

# Obey Creek Mixed-Use Development – Traffic Impact Study



Public Information Session Presentation  
May 20, 2014

Presented By:

HNTB North Carolina, PC  
Craig Scheffler, PE, PTOE



# Obey Creek Mixed-Use Development Traffic Impact Study

## Today's Presentation

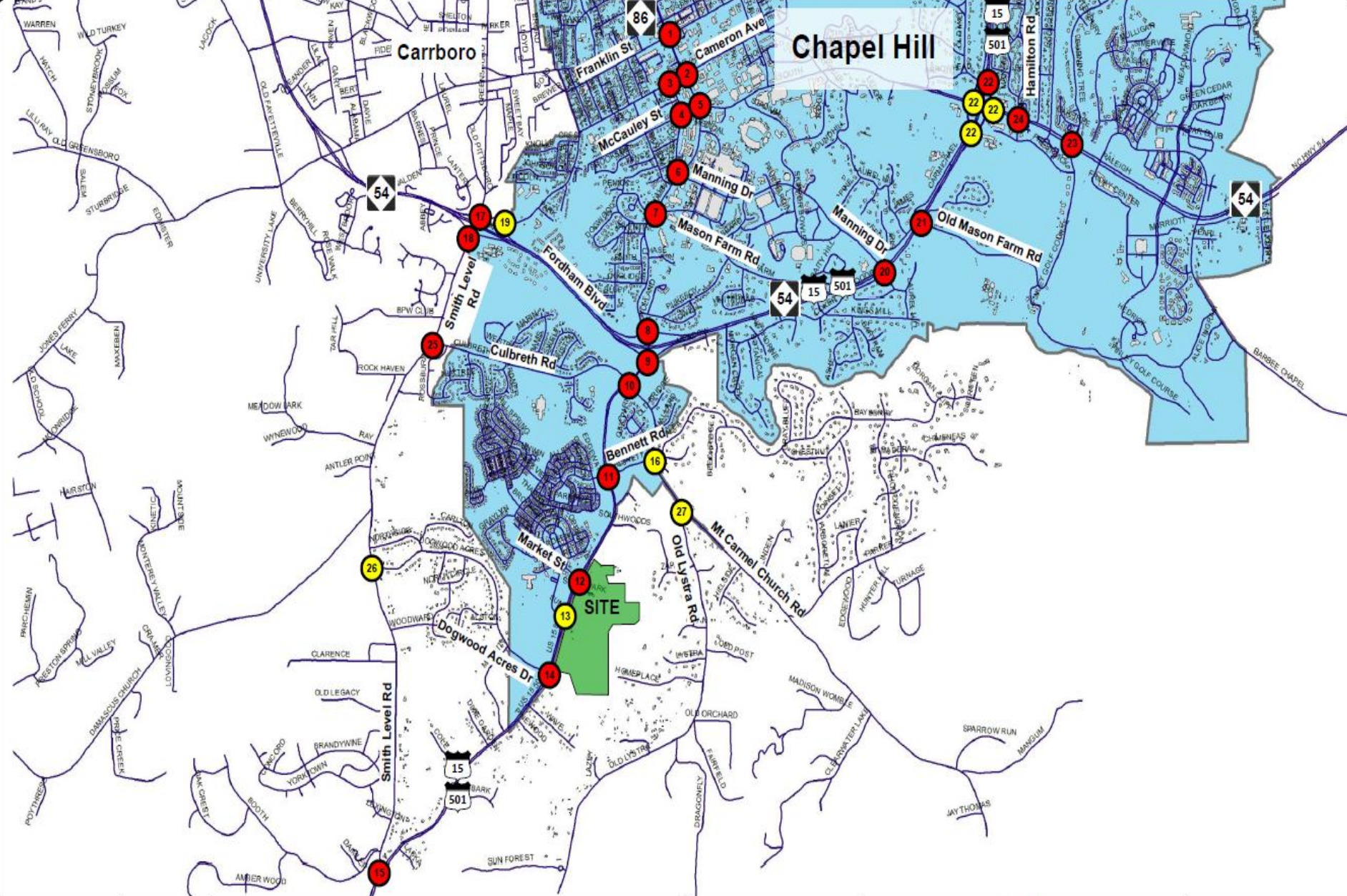


- Project Study Area
- Task 1 – Existing Conditions Analysis
- Task 2 – 2022 Concept Plan Analysis
- Trip Generation/Assignment
- Analysis Methodology
- Capacity Analysis Results
- Recommended Improvements
- Task 3 – Final TIS

# Obey Creek Mixed-Use Development Traffic Impact Study

## Task 1 - Existing Conditions Analysis Project Study Area

- 30 Existing Intersections in Southern and Eastern Chapel Hill
- 22 Signalized Intersections
- US 15-501 & NC 54 Bypass (Fordham Blvd) Corridors
- Southern UNC Main Campus Area
- Multi-modal Considerations



**Obey Creek Mixed-Use Development  
Traffic Impact Study**

**PROJECT STUDY AREA**



LEGEND	
<span style="color: red;">●</span>	= Signalized Study Area Intersection
<span style="color: yellow;">●</span>	= Unsignalized Study Area Intersection

DATE: May 2013

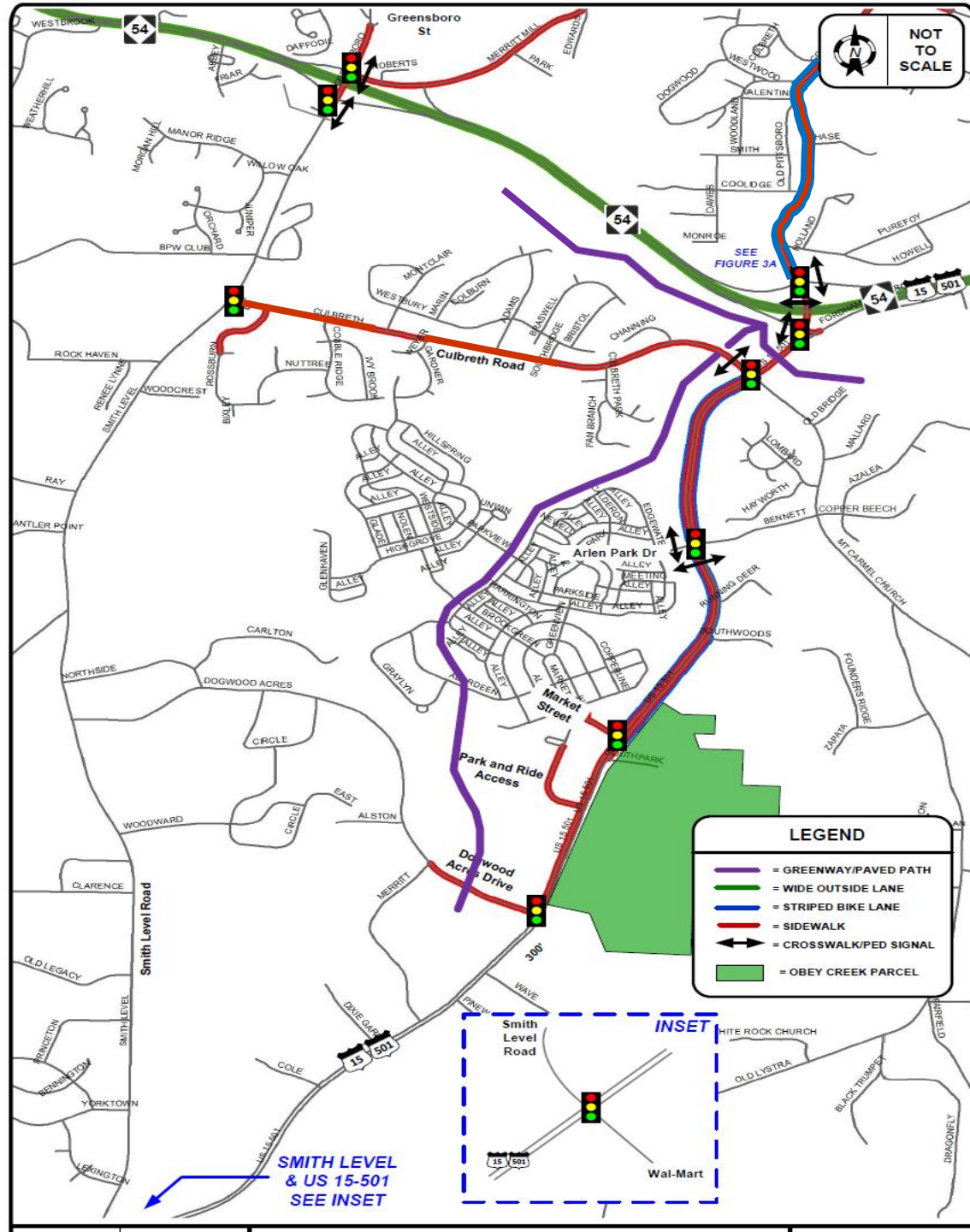
**FIGURE 1**

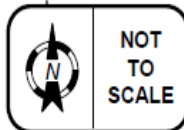
# Obey Creek Mixed-Use Development Traffic Impact Study

