0% 1 0%	0% 0%	1 0% 1 0%
Recreation Community Center	10,000	1.32 /1000ft ²	N/A	13	N/A	13	Entering 66% Exiting 34%	9 84% 4 84%	1 0% 1 0%	0% 0%	1 0% 1 0%
Sales Office (General Office Building)	1,238	1.56 /1000ft ²	$Ln(T)=0.797 Ln(X) + 1.558$	2	N/A	2	Entering 88% Exiting 12%	2 20% 0 20%	1 0% 0 0%	0% 0%	1 0% 0 0%
General Office (General Office Building)	7,100	1.56 /1000ft ²	$Ln(T)=0.797 Ln(X) + 1.558$	11	N/A	11	Entering 88% Exiting 12%	10 20% 1 20%	8 0% 1 0%	0% 0%	8 0% 1 0%
TND Retail (Specialty Retail) ³	7,105	0.71 /1000ft ²	N/A	5	N/A	5	Entering 61% Exiting 39%	3 20% 2 20%	2 0% 2 0%	0% 0%	2 0% 2 0%
ITE Code 814							Entering 26% Exiting 74%	11 10% 15 10%	5 0% 10 0%		16 0% 19 0%
Total								37 10% 19 10%	19 0% 19 0%		19 0% 19 0%

Attractors
Internal Capture Summary
Entering 12
Exiting 6
Captured 18

49%
(average internal capture)

Overall Internal Capture
16%

Notes:

¹ Rates and equations from Trip Generation (ITE; 6th Edition, 1997)

² Trips generated are estimated for the peak hour of adjacent street traffic, one hour between 7 and 9 a.m.

³ Due to greater accuracy, equation-generated trips are used when available. The one exception is "general office" use. In this case, the equation is not appropriate for small office buildings.

AM peak hour rate not available. Used shopping center ratio of PM to AM peak hour (AM peak ratio is 27.5% of PM peak ratio)

Note: Discrepancies, if any, are due to rounding.

Table 3B: AM Peak Hour Trips/Distribution (Phase I: 2003 - 2005)

Winmore (Carrboro, NC)

Hall Planning & Engineering, Inc.

May 16, 2003

New Project Trips
Entering Trips 49
Exiting Trips 143

	No. Lanes	LOS Area Type	Dir	Background Traffic: 2001 ¹	Background Traffic: 2005 (3%/yr)	% of New Entering Trips	% of New Exiting Trips	New Project trips	Total PM Peak Hour Trips	Adversity Test ²			Significance Test ⁴			Significant & Adverse Impact?
										Service Volume @ Standard ³	Adverse?	5% of Service Volume	% of Project @ Max. Service Volume	Significant?		
<u>Homestead Road</u>																
<u>East of Seawell School Road</u> From the East to Seawell School Road Seawell School Road to the East	2L	Urban	WB EB	417 588	469 662	45% 0%	0% 45%	9 27	479 689	800 800	NO NO	40 40	1% 3%	NO NO	NO NO	
<u>Seawell Road - North of Site</u> Seawell School Road to Rogers Road Rogers Road to Seawell School Road	2L	Urban	WB EB	417 421	469 474	60% 0%	0% 60%	19 56	488 530	800 800	NO NO	40 40	2% 7%	NO YES	NO NO	
<u>Rogers Road - North of Site</u> Rogers Road to High School Road High School Road to Rogers Road	2L	Urban	SB NB	184 332	207 374	65% 0%	0% 65%	21 60	228 434	800 800	NO NO	40 40	3% 8%	NO YES	NO NO	
<u>High School Road - North of Site</u> High School Road to Site Site to High School Road	2L	Urban	SB NB	175 546	197 615	65% 0%	0% 65%	32 93	229 707	800 800	NO NO	40 40	4% 12%	NO YES	NO NO	
<u>Stratford Drive - West of Site</u> Site to Stratford Drive Stratford Drive to Site	2L	Urban	WB EB	175 546	197 615	0% 35%	35% 0%	50 17	247 632	800 800	NO NO	40 40	6% 2%	YES NO	NO NO	
<u>Lake Hogan Farm Road - West of Site</u> Stratford Drive to Lake Hoagan Farm Road Lake Hogan Farm Road to Stratford Drive	2L	Urban	WB EB	190 473	214 532	0% 98%	98% 0%	49 17	263 549	800 800	NO NO	40 40	6% 2%	YES NO	NO NO	
<u>Old NC 86 - West of Site</u> Lake Hogan Farm Road to Old NC 86 Old NC 86 to Lake Hogan Farm Road	2L	Urban	WB EB	232 332	261 374	0% 96%	96% 0%	47 16	308 390	800 800	NO NO	40 40	6% 2%	YES NO	NO NO	
<u>West of Old NC 86</u> Old NC 86 to the West From the West to Old NC 86	2L	Urban	WB EB	144 382	162 430	0% 25%	25% 0%	12 4	174 434	800 800	NO NO	40 40	1% 0%	NO NO	NO NO	

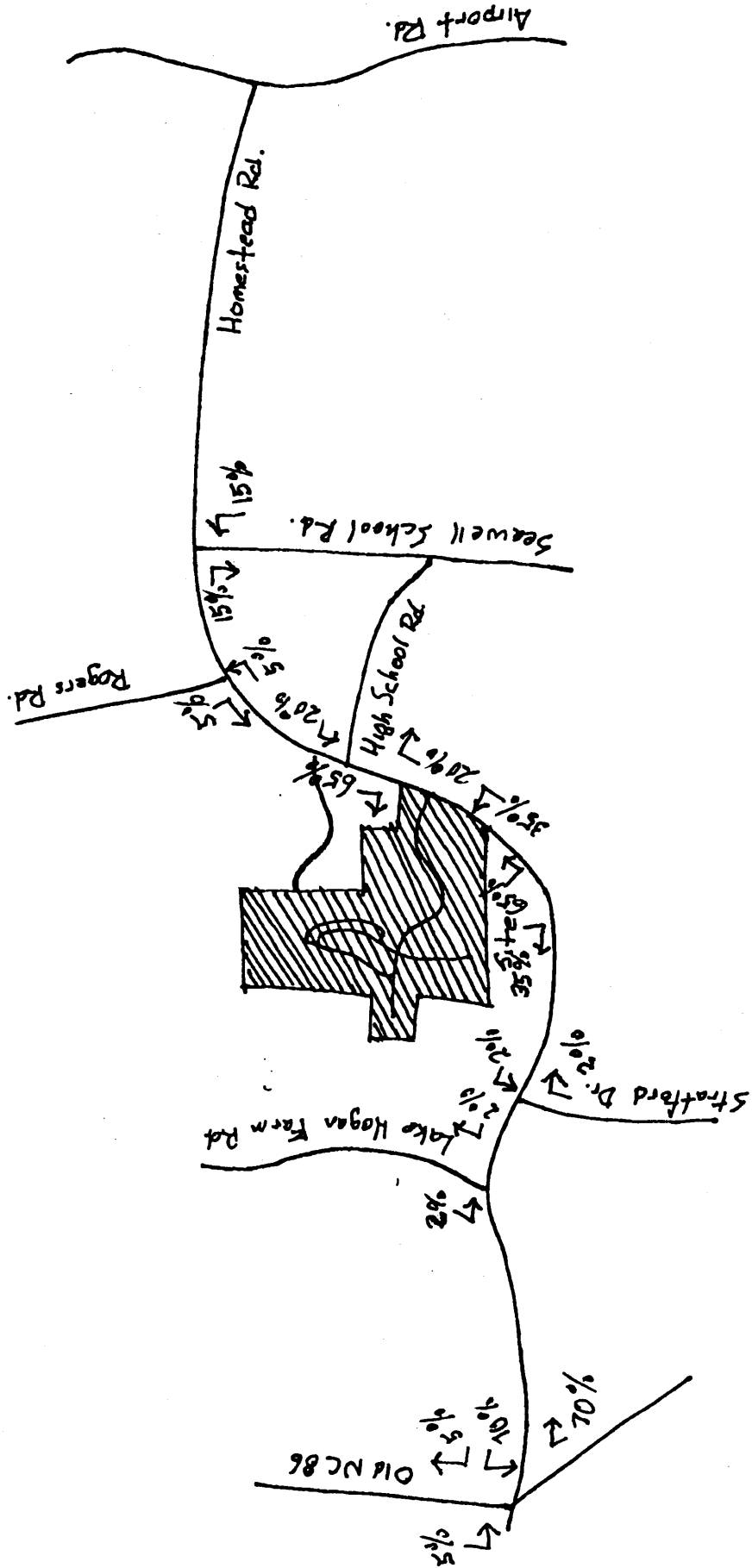
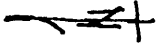
¹ Hall Planning & Engineering intersection counts: December 13, 2001; Seawell Road intersection counts by Greater Traffic Company: November 7, 2001

² Adversity Test: Will project trips + background trips exceed maximum service volume?

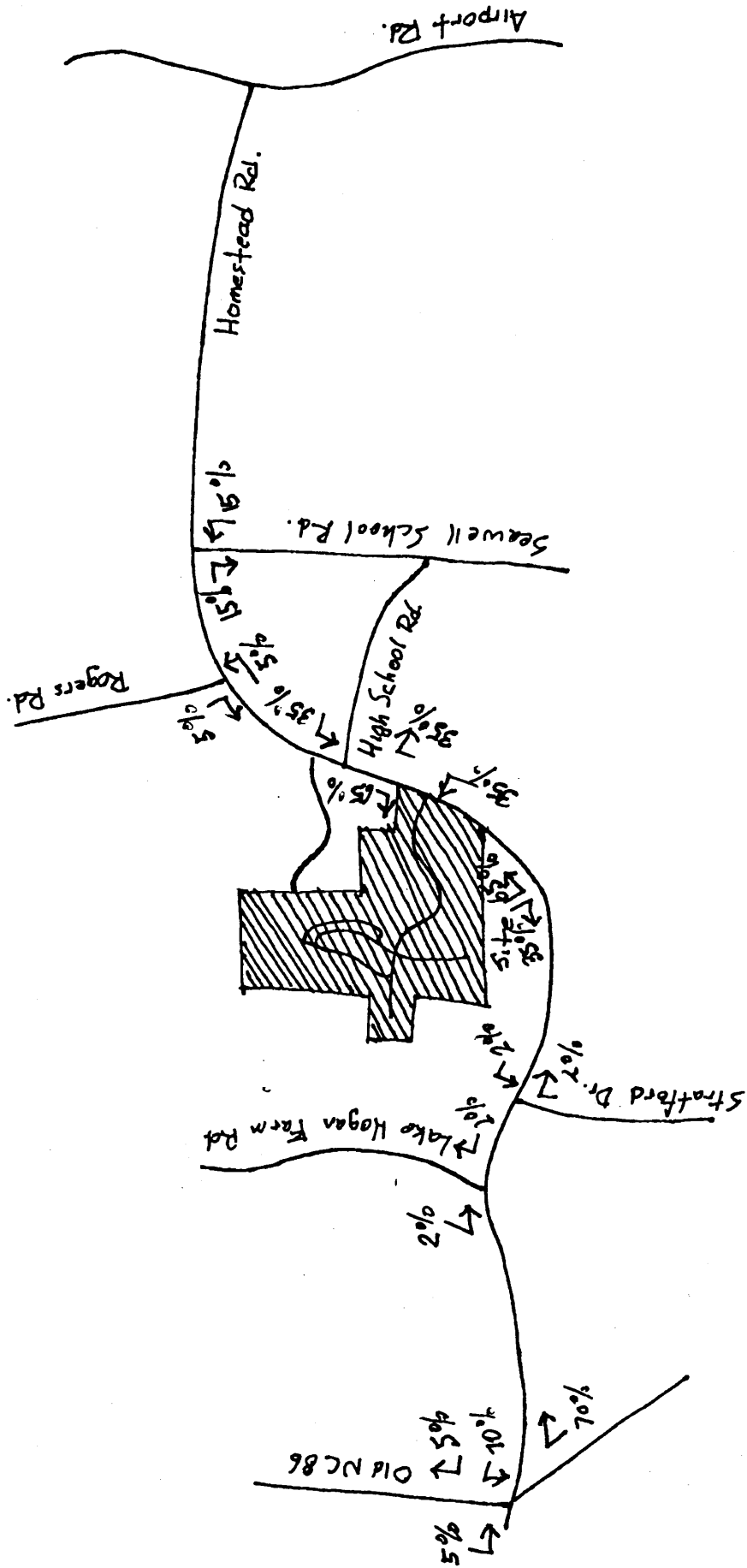
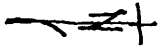
³ Peak Hour service volume for a two-lane roadway = 800 vehicles per hour per lane [Calculated by HighPlan Software, based on HCM 2000]

⁴ Significance test: Will project trips exceed 5% of the maximum roadway service volume?

