Northwest Huntersville Transportation Study

Vance Rd Ext. & NC Hwy. 73

Mecklenburg-Union MPO

September 21, 2011

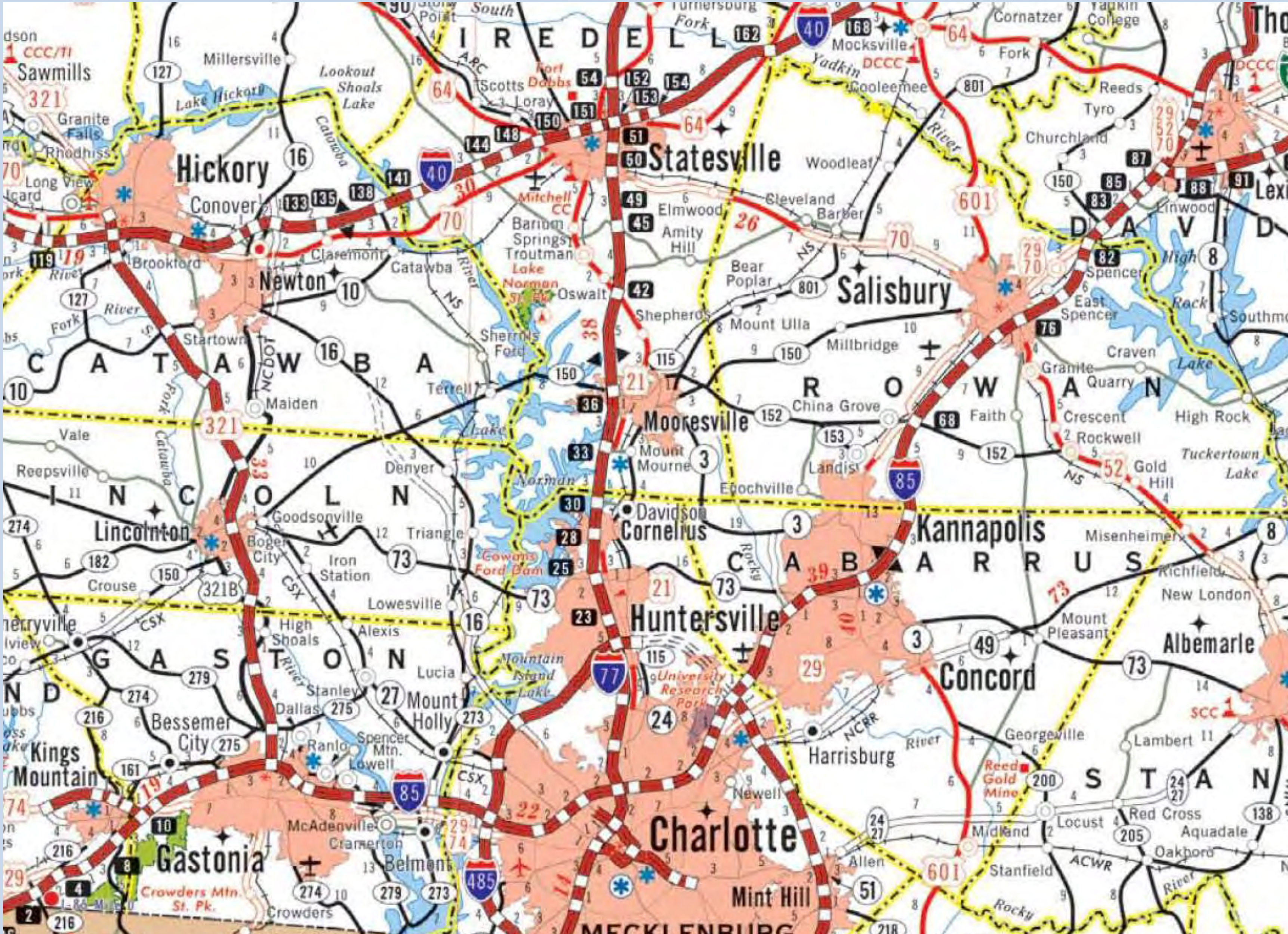
Tonight's Presentation

- Metropolitan area context
- Thoroughfare Plan evolution
- Other studies
- Current NW Huntersville Transportation Study
- NC 73/Vance Road Ext interaction
- Options for NC 73 and Vance Rd Ext
- Decision process & recommendations