## Task 1 – Existing Conditions Analysis Project Study Area

### BICYCLE and PEDESTRIAN FEATURES

**HNTB**

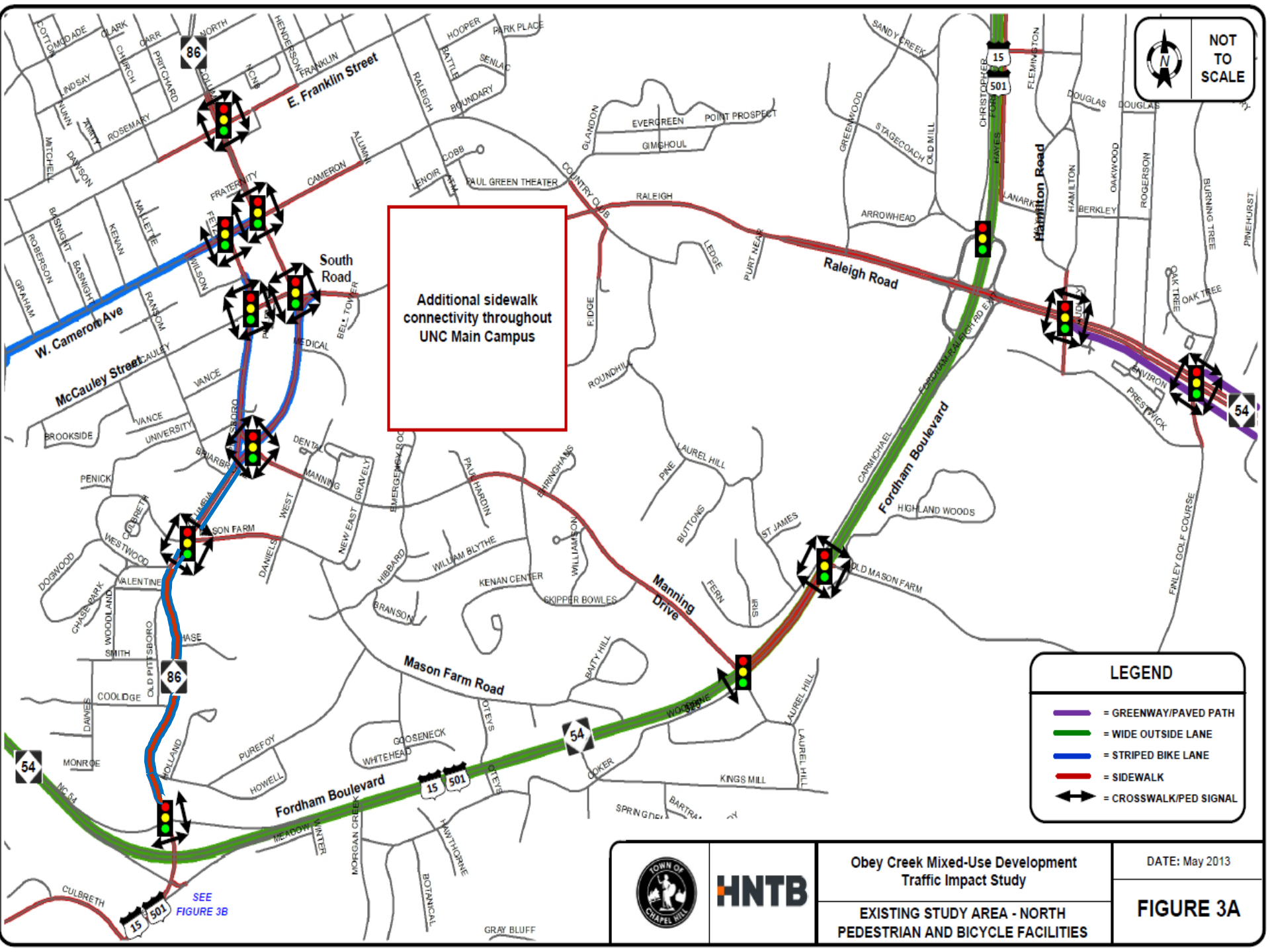




Additional sidewalk connectivity throughout UNC Main Campus

**LEGEND**

- = GREENWAY/PAVED PATH
- = WIDE OUTSIDE LANE
- = STRIPED BIKE LANE
- = SIDEWALK
- = CROSSWALK/PED SIGNAL



Obey Creek Mixed-Use Development  
Traffic Impact Study

EXISTING STUDY AREA - NORTH  
PEDESTRIAN AND BICYCLE FACILITIES

DATE: May 2013

**FIGURE 3A**

# Obey Creek Mixed-Use Development Traffic Impact Study

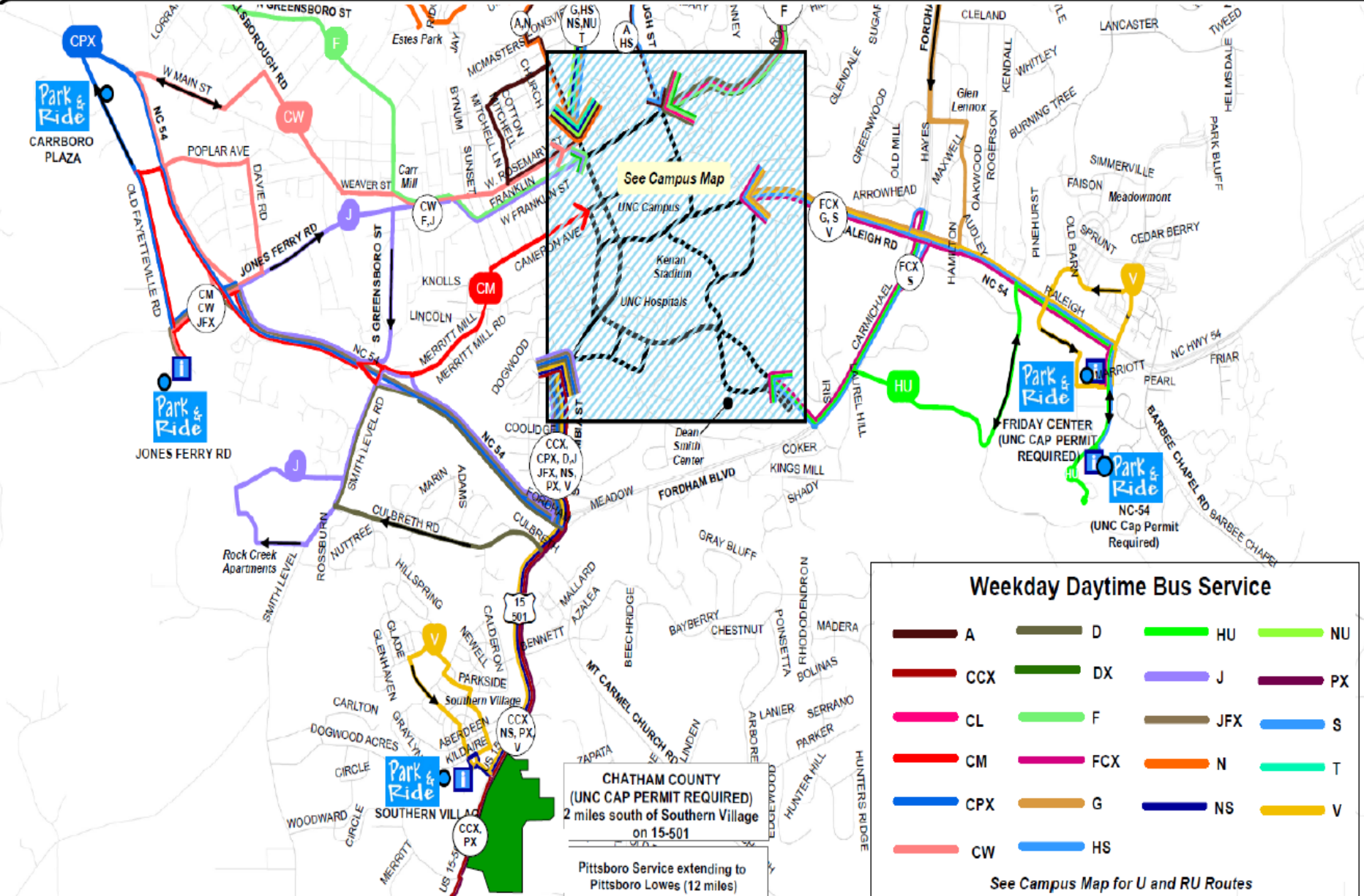
## Task 1 - Existing Conditions Analysis

### Project Study Area

### CHT Routes



- NS & V Routes Serve Southern Village/South Chapel Hill
- 8 Fixed Route / 5 Express Routes Serve Overall Study Area
- 4 Triangle Transit Routes Serve Overall Study Area
- Compiled Ridership Data from CHT for Local Routes for Use in Trip Generation