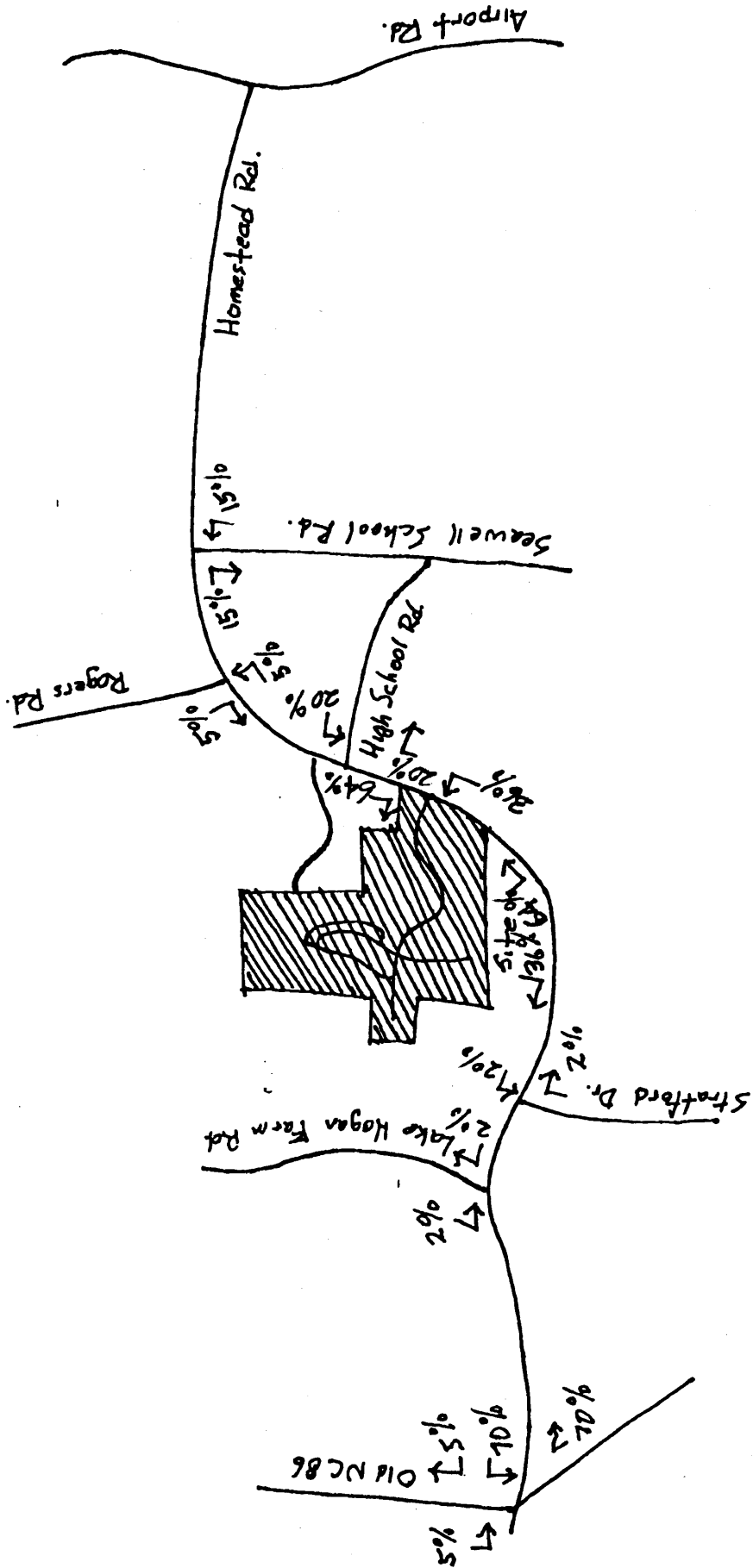
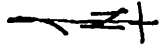
Winmore
Weekday Distributions
5.13.03



Winmore AM Peak Hour Distribution 5.13.03



Winmore PM Peak Hour Distribution 5.13.03





May 16, 2003

Mr. Robert Chapman, III
Winmore Land Management, LLC
310 ½ West Franklin Street
Chapel Hill, NC 27514

RE: Winmore (Carrboro, NC) – Phase I and Phase II traffic analysis

Dear Mr. Chapman:

HPE has completed revisions to the Winmore Development project traffic analysis. In summary, we conclude the following:

Phase I (Southern Tract: 2003 – 2005)

Based on Weekday, PM peak hour, and AM peak hour peak direction trip generation and distribution analysis results, the Winmore project will not cause the maximum service volume of Homestead Road to be exceeded. Therefore, Winmore Phase I can be implemented, based on the project assumptions used in this analysis.

Winmore Phase II (Northern Tract: 2006 – 2008)

Based on Weekday, PM peak hour, and AM peak hour peak direction trip generation and distribution analysis results, the Winmore project will cause the maximum service volume of Homestead Road (in its current two-lane configuration) to be exceeded.

Therefore, Winmore Phase II development timing will depend upon implementing Homestead Road improvements (e.g. the currently proposed widening to a three-lane shoulder section from NC 86 to High School Road) to increase roadway capacity.

High School Road Intersection Impact

When Phase II is approved, due to the additional residential trips generated, Winmore should contribute its fair share of necessary High School Road intersection improvement costs at that time.

Project Description

The Winmore development project is located in Carrboro, NC (Orange County). This analysis is based on the following assumptions:

Access Assumptions

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• Primary arterial access to the site is via Homestead Road (currently two-lanes; 2004 – 2010 Transportation Improvement Program [draft] includes a project to widen Homestead Road to a “three lane shoulder section” [Project U-2805; Orange County])

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Winmore Phase I and Phase II Traffic Analysis
 May 16, 2003
 Page 3

- Several roadways access Homestead Road, helping to alleviate traffic volumes along the primary roadway. These include:
 - Seawell School Road
 - Rogers Road
 - High School Road
 - Stratford Drive
 - Lake Hogan Farm Road

Development Assumptions

The following Winmore development program was used in this analysis:

Land Use	Phase I (Southern) 2003 – 2005	Phase II (Northern) 2006 – 2008	Total
<u>Residential (units)</u>			
Single Family	97 units	65 units	162 units
Townhouses	86 units	36 units	122 units
Condominiums	0 units	42 units	42 units
Co-op Apartments	24 units	0 units	24 units
Apartments	24 units	72 units	96 units
Garage Apartments	69 units	0 units	69 units
Total	300 units	215 units	515 units
<u>Non-Residential (sf)</u>			
General Office	7,100 sf	0 sf	7,100 sf
Sales Office	1,238 sf	0 sf	1,238 sf
TND Retail	7,105 sf	0 sf	7,105 sf
Civic Center	10,000 sf	0 sf	10,000 sf
Post Office	765 sf	0 sf	765 sf
Total	26,208 sf	0 sf	26,208 sf

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Intersections Primarily Affected by New Project Trips

The traffic analysis study area includes the following Homestead Road intersections:

- Seawell School Road (signalized)
- Rogers Road (unsignalized)
- High School Road (unsignalized)
- Stratford Road (unsignalized)
- Lake Hogan Farm Road (unsignalized)
- Old NC 86 (signalized)

Background Traffic

Average Annual Daily Traffic

Average annual daily traffic data for 2001 was obtained from the North Carolina Department of Transportation.

AM and PM Peak Hour Traffic

The following Homestead Road intersection traffic counts were used in this analysis:

- December 13, 2001 (Hall Planning & Engineering, Inc.): Rogers Road, High School Road, Stratford Road, Lake Hogan Farm Road, and Old NC 86.
- November 7, 2001 (Greater Traffic Company): Seawell School Road

Background Traffic Growth During Project Development

This analysis is based on 3% average annual Homestead Road traffic growth from 2001 (current base counts) through Phase I project buildout in 2005. According to the Orange County Economic Development Commission, between 1990 and 2000, the population of Chapel Hill Township (which includes this study area) grew at a compounded annual rate of 2.07%. This growth rate is conservatively reflected in the 3% average annual Homestead Road growth rate.

Short term, Homestead Road has exhibited a higher rate of trip growth. Over the two year period from 1999 to 2001, Homestead Road traffic increased from 5,100 vehicles per day to

6,600 vehicles per day—an annual average increase of 14.2% per year. It is probable a significant portion of this growth was due to two new facilities which opened during the period:

- Smith Middle School (opened August, 2001)
- Harris-Teeter grocery store (opened October, 1998)

Homestead Road Maximum Service Volume

HighPlan software (based on HCM 2000) was used to determine Homestead Road maximum service volume at level of service “C”. Based on the HighPlan model run, the weekday capacity of Homestead Road (modeled at two lanes) is **15,700** vehicles per day; **800** vehicles in the peak hour and peak direction.

Trip Generation and Distribution

Based on development plans for Winmore Phases I and II, HPE performed a traffic analysis utilizing estimates of trip generation and distribution, as follows:

Trip Generation

Weekday, PM peak hour, and AM peak hour trip generation analyses were prepared using trip generation rates supplied by the Town of Carrboro Planning Department and rates/equations from *Trip Generation* (Institute of Transportation Engineers; 6th edition; 1997). Variances from normal *Trip Generation* application are as follows:

- There is no ITE trip rate for “garage apartment”. Therefore, the rate for “apartment” was used to reflect that fewer occupants and vehicles are expected for a garage apartment than for a single family dwelling.
- There is no ITE trip rate for “specialty retail” in the AM peak hour (when very few retail establishments are open for business. Therefore, the AM peak hour rate was estimated at 27.5% of the PM peak hour rate (the PM to AM peak hour ratio for “shopping center”). Also, the shopping center entering and exiting trip distribution was used.

Appropriate internal capture rates were employed to reflect the portion of new trips generated by the development that will move about the project site only, with no impacts to Homestead Road. These internal capture rates reflect the traditional neighborhood design of the project which emphasizes internal mobility. For example, all non-residential uses are located internal to Winmore, rather than on Homestead Road, and most residential uses will be within a five-minute walk of the nonresidential uses.

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Trip Distribution

Weekday Trips

Phase I

According to the standard trip distribution performed for this analysis (see accompanying Table 1B), adding weekday project trips to background traffic **will not** cause Homestead Road maximum service volume to be exceeded. According to May, 2003, traffic counts by the Town of Carrboro, Homestead Road volume was at the level of **7,400** weekday trips. This 2003 traffic data was projected to 2005 based on **3%** average annual growth, yielding a 2005 estimate of **7,851** weekday trips. According to the weekday trip distribution, Winmore will load a maximum **906** weekday trips onto Homestead Road at the completion of Phase I. When projected 2005 background traffic is added to the net new Winmore project trips, Homestead Road link volumes **do not exceed** the Homestead Road maximum service volume at level of service "C".

Phase II

According to the standard trip distribution performed for this analysis (see accompanying Table 4B), adding weekday project trips to background traffic **will not** cause Homestead Road maximum service volume to be exceeded. According to trip 2008 projections (3% average annual growth) based on May, 2003, Town of Carrboro traffic counts, Homestead Road will reach **8,579** weekday trips. According to the weekday trip distribution, Winmore will load a maximum **1,409** weekday trips onto Homestead Road at the completion of Phase II. When projected 2008 background traffic is added to the net new Winmore weekday project trips, Homestead Road link volumes **do not exceed** the Homestead Road maximum service volume at level of service "C".

PM Peak Hour Trips

Phase I

According to the standard trip distribution performed for this analysis (see accompanying Table 2B), adding PM peak hour project trips to background traffic **will not** cause Homestead Road maximum service volume to be exceeded. 2001 intersection traffic counts were used to determine Homestead Road link volumes. To determine weekday background traffic, Homestead Road link volumes were increased at a rate of **3%** per year to estimate 2005 PM peak hour background traffic. According to the trip distribution step, a maximum **113** PM peak hour peak direction project trips will be loaded onto Homestead Road by 2005.

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When these project trips are added to projected background traffic, Homestead Road link traffic volumes are **do not exceed** the Homestead Road maximum service volume at level of service "C".

Phase II

According to the standard trip distribution performed for this analysis (see accompanying Table 5B), adding PM peak hour project trips to background traffic **will not** cause Homestead Road maximum service volume to be exceeded. 2001 intersection traffic counts were used to determine Homestead Road link volumes. As for weekday background traffic, these link volumes were increased at a rate of **3%** per year to estimate 2008 PM peak hour background traffic. According to the trip distribution step, a maximum **175** PM peak hour peak direction project trips will be loaded onto Homestead Road by 2008. When these project trips are added to projected background traffic, Homestead Road link traffic volumes **do not exceed** the Homestead Road maximum service volume at level of service "C".

AM Peak Hour Trips

Phase I

According to the standard trip distribution performed for this analysis (see accompanying Table 3B), adding AM peak hour project trips to background traffic **will not** cause Homestead Road roadway maximum service volume to be exceeded. 2001 intersection traffic counts were used to determine Homestead Road link volumes. As for weekday background traffic and PM peak hour traffic, these link volumes were increased at a rate of **3%** per year to estimate AM peak hour background traffic for 2005.

According to the trip distribution step, a maximum **93** AM peak hour peak direction project trips will be loaded onto Homestead Road by 2005. When these project trips are added to projected background traffic, the total link traffic volumes **do not exceed** the Homestead Road maximum service volume at level of service "C".

Phase II

According to the standard trip distribution performed for this analysis (see accompanying Table 6B), adding AM peak hour project trips to background traffic **will** cause Homestead Road roadway maximum service volume to be exceeded. 2001 intersection traffic counts were used to determine Homestead Road link volumes. As for weekday background traffic and PM peak hour traffic, these link volumes were increased at a rate of **3%** per year to estimate AM peak hour background traffic for 2008. According to the trip distribution step, a maximum **142** AM peak hour peak direction project trips will be loaded onto Homestead Road by 2008. When these project trips are added to projected background traffic,

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Homestead Road link volumes **exceed** the Homestead Road maximum service volume at level of service "C" on the following links:

- Project site to High School Road

It is probable this adverse condition will be relieved if Homestead Road is three-laned between NC 86 and High School Road.

High School Road Intersection Impact

During the AM peak hour---when High School Road turns are highest---Winmore Phase I contributes less than 10% of the eastbound or westbound Homestead Road trips approaching the High School Road intersection. However, when Phase II is approved, due to the additional residential trips generated, Winmore should contribute its fair share of necessary intersection improvement costs at that time.

Conclusions

Phase I (Southern Tract: 2003 – 2005)

Based on Weekday, PM peak hour, and AM peak hour peak direction trip generation and distribution analysis results, the Winmore project will not cause the maximum service volume of Homestead Road to be exceeded. Therefore, Winmore Phase I can be implemented, based on the project assumptions used in this analysis.

Winmore Phase II (Northern Tract: 2006 – 2008)

Based on Weekday, PM peak hour, and AM peak hour peak direction trip generation and distribution analysis results, the Winmore project will cause the maximum service volume of Homestead Road (in its current two-lane configuration) to be exceeded.

Therefore, Winmore Phase II development timing will depend upon implementing Homestead Road improvements (e.g. the currently proposed widening to a three-lane shoulder section from NC 86 to High School Road) to increase roadway capacity.

High School Road Intersection Impact

When Phase II is approved, due to the additional residential trips generated, Winmore should contribute its fair share of necessary High School Road intersection improvement costs at that time.

If you have questions, please do not hesitate to contact me or Ted Mack at (850) 222-2277

Winmore Phase I and Phase II Traffic Analysis
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Sincerely,

A handwritten signature in black ink, appearing to read "R. A. Hall", written in a cursive style.

Richard A. Hall, P.E.
President

RAH/lm
Attachments

ATTACHMENT A

**TRIP GENERATION AND DISTRIBUTION ANALYSIS
Phase 1 (2003 – 2005) and Phase II (2006 – 2008)**

Hall Planning & Engineering, Inc.

