Mount Mourne & South Iredell
Master Plan

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MOORESVILLE, NORTH CAROLINA
Mount Mourne & South Iredell Master Plan

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Mount Mourne/South Iredell
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Mount Mourne & South Iredell
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The information contained herein is conceptual in nature.
All reasonable efforts have been made to ensure accuracy of material.

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Master Plan
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In July of 2004, community leaders selected Burgess Design Studio to lead a project team to continue the ongoing planning efforts in Mt. Mourne, creating the third major planning exercise there since 2000. The project team began the effort with five days of Public Design Workshops (or charrettes) in August and September of 2004 and finished with another three day Workshop in February of 2006. This document is a summation of the ideas discussed and the designs derived from those discussions.

Scots-Irish settlers came to Mt. Mourne from Pennsylvania beginning in the 1750’s, and the Presbyterian Synod of North Carolina was formed at Centre Presbyterian Church in 1765. Princeton Presbyterians founded a classical school, Crowfield Academy, around 1760. Its first post office was opened in 1805, predating the Davidson College office by some thirty-plus years.

In the 200 years since, Mt. Mourne has existed as a loosely held rural, agricultural community. However, in 1960, events began to shape the entire region of the Catawba Piedmont, which have now begun to profoundly affect this community’s future. A small rural community centered around the outpost of Torrence’s Tavern and the sanctuary of Centre Church that has existed for 250 years is now experiencing rapid urbanization, driven by the growth engines described on the facing page – a “Top Ten” list presented at the first Public Design Workshop on August 9, 2004.

For those who have spent any time in the area, the ten items on the list might seem like a statement of the obvious but are also an indication of the seeming inevitability of continuing pressure for real estate development and population growth. The recently completed South Iredell Demographic and Employment Forecast predicts a population increase in the study area of 10,000 new residents by 2025. The need to direct and control this growth to create the foundation for a prosperous and livable community has guided the recent planning efforts.

The first Mt. Mourne Master Plan was prepared in 2000. Almost simultaneously with the completion of that Plan, came the announcement by Lowe’s Companies of its intention to relocate its headquarters to Mt. Mourne, with the promise of up to 12,000 new jobs and support services and assurances from the NCDOT of new freeway interchanges and other transportation improvements. Lowe’s plans were not necessarily inconsistent with the long-term goals of the original Master Plan; however, Lowe’s arrival increased the magnitude of anticipated growth in the area, as well as the speed with which the growth would be achieved.

After adoption of the initial plan, community leaders added the preliminary plan for the Lowe’s Companies Campus. The central focus of this first Plan was the area north and west of the Fairview Road/NC 115 intersection and Lowe’s campus, where the Town of Mooresville had zoning jurisdiction. The events set in motion by the Lowe’s relocation shifted the epicenter of the anticipated growth in the Mt. Mourne area toward the south and the new Langtree/I-77 interchange, as well as to huge undeveloped tracts of rural residential land to the east of 115, where Iredell County’s zoning jurisdiction prevailed.

Consistent with the anticipated shift in growth, in 2003 Iredell County undertook a master plan for the portion of southern Iredell County that includes Mt. Mourne. This planning exercise was helpful in soliciting and documenting the input of the local community and of adjacent municipalities regarding their image of Mt. Mourne and their hopes for the future. It also compiled and documented for the first time all the information of the various organizations and governmental agencies with plans affecting the area, including Mooresville, Iredell County, Mecklenburg County, Mooresville and Iredell County Schools, the Town of Davidson, and the NCDOT. But most importantly for the Town of Mooresville, the plan led to the decision by Iredell County to transfer its zoning jurisdiction to Mooresville for a large portion of the planning area.

So, with the hope of helping the Town of Mooresville lay the foundation for a livable and prosperous Mt. Mourne community, this Master Plan was created.
Mount Mourne Area Top Growth Engines

1. Lake Norman & I-77 Construction
2. Lake Norman Regional Medical Center
3. Lowe’s Companies Corporate Campus
4. Langtree Road Exit from I-77
5. Proposed CATS Transit Station
6. Brawley School Road Exit from I-77 & widening
7. Utility extension from Mecklenburg County & Town of Mooresville
8. Proximity to Metropolitan Region
9. Quality of Life: Lake Norman, open space, historical resources, employment centers, airports, transportation network, proximity to Charlotte, position in region.
Mission:

To reinforce the character and identity of Mount Mourne and coordinate a vision for growth as a prosperous, vital, and livable community.

Designs should:

- Recognize rapidly growing employment centers, including Lowe’s Corporation and Lake Norman Regional Medical Center as catalysts for new development.
- Study Interstate 77 interchanges as part of a comprehensive circulation network.
- Develop transportation strategies that improve street and pedestrian connectivity.
- Protect and enhance historic resources including sites, structures and rural character.
- Identify areas with new development and redevelopment potential.
- Plan areas of growth in balance with the natural topography and areas of watershed.
- Define centers of higher residential densities and mixed-use activity.
- Preserve areas of rural open space and identify sites for community parks.
- Study existing and future expansion areas for educational facilities.
- Integrate future transit corridor plans and surrounding land-use patterns.
The character of Highway 115 changes from rural, signified by green areas, to higher density 'town core' areas, shaded in red. Developing Mount Mourne at its core will continue this historic pattern.
Master Plan Legend

Langtree Gateway Employment Center:
A new freeway interchange at the southernmost portion of Mooresville’s jurisdiction offers a unique opportunity for development of a high density commercial employment center that takes advantage of the large tracts of developable land, close to Charlotte and the Lowe’s Companies headquarters, and with excellent accessibility to I-77.

Because of the potential for overburdening the I-77/Langtree Road interchange, a significant amount of other mixed uses that do not bring traffic volumes that compete with the employment center, such as housing, will be necessary.

Neighborhood Commercial Development:
Where existing land uses are primarily residential and mixed-use of a small scale, this encourages new residential of a higher density. It also encourages commercial uses that are intended to provide services to the adjoining neighborhood but at a small scale that is compatible with residential uses.

These areas are typically clustered around major intersections and near large areas of new residential development.

Mixed-use Commercial Development:
High density development is encouraged in the employment center/transit station area near the Lowe’s campus and Lake Norman Regional Medical Center, west of NC 115.

Commuter Rail:
The commuter rail station is indicated to the west of the existing Norfolk Southern “O Line,” with boarding access from both the east and the west sides of the tracks. This arrangement disperses arriving and departing traffic and allows shared parking with both the Fairview United Methodist Church and the planned new commercial development to the west, on the south side of Fairview Road.

Lowe’s Companies Campus:
Indicating the campus master plan current at the time of the Public Design Workshops.

Public Park and Lake Access:
A public access park to Lake Davidson is indicated at the end of the Transco Road peninsula. A similar public access park is under construction at the end of the Bridges Farm Road peninsula across the cove, to the east. These two projects encourage the development of a public shoreline park that allows a continuous jogging, walking & biking trail along the water’s edge while protecting the water quality of environmentally fragile Lake Davidson.

Mt. Mourne Village Center:
This is centered around the existing post office and extends along NC 115 from Langtree Road at the south to the Campus Lane/Faith Road intersection at the north. A unique opportunity exists to create small town scale, single-family housing on the east side of NC 115, amid existing older homes, similar to N. Main Street in Davidson. Commercial development on the west side of NC 115 should mimic the scale and building pattern of its sister NC 115 Main Streets in North Wilkesboro, Statesville, Mooresville and Davidson; 20 mph speed limit, on-street parking, wide sidewalks, one to three story buildings (near the street), with a limited number of driveway access points to minimize turning movements off and onto NC 115.

Neighborhood Residential Development:
There are three distinct types of residential districts described in this plan:
• Village Center and along NC 115;
• Other areas within ½ mile of the commuter rail station;
• Rural and agrarian areas east of NC 115.

Greenways and Neighborhood Parks:
An excellent opportunity exists to develop, or require to be developed, a pedestrian/bicycle greenway paralleling a vehicular parkway that follows the Rocky River basin. The natural topography and geology in this lowland area nearest the watershed is ill-suited to development, and the construction of new sewer lines through the drainage basin begins clearing rights-of-way in this area. The existing Transco natural gas pipeline easement provides an opportunity for an easily developed greenway that connects the Rocky River basin to the Lake.
Guiding Principles

1. Define a land use strategy that balances economic development with conservation and growth management.

2. Improve transportation access throughout Mount Mourne by expanding the local street network to increase connections and guide appropriate development patterns.

3. Develop conceptual designs for key areas of development.

4. Locate sites for parks, greenways, and conservation of open space to protect the environment and enhance quality of life.

5. Identify and preserve historic sites and buildings.
1

Define a land use strategy that balances economic development with conservation and growth management

1.1 Regional Concept Plan
1.2 Neighborhood Services & Schools
1.3 Land Use Concept Plan
1.4 Mount Mourne & South Iredell Master Plan

October 2006
Mt. Mourne is a historically rural, agricultural area surrounding NC State Highway 115, roughly centered around the existing post office and elementary school between Fairview Road and Langtree Road.