Source: Town of Chapel Hill Transit Ride Guide Spring 2013



Obey Creek Mixed-Use Development  
Traffic Impact Study

EXISTING TRANSIT ROUTES/STOPS

**LEGEND**

● = BUS STOP

■ = SITE LOCATION



NOT TO SCALE

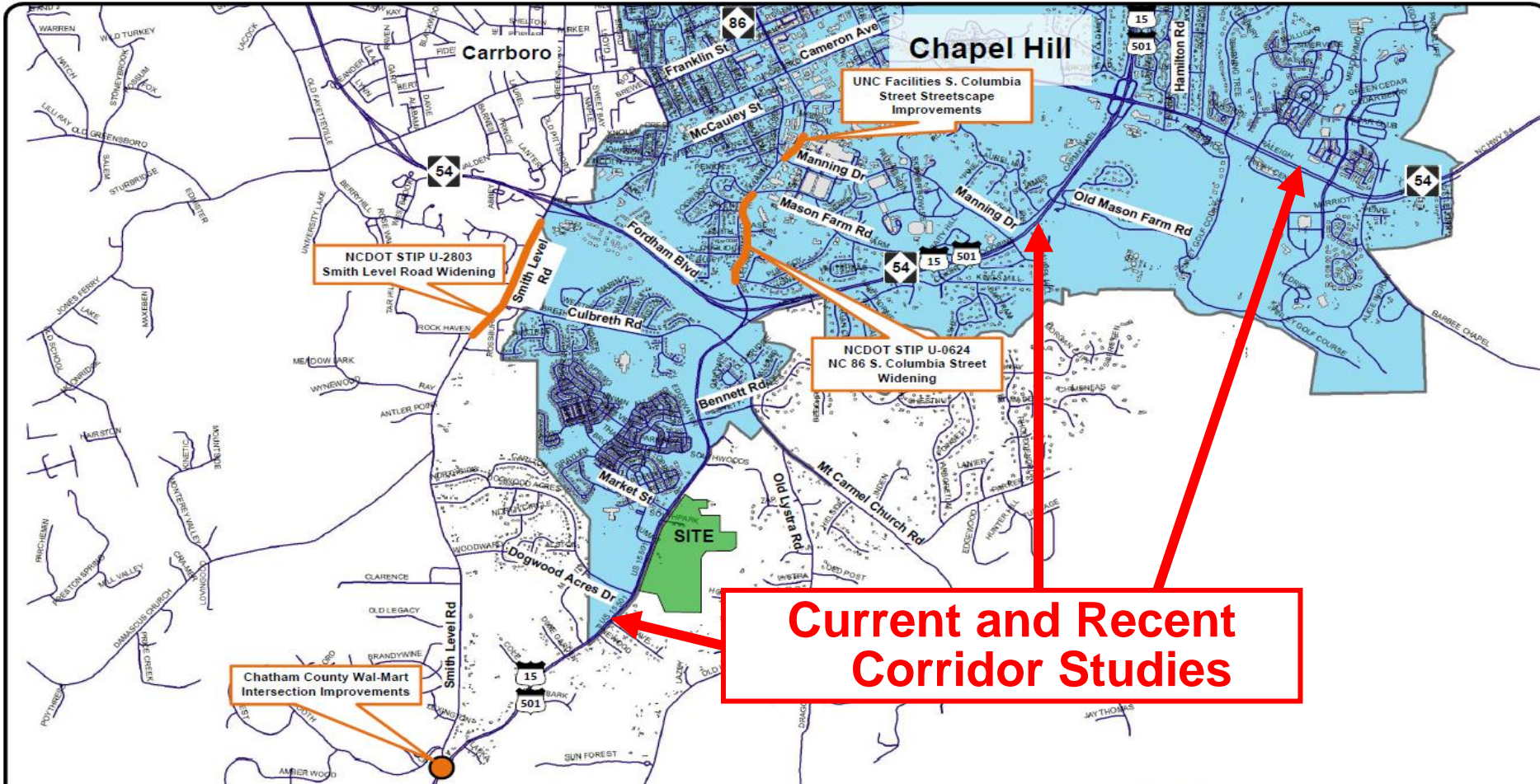
DATE: May 2013

**FIGURE 4**



# Obey Creek Mixed-Use Development Traffic Impact Study

## Construction Projects and Current Planning Studies



# Obey Creek Mixed-Use Development Traffic Impact Study

## Task 1 and 2 Analysis Methodology

- Weekday AM/Noon/PM Peak Hour Capacity Analysis
- LOS A – F (Threshold LOS D)
- Daily Volume/Capacity Analysis (Task 1)
- Task 1 - Collect Traffic Counts, Analyze Existing Conditions
- Task 2 – No-Build and Build Analyses for Site Build-out Year + 1
- 2 Meetings With NCDOT/Applicant/Town Staff to Agree on Assumptions/Methods

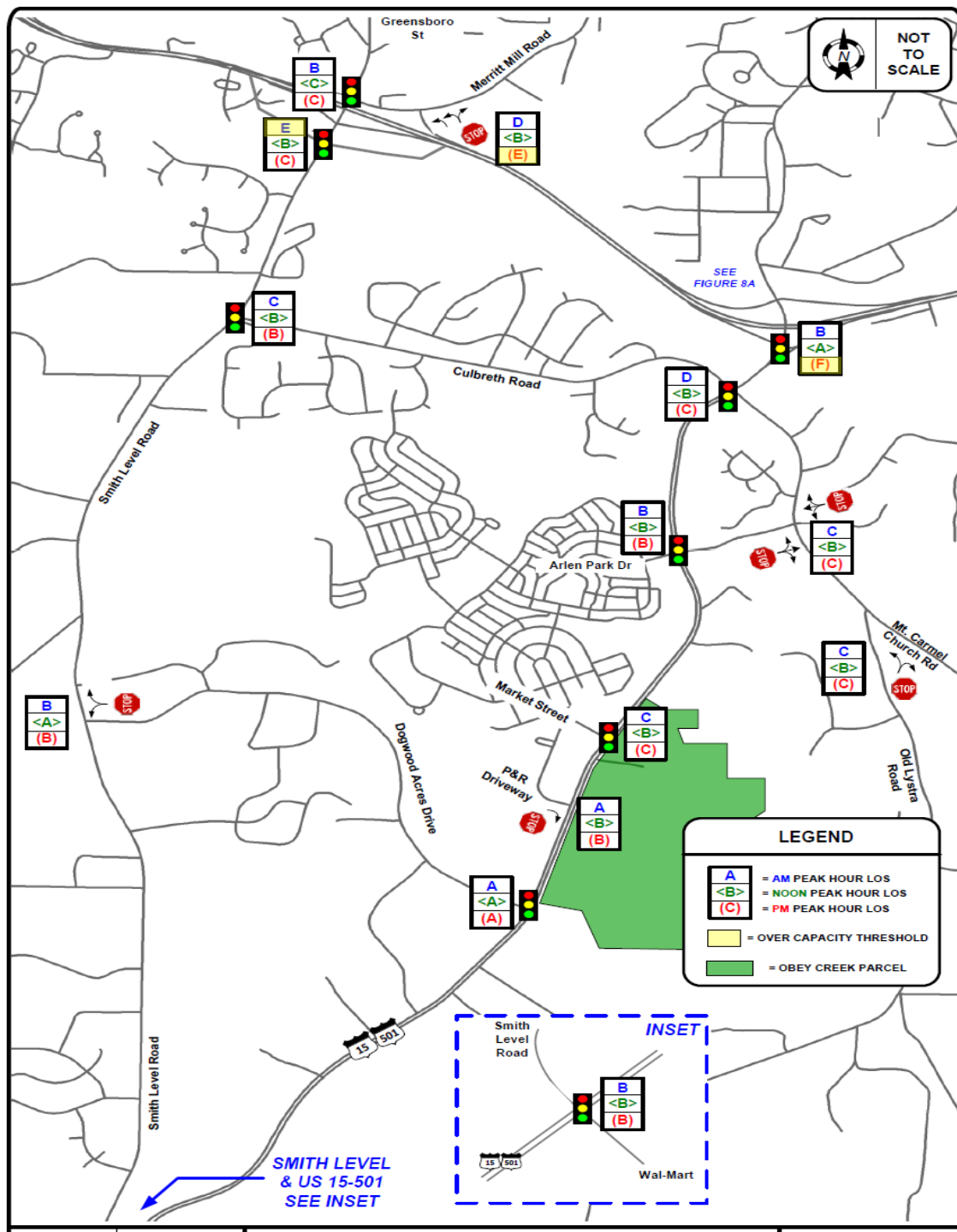
# Obey Creek Mixed-Use Development Traffic Impact Study