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Table 4A: Weekday Trips/Generation (Phase I + Phase II: 2006 - 2008)
Winmore (Carrboro, NC)

Hall Planning & Engineering, Inc.

May 16, 2003

The proposed
development generates

4,337 Total weekday trips.
2,168 Entering Trips
2,168 Exiting Trips

Trip Producers	Units	Weekday Trips Rate ¹	Weekday Trips Equation ¹	Calculated Trips by Rate	Calculated Trips by Equation	Weekday Trips Used In Analysis ²	Base Trip Generation		Internal Capture	Adjusted Trips	Pass-by Capture	Net New Trips	
							Entering	Exiting					
Single-Family Homes	162 Dwelling Units	10 /du	$\text{Ln}(T)=0.920 \text{ Ln}(X) + 2.707$	1,620	1616	1,616	Entering	50%	808	7%	752	0%	752
							Exiting	50%	808	7%	752	0%	752
	122 Dwelling Units	5.86 /du	$\text{Ln}(T)=0.850 \text{ Ln}(X) + 2.564$	715	771	771	Entering	50%	385	7%	359	0%	359
							Exiting	50%	385	7%	359	0%	359
Condominiums (Residential Condo/Townhouse)	42 Dwelling Units	5.86 /du	$\text{Ln}(T)=0.850 \text{ Ln}(X) + 2.564$	246	311	311	Entering	50%	156	7%	145	0%	145
							Exiting	50%	156	7%	145	0%	145
	24 Dwelling Units	6.63 /du	$T=5.994(X) + 134.114$	159	278	278	Entering	50%	139	7%	129	0%	129
							Exiting	50%	139	7%	129	0%	129
Apartments (Apartment)	96 Dwelling Units	6.63 /du	$T=5.994(X) + 134.114$	636	710	710	Entering	50%	355	7%	330	0%	330
							Exiting	50%	355	7%	330	0%	330
	69 Dwelling Units	6.63 /du	$T=5.994(X) + 134.114$	457	548	548	Entering	50%	274	7%	255	0%	255
							Exiting	50%	274	7%	255	0%	255
Garage Apartments (Apartment)	515 Dwelling Units						Entering	2,117	1,969	1,969		1,969	
							Exiting	2,117	1,969	1,969		1,969	
Total Dwelling Units - This Phase							Total		4,233	3,939		3,939	

Producers

Internal Capture Summary

Entering 147
Exiting 147
Captured 294
7%

(average internal capture)

(average internal capture)													
Trip Attractors	Units	Weekday Trips Rate ¹	Weekday Trips Equation ¹	Calculated Trips by Rate	Calculated Trips by Equation	Weekday Trips Used in Analysis ²	Base Trip Generation		Internal Capture	Adjusted Trips	Pass-by Capture	Net New Trips	
Post Office	765 ft ²	108.19 /1000ft ²	N/A	83	N/A	83	Entering	50%	41	56%	18	0%	18
							Exiting	50%	41	56%	18	0%	18
Civic Center (Recreation Community Center)	10,000 ft ²	22.88 /1000ft ²	N/A	229	N/A	229	Entering	50%	114	75%	29	0%	29
							Exiting	50%	114	75%	29	0%	29
Sales Office (General Office Building)	1,238 ft ²	11.01 /1000ft ²	$\text{Ln}(T)=0.768 \text{ Ln}(X) + 3.654$	14	N/A	14	Entering	50%	7	20%	5	0%	5
							Exiting	50%	7	20%	5	0%	5
General Office (General Office Building)	7,100 ft ²	11.01 /1000ft ²	$\text{Ln}(T)=0.768 \text{ Ln}(X) + 3.654$	78	N/A	78	Entering	50%	39	20%	31	0%	31
							Exiting	50%	39	20%	31	0%	31
TND Retail (Special Retail)	7,105 ft ²	40.67 /1000ft ²	N/A	289	N/A	289	Entering	50%	144	20%	116	0%	116
							Exiting	50%	144	20%	116	0%	116
ITE Code 814						Entering	348		199			199	
						Exiting	348		199			199	
						Total		692		398		398	

¹ Trip generation rates and equations from the Town of Carrboro and Trip Generation (ITE, 6th edition, 1997).
² Trips generated are estimated for a weekday.

¹ Trip generation rates and equations from the Town of Carrboro and Trip Generation (ITE, 6th edition, 1997).

trips generated are estimated for a weekday.

² Due to greater accuracy, equation-generated trips are used when available. The one exception is "general office" use. In this case, the equation is not appropriate for small office buildings.

Note: Discrepancies, if any, are due to rounding.

Attractors

Internal Capture Summary

Entering 147
Exiting 147
Captured 294
43%

(average internal capture)

Overall Internal Capture
12%

Table 4B: Weekday Trips/Distribution (Phase I + Phase II: 2006 - 2008)
Winmore (Carrboro, NC)

Hall Planning & Engineering, Inc.

May 16, 2003

New Project Trips 4,337
Entering Trips 2,168
Exiting Trips 2,168

	No. Lanes	LOS Area Type	Dir	Base Weekday Trips 2003 Data ¹	Background Traffic: 2008 (3%/yr)	K-Factor	D-Factor	Background Traffic	% of New Entering Trips	% of New Exiting Trips	New Project trips	Total Daily Trips	Adversity Test ²		Significance Test ⁴		Significant & Adverse Impact?	
													Service Volume @ Standard ³	Adverse?	5% of Service Volume	% of Project @ Max. Service Volume		Significant?
<u>Homestead Road</u>																		
<u>East of Seawell School Road</u>																		
From the East to Seawell School Road	2L	Urban	WB	7,400	8,579	1	0.5	4,289	60%	0%	677	4,966	7,850	NO	392.5	9%	YES	NO
Seawell School Road to the East			EB				0.5	4,289	0%	60%	677	4,966	7,850	NO	392.5	9%	YES	NO
<u>Seawell Road - North of Site</u>																		
Seawell School Road to Rogers Road	2L	Urban	WB	7,400	8,579	1	0.5	4,289	75%	0%	846	5,135	7,850	NO	392.5	11%	YES	NO
Rogers Road to Seawell School Road			EB				0.5	4,289	0%	75%	846	5,135	7,850	NO	392.5	11%	YES	NO
<u>Rogers Road - North of Site</u>																		
Rogers Road to High School Road	2L	Urban	SB	7,400	8,579	1	0.5	4,289	80%	0%	1,128	5,417	7,850	NO	392.5	14%	YES	NO
High School Road to Rogers Road			NB				0.5	4,289	0%	80%	1,128	5,417	7,850	NO	392.5	14%	YES	NO
<u>High School Road - North of Site</u>																		
High School Road to Site	2L	Urban	SB	7,400	8,579	1	0.5	4,289	65%	0%	1,409	5,699	7,850	NO	392.5	18%	YES	NO
Site to High School Road			NB				0.5	4,289	0%	65%	1,409	5,699	7,850	NO	392.5	18%	YES	NO
<u>Stratford Drive - West of Site</u>																		
Site to Stratford Drive	2L	Urban	WB	7,400	8,579	1	0.5	4,289	0%	35%	759	5,048	7,850	NO	392.5	10%	YES	NO
Stratford Drive to Site			EB				0.5	4,289	35%	0%	759	5,048	7,850	NO	392.5	10%	YES	NO
<u>Lake Hogan Farm Road - West of Site</u>																		
Stratford Drive to Lake Hogan Farm Road	2L	Urban	WB	7,400	8,579	1	0.5	4,289	0%	98%	744	5,033	7,850	NO	392.5	9%	YES	NO
Lake Hogan Farm Road to Stratford Drive			EB				0.5	4,289	98%	0%	744	5,033	7,850	NO	392.5	9%	YES	NO
<u>Old NC 86 - West of Site</u>																		
Lake Hogan Farm Road to Old NC 86	2L	Urban	WB	7,400	8,579	1	0.5	4,289	0%	96%	714	5,003	7,850	NO	392.5	9%	YES	NO
Old NC 86 to Lake Hogan Farm Road			EB				0.5	4,289	96%	0%	714	5,003	7,850	NO	392.5	9%	YES	NO
<u>West of Old NC 86</u>																		
Old NC 86 to the West	2L	Urban	WB	7,400	8,579	1	0.5	4,289	0%	25%	179	4,468	7,850	NO	392.5	2%	NO	NO
From the West to Old NC 86			EB				0.5	4,289	25%	0%	179	4,468	7,850	NO	392.5	2%	NO	NO

¹ 2003 (5-14-03) Homestead Road traffic count; Town of Carrboro

² Adversity Test: Will project trips + background trips exceed maximum service volume?

³ Daily service volume for a two-lane roadway = 15,700 vehicles per day (7,850 vehicles per day per lane)(Calculated by HighPlan software, based on HCM 2000)

⁴ Significance test: Will project trips exceed 5% of the maximum roadway service volume?

Table 5A: PM Peak Hour Trips/Generation (Phase I + Phase II: 2006 - 2008)
Winmore (Carrboro, NC)

Hall Planning & Engineering, Inc.

May 16, 2003

The proposed
development generates

431 Total pm peak hour trips.
274 Entering Trips
157 Exiting Trips

Trip Producers	Units	PM Peak Hr Trips Rate ¹	PM Peak Hour Trips Equation ¹	Calculated Trips by Rate	Calculated Trips by Equation	PM Peak Hr Trips Used in Analysis ²	Base Trip Generation				Internal Capture	Adjusted Trips	Pass-by Capture	Net New Trips
							Entering	Exiting	64%	106%	6%	100%	0%	100%
Single-Family Homes ITE Code 210	162 Dwelling Units	1.01 /du	$\text{Ln}(T)=0.801 \text{ Ln}(X) + 0.527$	164	166	166	64%	106%	6%	100%	6%	100%	0%	100%
Townhouses (Residential Condo/Townhouse) ITE Code 230	122 Dwelling Units	0.54 /du	$\text{Ln}(T)=0.827 \text{ Ln}(X) + 0.309$	66	72	72	67%	48%	6%	45%	0%	0%	0%	45%
Condominiums (Residential Condo/Townhouse) ITE Code 230	42 Dwelling Units	0.54 /du	$\text{Ln}(T)=0.827 \text{ Ln}(X) + 0.309$	23	30	30	67%	20%	6%	19%	0%	0%	0%	19%
Co-op Apartments (Apartment) ITE Code 220	24 Dwelling Units	0.62 /du	$T=0.541(X) + 18.743$	15	32	32	67%	21%	6%	20%	0%	0%	0%	20%
Apartments (Apartment) ITE Code 220	96 Dwelling Units	0.62 /du	$T=0.541(X) + 18.743$	60	71	71	67%	47%	6%	44%	0%	0%	0%	44%
Garage Apartments (Apartment) ITE Code 220	69 Dwelling Units	0.62 /du	$T=0.541(X) + 18.743$	43	56	56	67%	38%	6%	35%	0%	0%	0%	35%
Total Dwelling Units - This Phase	515						281	19	6%	263	17	0%	0%	263
							Entering	Exiting	146	137	400	137	400	400

Producers
Internal Capture Summary
Entering 17
Exiting 9
Captured 26
6%
(average internal capture)

Trip Attractors	Units	PM Peak Hr Trips Rate ¹	PM Peak Hour Trips Equation ¹	Calculated Trips by Rate	Calculated Trips by Equation	PM Peak Hr Trips Used in Analysis ²	Base Trip Generation				Internal Capture	Adjusted Trips	Pass-by Capture	Net New Trips
							Entering	Exiting	51%	4	60%	2	0%	2
Post Office ITE Code 732	765 ft ²	10.79 /1000ft ²	N/A	8	N/A	8	49%	4	60%	2	0%	2	0%	2
Recreation Community Center ITE Code 495	10,000 ft ²	1.75 /1000ft ²	N/A	18	N/A	18	34%	6	84%	1	0%	1	0%	1
Sales Office (General Office Building) ITE Code 710	1,238 ft ²	1.49 /1000ft ²	$T=1.121(X) + 79.295$	2	N/A	2	66%	12	84%	2	0%	2	0%	2
General Office (General Office Building) ITE Code 710	7,100 ft ²	1.49 /1000ft ²	$T=1.121(X) + 79.295$	11	N/A	11	17%	0	20%	0	0%	0	0%	0
TND Retail (Specialty Retail) ITE Code 814	7,105 ft ²	2.59 /1000ft ²	N/A	18	N/A	18	83%	2	20%	1	0%	1	0%	1
							Entering	Exiting	36	20	31	20	31	31
							Entering	Exiting	36	20	31	20	31	31

¹ Rates and equations are from Trip Generation (ITE, 6th edition, 1997).
trips generated are estimated for the peak hour of adjacent street traffic,
one hour between 4 and 6 p.m.

² Due to greater accuracy, equation-generated trips are used when available. The one exception is "general office" use.
In this case, the equation is not appropriate for small office buildings.

Note: Discrepancies, if any, are due to rounding.