NC 115 is a farm-to-market road that parallels the Norfolk-Southern rail corridor and forms the Main Streets of several small cities and towns: North Wilkesboro, Statesville, Troutman, Mooresville, Davidson, Cornelius and Huntersville. The roadway is a narrow, two-lane road for its entire length and historically has consisted of a series of relatively dense small town centers, transitioning to rural countryside and back to the next Town Center.

Recent developments in the Mt. Mourne area and the projected increase to the area’s population will support the emerging employment center adjacent to I-77 and Langtree and Fairview Roads and require new commercial and retail development to serve the new workforce and population.

The drawing at the right illustrates a concept for development in the Mt. Mourne area that respects the historical character of NC 115 – it should remain a two-lane highway and strip-type commercial development should be prohibited to allow the highway to continue to serve as a thoroughfare. Mt. Mourne’s new commercial areas should be developed with an urban form creating a distinct and compact center – a small town Main Street – before transitioning back to a rural thoroughfare that connects to the next town several miles down the road.
Regional Concept Plan

The towns of Mooresville and Davidson are signified by a greater building density along Highway 115. Mount Mourne, along 115 between Langtree Road and Fairview Road, should build to a similar density with areas of lower density and greater open space along 115 between the towns.
Neighborhood Services & Schools

Recent growth in Mt. Mourne has been characterized by intense residential development to the west along the lakeshore, commercial and institutional development along the east side of I-77, and the beginning of more intensive residential development in the rural agricultural area east of NC 115.

This Master Plan encourages the continuation of that pattern.

Because the lakefront is approaching 100% build out, most of the future population growth in the area will occur in the sparsely developed rural area east of 115 and north of Fairview Road. For that reason, new areas for neighborhood-oriented commercial services, such as grocery and convenience stores have been identified.

Neighborhood commercial and retail services differ from commercial uses proposed elsewhere in this Plan near the employment center in an important way – they are intended to provide services needed by the surrounding neighborhood, not to attract shoppers or businesses to the area. These services to the new neighborhoods should be embedded within the neighborhoods, for convenience and to avoid unnecessary traffic on the major thoroughfares of the area.

The possible future population of the rural area east of NC 115 could support two new elementary schools in the study area in the short term future. The South Iredell Demographic Forecast foresees 3,000 to 4,000 new households in the study area. Iredell County schools projects future elementary classroom requirements by assuming 0.6 students per household, in this case predicting 1800-2400 new students in the long term. Since a desired school size is 600 students, three or four elementary schools could be added to the area someday. Iredell County elementary schools require sites of approximately 20 to 35 acres and a location near the intersection of two through-streets is desirable. Specific locations have not been identified to avoid interference with property acquisition.

Because middle schools and high schools draw students from a larger geographical area, there is no absolute need for a secondary school in the study area, but there is a possibility that one of each in the study area will be required.

The fire stations that serve the study area are indicated per the Town of Mooresville’s existing plans, and the existing volunteer fire departments. New fire stations on Town-owned land on Shearer’s Road and land donated by Lowe’s Companies on Langtree Road will help provide fire & rescue services to new development in the study area.
GUIDING PRINCIPLE 1

Define a Balanced Land Use Plan

Neighborhood Services & Schools
Existing, zoned, and potential areas for neighborhood-oriented commercial development, fire stations, and schools

TOWN OF MOORESVILLE  Mount Mourne & South Iredell Master Plan
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Schematic Land Use Patterns

General land use patterns were developed to support the Concept Plan and to further the goals previously delineated in the Mooresville Zoning Ordinance, the original Mt. Mourne Plan, and the South Jockell Small Area Plan as follows:

Area for neighborhood retail development — around the intersection of US 21 and Waterlyn Road as encouraged by current zoning.

Area for high density development — generally defined by a 1/4 mile radius centered around the proposed transit station — primarily commercial development west of US 21, primarily higher density residential development east of US 21.

Area for expansion of the local employment center — on Langtree Road adjacent to the new freeway interchange and Lowe's campus, encouraging primarily office development, but also other commercial and high density residential uses to serve the employment center.

Area of opportunity for Planned Campus Development where large contiguous parcels of undeveloped land exist west of NC 115.

Area with unique assets for development of a conference center, retail and high density housing to support the employment center. Location on the shoreline of Lake Norman very near the new I-77 interchange and the current availability of water and sewer utilities make this site amenable for development.

Areas for watershed protection around the Lake Davidson shoreline — encouraging residential and recreation area development. This area falls in the WS-IV Lake Norman Critical Area (24% maximum impervious area) of the Watershed Protection Ordinance. Because of the extreme sensitivity of Lake Davidson to sediment runoff, a 100' shoreline buffer for recreational uses and restrictions on the size and speed of watercraft are encouraged here.

Area for increased density residential development — near Waterlyn Road and US 21 to provide a mix of higher density housing types near the proposed transit station and employment centers.

Area for development of a village center for Mt. Mourne — with two-story retail commercial buildings and residences lining the street in a traditional Main Street pattern in the heart of Mt. Mourne near the post office, elementary school and proposed transit station.

Area of opportunity to develop, or require to be developed, a greenway — with a pedestrians' bicycle path paralleling a vehicular parkway to follow the Rocky River basin. The natural topography and geology in this lowland area nearest the watershed is not well-suited to development, and the construction of new sewer lines through the drainage basin begins clearing right-of-way in this area.

Area of transition — from dense commercial uses near Langtree-I-77 to lower density commercial uses to more rural residential uses toward the south and east.

Areas for preservation of the historic rural heritage and character of Mt. Mourne — where strip commercial development is prohibited and continuation of the mixed-use but primarily residential development pattern is encouraged.

Areas for open space preservation and new low density residential development east of US 21.
Mount Mourne & South Iredell Master Plan

Three key sections of the Master Plan are enlarged to show greater detail in following pages.

SECTION 1
The area encompassing Exit 33, the future transit station, Lake Norman Regional Medical Center and the proposed Mt. Mourne Village Center showing suggested areas of highest density development, north to Waterlynn Road.

SECTION 2
The area just south of the Lowe’s Companies campus including the new Langtree interchange, the Lake Davidson shoreline and the largely undeveloped areas around the Transco peninsula and Bridges Farm Road.

SECTION 3
A portion of the sparsely developed rural residential and agricultural area east of NC Highway 115, showing desired characteristics of future residential development.
Master Plan Section 1 Highlights

Proposed commuter rail station consisting of a 350-foot-long boarding platform and parking for up to 500 cars. Location selected for maximum accessibility and to allow shared parking with adjacent commercial development and Fairview United Methodist Church.

New high density mixed-use development is proposed for the area around and between the Lowe’s Companies campus and the Lake Norman Regional Medical Center. This Plan envisions continuing expansion and densification of the existing employment center, including the following specific recommendations:

- Watershed high density option development to encourage a density near the transit station that maximizes pedestrian movement in the area.
- Urban form of 2, 3 & 4 story mixed-use buildings, with retail uses encouraged on the street level and office or residential uses on the upper floors.
- The construction of parking garages in this area is strongly encouraged to achieve the maximum amount of development in the employment center so that the Watershed Ordinance’s impervious area allowances are not used up on surface parking lots.

New Fairview Rd. overpass of I-77 to improve accessibility to west side and increase travel options to and from the Langtree and Brawley School Road peninsulas.

New I-77 off-ramp at Fairview Rd. that provides direct access from the freeway to the transit station, Lake Norman Regional Medical Center and Lowe’s Companies campus.

New connector road from transit station/Lowe’s Blvd. to Langtree Rd. to serve as a vehicular gateway to the employment center/transit station area and provide direct access from the Langtree peninsula and the new I-77 interchange. This also allows access to the transit station area, the hospital, US 21 and the Mooresville Gateway Center without using the freeway

New neighborhood retail center is proposed at the intersection of Waterlynn and US 21 to provide necessary commercial services to the rapidly expanding local population. Location has existing zoning in place; several hundred new residential units proposed for development in the area will be within walking distance; intersection is easily accessible from the north, south, east and west and will not cause excessive congestion around I-77, the transit station or Gateway Blvd.

NC Hwy. 115, north of Fairview should remain a two-lane rural character road. For the highway to continue to function as an efficient north-south thoroughfare it is imperative that turning movements on and off the highway be minimized; therefore, strip-type commercial development should be prohibited. Preservation of the Memorial Oaks on the west side should be mandatory, and additional planting of willow oaks on the highway required with new development. Infill residential development and redevelopment should be encouraged. Commercial development should be allowed only as a conditional use, and with building sizes and setbacks similar to those of its neighbors. Parking should be screened from view and driveways should be strictly limited. Left turn lanes should be added to the Waterlynn Road intersection.