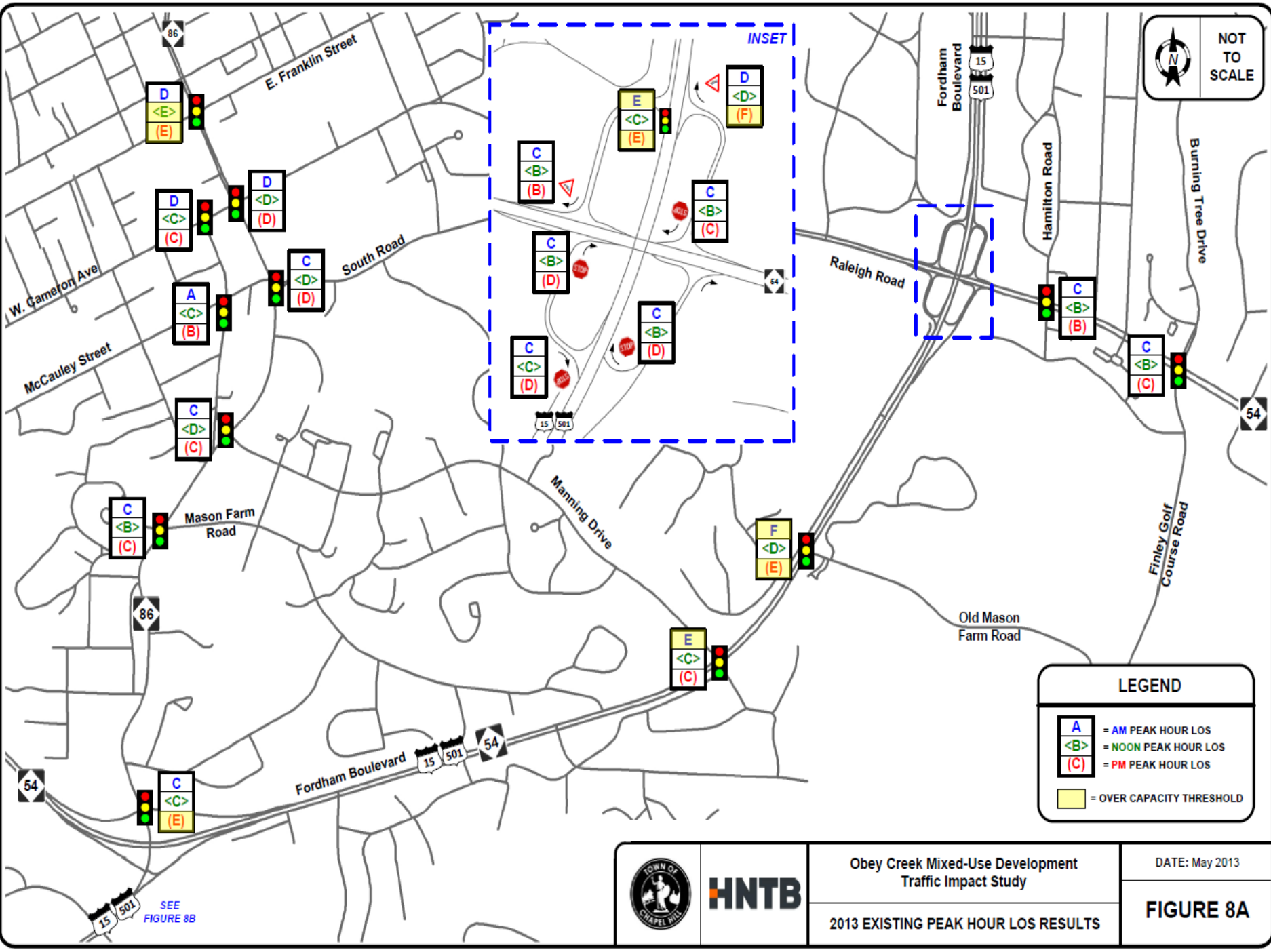
## Task 1 – Existing Conditions Analysis

### 2013 AM/Noon/PM Weekday Peak Hour LOS Results

Several Intersections Exceed  
LOS D Thresholds

**HNTB**





NOT TO SCALE

**LEGEND**

- A = AM PEAK HOUR LOS
- <B> = NOON PEAK HOUR LOS
- (C) = PM PEAK HOUR LOS
- = OVER CAPACITY THRESHOLD

SEE FIGURE 8B

# Obey Creek Mixed-Use Development Traffic Impact Study

## Task 2 – 2022 Concept Plan Analysis

- **Develop Trip Generation for All Modes Based on Applicant Provided Information**
- **Assess Applicant's Proposed Access Plan**
- **2022 Estimated Build-Out Year Calculations**
- **Compare No-Build and Build Conditions**
- **Develop Preliminary Recommendations**

Town of Chapel Hill  
soccer fields

Town of Chapel Hill  
Park & Ride

Southern  
Village

Market Street

15 501



**LEGEND**



= Existing Signalized Intersection



= Proposed Full Access Break/Signalized Intersection



= Proposed RIRO Stop-Controlled Intersection



0 20 100 FT



**Obey Creek Mixed-Use Development  
Traffic Impact Study**

**SITE CONCEPT - PRELIMINARY PLAN**



**NOT  
TO  
SCALE**

DATE: April 2014

**FIGURE 2**

# Obey Creek Mixed-Use Development Traffic Impact Study

## Task 2 – 2022 Concept Plan Analysis

### Detailed Site Development Breakout



Building	Shopping Center Retail	Office	Community Activi	Hotel	Condos	Notes
Anchor	135,000					1 STY + ROOFTOP PARK
JA1	29,000					1-STY
JA2	18,000					1-STY
G1	55,000					1-STY
T1	40,000					
S1	18,190					STREET LVL SHOPS (LESS LOBBY FOR USE ABV.)
S2	7,590					STREET LVL SHOPS (LESS LOBBY FOR USE ABV.)
S3	12,060					STREET LVL SHOPS (LESS LOBBY FOR USE ABV.)
S4	5,800					STREET LVL SHOPS (LESS LOBBY FOR USE ABV.)
S5	3,880					STREET LVL SHOPS (LESS LOBBY FOR USE ABV.)
S6	3,260					STREET LVL SHOPS (LESS LOBBY FOR USE ABV.)
S7	7,150					STREET LVL SHOPS (LESS LOBBY FOR USE ABV.)
S8	5,060					STREET LVL SHOPS/RESTAURANT
S9	13,335					STREET LVL SHOPS (LESS LOBBY FOR USE ABV.)
S10	28,400					STREET LVL SHOPS (LESS LOBBY FOR USE ABV.)
S11	9,200					STREET LVL SHOPS (LESS LOBBY FOR USE ABV.)
S12	13,600					STREET LVL SHOPS (LESS LOBBY FOR USE ABV.)
O1		92,750				3-STY @ 15/501 & 4-STY OVER DRIVE-THRU
O2		57,000				3 STY ABOVE SHOPS
O3		69,000				3 STY ABOVE THEATER
O4		7,500				1.5 STY OVER PARKING
O5						RESERVED
GA			48,000			2 STY BELOW + 2 AT PKG. DECK & ABOVE
H1				117,000		140 KEYS + FUNCTION 3 STY @ 15/501 & 4 STY ABOVE A1 AT MAIN
R2					78,760	4-STY ABV S1
R3					30,000	3 STY
R4					77,780	4 STY OVER SHOPS
R5					79,120	4-STY OVER SHOPS
R6					138,610	5 STY OVER SHOPS AT MAIN & 2-STY OVER SHOPS AT 15/501
R7					27,400	2 STY OVER SHOPS
R8					32,070	2 STY OVER SHOPS
R9					14,400	3 STY
R10					80,800	5 STY OVER SHOPS + 4-STY OVER GROCERY
R11					40,170	3 STY
AG1					181,400	3-STY ON 15/501 & 5-STY ON MAIN
<b>TOTAL (SF)</b>	<b>404,525</b>	<b>226,250</b>	<b>48,000</b>	<b>117,000</b>	<b>780,510</b>	
<b>TOTAL ALL USE</b>	<b>809,050</b>				<b>1,576,285</b>	<b>700 RESIDENTIAL TOTAL</b>

# Obey Creek Mixed-Use Development Traffic Impact Study

## Task 2 – 2022 Concept Plan Analysis

### Site Trip Generation Details



- Prepared Trip Generation Methodology Document
- Calculated Trips Using ITE Methodology and Adjusted by Field Collected Information/Research
- Adjusted Raw Trips For **Internal Capture**, **Transit**, **Pedestrian/Bicycle**, **Pass-by Trips** & **Diverted Linked Trips**
- Distribute Vehicle Trips By Existing Trip Patterns & Proposed Spatial Access
- Assign Trips