Before the Lake

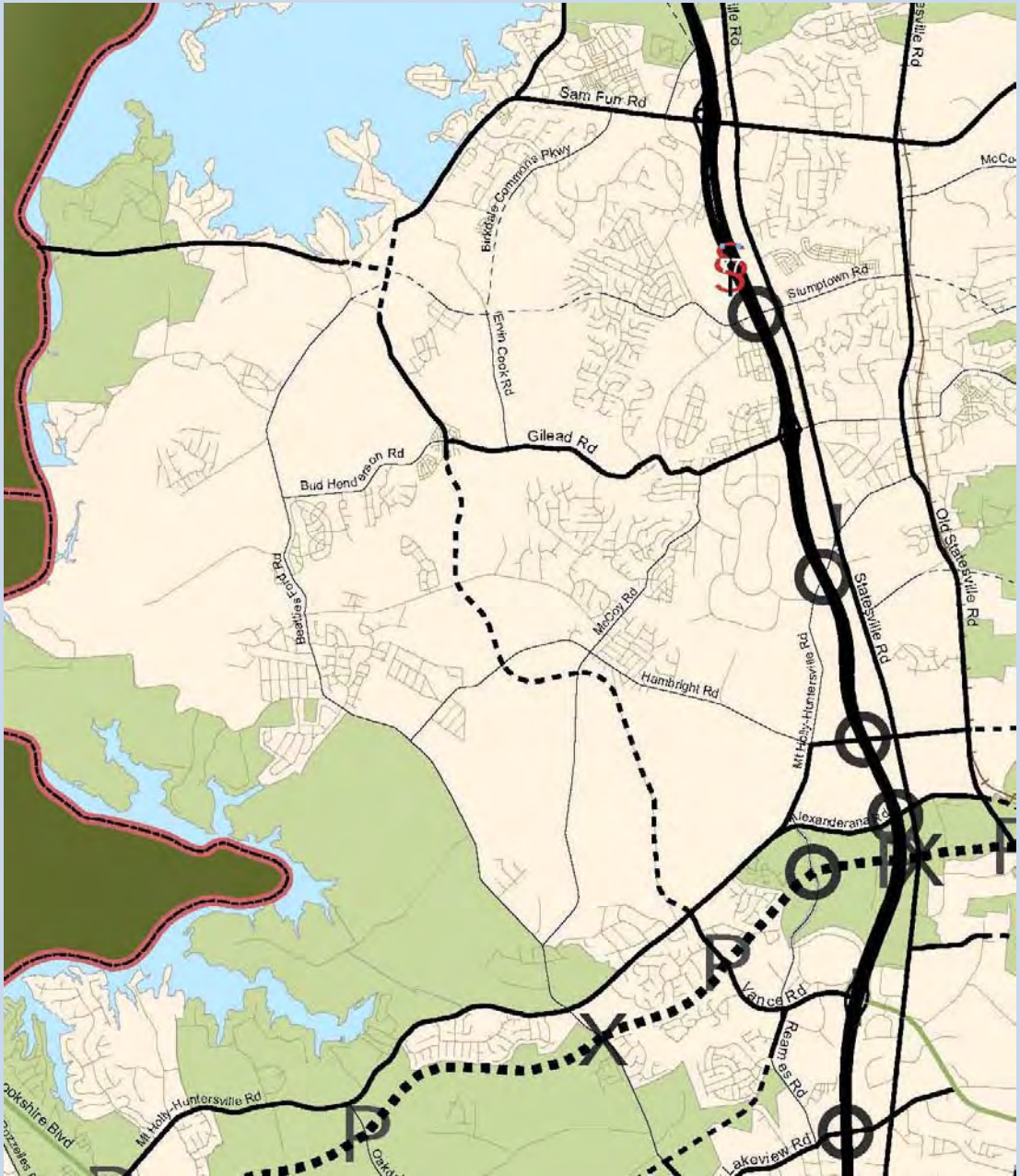
Charlotte Observer
1960

NC 73 Regional Context



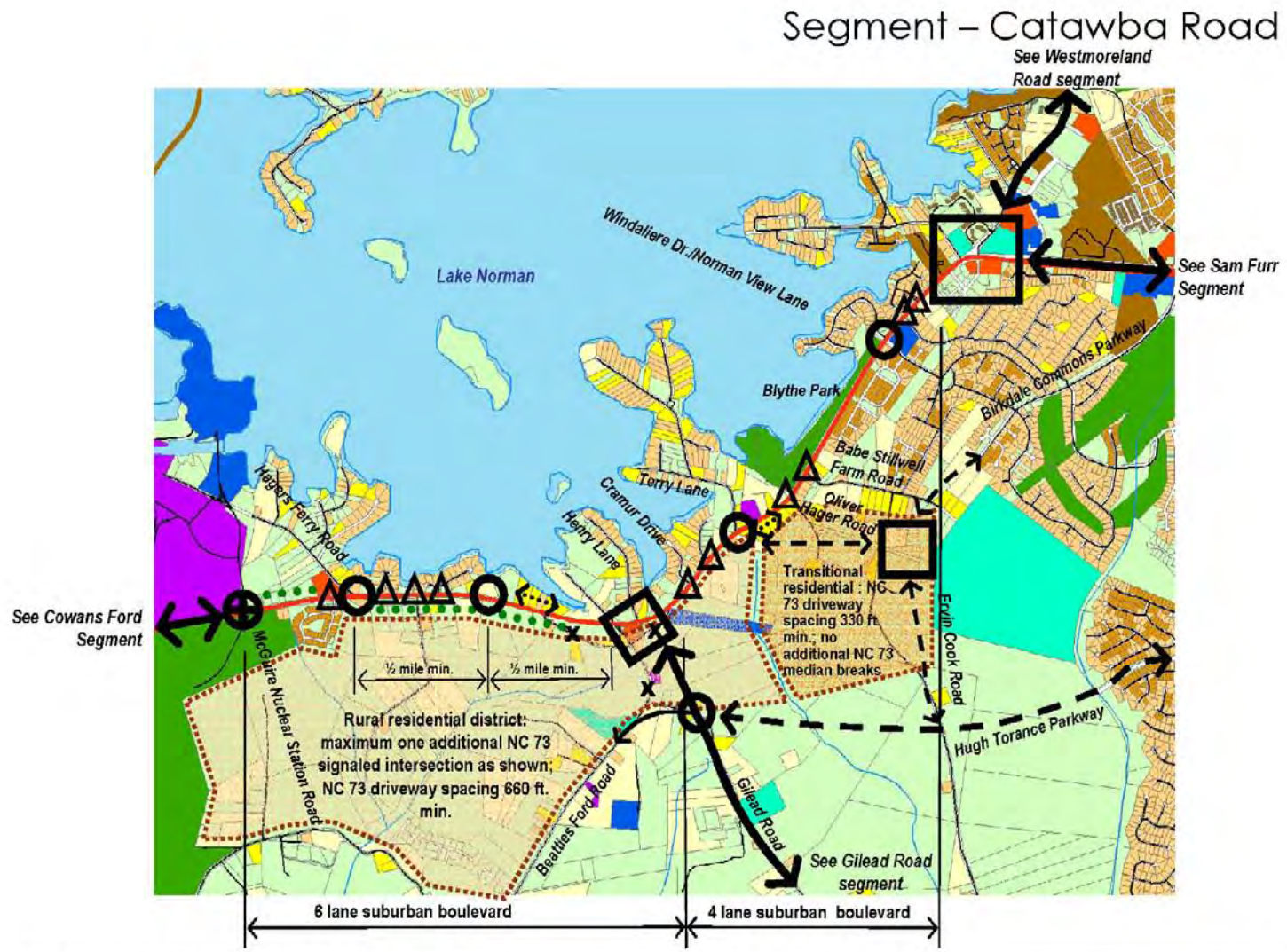
1988- Vance Rd Ext added to Thoroughfare Plan