NC Hwy. 115, south of Fairview should transition from a rural road to a small town Main Street as it approaches Langtree Road from the north, with sidewalks, curb and gutter and parallel parking. Left turn lanes should be added at the Faith Road and Langtree Road intersections. (See Chapter 3 for discussion of the “village center”).

Residential infill development and redevelopment is encouraged to revitalize existing neighborhoods. An increased housing density and the addition of new street connections and sidewalks are important to the long-term success of the village center and transit station.

New mixed housing type residential development, currently planned, provides relatively dense (8-12 units/acre) housing near transit and services, for a diverse range of age, family size and income.
GUIDING PRINCIPLE 1

1. Proposed commuter rail station consisting of a 350-foot-long boarding platform and parking for up to 500 cars. Location selected for maximum accessibility and to allow shared parking with adjacent commercial development and Fairview United Methodist Church.

2. New high density mixed-use development on the Pope property.

3. New high density mixed-use recommended.

4. Continuing medical office and mixed-use development related to the Lake Norman Regional Medical Center.

5. Lowe’s Companies Campus – existing and proposed future expansion phases.

6. New Fairview Rd. overpass of I-77 to improve accessibility to west side and increase travel options to and from the Langtree and Brawley School Road peninsulas.

7. New I-77 off ramp at Fairview Rd. that provides direct access from the freeway to the transit station, Lake Norman Regional Medical Center, and Lowe’s Companies campus.

8. New connector road from transit station/Lowe’s Blvd. to Langtree Rd. to serve as a vehicular gateway to the employment center/transit station area and provide direct access from the Langtree peninsula and the new I-77 interchange. This also allows access to the transit station area, the hospital, US 21 and the Mooresville Gateway Center without using the freeway.

9. New street connections to expand local roadway network.

10. New mixed housing type residential development, currently planned, provides relatively dense (8-12 units/acre) housing near transit and services, for a diverse range of age, family size, and income.

11. New neighborhood retail center is proposed at the intersection of Waterlynn and US 21 to provide necessary commercial services to the rapidly expanding local population. Location has existing zoning in place; several hundred new residential units proposed for development in the area will be within walking distance; intersection is easily accessible from the north, south, east and west and will not cause excessive congestion around I-77, the transit station or Gateway Blvd.

12. New “village center” development.

13. Existing elementary school.

14. Existing post office.

15. Lake Norman Regional Medical Center

16. Centre Presbyterian Church.

17. Fairview United Methodist Church.

18. Mooresville Gateway commercial center.

19. Highway 21 Corridor development should continue in the patterns described in the earlier Mt. Mourne Plan; large scale work place, medical and retail development at Mooresville Gateway, with neighborhood residential and small scale neighborhood services farther north. Because of the importance of the US 21 thoroughfare to the traffic movement in the area, strip commercial development should be prohibited in this area because of the traffic congestion it causes.

20. St. Patrick’s Episcopal Church.

21. Residential infill development and redevelopment is encouraged to revitalize existing neighborhoods. An increased housing density and the addition of new street connections and sidewalks are important to the long-term success of the village center and transit station.
MASTER PLAN SECTION 2

1. New I-77 interchange at Langtree Road should be developed to serve as a gateway to the major employment center. Because of this area’s importance as the southern entrance to Mooresville and Mt. Mourne, particular attention should be given to the design of the streets and landscaping to create a beautiful interchange and roadway. Freeway oriented businesses should be prohibited to avoid the associated congestion and visual blight.

2. Existing Transco gas pipeline pump station.

3. New east-west connector road to provide access to I-77 and the employment center/transit station area from developing areas south of Langtree and east of NC 115. The road is located to cross the railroad and NC 115 at natural grade midway between the Langtree and Bridges Farm Road crossings, provide connection to the new north-south connector road north of Langtree, and to provide access to portions of the employment center and other development south of Langtree Road.

4. New development on the Bridges Farm Road peninsula, currently under construction.

5. Future connector road to Davidson, west of the railroad and NC 115, should be a requirement of any development south of Bridges Farm Road.

6. Large, contiguous undeveloped tracts of land entirely in the Watershed Critical Area, provide a unique opportunity for Planned Campus Development for corporate offices, institutional or flex-office uses. However, due to the possibility of overloading the traffic capacity of the I-77/Langtree Road interchange, it is recommended that commercial development only be allowed as part of a comprehensive development for the entire Planned Campus Area.

7. Proposed public parks with lake access.

8. Greenway along Transco pipeline easement.

9. Cove Church.

10. New commercial and high-density residential development on the Transco Road peninsula. The excellent economic development opportunity for employment center uses in this area is tempered by traffic and access issues related to other developments and roadway improvements surrounding the Lowes campus. For these reasons, at least 50% of the development in this area should be a mix of other land uses, such as housing, that do not compete with the employment center uses at morning and evening rush hours. Along with these developments, this plan encourages a public shoreline park that forms a continuous buffer for environmentally fragile Lake Davidson.

11. New high-density mixed-use development, primarily office uses, is recommended along Langtree Road to enhance and provide support services to the employment center. Buildings of two, three and four stories are recommended, and parking garages are very desirable because of watershed limitations to impervious area. Commercial uses should transition to residential, then to rural toward the east and the south. Due to the proximity to environmentally sensitive Lake Davidson, a 100’ undisturbed buffer along the shoreline should be established.

12. Lowe’s Companies Campus, existing and proposed future expansion phases.

13. Alcove Road near Langtree Interchange, west of I-77 should remain as the boundary between the residential areas to the west and the office/employment center/transit station area from developing areas south of Langtree and east of NC 115. The road is located to cross the railroad and NC 115 at natural grade midway between the Langtree and Bridges Farm Road crossings, provide connection to the new north-south connector road north of Langtree, and to provide access to portions of the employment center and other development south of Langtree Road.

14. New development on the Bridges Farm Road peninsula, currently under construction.

15. Future connector road to Davidson, west of the railroad and NC 115, should be a requirement of any development south of Bridges Farm Road.

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7. Proposed public parks with lake access.

8. Greenway along Transco pipeline easement.

9. Cove Church.
MASTER PLAN SECTION 3

Future Residential Neighborhoods east of NC Highway 115

1. **Greenway and parkway development** is recommended in the Rocky River basin to provide recreation space and a pedestrian, bicycle and vehicular circulation route. See chapter 5 for detailed discussion of the greenway.

2. **New east-west connector road** from Coddle Creek Hwy (NC 3) in the east to Langtree Road at I-77 should be a two-lane rural character road, with sections divided by medians adjacent to areas of significant development.

3. **New primary collector roads** need to be constructed as development occurs to connect and supplement Faith, Timber, Midway Lake, Shearers, Johnson Dairy, Rocky River and Presbyterian Roads.

4. **New street connections** to expand the secondary road network and disperse traffic. In new developments this is accomplished with small block sizes and many connections to surrounding and future developments, which increases road capacity and encourages pedestrian and bicycle trips within neighborhoods. Existing dead-end and cul-de-sac streets should be connected wherever possible.

5. **Shearers Road** is recommended to remain a two-lane rural character road. A future connection to NC Hwy 73 in Mecklenburg County is likely, but this plan strongly recommends that the development of a regional north-south arterial road not occur on Shearers Road, but further to the east at NC Hwy 3 (Coddle Creek Hwy).

6. **Rural residential development with open space preservation** is recommended for virtually the entire study area east of NC 115 and south of Timber Road. See chapter 4 for additional discussion of residential development in this area. Areas for development of neighborhood commercial services and schools are discussed earlier in this chapter.

7. **New park space** for active and passive recreational activities is recommended for this rapidly growing area. The recent South Iredell Demographic Forecast predicts an increase of 3,000 households in this area by 2025, a possible population increase of approximately 10,000. The location of the active recreation park space indicated on the Master Plan was selected because of its central location at a major intersection within the developing area and a relatively flat topography suitable for ball fields. See chapter 5 for additional discussion of recreation areas.

8. **Possible Future Neighborhood Services Commercial Development** would be appropriate for the crossroads at Shearers Road and the proposed new east-west connector road.
2

Improve transportation access throughout Mount Mourne

2.1 Transportation Strategies
When the design effort was begun for this Mt. Mourne & South Iredell Master Plan in 2004, the design team included a transportation engineering consulting firm, Glatting, Jackson, Kercher, Anglin, Lopez, Rinehart, Inc. who developed many innovative strategies for improvements to the transportation systems in and around the Study Area, and their suggestions form the backbone of this Master Plan. These suggestions were developed into a chapter that appeared in the first drafts of the Master Plan.

The transportation system suggestions of Glatting Jackson were so compelling that the Town of Mooresville immediately implemented many of the design concepts. However, the transportation chapter of the Master Plan Draft of August 2005 is not published in this edition because it has been superseded by more detailed work by other engineering firms contracted to the Town of Mooresville and private developers in the area. The original Glatting Jackson chapter, as well as the more recent Mount Mourne Transportation Assessment prepared by Kimley-Horn and Associates are reproduced herein as Appendix C and Appendix D, respectively.