Table 15. Obey Creek Development - Summary Trip Generation Data

Trip Generation Step	24 Hour Volumes			AM Peak Hour Trips			Noon Peak Hour Trips			PM Peak Hour Trips		
	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
1. ITE Raw Trip Generation Calculations	12,836	12,836	25,672	719	450	1,169	814	772	1,585	1,098	1,295	2,393
2. Internal Capture	-1,284	-1,284	-2,568	-46	-46	-92	-144	-144	-288	-241	-241	-482
<b>EXTERNAL TRIP GENERATION BEFORE MODAL REDUCTION</b>	<b>11,552</b>	<b>11,552</b>	<b>23,104</b>	<b>673</b>	<b>404</b>	<b>1,077</b>	<b>670</b>	<b>628</b>	<b>1,297</b>	<b>857</b>	<b>1,054</b>	<b>1,911</b>
3. Transit Trip Reductions	-1,282	-1,282	-2,565	-98	-63	-161	-60	-57	-116	-131	-155	-286
4. Ped/Bike Trip Reductions	-130	-130	-259	-10	-6	-16	-6	-6	-12	-13	-15	-29
<b>TOTAL EXTERNAL VEHICLE TRIPS (DRIVEWAY VOLUMES)</b>	<b>10,140</b>	<b>10,140</b>	<b>20,280</b>	<b>565</b>	<b>335</b>	<b>900</b>	<b>604</b>	<b>565</b>	<b>1,169</b>	<b>712</b>	<b>884</b>	<b>1,596</b>
5. Pass-By Trips	-1,213	-1,213	2,425	-0	-0	-0	-119	-119	-237	-176	-176	-352
6. Diverted Linked Trips	-999	-999	1,997	-0	-0	-0	-98	-98	-195	-145	-145	-290
<b>TOTAL EXTERNAL VEHICLE TRIPS (NEW TRIPS)</b>	<b>7,928</b>	<b>7,928</b>	<b>15,858</b>	<b>565</b>	<b>335</b>	<b>900</b>	<b>387</b>	<b>348</b>	<b>736</b>	<b>391</b>	<b>563</b>	<b>954</b>

Building Designation	SIZE	Proportion of LU Type	TRIP GEN DATA		Site Driveway 1 - RIRO			Site Driveway 2 - RIRO			Site Driveway 3 / Town P&R Access			Site Driveway 4 / Market Street			Site Driveway 5 - RIRO			% check
			IN	OUT	%	Trips		%	Trips		%	Trips		%	Trips		%	Trips		
						IN	OUT		IN	OUT		IN	OUT		IN	OUT		IN	OUT	
A Target	135000	33%	76	46	0%	0	0	0%	0	0	75%	57	35	25%	19	12	0%	0	0	100%
G1 Grocery	55000	14%	31	19	0%	0	0	35%	11	7	65%	20	12	0%	0	0	0%	0	0	100%
T1 Theater	40000	10%	22	14	0%	0	0	0%	0	0	90%	20	12	10%	2	1	0%	0	0	100%
JA 1	29000	7%	16	10	0%	0	0	20%	3	2	80%	13	8	0%	0	0	0%	0	0	100%
JA 2	18000	4%	10	6	0%	0	0	20%	2	1	80%	8	5	0%	0	0	0%	0	0	100%
S1	18190	4%	10	6	0%	0	0	0%	0	0	10%	1	1	90%	9	6	0%	0	0	100%
S2	7590	2%	4	3	0%	0	0	0%	0	0	10%	0	0	90%	4	2	0%	0	0	100%
S3	12060	3%	7	4	0%	0	0	0%	0	0	10%	1	0	90%	6	4	0%	0	0	100%
S4	5800	1%	3	2	0%	0	0	0%	0	0	10%	0	0	90%	3	2	0%	0	0	100%
S5	3880	1%	2	1	0%	0	0	20%	0	0	80%	2	1	0%	0	0	0%	0	0	100%
S6	3260	1%	2	1	0%	0	0	20%	0	0	80%	1	1	0%	0	0	0%	0	0	100%
S7	7150	2%	4	2	0%	0	0	20%	1	0	80%	3	2	0%	0	0	0%	0	0	100%
S8	5060	1%	3	2	0%	0	0	20%	1	0	80%	2	1	0%	0	0	0%	0	0	100%
S9	13335	3%	7	5	0%	0	0	20%	1	1	80%	6	4	0%	0	0	0%	0	0	100%
S10	28400	7%	16	10	0%	0	0	20%	3	2	80%	13	8	0%	0	0	0%	0	0	100%
S11	9200	2%	5	3	0%	0	0	20%	1	1	80%	4	3	0%	0	0	0%	0	0	100%
S12	13600	3%	8	5	0%	0	0	20%	2	1	80%	6	4	0%	0	0	0%	0	0	100%
O1	92750	41%	133	18	0%	0	0	0%	0	0	0%	0	0	100%	133	18	0%	0	0	100%
O2	57000	25%	82	11	0%	0	0	0%	0	0	50%	41	6	50%	41	6	0%	0	0	100%
O3	69000	30%	99	13	0%	0	0	0%	0	0	50%	49	7	50%	49	7	0%	0	0	100%
O4	7500	3%	11	1	0%	0	0	0%	0	0	0%	0	0	0%	0	0	100%	11	1	100%
CA	48000	100%	65	33	0%	0	0	0%	0	0	50%	33	17	50%	33	17	0%	0	0	100%
H1	117000	100%	43	31	0%	0	0	0%	0	0	50%	22	16	50%	22	16	0%	0	0	100%
R2	78760	10%	6	20	0%	0	0	0%	0	0	25%	2	5	75%	5	15	0%	0	0	100%
R3	30000	4%	2	8	0%	0	0	0%	0	0	25%	1	2	75%	2	6	0%	0	0	100%
R4	77780	10%	6	20	0%	0	0	0%	0	0	25%	1	5	75%	4	15	0%	0	0	100%
R5	79120	10%	6	21	0%	0	0	20%	1	4	80%	5	16	0%	0	0	0%	0	0	100%
R6	138610	18%	11	36	0%	0	0	20%	2	7	80%	9	29	0%	0	0	0%	0	0	100%
R7	27400	4%	2	7	0%	0	0	20%	0	1	80%	2	6	0%	0	0	0%	0	0	100%
R8	32070	4%	2	8	0%	0	0	20%	0	2	80%	2	7	0%	0	0	0%	0	0	100%
R9	14400	2%	1	4	0%	0	0	20%	0	1	80%	1	3	0%	0	0	0%	0	0	100%
R10	80800	10%	6	21	0%	0	0	20%	1	4	80%	5	17	0%	0	0	0%	0	0	100%
R11	40170	5%	3	10	0%	0	0	0%	0	0	100%	3	10	0%	0	0	0%	0	0	100%
AG1	181400	23%	14	47	100%	14	47	0%	0	0	0%	0	0	0%	0	0	0%	0	0	100%
sum						14	47		31	35		332	241		331	125		11	1	
%						2%	11%		4%	8%		47%	54%		47%	28%		directly assigned		