Current Thoroughfare Plan



Sept 2004, NC 73 Corridor Study

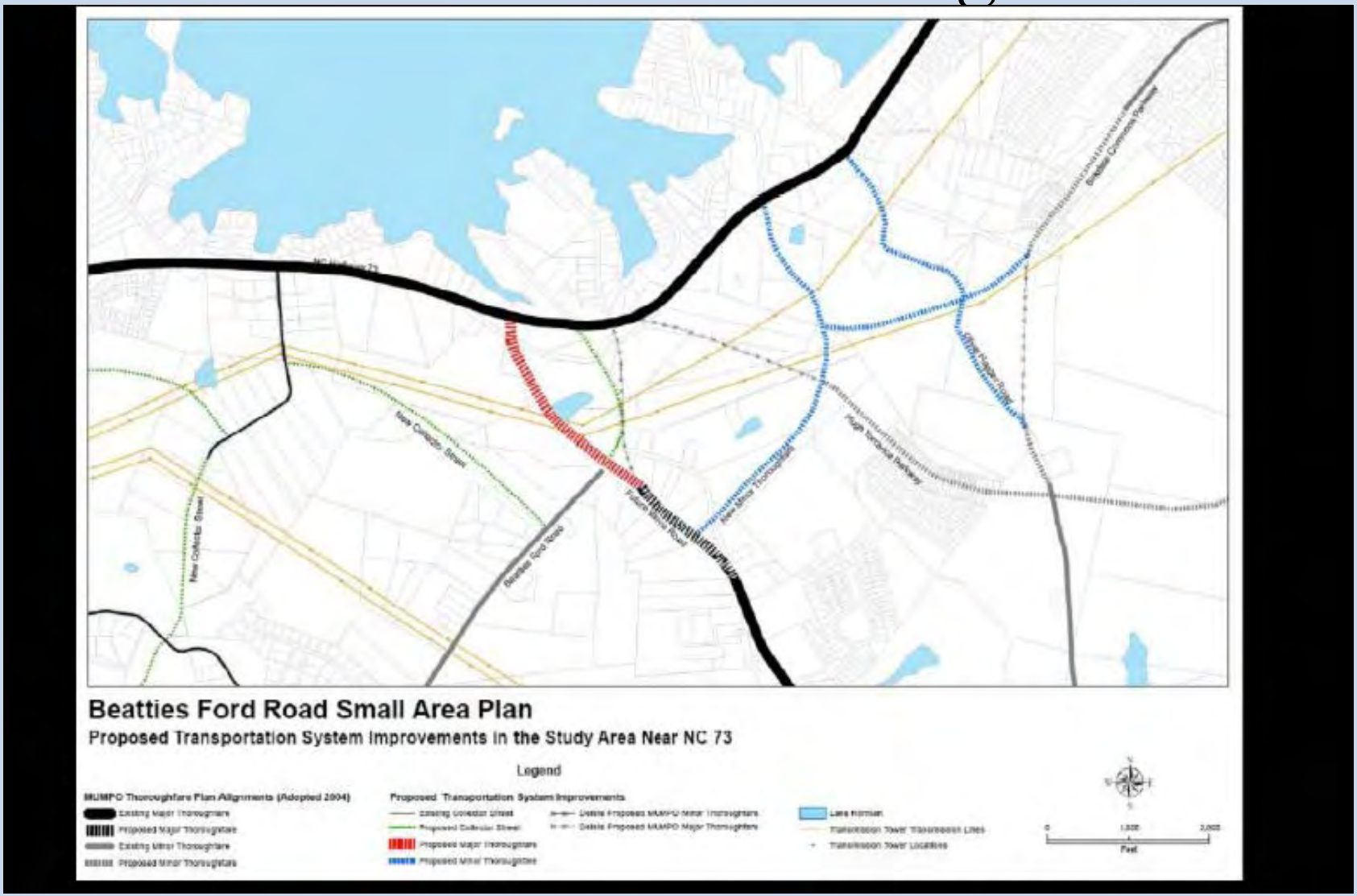
recommends alternate intersection



Suggested alternative intersection

Road Typologies – Dual Right/Left Turn Flyover Intersection

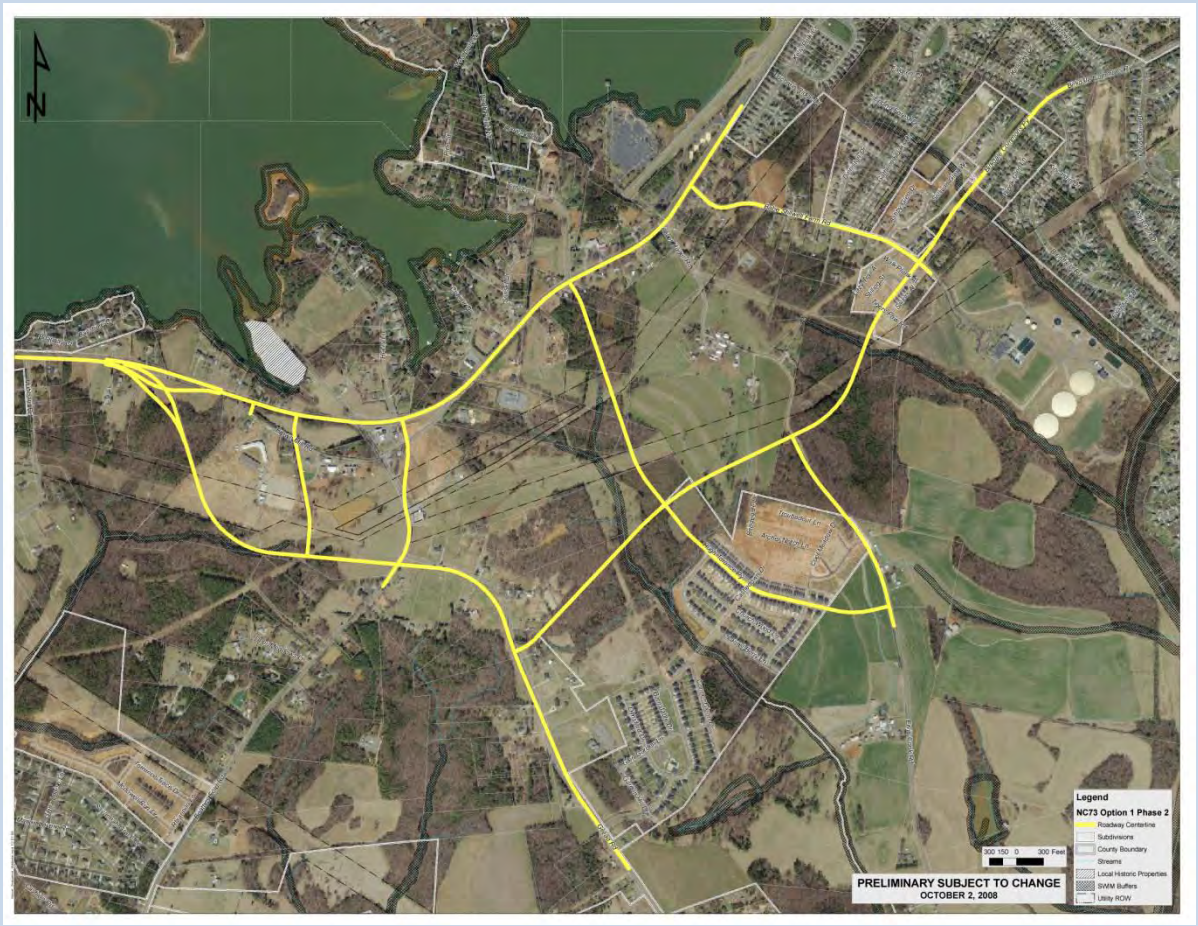
Sept 2007, Beatties Ford Rd SAP recommends new road alignments



Public Workshops

- December 2007, general area discussion
- April 2008, Option 1 displayed
- October 2008, Options 1,2, & 3 displayed
- May 2011, Options 1, 3 (revised), & 4 displayed