Following is a summary of the major transportation improvement concepts advanced by Glatting Jackson as part of the development of this Master Plan:

- Expansion of the roadway network throughout the study area by construction of new connections and connector roads.
- Recognition of the importance of a roadway’s character to historic preservation and the quality of life in the region.
- Development of a strategy for accessing proposed transit station from all directions via multiple possible routes.
- Development of a modified “box-diamond interchange” at Exit 33 and Fairview Road to ease congestion in the vicinity of Lake Norman Regional Medical Center, Lowe’s Companies campus and the proposed transit station.
- Proposed Fairview Road to Alcove Road bridge over I-77.
- New east-west road connecting I-77 and Langtree Road to NC Hwy 3, and the large tracts of undeveloped land east of NC 115.
GUIDING PRINCIPLE 2

Improve Transportation Access throughout Mount Mourne

See Appendix C for complete Transportation Strategies Section

TOWN OF MOORESVILLE Mount Mourne & South Iredell Master Plan
3

Develop conceptual designs for key development areas

3.1 Mount Mourne Village Center
3.2 Langtree Gateway
3.3 Transit Area Mixed-Use
3.4 Highway 21 Neighborhood Commercial
3.5 Residential Neighborhoods

October 2006
To help define the development concepts espoused in this Master Plan, the design team has developed the Conceptual Designs included in this chapter. These are illustrations of the design intentions for several key areas of anticipated development, as denoted on the facing page:

- **A Mt. Mourne Village Center**, intended to help create a physical identity as a “place” for Mt. Mourne, as well as a pedestrian environment for commercial services to the Mt. Mourne community near the Post Office, elementary school, and future transit station.

- **An Employment Center at Langtree Gateway**, Langtree Road and the I-77 interchange is identified as Priority #1 in the Mooresville Comprehensive Economic Development Strategy, creating new office developments for the region’s target industries.

- **A Transit Area Mixed Use Plan and Station Area Plan** with surrounding higher density mixed uses that help accommodate the station’s parking requirement and the adjacent development demanded by the Lake Norman Regional Medical Center and the Lowe’s Companies Campus.

- **A Neighborhood Residential Area**, in the heart of the existing rural agricultural area that emphasizes preserving significant open space and maintaining the rural character in balance with the new development.

- **Highway 21 Neighborhood Commercial Center** that provides a model for large- scale retail services for the neighborhoods within several miles. These services would include a grocery store, and the businesses that typically cluster around them, to serve the needs of the local community.
Key Areas of Development

Five types of new development, indicated above in five areas, are explained in the following pages.
The conceptual design for the Village Center creates a physical identity for the Mt. Mourne area, a "downtown," and a place for providing commercial services on a small scale to the Mt. Mourne community. The area chosen along NC 115 currently has commercial development on the west and residential development on the east. The owners of the properties to the west have expressed their desire to redevelop their land. Ample undeveloped land exists on the east side for infill residential development. The area is within walking distance of the post office, elementary school, transit station, and Lowe’s Companies campus.
GUIDING PRINCIPLE 3
Develop Conceptual Designs for Key Areas

The Village Center development shown has the characteristics of a traditional small town Main Street. These characteristics have been codified by the Town of Mooresville Zoning ordinance and the Mt. Mourne Zoning Overlay district, which both encourage:

- A mix of retail, residential and office uses.

- Buildings close to the street, on-street parking, sidewalks, street trees, and relatively narrow streets, which create an attractive environment and one that calms traffic to provide a safe pedestrian environment.

- Parking to the rear and sides of buildings to allow for uninterrupted window shopping, avoid unattractive parking lots, and further separate vehicular and pedestrian movement.

Mount Mourne Village Center
The **Langtree Gateway** is envisioned as an employment center. The development of the Lowe’s Companies Headquarters campus greatly accelerated the growth of the emerging employment center developing near Lake Norman Regional Medical Center and Exit 33. Lowes’ relocation to Mount Mourne necessitates the addition of a freeway interchange at Langtree Road, which will further accelerate the demand for development in the area.

The elements that made this area attractive as a location for Lowe’s Companies Headquarters make it attractive to other businesses as well; large tracts of undeveloped land, with good freeway accessibility, near Charlotte. For these reasons, Angelou Economics identified this area as Priority #1 for economic development efforts in the Mooresville Comprehensive Economic Development Strategy, targeting primarily office users in fields of business and technology.

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**Langtree Gateway**

*Proposed Langtree Connector Road at southern entrance to Lowe’s Campus*
In addition to the new I-77 freeway interchange at Langtree Road, other major transportation changes have been planned for the area:

- Widening of Langtree Road from I-77 to the Lowe’s Companies campus to four lanes and then ultimately six lanes, with a landscaped median, restricted turn options to and from Langtree and turn lanes.

- Construction of a new East-West connector road from Langtree across the railroad (at grade) to NC 115, and from NC 115 east to NC 3 (Coddle Creek Highway). This road would be the primary access to the hospital/transit/Lowe’s area from the large tracts of undeveloped land to the south and east where the greatest population increases are expected, and will provide a new railroad crossing to relieve congestion at Langtree where the steep grade makes the railroad crossing difficult.

Traffic volumes will, however, limit the amount of development possible in the Langtree Road area. Because the number of possible points of access to the area is restricted by Lake Norman and Lake Davidson to the west and the railroad to the east, the ultimate traffic capacity for the new freeway interchange and for Langtree Road is finite. Because Lowes’ master plan calls for expansion up to a possible 12,000 employees, a major portion of the traffic capacity on Langtree is already committed. According to the 2006 Mount Mourne Transportation Assessment prepared by Kimley-Horn & Associates in response to preliminary versions of this plan and the Economic Development Strategy, no more than 50% of the undeveloped land along Langtree Road should be allowed to develop as office, retail and commercial uses that compete directly with the employment center for traffic capacity at the morning and evening rush hours. Additionally, restrictions on the number of intersections and on left turns along Langtree will make access to much of the undeveloped land circuitous and indirect, making it less desirable for commercial development.
GUIDING PRINCIPLE 3
Develop Conceptual Designs for Key Areas

For this reason, this plan makes the following recommendations concerning development near Langtree Road:

- Office and other mixed use commercial development should occur in higher densities near Langtree Road, I-77 and the East-West connector, and from there transition to lower densities and then to more residential uses and a rural character. The illustration shows office buildings of three and four stories lining Langtree Road.

- Particular attention should be paid to the landscaping, street trees, lighting, sidewalks and bike lanes to make a beautiful thoroughfare that creates an inviting entrance to Mt. Mourne and a southern gateway to the Town of Mooresville. The illustration shows the important features of the Langtree development; buildings near the street with a uniform setback; a well-developed street tree planting plan with multiple rows of evenly spaced trees; wide, multi-purpose sidewalks that can accommodate pedestrians and bicycles on each side of the street; dedicated pedestrian crosswalks with center islands for pedestrian safety on the wide thoroughfare; and decorative lighting standards located in conjunction with the street tree plan.

Langtree Gateway
GUIDING PRINCIPLE 3

Develop Conceptual Designs for Key Areas

Freeway interchanges in the recent past are almost always accompanied by development of businesses that market themselves to the passing freeway traffic rather than to the surrounding community. One of the strong recommendations of the South Iredell Small Area Plan was to avoid freeway-oriented development. This plan supports that policy, and from a transportation perspective, will allow the Langtree interchange to provide freeway access to the Lowe’s campus, the surrounding denser commercial development and the residents of the Langtree peninsula, without the congestion associated with on/off freeway traffic and unnecessary local traffic drawn to the businesses at the interchange.

To avoid the need for local traffic to use Langtree Road, it will be necessary for a well-connected network of secondary roads to be developed throughout the area south of Langtree Road. This network of secondary roads will provide additional opportunities for commercial and mixed use development.

The illustration shows a concept for that development. A road fronting the Transco gas line easement is lined with one and two story commercial buildings housing a variety of retail, office and service uses. The easement creates an open vista connecting parcels throughout this area as well as a physical edge for a secondary street parallel to Langtree Road for local traffic. Buildings lining the street and the repetition of the street trees, planting areas, sidewalks and lighting reinforce the identity of the gateway area that was begun with the improvements to Langtree Road.

Greenway on the Transco Easement
The *Transit Area Mixed-Use* conceptual design creates a housing and employment center to take advantage of proximity to the transit line, to encourage uses that could share and help support the parking and access requirements of the transit station, and to help fill the need for additional office space demand in the area created by the Lowe’s Companies Headquarters and the Lake Norman Regional Medical Center.