Shopping Center

IN	OUT
227	139

Office

IN	OUT
324	44

Residential

IN	OUT
60	203

sum check

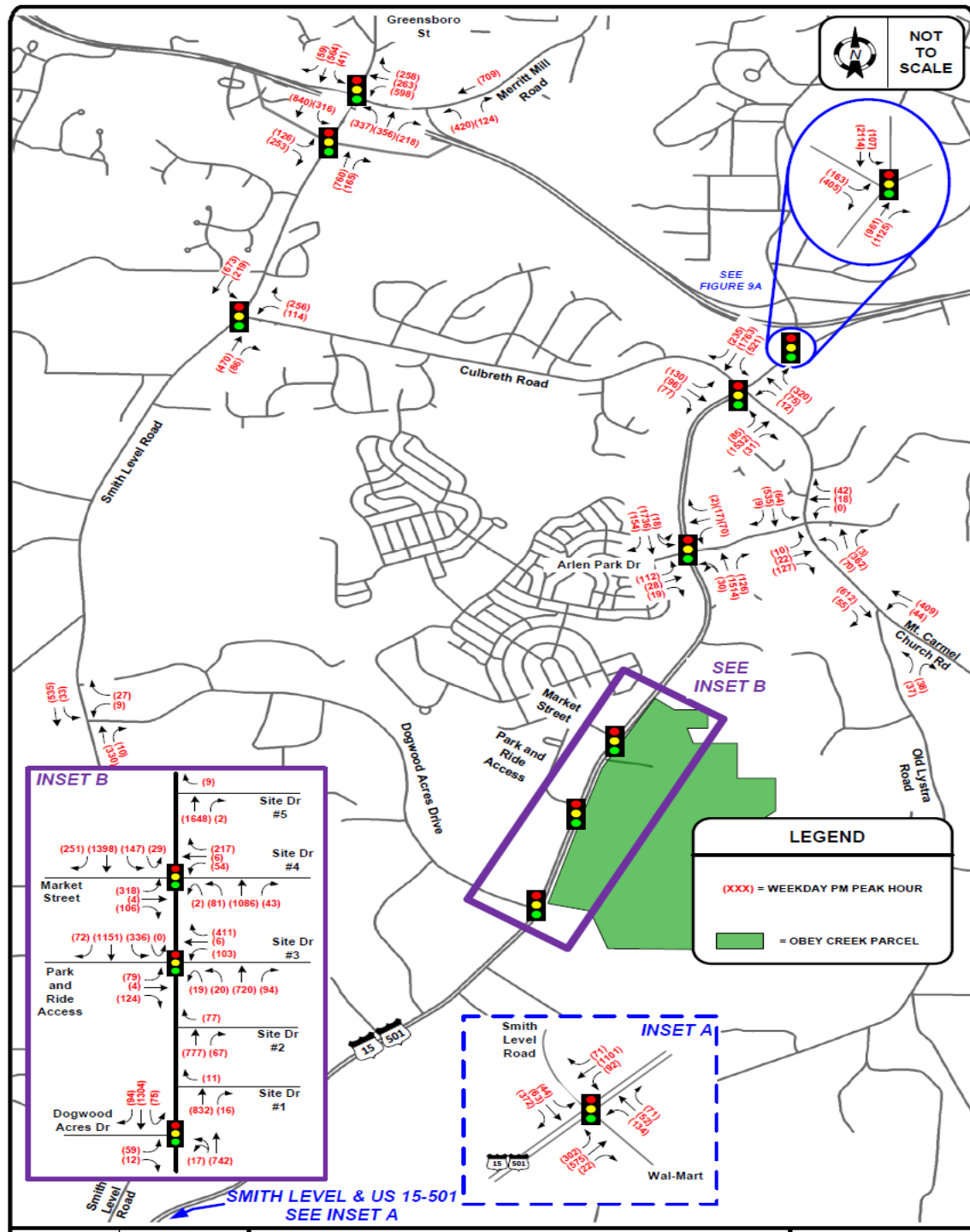
IN	OUT
719	450
719	450

Inputs Breakouts

100% 100%

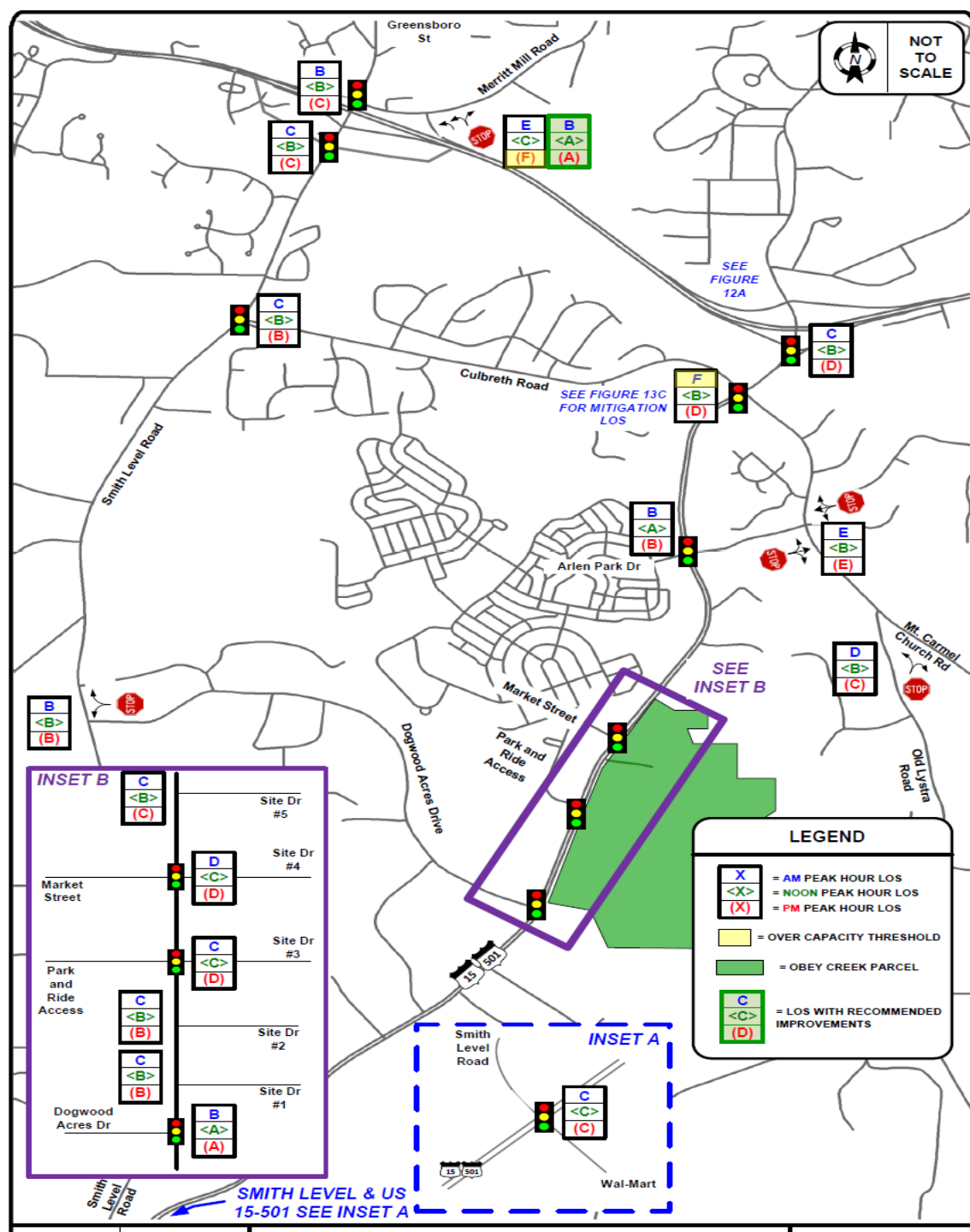
# Obey Creek Mixed-Use Development Traffic Impact Study

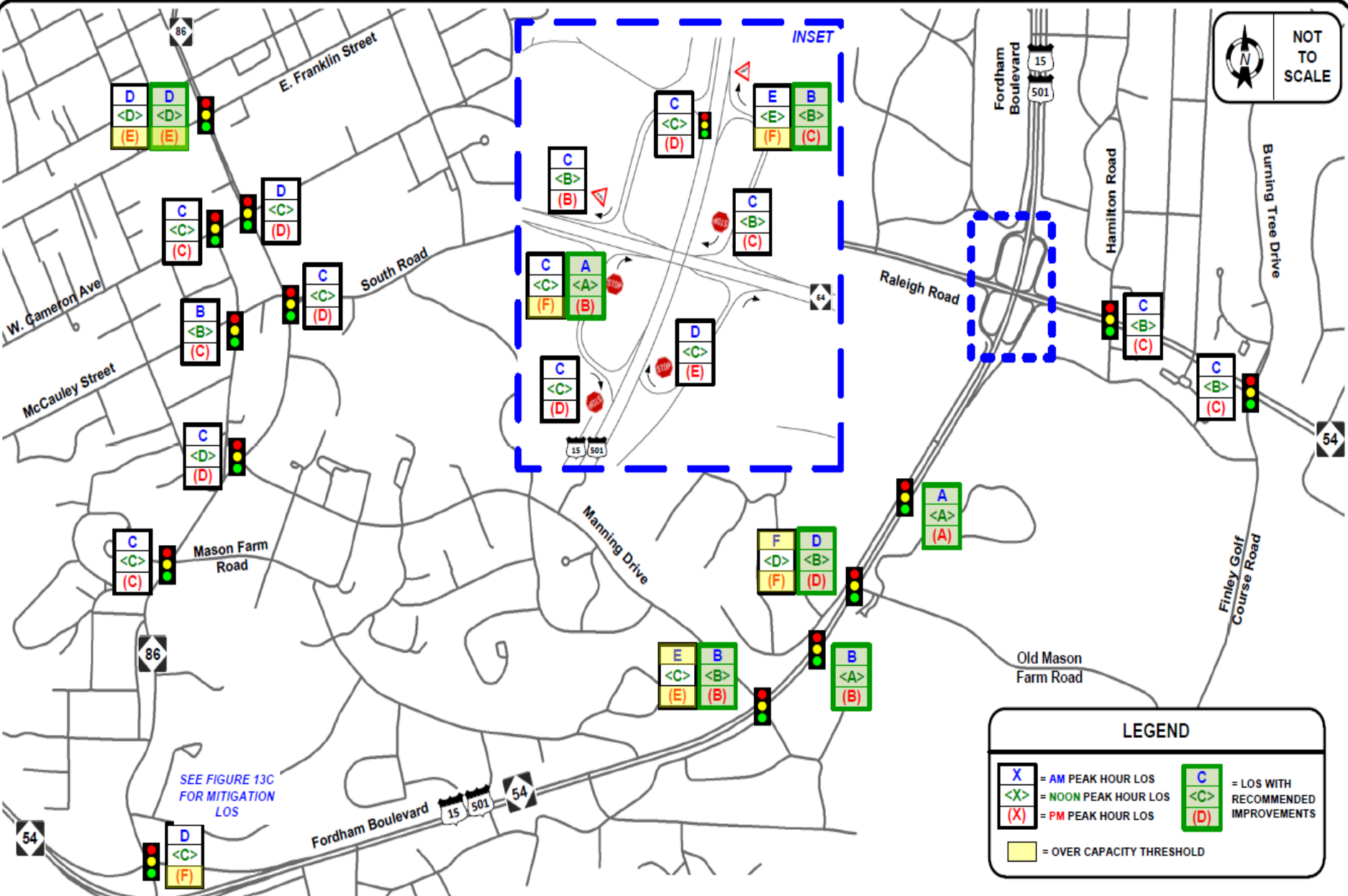
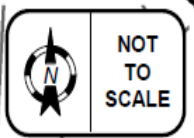
## Task 2 – 2022 Concept Plan Analysis Site Traffic Assignment Details