Attractors
Internal Capture Summary
Entering 10
Exiting 16
Captured 26
46%
(average internal capture)

Overall Internal Capture
11%

Table 5B: PM Peak Hour Trips/Distribution (Phase I + phase II: 2006 - 2008)
Winmore (Carrboro, NC)

Hall Planning & Engineering, Inc.
 May 16, 2003

New Project Trips 431
 Entering Trips 274
 Exiting Trips 157

	No. Lanes	LOS Area Type	Dir	Background Traffic: 2001 ¹	Background Traffic: 2008 (3%/yr)	% of New Entering Trips	% of New Exiting Trips	New Project trips	Total PM Peak Hour Trips	Adversity Test ²			Significance Test ⁴			Significant & Adverse Impact?
										Service Volume @ Standard ³	Adverse?	5% of Service Volume	Project @ Max. Service Volume	Significant?		
<u>Homestead Road</u>																
<u>East of Seawell School Road</u> From the East to Seawell School Road Seawell School Road to the East	2L	Urban	WB EB	474 337	583 414	60% 0%	0% 60%	84 48	667 463	800 800	NO NO	40 40	11% 6%	YES YES	NO NO	
<u>Seawell Road - North of Site</u> Seawell School Road to Rogers Road Rogers Road to Seawell School Road	2L	Urban	WB EB	474 217	583 267	75% 0%	0% 75%	132 75	715 342	800 800	NO NO	40 40	16% 9%	YES YES	NO NO	
<u>Rogers Road - North of Site</u> Rogers Road to High School Road High School Road to Rogers Road	2L	Urban	SB NB	369 197	454 242	80% 0%	0% 80%	140 80	594 323	800 800	NO NO	40 40	18% 10%	YES YES	NO NO	
<u>High School Road - North of Site</u> High School Road to Site Site to High School Road	2L	Urban	SB NB	343 208	422 256	64% 0%	0% 64%	175 100	597 356	800 800	NO NO	40 40	22% 13%	YES YES	NO NO	
<u>Stratford Drive - West of Site</u> Site to Stratford Drive Stratford Drive to Site	2L	Urban	WB EB	343 208	422 256	0% 36%	36% 0%	56 99	478 354	800 800	NO NO	40 40	7% 12%	YES YES	NO NO	
<u>Lake Hogan Farm Road - West of Site</u> Stratford Drive to Lake Hoagan Farm Road Lake Hogan Farm Road to Stratford Drive	2L	Urban	WB EB	320 189	394 232	0% 98%	98% 0%	55 97	449 329	800 800	NO NO	40 40	7% 12%	YES YES	NO NO	
<u>Old NC 86 - West of Site</u> Lake Hogan Farm Road to Old NC 86 Old NC 86 to Lake Hogan Farm Road	2L	Urban	WB EB	299 174	368 214	0% 96%	96% 0%	53 93	421 307	800 800	NO NO	40 40	7% 12%	YES YES	NO NO	
<u>West of Old NC 86</u> Old NC 86 to the West From the West to Old NC 86	2L	Urban	WB EB	324 165	398 203	0% 25%	25% 0%	13 23	412 226	800 800	NO NO	40 40	2% 3%	NO NO	NO NO	

¹ Hall Planning & Engineering intersection counts: December 13, 2001; Seawell Road intersection counts by Greater Traffic Company: November 7, 2001

² Adversity Test: Will project trips + background trips exceed maximum service volume?

³ Peak Hour service volume for a two-lane roadway = 800 vehicles per hour per lane [Calculated by HighPlan Software, based on HCM 2000]

⁴ Significance test: Will project trips exceed 5% of the maximum roadway service volume?

Table 6A: AM Peak Hour Trips/Generation (Phase I + Phase II: 2006 - 2008)
Winmore (Carboro, NC)

Hall Planning & Engineering, Inc.
May 16, 2003

The proposed development generates

287 Total am peak hour trips.
68 Entering Trips
219 Exiting Trips

Trip Producers	Units	AM Peak Hr Trips Rate ¹	AM Peak Hour Trips Equation ¹	Calculated Trips by Rate	Calculated Trips by Equation	AM Peak Hr Trips Used in Analysis ²	Base Trip Generation	Internal Capture	Adjusted Trips	Pass-by Capture	Net New Trips
Single-Family Homes	162	0.75	$T=0.700(X) + 9.477$	122	123	123	Entering 25% Exiting 31	6%	29	0%	29
ITE Code 210	Dwelling Units	/du					Entering 75% Exiting 92	6%	86	0%	86
Townhouses (Residential Condo/Townhouse)	122	0.44	$\ln(T)=0.780 \ln(X) + 0.288$	54	60	60	Entering 17% Exiting 10	6%	10	0%	10
ITE Code 230	Dwelling Units	/du					Entering 83% Exiting 50	6%	47	0%	47
Condominiums (Residential Condo/Townhouse)	42	0.44	$\ln(T)=0.780 \ln(X) + 0.288$	18		0	Entering 17% Exiting 0	6%	0	0%	0
ITE Code 230	Dwelling Units	/du					Entering 83% Exiting 0	6%	0	0%	0
Co-Op Apartments (Apartment)	24	0.51	$T=0.497(X) + 3.238$	12	15	15	Entering 16% Exiting 2	6%	2	0%	2
ITE Code 220	Dwelling Units	/du					Entering 84% Exiting 13	6%	12	0%	12
Apartment (Apartment)	96	0.51	$T=0.497(X) + 3.238$	49	51	51	Entering 16% Exiting 8	6%	8	0%	8
ITE Code 220	Dwelling Units	/du					Entering 84% Exiting 43	6%	40	0%	40
Garage Apartments (Apartment)	69	0.51	$T=0.497(X) + 3.238$	35	38	38	Entering 16% Exiting 6	6%	6	0%	6
ITE Code 220	Dwelling Units	/du					Entering 84% Exiting 57	6%	30	0%	30
Total Dwelling Units - This Phase	515						Entering 229 Exiting 214		268		268

Producers
Internal Capture Summary
Entering 4
Exiting 15
Captured 18
6%
(average internal capture)

Trip Attractors	Units	AM Peak Hr Trips Rate ¹	AM Peak Hour Trips Equation ¹	Calculated Trips by Rate	Calculated Trips by Equation	AM Peak Hr Trips Used in Analysis ²	Base Trip Generation	Internal Capture	Adjusted Trips	Pass-by Capture	Net New Trips
Post Office	765	8.02	N/A	6	N/A	6	Entering 52% Exiting 3	60%	1	0%	1
ITE Code 732	R ³	/1000R ³					Entering 48% Exiting 3	60%	1	0%	1
Recreation Community Center	10,000	1.32	N/A	13	N/A	13	Entering 66% Exiting 9	84%	1	0%	1
ITE Code 495	R ³	/1000R ³					Entering 34% Exiting 4	84%	1	0%	1
Sales Office (General Office Building)	1,238	1.56	$\ln(T)=0.787 \ln(X) + 1.558$	2	N/A	2	Entering 88% Exiting 2	20%	0	0%	0
ITE Code 710	R ³	/1000R ³					Entering 12% Exiting 0	20%	0	0%	0
General Office (General Office Building)	7,100	1.56	$\ln(T)=0.787 \ln(X) + 1.558$	11	N/A	11	Entering 88% Exiting 10	20%	8	0%	8
ITE Code 710	R ³	/1000R ³					Entering 12% Exiting 1	20%	1	0%	1
TND Retail (Specialty Retail) ³	7,105	0.71	N/A	5	N/A	5	Entering 61% Exiting 3	20%	2	0%	2
ITE Code 814	R ³	/1000R ³					Entering 39% Exiting 2	20%	2	0%	2
Total							Entering 26 Exiting 11		14		14
							Entering 37 Exiting 19		19		19

Notes:
¹ Rates and equations from Trip Generation (ITE; 6th Edition, 1997)
 Trips generated are estimated for the peak hour of adjacent street traffic, one hour between 7 and 9 a.m.
² Due to greater accuracy, equation-generated trips are used when available. The one exception is "general office" use. In this case, the equation is not appropriate for small office buildings.
³ AM peak hour rate not available. Used shopping center ratio of PM to AM peak ratio is 27.5% of PM peak ratio)
 Note: Discrepancies, if any, are due to rounding.

Attractors
Internal Capture Summary
Entering 12
Exiting 6
Captured 18
49%
(average internal capture)

Overall Internal Capture
11%

Table 6B: AM Peak Hour Trips/Distribution (Phase I + Phase II: 2006 - 2008)
Winmore (Carrboro, NC)

Hall Planning & Engineering, Inc.

May 16, 2003

287

New Project Trips

68

Entering Trips

219

Exiting Trips

	No. Lanes	LOS Area Type	Dir	Background Traffic: 2001 ¹	Background Traffic: 2008 (3%/yr)	% of New Entering Trips	% of New Exiting Trips	New Project trips	Total PM Peak Hour Trips	Adversity Test ²		Significance Test ⁴			Significant & Adverse Impact?	
										Service Volume @ Standard ³	Adverse?	5% of Service Volume	Project @ Max. Service Volume	Significant?		
<u>Homestead Road</u>																
<u>East of Seawell School Road</u>																
From the East to Seawell School Road	2L	Urban	WB	417	513	45%	0%	13	526	800	NO	40	2%	NO	NO	
Seawell School Road to the East			EB	588	723	0%	45%	42	765	800	NO	40	5%	YES	NO	
<u>Seawell Road - North of Site</u>																
Seawell School Road to Rogers Road	2L	Urban	WB	417	513	60%	0%	27	539	800	NO	40	3%	NO	NO	
Rogers Road to Seawell School Road			EB	421	518	0%	60%	85	603	800	NO	40	11%	YES	NO	
<u>Rogers Road - North of Site</u>																
Rogers Road to High School Road	2L	Urban	SB	184	226	65%	0%	29	255	800	NO	40	4%	NO	NO	
High School Road to Rogers Road			NB	332	408	0%	65%	93	501	800	NO	40	12%	YES	NO	
<u>High School Road - North of Site</u>																
High School Road to Site	2L	Urban	SB	175	215	65%	0%	44	259	800	NO	40	6%	YES	NO	
Site to High School Road			NB	546	672	0%	65%	142	814	800	YES	40	18%	YES	YES	
<u>Stratford Drive - West of Site</u>																
Site to Stratford Drive	2L	Urban	WB	175	215	0%	35%	77	292	800	NO	40	10%	YES	NO	
Stratford Drive to Site			EB	546	672	35%	0%	24	695	800	NO	40	3%	NO	NO	
<u>Lake Hogan Farm Road - West of Site</u>																
Stratford Drive to Lake Hoagan Farm Road	2L	Urban	WB	190	234	0%	98%	75	309	800	NO	40	9%	YES	NO	
Lake Hogan Farm Road to Stratford Drive			EB	473	582	98%	0%	23	605	800	NO	40	3%	NO	NO	
<u>Old NC 86 - West of Site</u>																
Lake Hogan Farm Road to Old NC 86	2L	Urban	WB	232	285	0%	96%	72	357	800	NO	40	9%	YES	NO	
Old NC 86 to Lake Hogan Farm Road			EB	332	408	96%	0%	22	431	800	NO	40	3%	NO	NO	
<u>West of Old NC 86</u>																
Old NC 86 to the West	2L	Urban	WB	144	177	0%	25%	18	195	800	NO	40	2%	NO	NO	
From the West to Old NC 86			EB	382	470	25%	0%	6	475	800	NO	40	1%	NO	NO	

¹ Hall Planning & Engineering intersection counts: December 13, 2001; Seawell Road intersection counts by Greater Traffic Company: November 7, 2001

² Adversity Test: Will project trips + background trips exceed maximum service volume?

³ Peak Hour service volume for a two-lane roadway = 800 vehicles per hour per lane [Calculated by HighPlan Software, based on HCM 2000]

⁴ Significance test: Will project trips exceed 5% of the maximum roadway service volume?

Table 1A: Weekday Trips/Generation (Phase I: 2003 - 2005)
Winmore (Carrboro, NC)

Hall Planning & Engineering, Inc.
May 16, 2003

The proposed development generates

2,789 Total weekday trips.
1,394 Entering Trips
1,394 Exiting Trips

Trip Producers	Units	Weekday Trips Rate ¹	Weekday Trips Equation ¹	Calculated Trips by Rate	Calculated Trips by Equation	Weekday Trips Used in Analysis ²	Base Trip Generation				Internal Capture	Adjusted Trips	Pass-by Capture	Net New Trips
							Entering	Exiting	50%	50%				
Single-Family Homes	97	10 /du	$\text{Ln}(T)=0.920 \text{ Ln}(X) +2.707$	970	1008	1,008	504	504	11%	11%	449	0%	449	
ITE Code 210	Dwelling Units	/du					504	504	11%	11%	449	0%	449	
Townhouses (Residential Condo/Townhouse)	86	5.86 /du	$\text{Ln}(T)=0.850 \text{ Ln}(X) +2.564$	504	573	573	286	286	11%	11%	255	0%	255	
ITE Code 230	Dwelling Units	/du					286	286	11%	11%	255	0%	255	
Condominiums (Residential Condo/Townhouse)	0	5.86 /du	$\text{Ln}(T)=0.850 \text{ Ln}(X) +2.564$	0		0	0	0	11%	11%	0	0%	0	
ITE Code 230	Dwelling Units	/du					0	0	11%	11%	0	0%	0	
Co-op Apartments (Apartment)	24	6.63 /du	$T=5.994(X) + 134.114$	159	278	278	139	139	11%	11%	124	0%	124	
ITE Code 220	Dwelling Units	/du					139	139	11%	11%	124	0%	124	
Apartments (Apartment)	24	6.63 /du	$T=5.994(X) + 134.114$	159	278	278	139	139	11%	11%	124	0%	124	
ITE Code 220	Dwelling Units	/du					139	139	11%	11%	124	0%	124	
Garage Apartments (Apartment)	69	6.63 /du	$T=5.994(X) + 134.114$	457	548	548	274	274	11%	11%	244	0%	244	
ITE Code 220	Dwelling Units	/du					274	274	11%	11%	244	0%	244	
Total Dwelling Units - This Phase	300						1,342	1,342	11%	11%	1,195	0%	1,195	
							1,342	1,342	11%	11%	1,195	0%	1,195	
							2,684	2,684			2,390		2,390	
							Total	Total						

Producers

Internal Capture Summary

Entering 147
Exiting 147
Captured 294

11%
(average internal capture)

Trip Attractors	Units	Weekday Trips Rate ¹	Weekday Trips Equation ¹	Calculated Trips by Rate	Calculated Trips by Equation	Weekday Trips Used in Analysis ²	Base Trip Generation				Internal Capture	Adjusted Trips	Pass-by Capture	Net New Trips
							Entering	Exiting	50%	41%				
Post Office	765 ft ²	108.19 /1000ft ²	N/A	83	N/A	83	Entering	Exiting	50%	41%	56%	18	0%	18
Civic Center (Recreation Community Center)	10,000 ft ²	22.88 /1000ft ²	N/A	229	N/A	229	Entering	Exiting	50%	114	56%	29	0%	18
Sales Office (General Office Building)	1,238 ft ²	11.01 /1000ft ²	$\text{Ln}(T)=0.768 \text{ Ln}(X) + 3.654$	14	N/A	14	Entering	Exiting	50%	114	75%	29	0%	29
General Office (General Office Building)	7,100 ft ²	11.01 /1000ft ²	$\text{Ln}(T)=0.768 \text{ Ln}(X) + 3.654$	78	N/A	78	Entering	Exiting	50%	7	20%	5	0%	5
TND Retail (Special Retail)	7,105 ft ²	40.67 /1000ft ²	N/A	289	N/A	289	Entering	Exiting	50%	39	20%	31	0%	31
ITE Code 814							Entering	Exiting	50%	144	20%	116	0%	116
							Entering	Exiting	50%	144	20%	116	0%	116
							Entering	Exiting	50%	346	199	199		199
							Entering	Exiting	50%	346	199	199		199
							Total	Total		692	399	399		399

¹ Trip generation rates and equations from the Town of Cambaro and Trip Generation (ITE, 6th edition, 1997).