This area should be developed under the Watershed high-density option to encourage a density and compactness near the transit station that maximizes pedestrian movement in the area. Buildings should be urban in form and two, three or four stories tall. The buildings should be designed for mixed-use, with retail uses encouraged on the street level and office or residential uses on the upper floors.
Specific goals of the design are as follows:

- Create a vehicular circulation network that allows multiple points of access from all directions, and is simple, straightforward and easily understandable, and accommodates the circular movements required for picking up and dropping off passengers.

- Develop a mixture of retail, office, hotel, and residential uses at a density that would make construction of parking decks economically feasible to avoid the creation of large surface parking lots.

- Preserve the large areas of open space required by the Watershed Protection Ordinance in a way that they could be enjoyed by the community at large, in the form of village greens, recreation fields, freeway buffers, etc.

Transit Area Mixed-Use
GUIDING PRINCIPLE 3

Develop Conceptual Designs for Key Areas

The *Highway 21 Neighborhood Commercial Center* conceptual design provides larger scale retail and commercial services for the high-density residential developments being created along Highway 21 around Waterlynn Road.

Highway 21 Neighborhood Commercial
GUIDING PRINCIPLE 3

Develop Conceptual Designs for Key Areas

The design typifies many of the planning principles outlined in the Mooresville Zoning Ordinance. A large commercial building (grocery store-sized) is shown set back from the street on US 21. The parking lot is screened from the street by a series of long narrow buildings fronting the street (liner buildings). The parking lot is heavily landscaped and has multiple points of access from all directions so that neighborhood residents can access the services without driving through the major intersections, thereby decreasing congestion. A mixture of housing types, multi-family, townhouses and live/work units surround the commercial development and separate it from the single-family neighborhoods nearby.

Highway 21 Neighborhood Commercial
Develop Conceptual Designs for Key Areas

The Residential Neighborhood conceptual designs were developed to preserve open space and to retain the rural character of the Mt. Mourne area. Toward this end, two sites were selected from the 8,000 acres of property currently zoned residential in the greater study area: Area A in the center of the sparsely developed rural residential and agricultural area east of NC 115, and Area B which represents a higher density pattern for single family development near the Town Center and Transit Station areas.

Typical Existing Neighborhood Condition

Rural Neighborhood Roadway

Rural neighborhood roadways are the predominant existing roadway type in the Mt. Mourne area and typify the community’s historic character. Their preservation is a primary goal of this Master Plan, particularly along portions of NC 115 and the large, sparsely developed areas east of NC 115.
GUIDING PRINCIPLE 3

Develop Conceptual Designs for Key Areas

Sample Conceptual Designs for Residential Neighborhoods
GUIDING PRINCIPLE 3

Develop Conceptual Designs for Key Areas

Area A is located in the rural, agrarian, largely undeveloped countryside of Mount Mourne. Illustrated is a theoretical residential development in Area A that shows several techniques to preserve open space and the rural character of the Mt. Mourne countryside:

- The large Rocky River drainage basin with numerous creeks and small streams runs through the center of the large, undeveloped area east of NC 115. The area is difficult to develop, with very steep slopes and wetland areas and represents an opportunity for greenway development and for preservation of a large undisturbed open space.
- The undeveloped land along the greenway provides an opportunity for a parkway along its perimeter, a roadway with little development. Where buildings occur they occupy only one side of the street, so that the rural heritage is always preserved.
- Single-loaded development; that is, buildings on one side of the street, along undevelopable property, again, to help preserve the rural character of the area.
- Village greens and park space – the South Iredell Small Area Plan revealed a startling statistic – there is no existing park or recreation space in the entire greater study area of 15 square miles. To help alleviate this shortage, this plan recommends mandatory provision of public park space with new development.
- Active recreation areas – the Mooresville Parks system is currently experiencing a shortage of recreation fields suitable for soccer, baseball & softball, football, lacrosse, and other field games, as well as basketball courts, playgrounds, etc. Contribution in land or funds for active recreation areas should be mandatory for all new development.
- Block sizes, though larger in rural residential areas than in cities, should be small enough to encourage people to take a stroll around the block. The recommendation of this plan is that no block may exceed 2500’ in its circumference, nor may it exceed 1000’ on any single side. Intersecting side streets or planned future connections should meet these same requirements.
- Cluster development houses built close together surrounded by large areas of open space, are encouraged by this plan.

A: Conceptual Neighborhood Design
Creating Parks and Greenways and Preserving Open Space

TOWN OF MOORESVILLE  Mount Mourne & South Iredell Master Plan
As development occurs nearer the Village Center, the transit station and employment centers, higher density housing and cluster developments will begin to develop.

The illustration shows a theoretical neighborhood development in Area B. Primarily single family housing, at a density of 8-10 dwelling units/acre, with attractive streets that are safe for vehicles and pedestrians: two lane, interconnected roadways with curbs and gutters, informal on-street parking, sidewalks, street trees, and front yards with uniform building setbacks.
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4

Locate sites for parks, greenways, and conservation of rural open space

4.1 Topography and Natural Drainage
4.2 Protection of Lake Davidson’s Water Quality
4.3 Potential Park Sites and Greenway System

October 2006
Early settlers situated Mt. Mourne along the ridgeline between two major drainage basins: the Catawba River to the west and the Rocky River to the east. NC Highway 115 and the Norfolk and Southern railroad line were each built along this ridge. A second ridge running east-west near Langtree, Fairview and Faith Roads defines the center of Mt. Mourne, where Torrence Tavern, Centre Church and the Mt. Mourne plantation reside. Hills and valleys surrounded each of these rivers, with each valley forming a small stream that drained to the rivers. The many coves of Lake Norman were the creeks and valleys that existed before its formation. The area east of NC 115, which drains to the West Branch of the Rocky River and to the Rocky River, has the same natural conditions with dozens of small ridges and valleys forming a myriad of small streams and creeks.

As is the case throughout the Piedmont, major roads and development followed the ridgelines between these creeks. The relatively flat areas at the ridge and in the valleys were logged for timber and farmed; the steepest slopes were more likely to be left forested.

The facing page illustrates an analysis of the topography and natural drainage features of the study area. We used this analysis to determine the areas where development is most likely to occur, and conversely, to ascertain the areas most likely to be proposed for preserved open space.

For example, areas with steep slopes (exceeding 15%) should probably never be built upon, because it is difficult and costly to grade the land for buildings and parking lots. Also, it permanently alters the surrounding natural environment because drainage patterns are changed forever, disturbing local plant and animal life. Steep sites must be clear-cut of trees because the earth moving destroys their root systems, causing sediment runoff into surrounding streams to increase exponentially. If development occurs in these areas, it is suitable only for very small buildings on large lots, specifically single-family residences.

Areas near the steep slopes normally transition into gentler slopes. These areas where the slope ranges from 10-15% are still most conducive to large lot residential development.

Areas described on the map as “Undeveloped Land” exist where land is undeveloped and the natural topography is relatively flat, with slopes less than 10%, generally. This land is relatively easy to build upon, and most new development in the study area will occur here.
GUIDING PRINCIPLE 4

Locate Sites for Parks, Greenways, and Conservation

Topography and Natural Drainage
GUIDING PRINCIPLE 4
Locate Sites for Parks, Greenways, and Conservation

The western portion of the Study Area (west of NC 115) drains to the Catawba River basin. Lake Davidson was created when the I-77 causeway was constructed, forming a dam between the Catawba River (Lake Norman) and the impounded drainage area between NC 115 and I-77. Lake Davidson does not enjoy the cleansing effect of the Catawba River running through it, carrying sediment and pollutants downstream.

For this reason, the Mecklenburg County Water Quality Program was contacted to evaluate Lake Davidson and a computer modeling program was used to investigate the effect of future development on the Lake’s water quality.

The Lake was found to currently have a “Good/Excellent” average score on the Lake Water Quality Indices. The entire Lake Davidson drainage area is located in the WS-IV Lake Norman Critical Area of the Watershed Ordinance, which allows a maximum of 50% of the land area to be developed as an impervious surface. The computer model predicts that the “Good/Excellent” water quality can be maintained if the entire Study Area is developed at the maximum impervious area of 50%.
However, there are several causes of water pollution that were not factored into the computer model. To offset the negative effects of these other pollution sources, the following recommendations are made:

- **Provide large wooded buffers around the shoreline of the Lake, 100’ or greater, which decreases runoff and allows all surface runoff to be filtered through the soil and vegetation of the buffer before entering the Lake.**

- **Allow no direct discharge of stormwater into the Lake, but instead discharge into detention ponds or employ other means that allow for filtration of the stormwater before it enters the Lake.**

- **Implement enhanced erosion control methods during construction** to reduce sediment runoff from denuded construction areas.

- **Consider restrictions on the size, speed and number of watercraft allowed on the Lake.** Motorized watercraft cause shoreline erosion and bring accompanying litter and spills of gas and oil into the Lake. Just a few speed boats on the very small Lake can cause safety problems.