# Obey Creek Mixed-Use Development Traffic Impact Study

## Task 2 - 2022 Site Concept Plan Analysis Peak Hour LOS Results





SEE FIGURE 13C FOR MITIGATION LOS

SEE FIGURE 12B



Obey Creek Mixed-Use Development  
Traffic Impact Study

2022 PEAK HOUR LOS RESULTS –  
BUILD & MITIGATION SCENARIOS

DATE: April 2014

**FIGURE 12A**

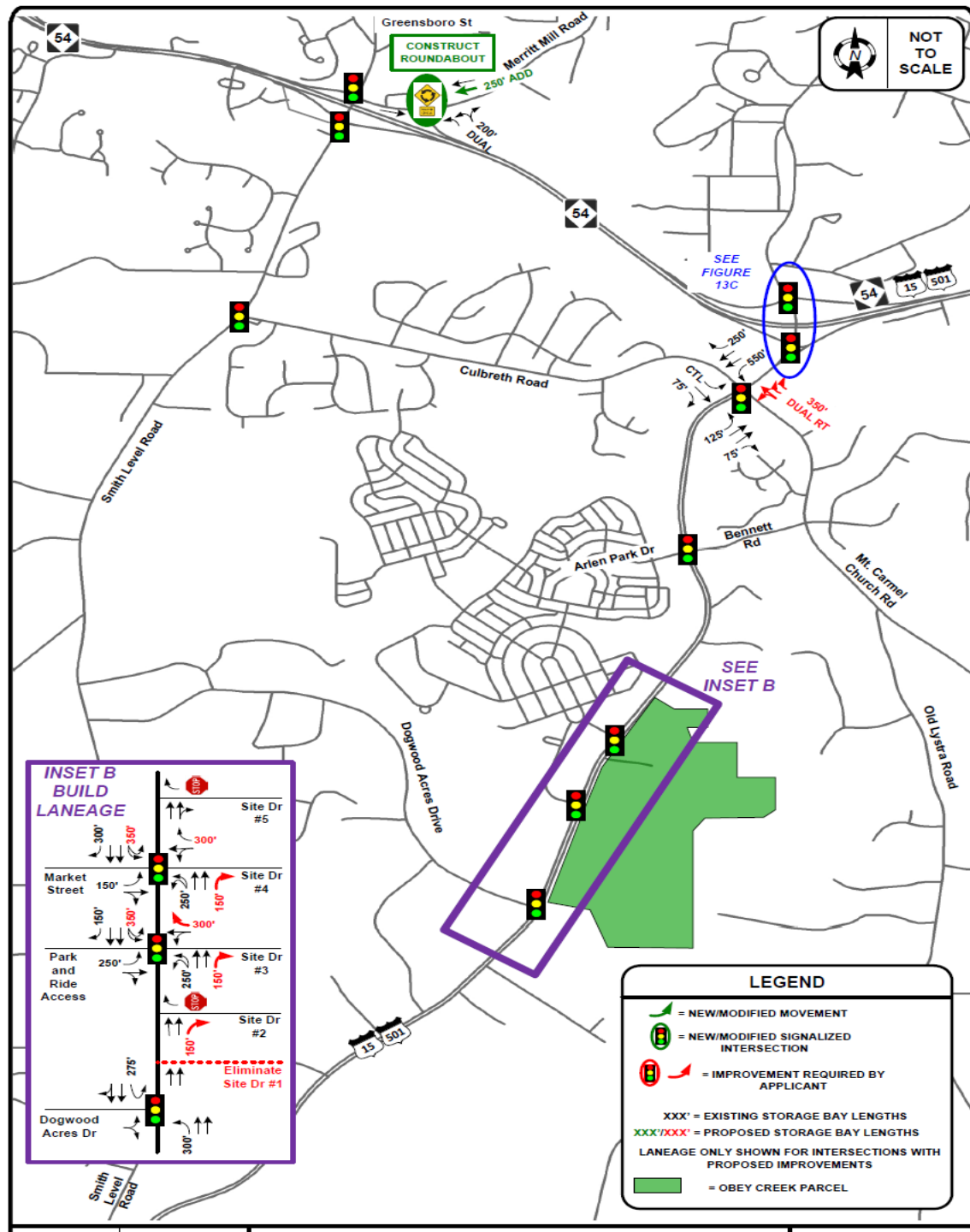
# Obey Creek Mixed-Use Development Traffic Impact Study