² Trips generated are estimated for a weekday.

¹ Trip generation rates and equations from the Town of Carrboro and Trip Generation (ITE, 6th edition, 1997).

trips generated are estimated for a weekday.

² Due to greater accuracy, equation-generated trips are used when available. The one exception is "general office" use. In this case, the equation is not appropriate for small office buildings.

Note: Discrepancies, if any, are due to rounding.

Attractors

Internal Capture Summary

Entering 147
Exiting 147
Captured 294

42%
(average internal capture)

Overall Internal Capture
17%

Table 1B: Weekday Trips/Distribution (Phase I: 2003 - 2005)
Winmore (Carrboro, NC)

Hall Planning & Engineering, Inc.
May 16, 2003

New Project Trips 2,789
Entering Trips 1,394
Exiting Trips 1,394

	No. Lanes	LOS Area Type	Dir	Base Weekday Trips 2003 Data ¹	Background Traffic: 2005 (3%/yr)	K-Factor	D-Factor	Background Traffic	% of New Entering Trips	% of New Exiting Trips	New Project trips	Total Daily Trips	Adversity Test ²		Significance Test ⁴		Significant & Adverse Impact?	
													Service Volume @ Standard ³	Adverse?	5% of Service Volume	% of Project @ Max. Service Volume		
Homestead Road																		
East of Seawell School Road From the East to Seawell School Road Seawell School Road to the East	2L	Urban	WB EB	7,400	7,851	1	0.5 0.5	3,925 3,925	60% 0%	0% 60%	435 435	4,360 4,360	7,850 7,850	NO NO	392.5 392.5	6% 6%	YES YES	NO NO
Seawell Road - North of Site Seawell School Road to Rogers Road Rogers Road to Seawell School Road	2L	Urban	WB EB	7,400	7,851	1	0.5 0.5	3,925 3,925	75% 0%	0% 75%	544 544	4,469 4,469	7,850 7,850	NO NO	392.5 392.5	7% 7%	YES YES	NO NO
Rogers Road - North of Site Rogers Road to High School Road High School Road to Rogers Road	2L	Urban	SB NB	7,400	7,851	1	0.5 0.5	3,925 3,925	80% 0%	0% 80%	725 725	4,650 4,650	7,850 7,850	NO NO	392.5 392.5	9% 9%	YES YES	NO NO
High School Road - North of Site High School Road to Site Site to High School Road	2L	Urban	SB NB	7,400	7,851	1	0.5 0.5	3,925 3,925	65% 0%	0% 65%	906 906	4,832 4,832	7,850 7,850	NO NO	392.5 392.5	12% 12%	YES YES	NO NO
Stratford Drive - West of Site Site to Stratford Drive Stratford Drive to Site	2L	Urban	WB EB	7,400	7,851	1	0.5 0.5	3,925 3,925	0% 35%	35% 0%	488 488	4,413 4,413	7,850 7,850	NO NO	392.5 392.5	6% 6%	YES YES	NO NO
Lake Hogan Farm Road - West of Site Stratford Drive to Lake Hogan Farm Road Lake Hogan Farm Road to Stratford Drive	2L	Urban	WB EB	7,400	7,851	1	0.5 0.5	3,925 3,925	0% 98%	98% 0%	478 478	4,404 4,404	7,850 7,850	NO NO	392.5 392.5	6% 6%	YES YES	NO NO
Old NC 86 - West of Site Lake Hogan Farm Road to Old NC 86 Old NC 86 to Lake Hogan Farm Road	2L	Urban	WB EB	7,400	7,851	1	0.5 0.5	3,925 3,925	0% 96%	96% 0%	459 459	4,385 4,385	7,850 7,850	NO NO	392.5 392.5	6% 6%	YES YES	NO NO
West of Old NC 86 Old NC 86 to the West From the West to Old NC 86	2L	Urban	WB EB	7,400	7,851	1	0.5 0.5	3,925 3,925	0% 25%	25% 0%	115 115	4,040 4,040	7,850 7,850	NO NO	392.5 392.5	1% 1%	NO NO	NO NO

¹ 2003 (5-14-03) Homestead Road traffic count; Town of Carrboro

² Adversity Test: Will project trips + background trips exceed maximum service volume?

³ Daily service volume for a two-lane roadway = 15,700 vehicles per day (7,850 vehicles per day per lane) [Calculated by HighPlan software, based on HCM 2000]

⁴ Significance test: Will project trips exceed 5% of the maximum roadway service volume?

Table 2A: PM Peak Hour Trips/Generation (Phase I: 2003 - 2005)
Winmore (Carrboro, NC)

Hall Planning & Engineering, Inc.
May 16, 2003

The proposed
development generates

282 Total pm peak hour trips.
176 Entering Trips
106 Exiting Trips

Trip Producers	Units	PM Peak Hr Trips Rate ¹	PM Peak Hour Trips Equation ¹	Calculated Trips by Rate	Calculated Trips by Equation	PM Peak Hr Trips Used in Analysis ²	Base Trip Generation	Internal Capture	Adjusted Trips	Pass-by Capture	Net New Trips
Single-Family Homes	97	1.01	$\ln(T)=0.901 \ln(X) + 0.527$	98	104	104	Entering 84% Exiting 16%	10%	61	0%	61
ITE Code 210	Dwelling Units	/du									
Townhouses (Residential Condo/Townhouse)	86	0.54	$\ln(T)=0.827 \ln(X) + 0.309$	46	54	54	Entering 36% Exiting 64%	10%	34	0%	34
ITE Code 230	Dwelling Units	/du									
Condominiums (Residential Condo/Townhouse)	0	0.54	$\ln(T)=0.827 \ln(X) + 0.309$	0		0	Entering 33% Exiting 67%	10%	16	0%	16
ITE Code 230	Dwelling Units	/du									
Co-op Apartments (Apartment)	24	0.62	$T=0.541(X) + 18.743$	15	32	32	Entering 33% Exiting 67%	10%	19	0%	19
ITE Code 220	Dwelling Units	/du									
Apartments (Apartment)	24	0.62	$T=0.541(X) + 18.743$	15	32	32	Entering 33% Exiting 67%	10%	19	0%	19
ITE Code 220	Dwelling Units	/du									
Garage Apartments (Apartment)	69	0.62	$T=0.541(X) + 18.743$	43	56	56	Entering 33% Exiting 67%	10%	34	0%	34
ITE Code 220	Dwelling Units	/du									
Total Dwelling Units - This Phase											
	300						Entering 183 Exiting 95	10%	166	0%	166
							Total 278		252		252

Producers
Internal Capture Summary
Entering 17
Exiting 9
Captured 26
10%
(average internal capture)

Trip Attractors	Units	PM Peak Hr Trips Rate ¹	PM Peak Hour Trips Equation ¹	Calculated Trips by Rate	Calculated Trips by Equation	PM Peak Hr Trips Used in Analysis ²	Base Trip Generation	Internal Capture	Adjusted Trips	Pass-by Capture	Net New Trips
Post Office	765	10.79	N/A	8	N/A	8	Entering 51% Exiting 49%	40%	2	0%	2
ITE Code 732	ft ²	/1000ft ²									
Recreation Community Center	10,000	1.75	N/A	18	N/A	18	Entering 34% Exiting 66%	84%	2	0%	2
ITE Code 495	ft ²	/1000ft ²									
Sales Office (General Office Building)	1,238	1.49	$T=1.121(X) + 79.295$	2	N/A	2	Entering 17% Exiting 83%	20%	0	0%	0
ITE Code 710	ft ²	/1000ft ²									
General Office (General Office Building)	7,100	1.49	$T=1.121(X) + 79.295$	11	N/A	11	Entering 17% Exiting 83%	20%	1	0%	1
ITE Code 710	ft ²	/1000ft ²									
TND Retail (Specialty Retail)	7,105	2.59	N/A	18	N/A	18	Entering 43% Exiting 57%	20%	7	0%	7
ITE Code 814	ft ²	/1000ft ²									
Total											
							Entering 36 Exiting 57		31		31

¹ Rates and equations are from Trip Generation (ITE, 6th edition, 1987).
trips generated are estimated for the peak hour of adjacent street traffic,
one hour between 4 and 6 p.m.

² Due to greater accuracy, equation-generated trips are used when available. The one exception is "general office" use.
In this case, the equation is not appropriate for small office buildings.

Note: Discrepancies, if any, are due to rounding.

Attractors
Internal Capture Summary
Entering 10
Exiting 16
Captured 26
46%
(average internal capture)

Overall Internal Capture
16%

Table 2B: PM Peak Hour Trips/Distribution (Phase I: 2003 - 2005)

Winmore (Carrboro, NC)

Hall Planning & Engineering, Inc.

May 16, 2003

New Project Trips 282
Entering Trips 176
Exiting Trips 106

	No. Lanes	LOS Area Type	Dir	Background Traffic: 2001 ¹	Background Traffic: 2005 (3%/yr)	% of New Entering Trips	% of New Exiting Trips	New Project trips	Total PM Peak Hour Trips	Adversity Test ²			Significance Test ⁴		Significant & Adverse Impact?
										Service Volume @ Standard ³	Adverse?	5% of Service Volume	% of Project @ Max. Service Volume	Significant?	
<u>Homestead Road</u>															
<u>East of Seawell School Road</u>															
From the East to Seawell School Road	2L	Urban	WB	474	533	60%	0%	54	588	800	NO	40	7%	YES	NO
Seawell School Road to the East			EB	337	379	0%	60%	33	412	800	NO	40	4%	NO	NO
<u>Seawell Road - North of Site</u>															
Seawell School Road to Rogers Road	2L	Urban	WB	474	533	75%	0%	85	618	800	NO	40	11%	YES	NO
Rogers Road to Seawell School Road			EB	217	244	0%	75%	51	295	800	NO	40	6%	YES	NO
<u>Rogers Road - North of Site</u>															
Rogers Road to High School Road	2L	Urban	SB	369	415	80%	0%	90	506	800	NO	40	11%	YES	NO
High School Road to Rogers Road			NB	197	222	0%	80%	54	276	800	NO	40	7%	YES	NO
<u>High School Road - North of Site</u>															
High School Road to Site	2L	Urban	SB	343	386	64%	0%	113	499	800	NO	40	14%	YES	NO
Site to High School Road			NB	208	234	0%	64%	68	302	800	NO	40	8%	YES	NO
<u>Stratford Drive - West of Site</u>															
Site to Stratford Drive	2L	Urban	WB	343	386	0%	36%	38	424	800	NO	40	5%	NO	NO
Stratford Drive to Site			EB	208	234	36%	0%	64	298	800	NO	40	8%	YES	NO
<u>Lake Hogan Farm Road - West of Site</u>															
Stratford Drive to Lake Hogan Farm Road	2L	Urban	WB	320	360	0%	98%	37	398	800	NO	40	5%	NO	NO
Lake Hogan Farm Road to Stratford Drive			EB	189	213	98%	0%	62	275	800	NO	40	8%	YES	NO
<u>Old NC 86 - West of Site</u>															
Lake Hogan Farm Road to Old NC 86	2L	Urban	WB	299	337	0%	96%	36	372	800	NO	40	4%	NO	NO
Old NC 86 to Lake Hogan Farm Road			EB	174	196	96%	0%	60	256	800	NO	40	7%	YES	NO
<u>West of Old NC 86</u>															
Old NC 86 to the West	2L	Urban	WB	324	365	0%	25%	9	374	800	NO	40	1%	NO	NO
From the West to Old NC 86			EB	165	186	25%	0%	15	201	800	NO	40	2%	NO	NO

¹ Hall Planning & Engineering intersection counts: December 13, 2001; Seawell Road intersection counts by Greater Traffic Company: November 7, 2001

² Adversity Test: Will project trips + background trips exceed maximum service volume?

³ Peak Hour service volume for a two-lane roadway = 800 vehicles per hour per lane [Calculated by HighPlan Software, based on HCM 2000]

⁴ Significance test: Will project trips exceed 5% of the maximum roadway service volume?

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Table 3A: AM Peak Hour Trips/Generation (Phase I: 2003 - 2005)
Winmore (Carrboro, NC)

Hall Planning & Engineering, Inc.
May 16, 2003

The proposed
development generates

192 Total am peak hour trips.
49 Entering Trips
143 Exiting Trips

Trip Producers	Units	AM Peak Hr Trips Rate ¹	AM Peak Hour Trips Equation ¹	Calculated Trips by Rate	Calculated Trips by Equation	AM Peak Hr Trips Used in Analysis ²	Base Trip Generation		Internal Capture	Adjusted Trips	Pass-by Capture	Net New Trips		
Single-Family Homes	97	0.75	$T=0.700(X) + 9.477$	73	77	77	Entering	25%	19	10%	18	0%	18	
	Dwelling Units	/du					Exiting	75%	58	10%	53	0%	53	
	Townhouses (Residential Condo/Townhouse)	86	0.44	$\ln(T)=0.790 \ln(X) + 0.298$	38	45	45	Entering	17%	8	10%	7	0%	7
		Dwelling Units	/du					Exiting	83%	38	10%	34	0%	34
	Condominiums (Residential Condo/Townhouse)	0	0.44	$\ln(T)=0.790 \ln(X) + 0.298$	0	0	0	Entering	17%	0	10%	0	0%	0
		Dwelling Units	/du					Exiting	83%	0	10%	0	0%	0
	Co-Op Apartments (Apartment)	24	0.51	$T=0.497(X) + 3.238$	12	15	15	Entering	16%	2	10%	2	0%	2
		Dwelling Units	/du					Exiting	84%	13	10%	12	0%	12
	Apartments (Apartment)	24	0.51	$T=0.497(X) + 3.238$	12	15	15	Entering	16%	2	10%	2	0%	2
		Dwelling Units	/du					Exiting	84%	13	10%	12	0%	12
Garage Apartments (Apartment)	69	0.51	$T=0.497(X) + 3.238$	35	38	38	Entering	16%	6	10%	5	0%	5	
	Dwelling Units	/du					Exiting	84%	32	10%	29	0%	29	
Total Dwelling Units - This Phase							Entering	153	138	34	0%	34		
							Exiting	191	173	0%	0%	0%	0%	
							Total	191	173	0%	0%	0%	0%	

Producers
Internal Capture Summary
Entering 4
Exiting 15
Captured 18
10%
(average internal capture)

(average internal capture)												
Trip Attractors		Units	AM Peak Hr Trips Rate ¹	AM Peak Hour Trips Equation ¹	Calculated Trips by Rate	Calculated Trips by Equation	AM Peak Hr Trips Used in Analysis ²	Base Trip Generation			Net New Trips	
								Entering	Internal Capture	Adjusted Trips	Pass-by Capture	
Post Office	ITE Code 732	765	8.02 /1000ft ²	N/A	6	N/A	6	Entering 52% Exiting 48%	3	60%	1	0%
Recreation Community Center	ITE Code 495	10,000	1.32 /1000ft ²	N/A	13	N/A	13	Entering 66% Exiting 34%	9	84%	1	0%
Sales Office (General Office Building)	ITE Code 710	1,238	1.56 /1000ft ²	$\ln(T)=0.797 \ln(X) + 1.558$	2	N/A	2	Entering 88% Exiting 12%	2	20%	1	0%
General Office (General Office Building)	ITE Code 710	7,100	1.56 /1000ft ²	$\ln(T)=0.797 \ln(X) + 1.558$	11	N/A	11	Entering 88% Exiting 12%	10	20%	8	0%
TND Retail (Specialty Retail) ³	ITE Code 814	7,105	0.71 /1000ft ²	N/A	5	N/A	5	Entering 61% Exiting 39%	3	20%	2	0%
								Entering 26 Exiting 11	2	20%	2	0%
								Entering 14 Exiting 5	14	5	5	19
								Total	37	19		19

Notes:

Notes:

¹ Rates and equations from Trip Generation (ITE, 6th Edition, 1997)

² Trips generated are estimated for the peak hour of adjacent street traffic, one hour between 7 and 9 a.m.