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**Lake Davidson**

*100’ undisturbed buffer surrounds the lake, with potential trails beyond*
The South Iredell Small Area Plan revealed a startling statistic – there is no existing park or recreation space in the entire 20 square mile greater study area of this Master Plan. The Mooresville Parks system is currently experiencing a shortage of recreation fields suitable for soccer, baseball and softball, football, lacrosse, and other field games, as well as basketball courts, playgrounds, etc. The anticipated population growth in the study area will exacerbate the existing shortage.

This plan strongly encourages an update to the Town of Mooresville Parks & Recreation Master Plan to address the needs of this rapidly growing area recently added to its jurisdiction, and discussed in detail on the facing page.
Site A is located in the area along the West Branch of the Rocky River near Faith Road. This site provides an excellent opportunity for the development of a greenway and bikeway and would also include a vehicular parkway. The reasons for selecting this greenway site are threefold:

- this stream corridor is roughly equidistant to NC 115 and Shearers Road and would provide traffic relief to each of these roads;
- the construction of planned new sewer lines in the drainage basin will begin the creation of a right-of-way along this corridor; and
- the sometimes marshy, low lying land and numerous tributary streams make much of this land difficult to build on and environmentally sensitive to major earthmoving activity.

The area nearest Faith Road is relatively flat and presents an opportunity for active recreation fields. This flat area also promises to be a center of much residential development, so this location would serve the local population.

Site B is located along the existing 200’ wide Transco natural gas pipeline easement, an already developed right-of-way for a greenway that can connect the greenway and neighborhoods east of 115 to the employment center and Lake Davidson with very little cost and effort.

A: Proposed Greenway within New Residential Neighborhoods

B: Proposed Greenway along Transco Easement
Site C encompasses a possible chain of interconnected parks around the shoreline of Lake Davidson. The site where Transco Road terminates into Lake Davidson has served as an unofficial boat launch ramp, picnic area, and fishing spot since the creation of the lake more than 40 years ago. Coupling that with the long-stated desire of the community to have a public, lake-access park, this plan recommends a park on Lake Davidson at the end of the Transco Road peninsula.

A similar public access park is under construction at a development at the end of the Bridges Farm Road peninsula across the cove, to the east, a short swim or canoe trip apart. These two projects point out the potential for the long-term development of a narrow public park along the shoreline that allows a continuous jogging, walking & biking trail along this cove’s shoreline, occurring in the recommended 100’ minimum shoreline buffer, protecting the water quality of the environmentally fragile Lake.

The cove at the northernmost tip of the Lake, just south of Cove Church, is currently an undisturbed natural area of particular beauty, guarding a pristine wetland and would make an excellent park site to acquire for protection of the environment, within walking distance of the Lowe’s Companies campus and the employment center.

The park sites discussed in this section represent the opportunity to develop a three or more public parks that address community needs for active and passive recreation plus lake access, each connected to the other by walking/biking trails exceeding four miles in length.
GUIDING PRINCIPLE 4

Locate Sites for Parks, Greenways, and Conservation

The park sites discussed in this section represent the opportunity to develop three or more public parks that address community needs for active and passive recreation plus lake access, each connected to the other by walking/biking trails exceeding four miles in length.

Lake Davidson
(Private) Access, Existing

Lake Davidson
Trails line the lake, connecting neighborhoods and creating a buffer along the water’s edge
5

Identify and preserve historic sites and buildings

5.1 Historic Rural Character
5.2 Historic Sites
Identify and preserve historic sites and buildings.

A Brief History of Mt. Mourn

Sources: An Inventory of Historic Architecture by Ruth Little-Stokes, Iredell County Landmarks: A Pictorial History (1976), and articles in The Charlotte Observer by Erica Beshears.

In the late 1740s and early 1750s, Calvinists from Pennsylvania and Maryland drifted south in search of farmland and settled in Iredell County. Cotton was generally prosperous in southern Iredell County. Mooresville, formed in the 1870s at a railroad siding, rivaled Statesville for a few years as a cotton marketing center and led the commerce of the southern region of the County. A shift in commercial emphasis from trading to manufacturing launched Iredell, Statesville, and Mooresville into the twentieth century. Three cotton mills operated in Mooresville by 1907, and industry flourished through the greater part of the century.

The community of Mt. Mourn, four miles south of Mooresville, was so named from the neoclassic frame plantation house that still stands along NC 115. Major Rufus Reid, a successful merchant, planter, and statesman, built the house in about 1831. He named his plantation Mount Mourn after the Mourne Mountains in Ireland from which his family immigrated. Reid was known as a major slaveholder in the area which certainly contributed to his success in large-scale planting and building.

Mt. Mourn once surged with Revolutionary resistance, its landscape dotted with federalist-style plantation homes and the site of a skirmish between British redcoats and Colonial militiamen. Most of the historic structures and markers in the Mount Mourn area are concentrated along NC 115.

Torrence Tavern once stood near what is now the corner of Langtree Road and NC 115. A marker, placed there by the Daughters of the American Revolution in 1914, marks the spot of Iredell County’s only Revolutionary War battle: the Skirmish of Torrence Tavern, on Feb. 2, 1781. Many militiamen retreated to the tavern after their leader was killed, and the British troops took the chaos as an opportunity to attack. American versions of the skirmish say the British looted the refugees’ possessions, killed livestock, and burned the tavern. Dead British troops were buried somewhere near the tavern, possibly in a mass grave.

Formal education in the Mount Mourn area commenced in the 1760s when many young men learned the classics at Crowfield Academy just north of the Mecklenburg County line along NC 115. Graduates of the Academy later played roles in the Revolutionary War.

A short distance from the site of Crowfield Academy stands the Houston House, built by Dr. Walls in 1818. The Brown-Hobbs House, 1877, stands behind the present volunteer fire station on NC 115 at Langtree Road. About a half-mile down Langtree Road, on the property of the Lowe’s Companies campus, stands the Will Mott House, now vacant, built during the Civil War.

Other historic homesites exist in the Mt. Mourn area outside the boundaries of the Mount Mourn and South Iredell Master Plan. Several may be found along Langtree Road and NC Highway 115.

Centre Church was organized in 1765, and the present church was built in 1854. In the nearby cemetery are buried many Revolutionary War leaders and prominent local pioneers. The earliest marker is dated 1776. Graves were also moved to the Centre Church cemetery from land flooded for the creation of Lake Norman in the 1960s.

Southern Iredell County retained its rural character into the twenty-first century. In the past five years, however, the Mt. Mourn area has seen large-scale development with plans for future development that will change the character of the community. With the construction of the 178,000 sq. ft. Lake Norman Regional Medical Center, the 165-acre Lowe’s Co. Inc. corporate campus and national headquarters, along with proposals for a commuter rail stop and an interstate exit at Langtree Road, it is important to identify and preserve Mt. Mourn’s historic sites and buildings prior to development.
GUIDING PRINCIPLE 5

Identify and Preserve Historic Sites and Buildings

Recommendations for Preservation

As a rural community, Mt. Mourne faces some unique challenges to preserving its history. Most historic towns and cities contain downtowns and neighborhoods that remain from early in the community’s history when dense building patterns were created out of necessity (pre-automobile). The historic buildings can be protected en masse by creating an official Historic District, which affords protection under North Carolina state law. Although Mt. Mourne contains a great number of significant historic buildings and several very significant historic sites, they are spread out over a large area as dictated by the area’s agricultural history. The State’s regulations for a historic district require more compactness to achieve a district designation. Preservation must be championed by Iredell County, the Town of Mooresville and individual property owners, to be achieved.

Because there is no single step that can be taken to ensure protection to the local history, this plan recommends a multi-faceted approach to achieve the preservation goal:

**Rural Character:** This plan has discussed preservation of the area’s rural character throughout; preservation of roadway character (Chapters 1 & 2); preservation of open space (Chapters 3 & 4); preservation of Memorial Oaks on NC 115; and preservation of historic buildings and contributing buildings as described below.

**Landmark Buildings:** These buildings are singled out for both their architectural and historical significance, and are identified on page 69. Several of these buildings have already been placed on the National Register of Historic Places and been recognized as State landmarks – each is a candidate for landmark status. Other candidates for landmark status undoubtedly exist, but were not discovered during the creation of this plan.

**Contributing Structures:** Many buildings exist throughout the Mt. Mourne area that are indicative of the local rural history, like those illustrated on page 68. Most of these structures have no special architectural or historic significance in and of themselves, but contribute greatly to the historic character of the area.

**Historical Markers:** This plan encourages planning around the existing historical markers to encourage passersby to stop and read the marker. A bench, some shade, and additional historical documentation may be provided as a means of enhancing each site. Markers exist for Torrence Tavern, Centre Church and Crowfield Academy. An additional marker memorializing Beattie’s Ford Road (now Langtree Road) and its significance to Revolutionary War history and the settlement of the region as the local Catawba River crossing is appropriate.