## Task 2 – 2022 Site Concept Plan Analysis

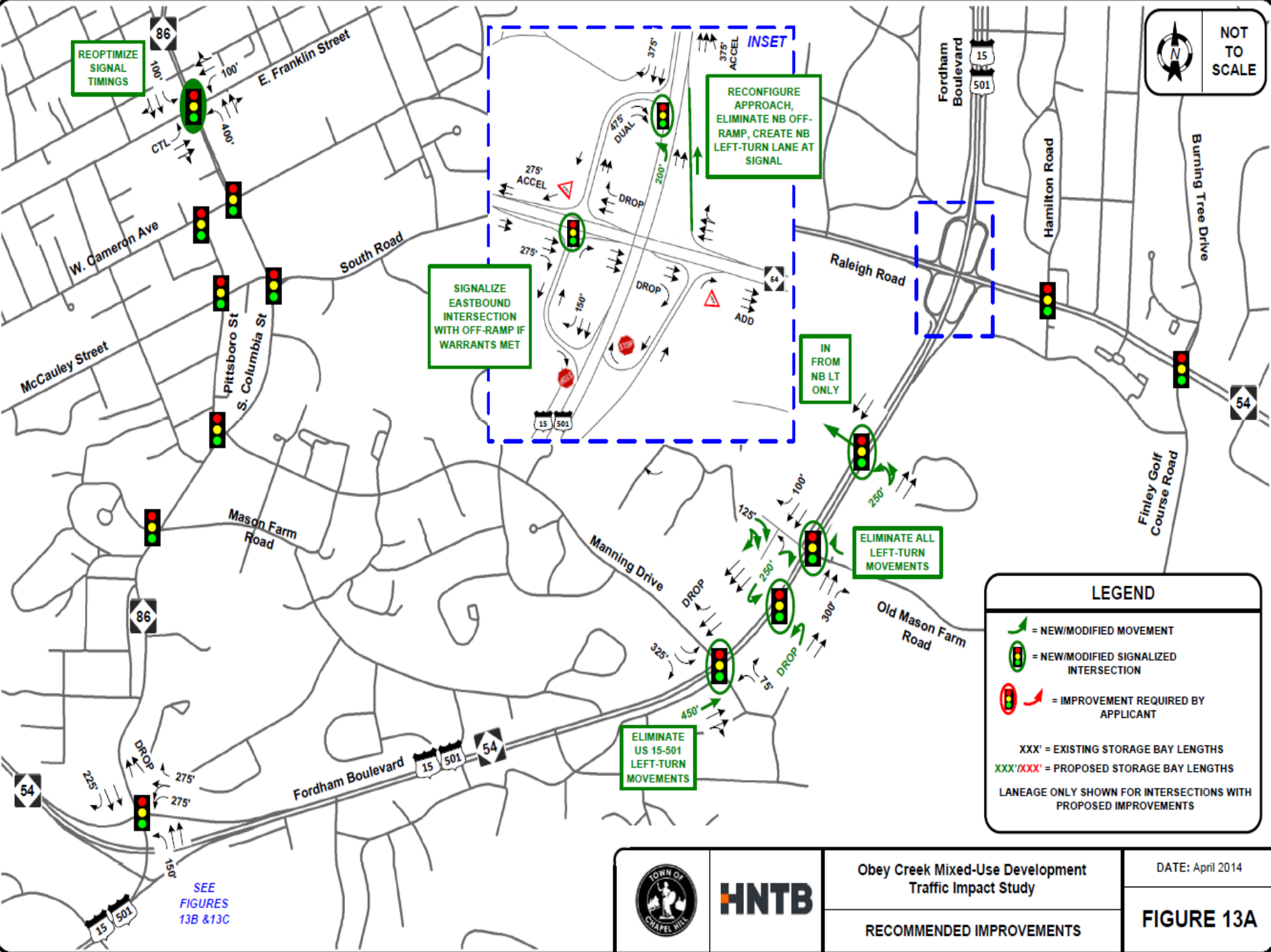
### Possible Improvements

**RED** = Developer  
Required

**GREEN** = Necessary to  
Achieve LOS



NOT TO SCALE



REOPTIMIZE SIGNAL TIMINGS

RECONFIGURE APPROACH, ELIMINATE NB OFF-RAMP, CREATE NB LEFT-TURN LANE AT SIGNAL

SIGNALIZE EASTBOUND INTERSECTION WITH OFF-RAMP IF WARRANTS MET

IN FROM NB LT ONLY

ELIMINATE ALL LEFT-TURN MOVEMENTS

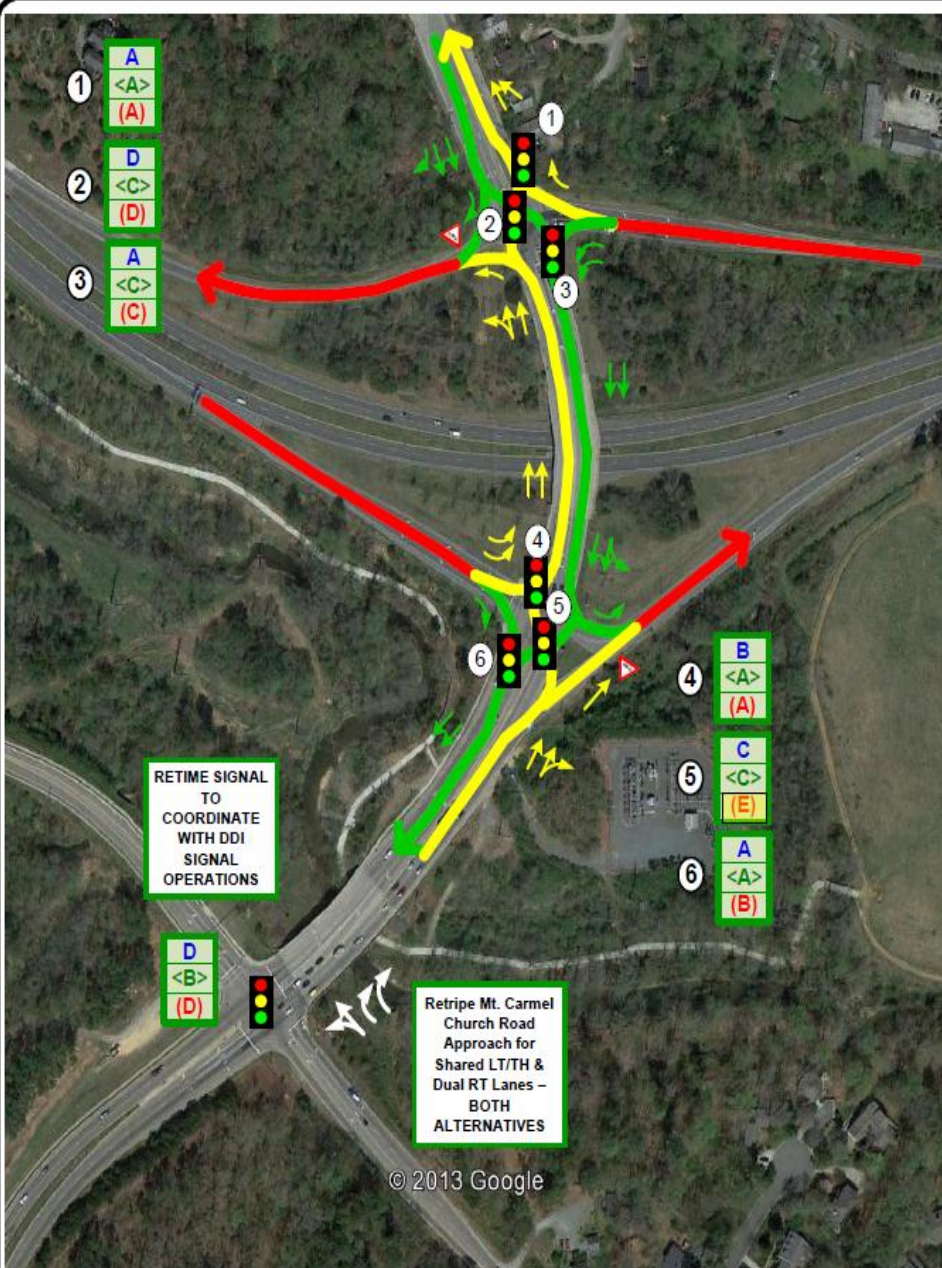
ELIMINATE US 15-501 LEFT-TURN MOVEMENTS

**LEGEND**

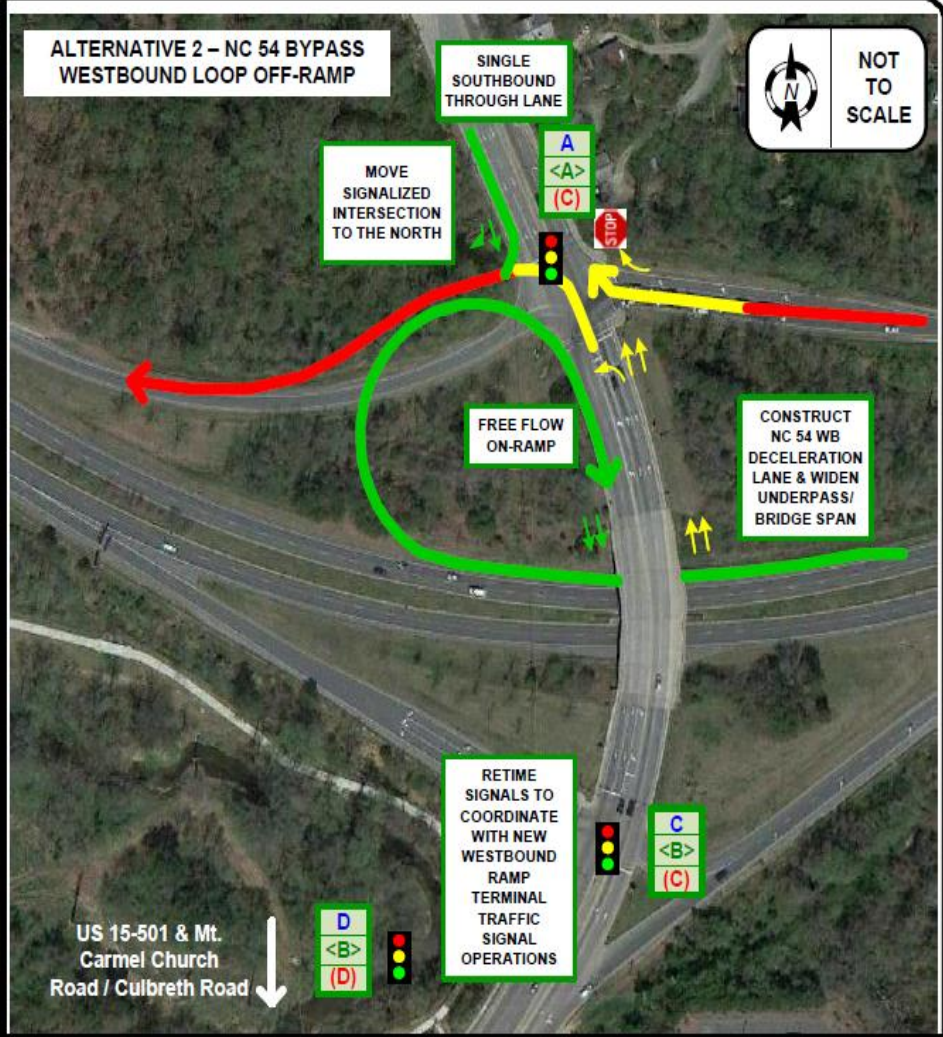
- = NEW/MODIFIED MOVEMENT
- = NEW/MODIFIED SIGNALIZED INTERSECTION
- = IMPROVEMENT REQUIRED BY APPLICANT

XXX' = EXISTING STORAGE BAY LENGTHS  
 XXX'/XXX' = PROPOSED STORAGE BAY LENGTHS  
 LANEAGE ONLY SHOWN FOR INTERSECTIONS WITH PROPOSED IMPROVEMENTS

SEE FIGURES 13B & 13C



ALTERNATIVE 1 - DIVERGING DIAMOND INTERCHANGE



LEGEND

- = PROPOSED TRAFFIC CONTROL
- = PROPOSED TRAFFIC MOVEMENTS/LANEAGE
- YELLOW = NORTHBOUND MOVEMENTS
- GREEN = SOUTHBOUND MOVEMENTS
- RED = RAMP MOVEMENTS
- = LOS WITH RECOMMENDED IMPROVEMENTS
- = LOS WITH RECOMMENDED IMPROVEMENTS
- = LOS WITH RECOMMENDED IMPROVEMENTS
- = OVER CAPACITY THRESHOLD



HNTB

Obey Creek Mixed-Use Development Traffic Impact Study

DATE: April 2014

RECOMMENDED IMPROVEMENTS

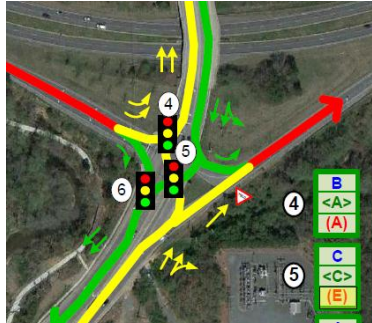
FIGURE 13C



# Obey Creek Mixed-Use Development Traffic Impact Study

## Task 3 – Final TIS Current Timeline & Content

- Task 1 and Task 2 Analyses Under Review by NCDOT
- Incorporate Comments into Final TIS Document
- Include Crash Analysis
- Include 2040 Long-Term Planning-Level Analysis
- Include Other Town-Required Analyses (Access, Signal Warrant, Acceleration/Deceleration Lanes, Transit, Bike/Ped)



# Obey Creek Mixed-Use Development Traffic Impact Study



## QUESTIONS AND DISCUSSION



**HNTB**