³ Due to greater accuracy, equation-generated trips are used when available. The one exception is "general office" use. In this case, the equation is not appropriate for small office buildings.

AM peak hour rate not available. Used shopping center ratio of PM to AM peak ratio is 27.5% of PM peak ratio)

Note: Discrepancies, if any, are due to rounding.

Attractors
Internal Capture Summary
Entering 12
Exiting 6
Captured 18
49%
(average internal capture)

Overall Internal Capture
16%

Table 3B: AM Peak Hour Trips/Distribution (Phase I: 2003 - 2005)

Winmore (Carrboro, NC)

Hall Planning & Engineering, Inc.

May 16, 2003

New Project Trips 192
 Entering Trips 49
 Exiting Trips 143

	No. Lanes	LOS Area Type	Dir	Background Traffic: 2001 ¹	Background Traffic: 2005 (3%/yr)	% of New Entering Trips	% of New Exiting Trips	New Project trips	Total PM Peak Hour Trips	Adversity Test ²			Significance Test ⁴			Significant & Adverse Impact?
										Service Volume @ Standard ³	Adverse?	5% of Service Volume	Project @ Max. Service Volume	Significant?		
<u>Homestead Road</u>																
<u>East of Seawell School Road</u>	2L	Urban	WB EB	417 588	469 662	45% 0%	0% 45%	9 27	479 689	800 800	NO NO	40 40	1% 3%	NO NO	NO NO	
<u>Seawell Road - North of Site</u>	2L	Urban	WB EB	417 421	469 474	60% 0%	0% 60%	19 56	488 530	800 800	NO NO	40 40	2% 7%	NO YES	NO NO	
<u>Rogers Road - North of Site</u>	2L	Urban	SB NB	184 332	207 374	65% 0%	0% 65%	21 60	228 434	800 800	NO NO	40 40	3% 8%	NO YES	NO NO	
<u>High School Road - North of Site</u>	2L	Urban	SB NB	175 546	197 615	65% 0%	0% 65%	32 93	229 707	800 800	NO NO	40 40	4% 12%	NO YES	NO NO	
<u>Stratford Drive - West of Site</u>	2L	Urban	WB EB	175 546	197 615	0% 35%	35% 0%	50 17	247 632	800 800	NO NO	40 40	6% 2%	YES NO	NO NO	
<u>Lake Hogan Farm Road - West of Site</u>	2L	Urban	WB EB	190 473	214 532	0% 98%	98% 0%	49 17	263 549	800 800	NO NO	40 40	6% 2%	YES NO	NO NO	
<u>Old NC 86 - West of Site</u>	2L	Urban	WB EB	232 332	261 374	0% 96%	96% 0%	47 16	308 390	800 800	NO NO	40 40	6% 2%	YES NO	NO NO	
<u>West of Old NC 86</u>	2L	Urban	WB EB	144 382	162 430	0% 25%	25% 0%	12 4	174 434	800 800	NO NO	40 40	1% 0%	NO NO	NO NO	

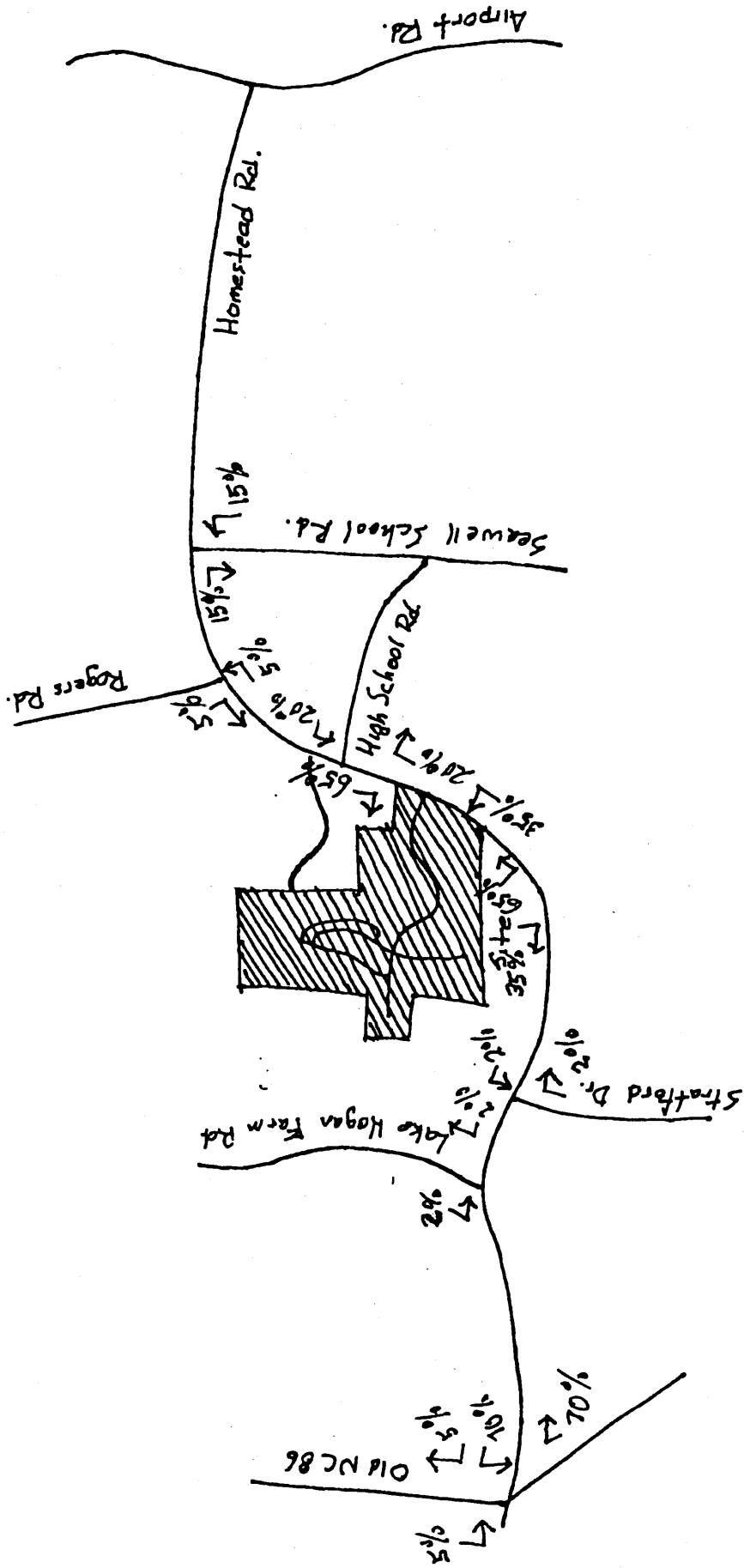
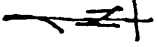
¹ Hall Planning & Engineering intersection counts: December 13, 2001; Seawell Road intersection counts by Greater Traffic Company: November 7, 2001

² Adversity Test: Will project trips + background trips exceed maximum service volume?

³ Peak Hour service volume for a two-lane roadway = 800 vehicles per hour per lane [Calculated by HighPlan Software, based on HCM 2000]

⁴ Significance test: Will project trips exceed 5% of the maximum roadway service volume?

Winmore Weekday Distribution 5.13.03



SHARED PARKING

AT

WINMORE

Introduction:

Under Section 15-297 of the Carrboro Land Use Ordinance, Joint Use of Required Parking Spaces, paragraph (b):

"To the extent that developments that wish to make joint use of the same parking spaces operate at different times, the same spaces may be credited to both uses. For example, if a parking lot is used in connection with an office building on Monday through Friday but is generally 90% vacant on weekends, another development that operates only on weekends could be credited with 90% of the spaces on that lot. Or, if a church parking lot is generally occupied only to 50% of capacity on days other than Sunday, another development could make use of 50% of the church lot's spaces on those other days."

Winmore wishes to make joint use of parking spaces to reflect the different times for demand by commercial and residential users.

To determine how much sharing can take place, we have utilized formulas for determining shared parking set forth in the Transect Codeware Company Smart Code, V5.0 by Duany Plater-Zyberk & Co. published by the Municipal Code Corp., P.O. Box 2235, Tallahassee, Florida 32316.

The procedure is stated in Article 5. Building Plans, Section 5.3.3b and 5.3.3c as follows: "The Functions specified in Section 6.4 [Residential, Lodging, Office, Retail, Civic, and Other] shall be limited in intensity by the required parking (Section 6.5.1). This shall constitute the base intensity".... "The base intensity may be adjusted upward by adding the actual parking available for each of two functions within any pair of adjacent blocks, and the resulting sum multiplied by the corresponding Sharing Factor (Section 6.5). The result shall be the effective parking available for calculating the adjusted intensity.

Keep in mind that the required parking in Section 5.1 of the Smart Code is not utilized in the *Winmore* Calculations. Instead, *Winmore* utilizes the required parking as set forth in the Carrboro Land Use Ordinance, adjusted, as permitted by the LUO, to account for shared parking. However, because *Winmore* is a Village Mixed Use Development consistent with the type of development envisioned by the Smart Code, we believe it is appropriate to use the Smart Code shared parking methodology. Therefore, the total number of parking spaces on the *Winmore* site plan was counted and then adjusted upward using the Smart Code Sharing Factor.

The Smart Code Sharing Factors are: Residential + Lodging, 1.1; Residential + Office, 1.7; Residential+Retail, 1.2; Lodging+Office, 1.2; Lodging+Retail, 1.3; Office+Retail, 1.2.

The Smart Code Sharing Factors are based on research published in four studies:

Thomas P. Smith, *Flexible Parking Requirements* , PAS Report 377, American Planning Association (Chicago; www.planning.org) 1983.

Barton-Aschman Associates, *Shared Parking* , Urban Land Institute (www.uli.org), 1982.

K.T. Analytics, Inc., *Parking Management Strategies: A Handbook For Implementation* , Regional Transportation Authority (Chicago), 1995.

ITE, *Shared Parking Planning Guidelines* , Institute of Transportation Engineers (www.ite.org), 1995.

A good review and analysis of contemporary shared parking methodology is found in the publication *Sharing Parking Facilities Among Multiple Users*, from the TDM Encyclopedia of the Victoria Transport Policy Institute, November 18, 2002. www.vtpi.org 1250 Rudlin Street, Victoria, BC, V8V 3R7, Canada Phone & Fax 250-360-1560 The following extracts are quoted verbatim from this publication:

Description

Shared Parking means that parking spaces are shared by more than one user, which allows parking facilities to be used more efficiently. It is a type of Parking Management. Shared Parking takes advantage of the fact that most parking spaces are only used part time by a particular motorist or group, and many parking facilities have a significant portion of unused spaces, with utilization patterns that follow predictable daily, weekly and annual cycles.

There are various degrees of shared parking. A parking space assigned to a specific user is not shared at all. On-street parking spaces located in a busy, mixed use urban area tends to be the most shared. In between are parking spaces that are shared among various employees at a particular worksite, parking that is shared by customers at a variety of businesses located in a mall, or arrangements by one facility to use another facilities parking at certain times, such as a tavern that allows its parking spaces to be used on Sunday mornings by attendees at a nearby church. An assigned employee parking space is typically used about 2,000 hours per year, while an on-street parking space in a busy area often gets three times as much use. Efficient sharing of spaces can allow parking requirements to be reduced significantly.

Specific ways of sharing parking are described below.

[1.] *Zoned Rather Than Assigned Spaces*

Parking can be shared among a group of employees or residents, rather than assigned to individuals. For example, 100 employees or residents can usually share 60-80 parking spaces without problem, since not all employees will drive to work at one time.

This strategy complements other TDM strategies that encourage people to reduce their vehicle ownership and use, such as *Commute Trip Reduction* and *Location Efficient Development*. This type of sharing can be a consumer option. For example, motorists could be offered an assigned space for \$100 per month, or a shared space for \$60 per month. This allows individuals to decide whether they are willing to pay extra for an assigned space, or capture the savings that result from shared parking.

[2.] *Share Parking Between Sites*

Parking can be shared among different buildings and facilities in an area to take advantage of different peak periods (see Table 1). For example, an office complex can efficiently share parking facilities with a restaurant or theaters, since offices require maximum parking during weekdays, while restaurants and theaters require maximum parking during evenings and weekends. As a result, the total amount of parking can be reduced 40-60% compared with standard off-street parking requirements for each destination (Smith, 1983). Barton-Aschman Associates (1982) and ITE (1995) provide specific recommendations for shared parking implementation.