*Mount Mourne, built by Rufus Reid, ca. 1837.*

*Historic Mott House, near Lowe’s Campus, mid-1800s.*
NC 115 today functions as an efficient north-south artery, with the ability to greatly increase its traffic volume. Although only a two-lane highway, the road is not lined with commercial businesses that congest traffic with turning movements in and out of their parking lots. For this reason, this plan recommends limiting commercial development, especially strip-type development, as a necessary step to reduce traffic congestion in the study area. To further ease congestion, turn lanes should be added to the intersections of Waterlynn and Faith Roads.

This Plan recommends measures to prevent the widening of the highway that will help save vestiges of the rural character of the Mt. Mourne community; protect the historic Main Streets of its neighbors, Mooresville and Davidson; and help halt the degradation of this historic highway that is marching northward from Charlotte.

This Plan also recommends the creation of a “rural heritage preservation zone” along this historic highway to preserve the Great War (World War I) Memorial oak trees along its frontage; the Mt. Mourne plantation house (Rufus Reid house), Houston House and other structures that contribute to the historic fabric of the highway.
GUIDING PRINCIPLE 5
Identify and Preserve Historic Sites and Buildings

Historic Rural Character
Examples of local vernacular landscapes and dwellings

TOWN OF MOORESVILLE Mount Mourne & South Iredell Master Plan
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 Prosecution of the action at law was granted, and judgment was entered for the plaintiff.

The Court of Appeals reversed the judgment of the lower court and remanded the case for further proceedings.

The defendant appealed to the Supreme Court, which affirmed the decision of the Court of Appeals.

The plaintiff then appealed to the United States Supreme Court, which granted a writ of certiorari, heard the case, and reversed the decision of the Supreme Court of the State of [State].

The case was subsequently remanded to the lower courts for further proceedings in accordance with the decision of the United States Supreme Court.
Appendices

Appendix A
Existing Conditions Photo Survey
June 2004

Appendix B
Charrette Process
August, September 2004
February 2006

Appendix C
Transportation Strategies
August 2005

Appendix D
Mount Mourne Transportation Assessment
August 2006
Appendix A

Existing Conditions Photo Survey

June 2004
Key to Photo Survey
Existing Conditions, June 2004
APPENDIX A
Existing Conditions Photo Survey

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APPENDIX A

Existing Conditions Photo Survey
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Existing Conditions Photo Survey

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Appendix B

Charrette Process

Session 1: August 10 & 11, 2004
Session 2: August 31, September 1 & 2, 2004

Langtree / I-77 Interchange Small Area Study:
February 14 – 16, 2006
## APPENDIX B

**Charrette Process**

### Charrette Agenda

**SESSION ONE**

### DAY ONE

**Tuesday, August 10, 2004**

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<th>Activity</th>
<th>Description</th>
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<tr>
<td>8:00 am – 9:00 am</td>
<td>Set-up</td>
<td>Design Team arrive, set-up</td>
</tr>
<tr>
<td>9:00 am – 12:00 pm</td>
<td>Tour of study area</td>
<td>Meet at Citizen's Center for a driving tour of the study area in 15-passenger van.</td>
</tr>
<tr>
<td>12:00pm – 12:30 pm</td>
<td>Regroup at Citizen’s Center, set-up, lunch</td>
<td>Begin mapping and analyzing the site</td>
</tr>
<tr>
<td>12:30pm – 2:00 pm</td>
<td>Stakeholders Group #1 Historian</td>
<td>Presentation to discuss history of Mount Mourne area by O.C. Stonestreet; Amy Sottile and Lewis Alexander participating.</td>
</tr>
<tr>
<td>2:00 pm</td>
<td>Stakeholders Group #2 Town Staff</td>
<td>Discussions with Town of Mooresville/Iredell County representatives from Public Works, Police, Fire, and Engineering departments.</td>
</tr>
<tr>
<td>2:00 pm</td>
<td>Stakeholders Group #3(a) Transportation</td>
<td>NCDOT Focus, Public Works, LPA Group</td>
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### Charrette Process

**DAY ONE, continued**

CATS Focus, NCDOT, Others

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<thead>
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<th>Event Description</th>
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</thead>
</table>
| 3:00 pm       | Stakeholders Group #3(b)               CATS Focus, NCDOT, Others  
Transportation                                     |
| 4:00 pm       | Stakeholders Group #4(a)               Lowe’s Corporate Campus  
Property Owners                                     |
| 4:00 pm       | Stakeholders Group #4(b)               Lake Norman Regional Medical Center  
Property Owners                                     |
| 5:30 pm – 7:00 pm | Work and discussion among design team regarding information gathered.        |
| 7:00 pm – 8:30 pm | Stakeholders Group #5(a)               Brief, informal presentation of the day’s activities, discussion with citizens about general issues.  
Citizens                                              |
| 7:30 pm – 8:30 pm | Stakeholders Group #5(b)               Discussions with large property owners regarding their plans for development and/or conservation of their property.  
Large Property Owners                                |
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**Charrette Process**

**Charrette Agenda**

**SESSION ONE**

**DAY TWO**

*Wednesday, August 11, 2002*

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<th>Description</th>
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<tbody>
<tr>
<td>8:00 - 9:00 am</td>
<td>8:00 - 9:00 am</td>
<td>Day begins, all arrive.</td>
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</table>
| 9:00 am – 11:30 pm | Stakeholders Group #4(c)  
Property Owners               | Commercial Developers - All of the major committed developers (4 or 5) invited, others welcome.       |
| 9:00 pm – 11:30 pm | Stakeholders Group #4(d)  
Property Owners               | Residential developers – Frank Jacobus, Faison, others welcome.                                        |
| 9:00 am – 12:00 pm | Design team members not in Stakeholders meetings                     | Work.                                                                                                |
| 12:00 pm – 2:00 pm | Lunch w/Mayor, Town Board, Planning Board                            | Design team presents preliminary concepts and site analysis.                                         |
| 2:00 pm – 4:00 pm | Public invitation                                                      | Work.                                                                                                |
| 4:00 pm - 7:00 pm | Public invitation                                                      | Work, prepare for presentation.                                                                     |
| 7:00 pm       | Public invitation                                                      | *Kick-off presentation*: Discuss mission statement, site analysis. Transportation presentation by Walter Kulash. |

*Site Analysis & Preliminary Concepts*
APPENDIX B
Charrette Process

Charrette Agenda
SESSION TWO

DAY THREE
Tuesday, August 31, 2004

Preliminary Design

7:30 am - 8:30 am
Design team sets up.

8:30 am - 9:00 am
Design Team meeting
Discuss work assignments & objectives; design issues.

9:00 am - 11:00 pm
Stakeholders
Discuss roadway network proposals.
NCDOT

9:00 am - 11:00 pm
Stakeholders
Discuss development plans for Pope property.
Transit Station Area

12:00 pm - 1:00 pm
Lunch
Design team regroup to continue coordination.

1:00 pm - 7:00 pm
Work.

7:00 pm - 8:30 pm
Pin – up session, present first three days’ work.
APPENDIX B
Charrette Process

Charrette Agenda
SESSION TWO

DAY FOUR
Wednesday, September 1, 2004

Design Refinement

8:00 am - 9:00 am  Day begins, all arrive.

9:00 am - 12:00 am  Discuss information gathered from charrette meetings. Work on conceptual design for the site and key areas. Work on transportation plans.

12:00 pm - 1:30 pm  Lunch with Town Board and Planning Board.  Design team presents conceptual plans.

1:30 pm - 2:00 pm  Design team meeting.

1:00 pm – 7:00 pm  Public invitation  Work on conceptual design for the site and key areas. Work on transportation plans and diagrams.

7:00 pm - 8:30 pm  Public invitation  Presentation of transportation strategies, presentation of preliminary Master Plan concepts.
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Charrette Process

Charrette Agenda
SESSION TWO

DAY FIVE
Thursday, September 2, 2004

Final Design & Presentation

8:00 am - 9:00 am  Day begins, all arrive.

9:00 am - 12:00 pm  Synthesize and coordinate information gathered from all charrette meetings. Work on conceptual designs for key areas. Illustrate design concepts.

12:00 pm - 1:00 pm  Lunch

1:00 pm - 7:00 pm  Finalize and illustrate master plan and conceptual designs for key areas. Prepare and design final presentation.

7:00 pm - 8:30 pm  Final presentation of Mount Mourne & South Iredell Master Plan and supporting plans/drawings.

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Charrette Process

Charrette Agenda
LANGTREE SMALL AREA STUDY

DAY ONE
Tuesday, February 14, 2006

Information Gathering

7:30 - 8:30 am    Set-up
Design Team arrive, set-up

8:30 - 11:00 am   Transportation Issues
Discussion with transportation experts URS and Kimley-Horn.

Participants:
Design team, Town planning & engineering staffs & consultants, key stakeholders, representatives of NCDOT.