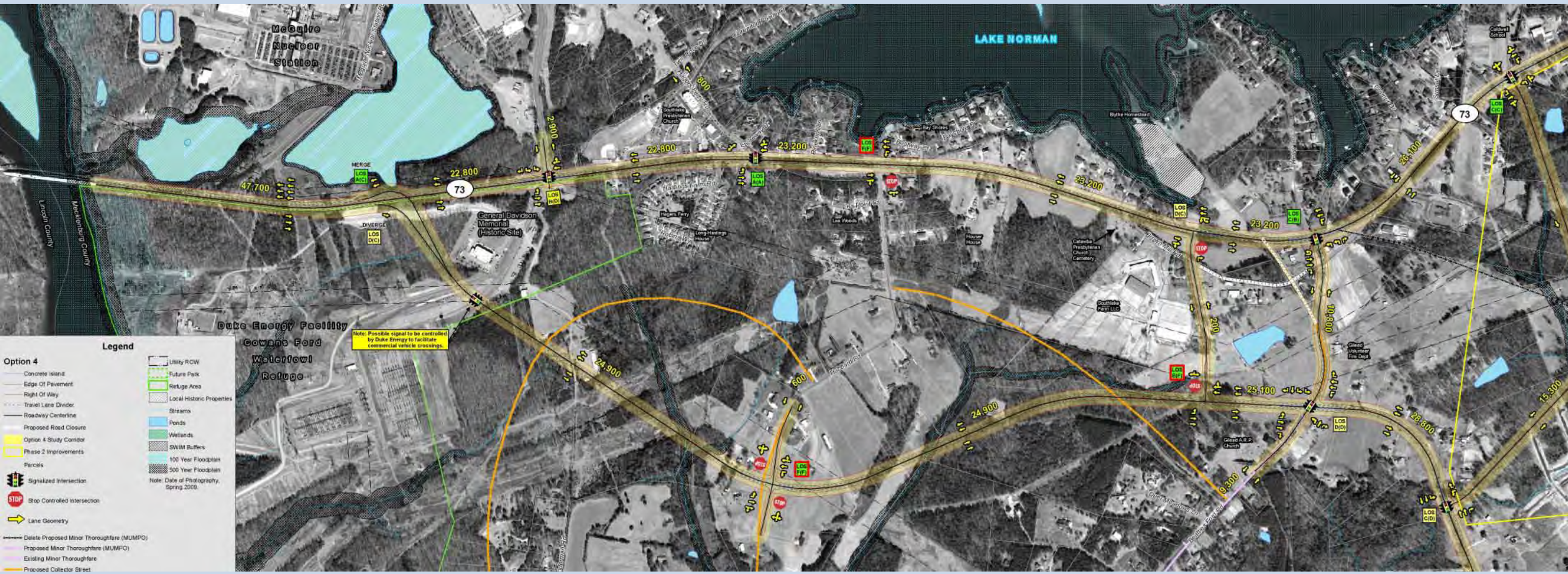
Northwest Huntersville Transportation Study



Option 1 - Phase 2


LAKE NORMAN
73
48,100
26,100
23,200
23,200
24,900
10,800
25,100
28,800
9,300
200
DIVERGE
LOS C(D)
LOS D(C)
LOS C(C)
LOS F(F)
LOS D(D)
LOS C(D)
LOS C(B)
General Davidson Memorial (Historic Site)
Southlake Presbyterian Church
Bay Shores
Blythe Homestead
Caldwell School
Hagers Ferry
Long-Hastings House
Houser House
Les Woods
Catawba Presbyterian Church Cemetery
Southlake Farm LLC
Gilead Volunteer Fire Dept
Gilead A.R.P. Church
Legend
Option 1 Phase 2
Concrete Island
Edge Of Pavement
Right Of Way
Travel Lane Divider
Roadway Centerline
Proposed Road Closure
Preliminary Study Corridor
Parcels
Signalized Intersection
Stop Controlled Intersection
Lane Geometry
Delete Proposed Minor Thoroughfare (MUMPO)
Proposed Minor Thoroughfare (MUMPO)
Utility ROW
Future Park
Refuge Area
Local Historic Properties
Streams
Ponds
Wetlands
SWIM Buffers
100 Year Floodplain
500 Year Floodplain


LAKE NORMAN
73
47,700
1,800
4,400
46,400
4,400
26,100
29,200
5,500
25,500
32,300
28,900
15,300
9,300
22,600
General Davidson Memorial (Historic Site)
Southlake Presbyterian Church
Bay Shores
Blythe Homestead
Hagers Ferry
Long-Hastings House
Lee Woods
Housel House
Catawba Presbyterian Church Cemetery
Southlake Farm LLC
Gilead Volunteer Fire Dept
Gilead A.R.P. Church
Riverdale
Meadowlake Presbyterian Church
Gilead School
Gilead Ridge
Legend
Option 3
Concrete Island
Edge Of Pavement
Right Of Way
Travel Lane Divider
Roadway Centerline
Proposed Road Closure
Preliminary Study Corridor
Parcels
Signalized Intersection
Stop Controlled Intersection
Lane Geometry
Delete Proposed Minor Thoroughfare (MUMPO)
Proposed Minor Thoroughfare (MUMPO)
Existing Minor Thoroughfare
Proposed Collector Street (From Beatties Ford Road Small Area Plan)
10,000 2030 AADT Volumes
Level of Service A-C
Level of Service D
Level of Service E
Level of Service F
LOS X (X)
AM (PM) Peak Hour Level of Service
Utility ROW
Future Park
Refuge Area
Local Historic Properties
Streams
Ponds
Wetlands
SWIM Buffers
100 Year Floodplain
500 Year Floodplain
0 250 500 Feet
PRELIMINARY SUBJECT TO CHANGE OCTOBER 16, 2006



LAKE NORMAN
McGuire Nuclear Station
Duke Energy Facility
Cowans Ford Waterfowl Refuge
General Davidson Memorial (Historic Site)
Note: Possible signal to be controlled by Duke Energy to facilitate commercial vehicle crossings.
Lincoln County
Mecklenburg County
73
47,700
22,800
23,200
23,700
23,200
26,100
25,100
24,900
28,800
9,300
10,800
2,900
MERGE
DIVERGE
Legend
Option 4
Concrete Island
Edge Of Pavement
Right Of Way
Travel Lane Divider
Roadway Centerline
Proposed Road Closure
Option 4 Study Corridor
Phase 2 Improvements
Parcels
Signalized Intersection
Stop Controlled Intersection
Lane Geometry
Delete Proposed Minor Thoroughfare (MUMPO)
Proposed Minor Thoroughfare (MUMPO)
Existing Minor Thoroughfare
Proposed Collector Street
Utility ROW
Future Park
Refuge Area
Local Historic Properties
Streams
Ponds
Wetlands
SWIM Buffers
100 Year Floodplain
500 Year Floodplain
Note: Date of Photography, Spring 2009.