<i>Table 1</i>		
Peak Parking Demand		
Weekday Peaks	Evening Peaks	Weekend Peaks
Banks	Auditoriums	Religious institutions
Schools	Bars and dance halls	Parks
Distribution facilities	Meeting halls	Shops and malls
Factories	Restaurants	
Medical clinics	Theaters	
Offices		
Professional services		
Factories		

This table indicates peak parking demand for different land use types. Parking can

be shared efficiently by land uses with different peaks.

[3.] *Public Parking/In Lieu Fees*

Parking can be shared by relying on public parking facilities rather than having each building provide private off-street parking, since each public space can serve many users and destinations. As a result, 100 public parking spaces can be equivalent to 150 to 250 private parking spaces. Developers or building owners can be allowed or required to pay in-lieu fees that fund public parking facilities as an alternative to minimum requirements for private off-street parking (Shoup, 1999b). On-street parking tends to be the best type of public parking facility for sharing, since it is visible and convenient. It is therefore helpful to manage on-street parking for maximum use, particularly in busy commercial centers.

Geographic Considerations

Shared Parking is limited by the proximity of destinations that share a parking facility. Exactly how close they must be depends on the type of land use and the type of user. Table 2 summarizes acceptable walking distances for various types of activities. Acceptable walking distance is also affected by the quality of the pedestrian environment, climate, line of site (longer distances are acceptable if people can see their destination), and "friction" (barriers along the way, such as crossing busy traffic).

<i>Table 2</i>			
Acceptable Walking Distances (Parking Evaluation)			
Adjacent (Less than 100 ft.)	Short (less than 800 ft)	Medium (less than 1,200 ft)	Long (less than 1,600 ft.)
People with disabilities	Grocery stores	General retail	Religious institution
Deliveries and loading	Professional services	Restaurant	Airport parking
Emergency services	Medical clinics	Employees	Major sport or cultural event
Convenience store	Residents	Entertainment center	Overflow parking

This table indicates maximum acceptable walking distance from parking to destinations for various activities and users. It assumes good pedestrian conditions (sidewalks, crosswalks, level terrain) that are outdoors and uncovered, with a mild climate.

In general, the potential for sharing parking is greatest in areas where land use

activities are Clustered, and the benefits from sharing parking are greatest where parking costs are highest. Priorities for sharing parking are listed below.

1. *On-street parking on commercial streets.* These are the most convenient parking spaces and so should be managed for maximum turnover to serve short stops (shopping and other errands), by limiting time or applying short-term pricing. This usually means limits of less than 2 hours.
2. *Off-street public parking facilities and on-street parking outside the commercial streets.* These are less convenient parking spaces and so should be managed for longer stops, including parking by employees, long-term visitors and residents.
3. *Off-street private parking facilities.* These are often the most convenient parking spaces for a particular site, but may also be convenient for other nearby users. They tend to be used to serve other nearby facilities with different peaks. For example, since a bar has peak demand during Saturday night and a church has peak demand during Sunday morning, they can efficiently share parking if located near to each other (usually within a block or so).

The concept of Shared Parking is well known, but it is often discouraged by current planning practices. Conventional planning often reflects an assumption that communities want the greatest possible supply of parking provided at the lowest possible price. Standards used in most communities require each building or facility include a minimum amount of off-street parking supply, based on studies of peak-period demand. Transportation professionals and public officials often prefer generous, simple and consistent minimum parking standards because they are easy to administrate and minimize spillover problems. All of these factors contribute to inefficient use of parking resources: many parking lots are seldom or never full, even during peak periods, and most parking spaces are unused most of the time.

These practices are well established, but are beginning to change, particularly in growing urban communities. Increasingly, communities have objectives to encourage infill development, use of alternative modes and reduce the portion of land that is paved.

How it is Implemented

Shared Parking is usually implemented by municipal government policy to allow and encourage it, with sharing arrangements actually made between individual facility developers and managers. It may require changes to zoning codes (see below), and development of appropriate standards and practices that local transportation planners can use to evaluate, manage and enforce shared parking arrangements. It can be encouraged by establishing parking sharing brokerage services to match potential sharing partners, which can be provided by a

Transportation Management Association or local government agency.

Shared parking can also be implemented by providing public parking as a substitute for private parking. This can be done by:

- Providing a maximum amount of on-street parking in an area.
- Providing public off-street parking.
- Managing public parking facilities so the most convenient spaces are available to priority uses (such as customers).
- Addressing barriers, such as inadequate walkways that limit use of public parking.
- Encouraging more Clustered development.
- Allowing or requiring in lieu fees instead of private off-street parking.

Model Shared Parking Code

Below is an example of wording to allow shared parking in municipal parking ordinances.

Introduction

Cumulative parking requirements for mixed-use occupancies or shared facilities may be reduced where it can be determined that the peak requirements of the several occupancies occur at different times (either daily or seasonally). The submittal requirements for a parking reduction request vary according to the method used to determine the parking reduction. The reduction methods and accompanying submittal requirements are outlined in this section. In all cases, a shared parking operations plan must be prepared to the satisfaction of the Department of Planning showing that parking spaces most conveniently serve the land uses intended, directional signage is provided if appropriate, and pedestrian links are direct and clear. On-street parking spaces wholly adjacent to the property may be included in the required minimum.

Three methods for determining a parking reduction are as follows:

A. Intermittent or Seasonal Nonconflicting Uses

(1.) When required parking reductions are predicted as a result of sharing between intermittent or seasonal uses with nonconflicting parking demands (e.g. a church and a bank), then the reduction can be considered for approval by the Planning Commission without demand calculations or a parking study. Individual

spaces identified on a site plan for shared users shall not be shared by more than one user at the same time.

(2.) If a privately owned parking facility is to serve two or more separate properties, then a "Shared Parking Agreement" shall be filed with the City of Fayetteville for consideration by the Planning Commission. ...

B. Parking Occupancy Rate Table

(Note: The default rates from the Table 3, Parking Occupancy Rates are set to include a small "safety margin" of parking beyond that minimally needed to serve an average peak demand. Therefore a local study of parking demand may yield a greater reduction in parking required.)

Table 3 Parking Occupancy Rates

Uses	M-F 8am-5pm	M-F 6pm-12am	M-F 12am-6am	Sat. & Sun. 6pm-12am	Sat. & Sun. 12am-6am	Sat. & Sun. Residential
Residential	60%	100%	100%	80%	100%	100%
Office/ Warehouse /Industrial	100%	20%	5%	5%	5%	5%
Commercial	90%	80%	5%	100%	70%	5%
Hotel	70%	100%	100%	70%	100%	100%
Restaurant	70%	100%	10%	70%	100%	20%
Movie Theater	40%	80%	10%	80%	100%	10%
Entertainment	40%	100%	10%	80%	100%	50%
Conference/ Convention	100%	100%	5%	100%	100%	5%
Institutional (non-church)	100%	20%	5%	10%	10%	5%
Institutional (church)	10%	5%	5%	100%	50%	5%

This table defines the percent of the basic minimum needed during each time period for shared parking.

.... Proximity and convenience factors. The following factors may influence the Planning Commission's approval of the parking reduction figures:

- Distance between sharing uses and the parking facility
- Pedestrian connections among sharing uses and the parking facility
- Vehicular connections
- Whether parking will be paid
- Location--proximity to the CBD and general development density.
- Proximity to major transit corridors or stations.
- Special trip reduction programs, such as subsidized vanpooling, transit,

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- shuttle or telecommuting
- Need for any reserved parking spaces. (Parking spaces to be shared cannot be reserved for specific uses or individuals except during off-peak hours.) ...

... Off-Site Locations. If off-street parking cannot be provided on the same lot as the principal use due to existing buildings or the shape of the parcel, parking lots may be located on other property not more than 600 feet distant from the principal use. ... Parking spaces serving residential units must be located within 300 feet of the dwelling unit entrances they will serve whether they are off or on the site. Clear, safe pedestrian connections must be provided, requiring no crossing of an arterial street except at a signalized intersection along the pedestrian pathway.

Maximum Number Allowed

Parking lots may contain up to 20% more spaces than the required minimum. Any additional spaces above 20% shall be allowed only as a conditional use and shall be granted in accordance with City zoning governing applications of conditional uses; procedures, and upon the finding that additional spaces are needed.

Travel Impacts

Shared Parking does not directly reduce vehicle travel if it substitutes for increased parking supply. To the degree that it increases the available supply of parking and reduces parking prices it can encourage automobile travel. To the degree that Shared Parking allows more Clustered Development it can encourage use of alternative modes.

Benefits And Costs

Shared Parking can reduce parking facility costs (including aesthetic and environmental impacts), allows greater flexibility in facility location and site design, and encourage more efficient land use. Costs include reduced motorist convenience and prestige, and increased automobile travel if it increases total parking supply. ...

Benefit Summary

Objective	Rating	Comments
-----------	--------	----------

Congestion Reduction	0	Depends on parking cost and land use impacts.
Road & Parking Savings	3	Can provide significant parking facility savings.
Consumer Savings	2	Can provide savings to consumers.
Transport Choice	0	Depends on parking cost and land use impacts.
Road Safety	0	Depends on parking cost and land use impacts.
Environmental Protection	2	Reduces paved area.
Efficient Land Use	2	Allows more clustered land use.
Community Livability	2	Allows more clustered land use.

Rating from 3 (very beneficial) to -3 (very harmful). A 0 indicates no impact or mixed impacts.

Equity Impacts

The Equity impacts of Shared Parking depend on how it is implemented and what is assumed to be the alternative. If Shared Parking reduces total parking costs it can increase horizontal equity by reducing cross subsidies from non-drivers to drivers. If it provides savings that are passed on to lower-income people it can be progressive. If it helps create more Accessible land use it can benefit people who are transportation disadvantaged and improve basic mobility.

On the other hand, zoning codes may be considered most equitable if they are applied consistently. Flexible standards, which are required for Shared Parking, may be considered unfair to competitors, and may create spillover problems if they fail (for example, if employees parking on residential streets rather than using a parking lot several blocks away as arranged by their employer).

Applications

Shared Parking can be applied in many situations. It is particularly appropriate where:

- A specific parking problem exists.
- Land values and parking facility costs are high.
- Clustered development is desired.
- Traffic congestion or vehicle pollution are significant problems.
- Excessive pavement is undesirable.

Relationships With Other TDM Strategies

Shared Parking is a type of Parking Management and a Parking Solution. It is often implemented as part of TDM, Commute Trip Reduction, Transportation Management Associations and Campus Trip Reduction programs. It supports and is supported by Pedestrian and Cycling Improvements, Transit Improvements,

Smart Growth, New Urbanism, Clustering and Transportation Pricing Reforms. It is important for Location Efficient Development.

Stakeholders

Shared Parking is primarily implemented by local government policies and agencies, and by individual developers and businesses. Implementation often involves changing current planning, enforcement and design practices, sometimes with the support of professional organizations. Transportation Management Associations can provide parking facility brokerage services (for example, maintaining a system to match businesses that can share parking facilities).

Barriers to Implementation

Shared Parking require overcoming the traditional assumption that society benefits from a maximum supply of free or low-priced parking, and the resistance from land use and transportation planning institutions that are accustomed to inflexible minimum parking standards. Some public officials consider Shared Parking difficult to administrate (since it requires flexible parking standards, verification and enforcement), unfair (since some developers benefit more than others), and risky (since they could create spillover problems. Users accustomed to assigned spaces may object to this practice. There may be inadequate capacity during unusual peak demand periods.

Best Practices

Best practices for Shared Parking are described in various reports listed below. They include:

- Establish standard procedures for implementing Shared Parking which specify how to calculate minimum parking requirements for different combinations of land uses, acceptable walking distances, requirements for sharing agreements, verification and enforcement.
- Educate planning officials and developers as the potential for Shared Parking and procedures for implementing it.
- Provide a maximum amount of on-street parking, and public off-street parking as a substitute for private off-street parking. Encourage use of in lieu fees to substitute for private off-street parking.
- Use Transportation Management Associations or local planning agencies to provide Shared Parking matching and brokerage services.
- Insure that there is good pedestrian access and appropriate signage for users concerning Shared Parking.

- Perform regular parking studies and feedback from users to identify problems with Shared Parking.
- Anticipate potential spillover problems, and respond with appropriate regulations and enforcement programs.

Examples and Case Studies

Shared Parking at Portland Transit Stations

The Tri-Met (Portland area) Park & Ride Policy encourages Shared Parking near transit stations as an efficient and cost effective way to provide parking while minimizing the amount of land devoted to parking facilities. Park & Ride lots are shared with apartment complexes, a regional justice center, churches and movie theaters at more than three dozen sites. With some Transit Oriented Development projects, Tri-Met allows the total supply of off-street parking to decline. For example, if a Park & Ride facility is replaced by a new Transit Oriented Development of at least 30 residential units per acre, at least 75 employees per acre, or other comparable high-density development (Tri-Met, 2001).

City of Monrovia Downtown Parking Management

By Dick Singer, City of Monrovia Public Information Officer

It seemed a risk worth taking - locating a 12-screen, 2,400-seat movie theater in the middle of Monrovia's Old Town without providing the usual adjacent parking structure.

It made sense. Monrovia's Old Town business district is compact (six blocks long and two wide) and abutted by residential neighborhoods on three sides. Medium and high-density housing (mainly senior citizen) had been developed immediately adjacent to the commercial properties. Both MTA and Foothill Transit buses provide service to the edges of Old Town and Monrovia has an active dial-a-ride service providing door-to-door public transportation.

Old Town was redeveloped in the 1970s as a pedestrian-friendly "main street" shopping and service district. Free public parking lots and street parking combined to provide more than 1,200 spaces scattered throughout the district that were never more than 80% filled. For several years, a Friday night Family Festival street fair - running weekly from March through to Christmas - drew as many as 8,000 people on a typical summer night with very little overflow parking into residential neighborhoods. Additionally, most of the businesses using public parking for their employees closed at 5 p.m. and few stores stayed open past 7 p.m., meaning that a shared parking plan seemed feasible - daytime use for office workers and nighttime use for theater goers.