Traditional Impact Measures

NW Huntersville Area Study

Impacts identified along NC 73 and west of Gilead and Beatties Ford Roads. All comparisons extend to the Catawba River.

Historic and Cultural Resources

	Method of Measurement	Option 1	Option 3 revised	Option 4
1. Historic Site (National Designation) (1)	Number affected	1 ?	0	0
2. Historic Sites (Local Designation)	Number affected	0	0	0
3. Cemeteries	Number affected	1	0	1
4. Churches or schools	Number affected	2(2)	0(2)	2(2)
5. Public Parks	Number affected	0	0	0
6. Fire Station	Number affected	0	1	0

Socio-Economic Factors

	Method of Measurement	Option 1	Option 3 revised	Option 4
1. Homes or (Businesses) Taken	Number in right-of-way	7 (2)	6 (0)	7 (2)
2. Homes or (Businesses) Affected (3)	Number within 100 feet	73 (5)	49 (4)	72 (4)

Socio-Economic Factors

	Method of Measurement	Option 1	Option 3 revised	Option 4
1. Construction Costs (4)	Dollars (million)	$25.6	$27.4	$35.3
2. R/W Costs (5)	Dollars (million)	$12.8	$9.9	$11.2
Total	Dollars (million)	$38.4	$37.3	$46.5

Updated August 22, 2011

(1) Historical Architectural Resources Report has not been completed for this project. Impacts are based on known locations identified by Town Staff. Houser House suspected as potential site.

(2) No structures will be impacted. Only land along road frontage.

(3) Includes all structures impacted by the widening of existing NC 73 (required under any alternative), the new roadways related to the Vance Road connection to NC 73, or the new NC 73 alignments.

(4) Estimate is for comparison purposes only. Variance of estimates for each option are as follows:
   a. Option 1 - $18 - $39 million
   b. Option 3 revised - $20 - $41 million
   c. Option 4 - $25 - $53 million

(5) Estimate utilized LRTP right-of-way estimate methodology and is based on GIS data. Values used were: Commercial - $150k / acre, Industrial - $395k / acre, Office - $160k / acre, Residential - $190k / acre.

Decision Analysis Model

Decision analysis is a formal, quantitative approach for evaluating and comparing the alternatives to a decision

- Developed initially at Harvard and Stanford in 1960's.
- Currently taught in most graduate school business programs.
- Used widely by businesses, especially energy, pharma, and tech industries, mostly for evaluating major capital investments.
- Also used in government sector, especially by federal agencies for facilitating and defending large-scale, controversial decisions.

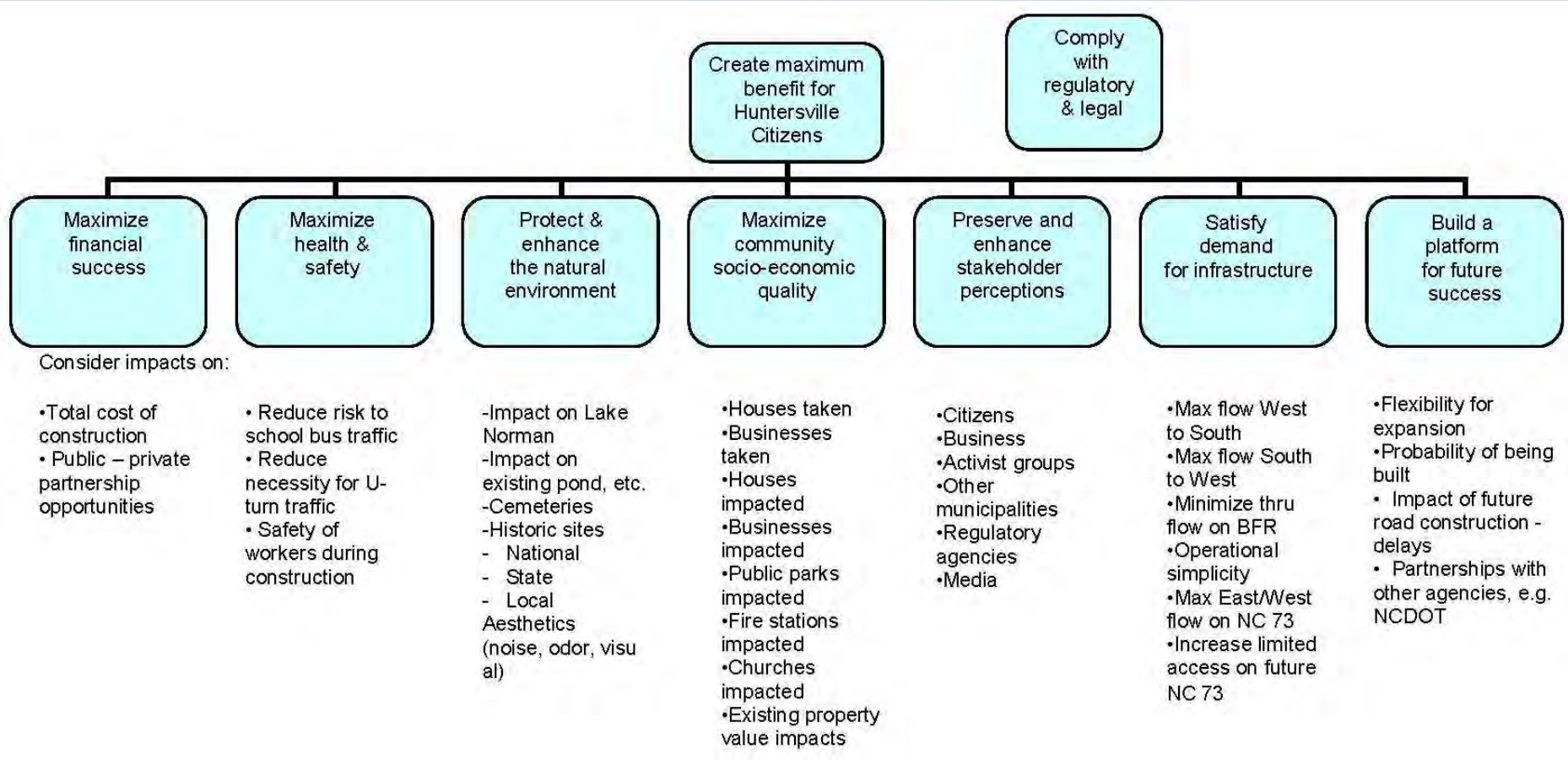
Source: Lenny Cook

The philosophy underlying the approach

- Resources are insufficient to implement construction of a transportation project now.
- The value of each project option is determined by the degree to which it contributes to the achievement of objectives.
- Objectives can be identified.
- The degree to which projects are likely to achieve objectives can be estimated.

Source: Lenny Cook

Objectives Hierarchy



Created by Huntersville Planning Board with input from staff

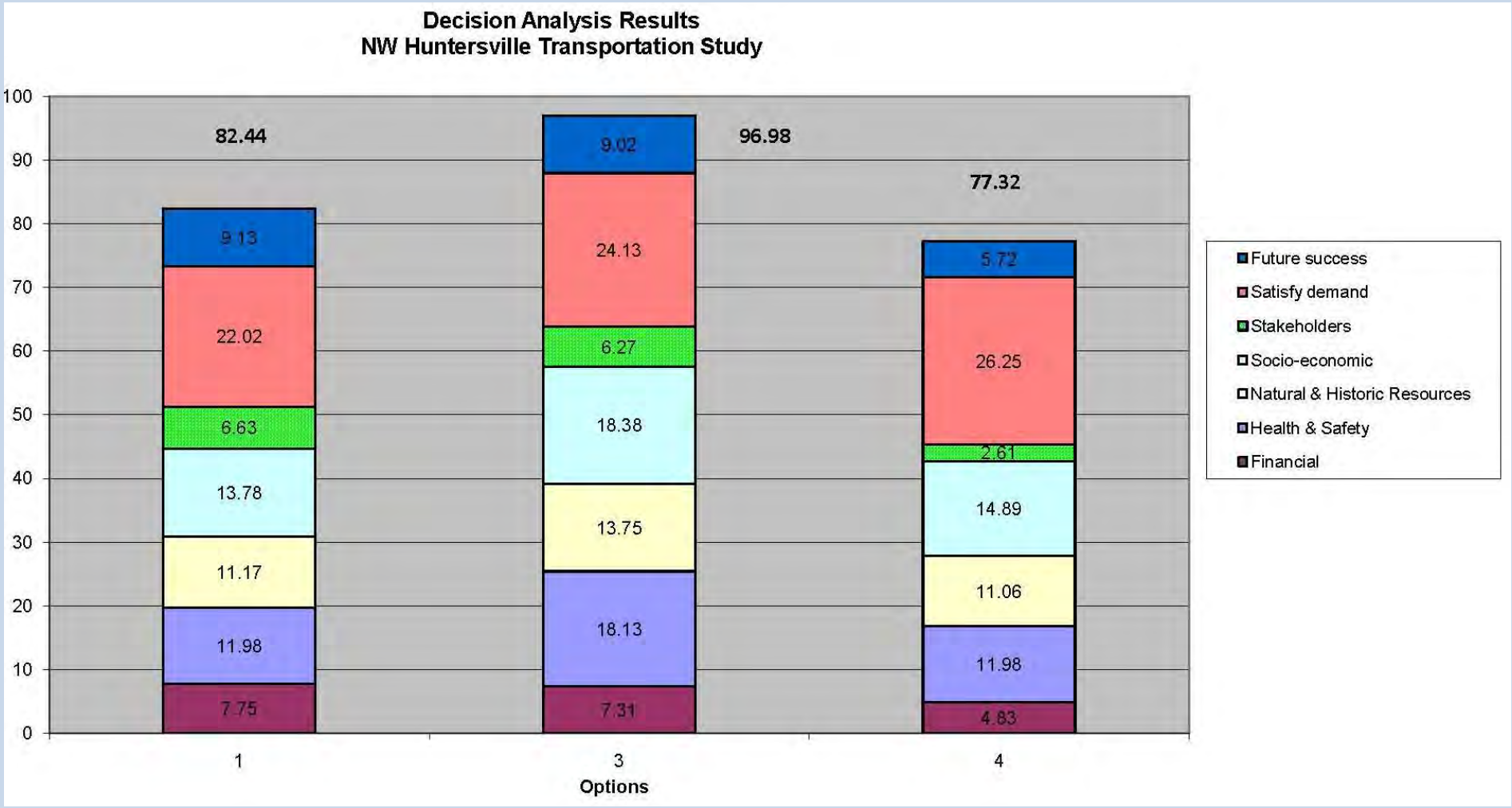
Decision Matrix Evolution

- Planning Board determined components to evaluate under each objective, staff feedback altered them somewhat
- Planning Board assigned weights to each objective
- Staff determined relative importance of each component within each objective (scaling)
- Staff assigned values to each component for each option
- Math takes over to adjust for # of components in each objective, then assigns weights to "normalized" results
- Total scores are then displayed for use

Decision Analysis Model
NW Huntersville Transportation Study - 2011 Update

Note: Range of points = 0 to 5 (higher = better)