The theater was to go up on one of the public parking lots, so those spaces had to be replaced, and were by the expansion of another City-owned lot and the re-configuration of a sidestreet adjacent to both that lot and the theater site. When the theater opened, there were more spaces than before the project began. In its first six months of operation, the theater has attracted good crowds and the parking has yet to be a problem. Lot and street parking is sufficient to handle the demand and convenient enough so movie-goers will happily walk two-to-three blocks between their cars and the theater to stroll past shops and restaurants.

The shared-parking plan has worked well in the project's early stages. The second phase of our plan is now about to begin. Theater crowds are drawing a new business mix to the district (as planned) and we are aware that more nighttime business use will develop over the next year. An assessment district is now in the works to finance more Old Town parking - either a structure or an additional street-level lot - to handle the expected increase.

Wit and Humor

Bars and churches are an ideal combination to share parking. Bars have their peak demand Saturday nights and churches have peak demand Sunday mornings. Bar patrons who stay late can simply leave their cars in the parking lot and walk to church early the next morning to pray for forgiveness.

References And Resources For More Information

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ATTACHMENT "J"

WINMORE
Winmore Land Management, LLC

March 18, 2003

Mr. Marty Roupe
Development Review Administrator
Town of Carrboro
Carrboro, NC 27510

Dear Marty:

This is to follow up on our recent conversation on protecting trees. As you pointed out, at many developments some trees that could be retained are being cut down and removed — largely because a certain tree may not be legally-required to be saved and a developer or builder concludes that the requirements of protecting such trees are prohibitive. For example, there may be trees that would very likely survive being close to a greenway trail or a street or a building, but full drip-line protection would prevent the trail or street or building from being built.

You requested that we develop a policy for protecting these trees as well, and we are delighted to do so. Fortunately, I have just had experience with exactly the same situation at the *Trinity Heights* project in Durham. I have attached a statement outlining our experience there. In view of this experience, we committed to saving as many trees as possible at *Winmore*, even if they are not trees that are legally required to be saved and even if we cannot provide protection that would meet the full protection standards. We will do this in two ways: First we have appointed a Cheryl Sweeney, a veteran landscaper, as *Winmore* Tree Protection Coordinator. Cheryl has received a certificate from the National Arbor Day Federation "Building with Trees" program. All builders and subcontractors at *Winmore* will be required to attend a half-day Building with Trees seminar before they are allowed on the *Winmore* site.

Second, we will implement a *Winmore* Adopt-a-Tree program for all trees that could conceivably be saved, even if providing full protection is not possible. These trees will be marked by green and white tape bands and bilingual placards and, to the maximum extent possible, protected by orange tree protection. Builders and sub-contactors will not be allowed to drive equipment or stack materials within the limited protection areas. With an aggressive Adopt-a-Tree program we will be telling everyone on the construction team that these trees are very important.

We view trees as extremely valuable assets and we look forward to retaining as many as possible.

Sincerely,



Robert L. Chapman, III
WINMORE LAND MANAGEMENT, LLC

RLC:ae

Cc: Phil Szostak, Herman Greene

TRINITY HEIGHTS
Durham, NC
Limited Tree Protection
Two Year Survival Experience

SPECIMEN TREES

Two specimen oak trees, each over 200+ years old
Full drip-line protection, no impervious surface within drip line.
Three platted lots were not built upon, and will remain vacant as long as the tree are alive.
Two year survival rate: 100%.

EXISTING STREET TREES

Approximately 50 existing 35-60 year old willow oaks located within the City owned right-of-way planter strip, i.e. between the street curb and the sidewalk.

Partial protection, within planter strip only (approximately 20% of drip line).
Protection violation: City utility department always cut the roots of a tree that was in the path of water or sewer laterals that they installed. Trees could have been saved if the City used directional drilling for the laterals rather than backhoes.
Two year survival rate 88%.

OTHER TREES

Within the building lots attempts were made to save another 28 trees using techniques such as revised building placement, limited tree protection fencing, and bilingual tree protection signs. None had full drip line protection,

We lost 3 of these trees, an 89% survival rate after two years.

Robert L. Chapman
Project Developer



Sungate Design Group, P.A.

ENGINEERING • LANDSCAPE ARCHITECTURE • ENVIRONMENTAL

915 Jones Franklin Road • Raleigh, NC 27606 • Phone 919.859.2243 • Fax 919.859.6258

May 22, 2003

Mr. Marty Roupe, Development Review Administrator
Zoning Division
Town of Carrboro
301 West Main Street
Carrboro, N. C. 27510

Re: CUP Plans for Winmore Subdivision

Dear Marty:

On April 17, 2003 we completed our fifth review of the CUP plans for Winmore Subdivision. Subsequent to that letter we met with Phil Szostak and Allison Steele (PSA) at our office on 5/14/03 to discuss the outstanding items of concern. Per your request I will summarize the discussion of comments 27, 28, 29 (walking trail and landscape) and 30 below:

27. Some of the StormCeptors appear to be located in the Public Right-of-Way. Is this going to be allowed by Public works.

4/17/03 annotation. This comment has not been satisfactorily addressed and should be finalized prior to CUP approval.

5/14/03 meeting. PSA indicated that they had moved all StormCeptors outside the public right-of-way.

28. All weather access to all of the StormCeptor units should be provided.

4/17/03 annotation. Is the 18" guzzler 4816TC available locally?

5/14/03 meeting. PSA indicated that they had spoken to a local firm who had the necessary equipment and would perform maintenance on the StormCeptors. I told them that we would need a letter from the owner of the equipment indicating that the equipment was indeed available locally.

K-2

29. Stormwater Wetland Area #1

Landscaping is not shown.

4/17/03 annotation. List size of plant material and whether the are bare root, container or other.

What are the herbaceous plant quantities based on?

Potamogeton pectinatus and valisnaria americana may be difficult to find. What are the sources for these?

The Wetland construction sequence could not be located.

5/14/03 meeting. PSA showed us that these items had been added to the plans and that the sources for the plants were available locally.

How will the discharge from the Wetland outlet structure be conveyed across the proposed walking trail?

4/17/03 annotation. This comment has not been satisfactorily addressed. The discharge still appears to be crossing the walking trail on the Grading Plan and the outlet dissipater is shown on the path.

5/14/03 meeting. PSA indicated that the dissipater would be removed from the walking trail on the plans and that a board walk would be installed to allow stormwater to pass under the walking trail.

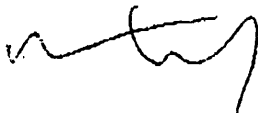
Additional comments based on 4/17/03 review:

30. A complete packet of information should be submitted, including all approved stormwater issues from prior submittals (stormwater quality, etc) and an accurate and concise Truth in Drainage Statement.

5/14/03 meeting. PSA indicated that this information would be provided prior to the public hearing.

To date we have received nothing from PSA as backup to the discussion at the 5/14/03 meeting. If you have questions or need further information, please contact me.

Sincerely,

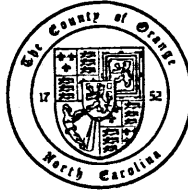


W. Henry Wells, Jr., PE

ORANGE COUNTY PLANNING & INSPECTIONS DEPARTMENT

Craig N. Benedict, AICP, Director
Administration 245-2575

Erosion Control Division
(919) 245-2586
(919) 644-3002 (FAX)
www.co.orange.nc.us



306F Revere Road
P O Box 8181
Hillsborough,
North Carolina, 27278



November 5, 2002

Planning Department
301 West Main Street
Carrboro, North Carolina 27510

RE: Winmore Subdivision
Erosion Control Pre-approval

Dear Mr. Roupe:

The proposed Winmore Subdivision has preliminary approval from this office. As previously stated the site will require innovative technology for sediment control in the form of floating weirs (skimmers) as dewatering devices.

Upon formal application for erosion control final plan approval/denial typically takes less than 30 working days .

Please call if you need additional information.

Sincerely,

Reynolds j. (Ren) Ivins

Erosion Control Supervisor

G:/erosioncontroldiv/newwork02/carrboro/Winmore/comment1

Location of Public Playfields at *Winmore*

1. Public Soccer Field/Playfield No. 1, 29,000 sq. ft. This represents the adaptation of an existing field that was constructed before 1940 and has been continuously maintained as a large flat lawn ever since.



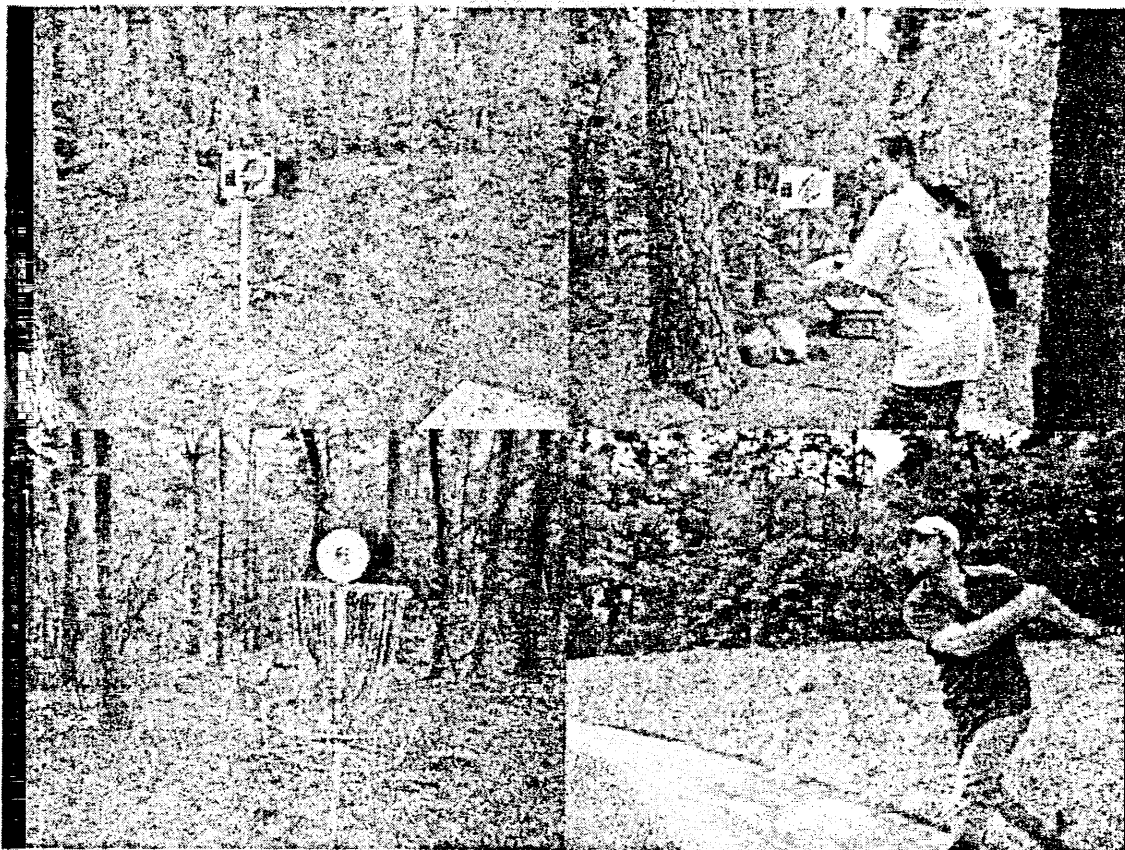
2. Playfield No. 2, 85,000 sq. ft.

This is a wooded area that we plan to adapt as a disc golf course.

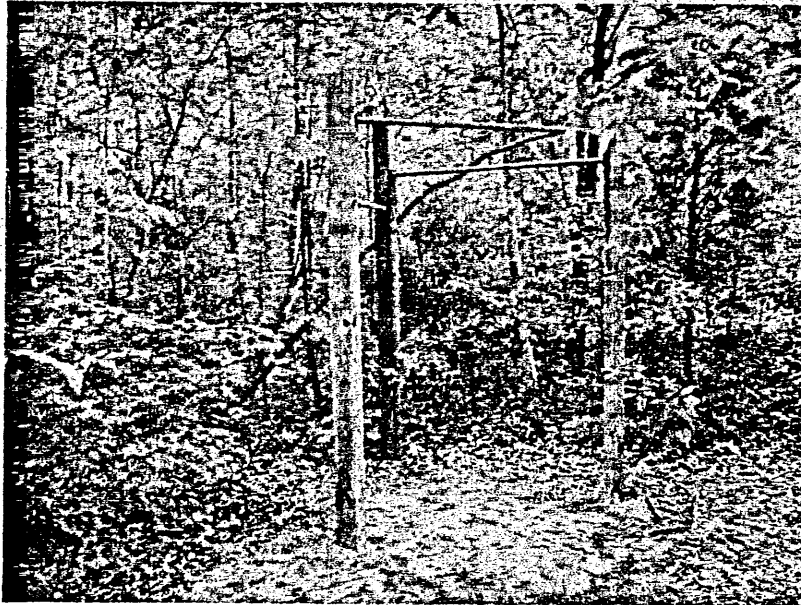
According to the Professional Disc Golf Association "Disc golf is played much like traditional golf. Instead of a ball and clubs, however, players use a flying disc, or Frisbee®. The sport was formalized in the 1970's, and shares with "ball golf" the object of completing each hole in the fewest number of strokes (or, in the case of disc golf, fewest number of throws). A golf disc is thrown from a tee area to a target which is the "hole". The hole can be one of a number of disc golf targets; the most common is called a Pole Hole® an elevated metal basket. As a player progresses down the fairway, he or she must make each consecutive shot from the spot where the previous throw has landed. The trees, shrubs, and terrain changes located in and around the fairways provide challenging obstacles for the golfer. Disc golf ... is designed to be enjoyed by people of all ages, male and female, regardless of economic status."

The following photos were taken on May 14, 2003 at the Cornwallis Road Park disc golf course in Durham. They show that there is little clearing required.





In addition to disc golf, the course on Cornwallis road includes exercise stations.



Location:

Playfields 1 and 2 are located in the buffer area. Because the area for Playfield 1 is a pre-existing field and because area for Playfield 2 is a wooded area that has few specimen trees and was heavily damaged by Hurricane Fran we believe that both areas are ideal for adaptive use.

Alternative Locations:

There is sufficient not-currently-planned-to-be-developed land outside the buffer areas at *Winmore*, approximately 5 to 7 acres, to provide alternative sites for these playfields. However there are many wonderful specimen trees in these alternative areas. We would prefer not to have to remove them in order to utilize these alternative sites, especially since our first choice sites are so well locate, so adaptable, and entail little or no damage to specimen trees.