Catagories and Factors affecting decision	Scaling Factor	Option 1 Value	Option 1 Points	Option 1 Scaled	Option 1 Normal	Option 3 Value	Option 3 Points	Option 3 Scaled	Option 3 Normal	Option 4 Value	Option 4 Points	Option 4 Scaled	Option 4 Normal	Category Weight	Weighted Results 1	Weighted Results 3	Weighted Results 4	Method of Measurement
Financial																		
Total costs (+ or - 25%)	10	38.4	5	50	94.34	37.3	5	50	94.34	46.5	3	30	56.60					Projected cost in $ Million
Public private partnership opportunities	3		1	3	5.66		0	0	0.00		1	3	5.66					Compare likelihood of partnership
	Total			53	100.00			50	94.34			33	62.26	7.75%	7.75	7.31	4.83	
Maximize Health and Safety																		
Reduces risk to school traffic	2		1	2	3.57		3	6	10.71		2	4	7.14					Impact on school related traffic
~~Reduces necessity for U-turn traffic~~																		
Safety of Workers during construction	1		1	1	1.79		2	2	3.57		1	1	1.79					Traffic conditions during construction
Affect on McGuire Evacuation *	4		1	4	7.14		2	8	14.29		3	12	21.43					
Minimize Conflict Points *	10		3	30	53.57		4	40	71.43		2	20	35.71					Conflict counts
	Total			37	66.07			56	100.00			37	66.07	18.13%	11.98	18.13	11.98	
Protect Natural & Historic Resources																		
Impact of construction on Mt. Is. Lake *	10		4	40	16.00		2	20	8.00		2	20	8.00					Linear disturbance
Impact of construction on Lake Norman	8		2	16	6.40		5	40	16.00		3	24	9.60					Linear disturbance
Impact to existing ponds, streams, wetlands	8		3	24	9.60		3	24	9.60		2	16	6.40					Experience (3 must move off SWIM)
Aesthetics (odors, noise, visual)	2		2	4	1.60		3	6	2.40		1	2	0.80					Noise and visual impact
Historic Site impact - National designation	10		3	30	12.00		5	50	20.00		5	50	20.00					Number within 100 Feet of facility
Historic Site impact - State designation	8		5	40	16.00		5	40	16.00		5	40	16.00					Number within 100 Feet of facility
Historic Site impact - Local designation	7		5	35	14.00		5	35	14.00		5	35	14.00					Number within 100 Feet of facility
Cemeteries impacted	7		2	14	5.60		5	35	14.00		2	14	5.60					Impact on funerals
	Total			203	81.20			250	100.00			201	80.40	13.75%	11.17	13.75	11.06	
Maximize Socio-economic Quality																		
Houses taken	10	7	2	20	8.62	6	3	30	12.93	7	2	20	8.62					Number in R/W
Businesses taken	10	2	2	20	8.62		5	50	21.55	2	2	20	8.62					Number in R/W
Houses impacted	8		2	16	6.90		4	32	13.79		2	16	6.90					Number negatively impacted
Businesses impacted	8		2	16	6.90		3	24	10.34		3	24	10.34					Number negatively impacted
Public Parks impacted	10		5	50	21.55		5	50	21.55		5	50	21.55					Number negatively impacted
Fire stations or other public facilities taken	8		5	40	17.24	1	0	0	0.00		5	40	17.24					Number negatively impacted
Institutions impacted (churches, schools)	8	2	1	8	3.45		5	40	17.24	2	2	16	6.90					Negative impact of widening (# of lanes)
Existing property value impacts	2		2	4	1.72		3	6	2.59		1	2	0.86					Subjective
	Total			174	75.00			232	100.00			188	81.03	18.38%	13.78	18.38	14.89	
Preserve Stakeholder Perceptions																		
Citizens	7		3	21	22.34		4	28	29.79		1	7	7.45					Public hearing and workshop comments
Business/Non-residential	7		4	28	29.79		3	21	22.34		1	7	7.45					Comments received
Activist Groups	3		2	6	6.38		3	9	9.57		0	0	0.00					Based on emails & other communication
Other Municipalities	5		3	15	15.96		3	15	15.96		3	15	15.96					Subjective
Regulatory Agencies	8		3	24	25.53		2	16	17.02		1	8	8.51					LEDPA & area disturbed
~~Media~~																		
	Total			94	100.00			89	94.68			37	39.36	6.63%	6.63	6.27	2.61	
Satisfy Infrastructure Demand																		
Provides maximum flow from West to South	8		4	32	17.20		2	16	8.60		4	32	17.20					Number of turns required
Provides maximum flow from South to West	8		3	24	12.90		2	16	8.60		4	32	17.20					Number of turns required
Minimizes thru traffic on minor road (BFR)	7		2	14	7.53		3	21	11.29		2	14	7.53					Number of turns required
Provides driving operational simplicity	4		3	12	6.45		2	8	4.30		4	16	8.60					Subjective
Provides maximum East/West flow on NC 73	10		3	30	16.13		2	20	10.75		3	30	16.13					# of signals & volumes at signals
Increases limited access on NC 73	6		1	6	3.23		3	18	9.68		1	6	3.23					Improves access management
Impact on the bicyclist *	8		1	8	4.30		4	32	17.20		2	16	8.60					Improve existing road for bikes vs. volume
Impact on the pedestrian *	5		2	10	5.38		4	20	10.75		2	10	5.38					Pedestrian/Vehicle compatability
Average LOS on key intersections *	10		2	20	10.75		2	20	10.75		3	30	16.13					Average of numerical equivalents
	Total			156	83.87			171	91.94			186	100.00	26.25%	22.02	24.13	26.25	
Platform for Future Success																		
Flexibility for Expansion	7		2	14	16.87		4	28	33.73		3	21	25.30					Based on R-O-W availability
Probability of road system being built	9		3	27	32.53		2	18	21.69		1	9	10.84					Based on experience
Impact of future road construction - delays	2		2	4	4.82		4	8	9.64		2	4	4.82					Based on experience
Further the adopted land use goals *	10		3	30	36.14		2	20	24.10		1	10	12.05					BFRSAP,NC73 Corr. Pln, H Comm Pln
Partnerships with other agencies (e.g., DOT)	4		2	8	9.64		2	8	9.64		2	8	9.64					Based on experience
	Total			83	100.00			82	98.80			52	62.65	9.13%	9.13	9.02	5.72	
														100.00%				
Sum of weighted results >>>>>>>>>>															**82.44**	**96.98**	**77.32**	


Decision Analysis Results
NW Huntersville Transportation Study
100
90
80
70
60
50
40
30
20
10
0
82.44
9.13
22.02
6.63
13.78
11.17
11.98
7.75
96.98
9.02
24.13
6.27
18.38
13.75
18.13
7.31
77.32
5.72
26.25
2.61
14.89
11.06
11.98
4.83
1
3
4
Options
Future success
Satisfy demand
Stakeholders
Socio-economic
Natural & Historic Resources
Health & Safety
Financial

Huntersville Planning Board Recommendation

On 8/23/11, the Huntersville Planning Board voted 8 to 0 with one abstention to:

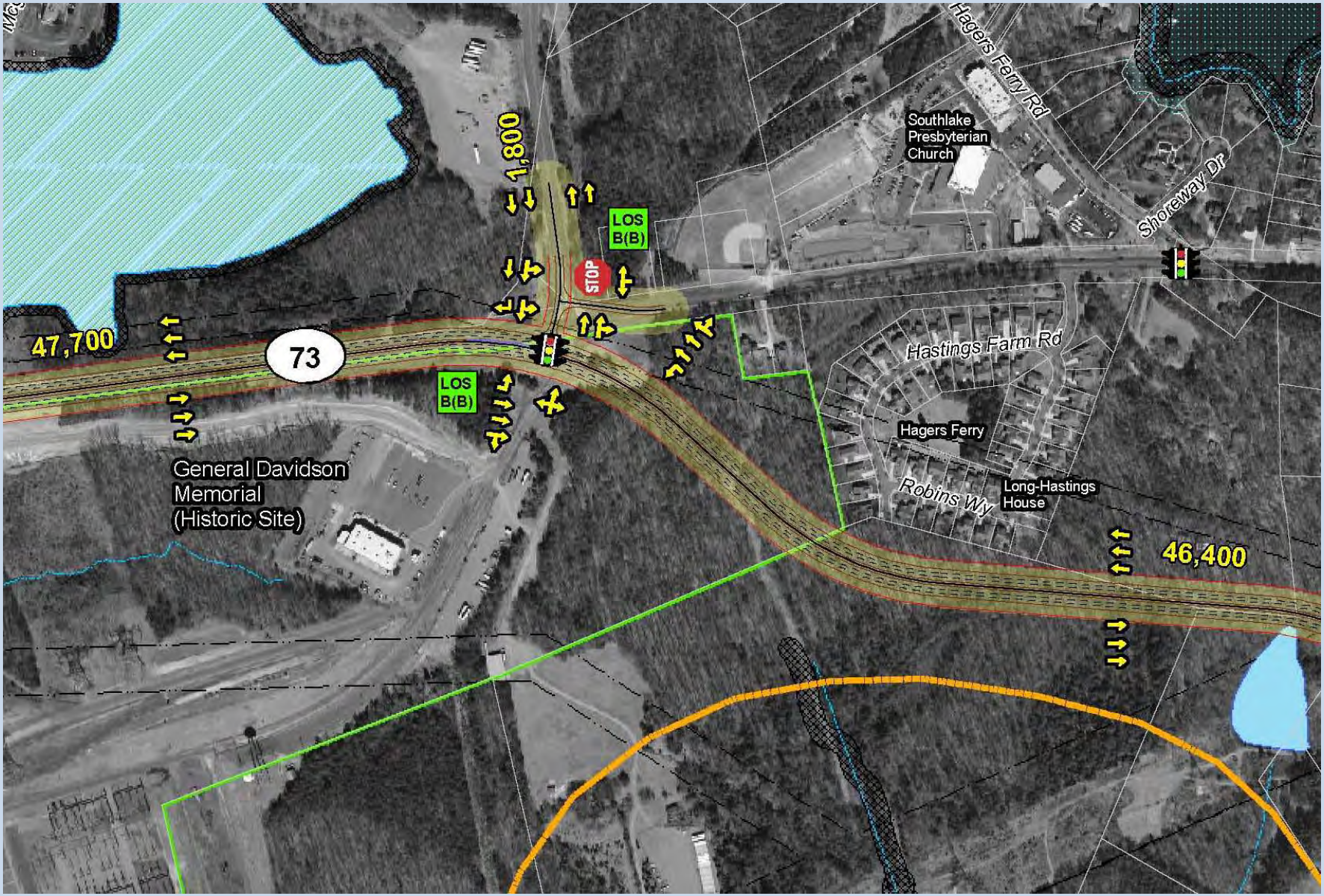
Accept the validity of the decision analysis process and recommend its results to the Huntersville Town Board.

The net result of that is to recommend Opt. 3

Remaining Option 3 Issues

- Western terminus at entrance to McGuire Nuclear Station, how to connect old NC 73

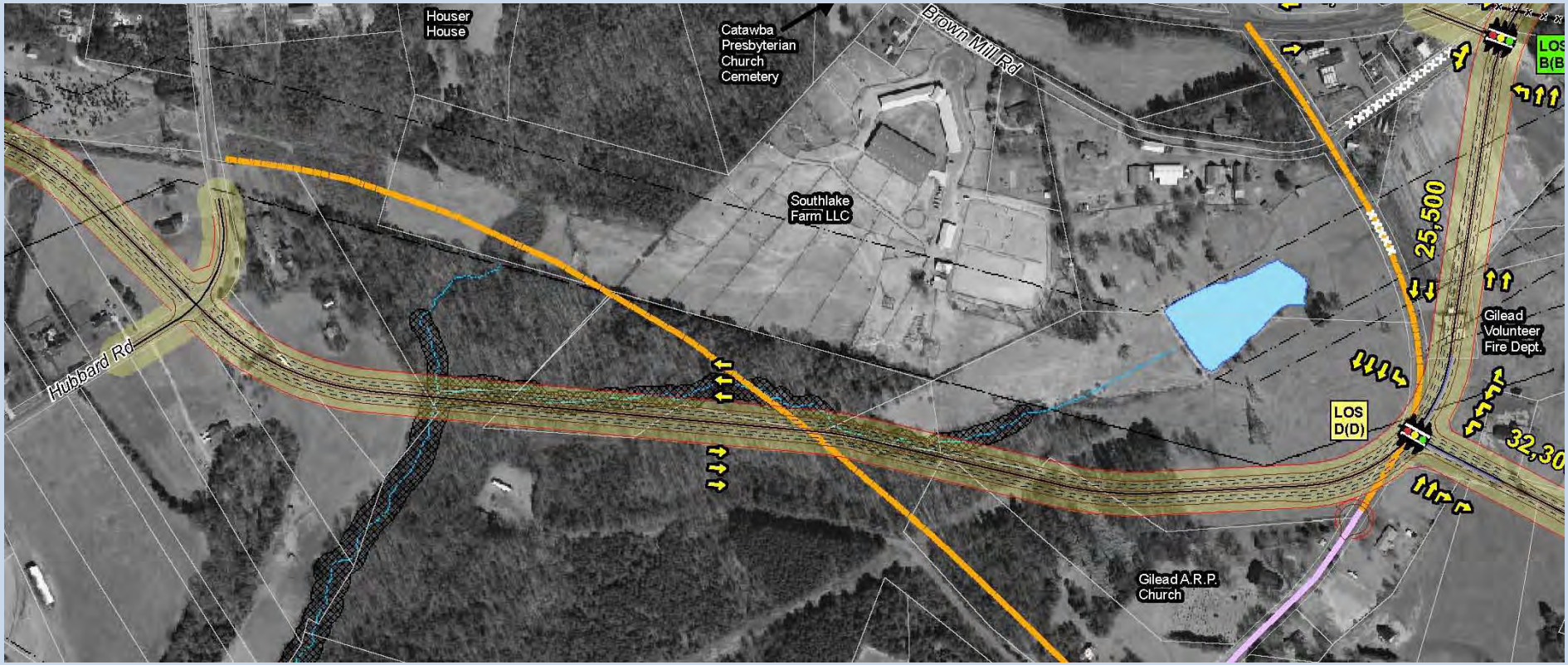
Opt. 3 @ McGuire Entrance



Remaining Option 3 Issues

- Western terminus at entrance to McGuire Nuclear Station, how to connect old NC 73
- West of Vance Rd, need to shift alignment south off stream, create new Transco crossing

Opt. 3 west of Vance Rd Ext.



Remaining Option 3 Issues

- Western terminus at entrance to McGuire Nuclear Station, how to connect old NC 73
- West of Vance Rd, need to shift alignment south off stream, create new Transco crossing
- How to protect new alignment from access degradation especially opposite Vance Rd Ext.
- How to protect 150' of right of way
- Problem statement, aka purpose and need, for new alignment
- Need area plan for land between Lake Norman and new road
- CTP designation of remnant section of old NC 73

Mecklenburg-Union Technical Coordinating Committee 9/1/11

- Endorsed Opt. 3 in concept with modifications needed @ McGuire entrance and @ the stream and Transco pipeline crossing west of Vance Rd.
- Leave the "bypassed" section of NC 73 designated as a major thoroughfare
- Charged the TCC's CTP committee with discussion of r/w protection and access management issues

Additional TCC Actions

- Recommended that Town pursue an area plan to develop the public good in creating a new alignment and manage development pressures that will stem from the new road.
- Agreed that the area plan include details on Lake Norman Bike Route, NC Bike Route # 6, and Carolina Thread Trail
- Try and find a different option than the triple left turn lane intersection

Huntersville Recommendation

- On September 6, 2011, the Huntersville Board of Commissioners recommended adding to the Thoroughfare Plan the concept of Option 3 with future modifications as addressed by the TCC.