11:00 - 12:30 pm  Water Quality Issues
Presentation by David Caldwell of Meck. County Water Quality Program to discuss unique water quality characteristics of Lake Davidson as they relate to future land use in the area.

Participants:
Design Team, Town planning staff & consultants, key stakeholders.

12:30 - 1:30 pm   Lunch
Invitation to Town Boards & Planning Boards, design team, Town planning staff & consultants, key stakeholders; Mecklenburg County Water Quality representatives; Chamber & consultants
APPENDIX B
Charrette Process

DAY ONE, continued

CATS Focus, NCDOT, Others

1:30 - 3:00 pm  Land Use & Economic Development

Present and discuss previous planning efforts in Mt. Mourne, recent development plans and objectives of stakeholders.  Tim Brown, facilitator.
Present and discuss Strategic Economic Development Plan.

Participants:
Design Team, Town planning staffs & consultants, key stakeholders, invitation to Town Boards and Planning Boards.

3:00 - 4:30 pm  Market Issues

Continue discussion with presentation from Frank Warren regarding local market analysis and demographics.

Participants:
Design Team, Town planning & engineering staffs & consultants, key stakeholders, invitation to Town Board and Planning Board.

4:30 - 6:00 pm  Day Recap, Goals, Objectives, Mission

Discussion with transportation experts URS and Kimley-Horn.

Participants:
Design Team, Town planning & engineering staffs & consultants, key stakeholders.
APPENDIX B
Charrette Process

Charrette Agenda
LANGTREE SMALL AREA STUDY

DAY TWO

Wednesday, February 15, 2006

Design Concepts

8:00 - 9:00 am Set-Up, Discussion of Day One
Design Team arrive, set-up.

9:00 - 10:30 pm Utilities
Present and discuss current plans for new utilities as they relate to future development.

Participants:
Design Team, Town planning & engineering staffs & consultants, key stakeholders, invitation to Town Board and Planning Board.

10:30 - 12:30 pm Individual Stakeholder Issues
Small breakout meetings to discuss issues in greater detail:

Transportation
Transportation consultants, Town engineering & planning staffs, design team.

Economic Development & Land Use
Property owners, Town planning staffs, design team.

1:30 - 5:30 pm Preliminary Design Concepts
Design team prepares preliminary design concepts summarizing first two days’ consensus.

5:30 - 7:00 pm Prepare for Pin-Up

7:00 - 8:00 pm Public Pin-Up Presentation
# APPENDIX B

## Charrette Process

### Charrette Agenda

**LANGTREE SMALL AREA STUDY**

## DAY THREE

**Thursday, February 16, 2006**

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<th>Activity</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00 - 9:00 am</td>
<td>Day Planning</td>
<td>Design team arrive, set up, task assignment.</td>
</tr>
<tr>
<td>9:00 - 12:00 am</td>
<td>Design, Work, Receive Visitors</td>
<td>Present and discuss current new utility plans as they relate to future development.</td>
</tr>
<tr>
<td></td>
<td>Participants:</td>
<td>Design Team, Town planning &amp; engineering staffs &amp; consultants as required.</td>
</tr>
<tr>
<td>12:00 - 1:00 pm</td>
<td>Lunch with Town Officials</td>
<td>Brief Summary presentation of info-gathering and design thusfar.</td>
</tr>
<tr>
<td></td>
<td>Participants:</td>
<td>Design Team, Town planning &amp; engineering staffs &amp; consultants, invitation to Town Board and Planning Board.</td>
</tr>
<tr>
<td>1:00 - 7:00 pm</td>
<td>Prepare Evening Presentation</td>
<td>Design team work session.</td>
</tr>
<tr>
<td>7:00 - 8:00 pm</td>
<td>Public Pin-Up Presentation</td>
<td></td>
</tr>
</tbody>
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Appendix C

Transportation Strategies

Glatting, Jackson, Kercher, Anglin,
Lopez, Rinehart, Inc.
August 2005
APPENDIX C

Transportation Strategies

Existing Roadway Network

The regional roadway network consists of a major north-south arterial highway, I-77, and two secondary east-west arterials at NC Hwy 150 and NC Hwy 73.

These arterial roads are supplemented by a sparse and discontinuous secondary network of two-lane collector streets.

Within the study area is a secondary network of two-lane collector streets that includes Langtree, Fairview, Waterlynn, Faith and Presbyterian Roads in the east-west direction.

Running north-south are Williamson Road, US 21, NC Hwy 115, Shearer’s Road and NC Hwy 3 (formerly NC 136, Coddle Creek Hwy).

Improvements to the Regional Transportation Network

The recently completed South Iredell Demographic and Employment Forecast predicts a population growth of 80,000 new residents in the Mooresville area by 2025.

Traffic volumes will increase because of the ongoing growth in the area.

This Plan supports the following improvements to the Regional arterial transportation network that will be important steps toward addressing the traffic volume increases:

1. New north-south arteries at commuter rail transit line and I-77 busways.

2. Develop new connections of NC Hwy 3 to Prosperity Church area in northern Mecklenburg County and to NC 115 and NC 801 north of Mooresville to serve as a new north-south artery.

3. Develop a new east-west connecting street south of Langtree Road that ties all the new north-south arteries together and provides new access to rapidly developing residential areas east of NC 115.
Existing Study Area Roadway Network
Transportation Strategies for the Study Area

Seven Major Traffic Improvement Priorities were identified at the beginning of the Public Design Workshops that will be discussed in this chapter:

1. Add to traffic capacity by increasing street connections throughout the study area.
2. Ensure excellent access to and from the proposed commuter rail station from all sectors of the study area.
3. Improve circulation around Exit 33, especially from Fairview Road, NC 115, Lowe’s and Lake Norman Regional Medical Center.
4. Investigate the design of a Fairview Road bridge over I-77 to relieve congestion at Exit 33.
5. Investigate the design of the new I-77/Langtree Road interchange.
6. Investigate the design of Langtree Road to handle increased traffic volume from the new interchange.
7. Recognize the importance of a roadway’s physical appearance and character to the quality of life in the area.

Expand the Street Network

Several new primary roads have been recommended in this plan, among them:

- A new road that connects Fairview Road in the hospital/transit/Lowe’s district area to Langtree Road, Transco Road, NC 115, Midway Lake Road, Shearers Road and NC 3.
- A new north-south road connecting Waterlynn Road to Faith and Presbyterian Roads. This road is conceived as a limited access parkway and built in conjunction with the sewer line and greenway following the drainage basin.
- Provide multiple new connections between the existing rural roads: Shearer’s, Midway Lake, Faith, Presbyterian, Timber, Rocky River and Johnson Dairy Roads.
- Provide miscellaneous street connections where indicated.
- This plan recommends a significant expansion to the secondary road network throughout the study area to avoid excessive concentration of traffic on the primary roads.

The secondary network can be expanded by:

- Encouraging connection of existing dead-end streets and cul-de-sacs wherever possible.
- Requiring new developments to build connecting streets, as many as possible, to surrounding developments and to provide planned connections to surrounding properties where development may occur in the future.
- Require new developments to have an internal roadway network that encourages pedestrian and bicycle trips within the neighborhood. This can be accomplished by providing sidewalks and bike paths, of course, but the sizes of the blocks within the development are also important. A city block can vary from 200’ to 400’ in urban areas and up to 1000’ in more rural residential areas. The recommendation of this plan is that no block may exceed 2000’ in its circumference, nor may it exceed 1000’ on any single side. Intersecting side streets or planned future connections should meet these same requirements.
Proposed New Roadway Network

New Roads Indicated in Red
The drawing on the facing page illustrates how the roadway characters indicated for NC Highway 115 embody the spirit of the Master Plan’s concept. An area of high intensity activity (a ‘village center’) at the center of Mt. Mourne transitions back into the rural countryside as one approaches Mooresville to the north, or Davidson to the south.

NC 115 today functions as an efficient north-south artery, with the ability to greatly increase its traffic volume. Although only a two-lane highway, the road is not lined with commercial businesses that congest traffic with turning movements in and out of their parking lots. For this reason, this plan recommends limiting commercial development, especially strip-type development, as a necessary step to reduce traffic congestion in the study area. To further ease congestion, turn lanes should be added to the intersections of Waterlynn and Faith Roads.

This Plan recommends measures to prevent the widening of the highway that will help save vestiges of the rural character of the Mt. Mourne community; protect the historic Main Streets of its neighbors, Mooresville and Davidson; and help halt the degradation of this historic highway that is marching northward from Charlotte.

This Plan also recommends the creation of a “rural heritage preservation zone” along this historic highway to preserve the Great War (World War I) Memorial oak trees along its frontage; the Mt. Mourne plantation house (Rufus Reid house), Houston House and other structures that contribute to the historic fabric of the highway.

NC Highway 115

The rural character of this roadway should be preserved between towns

TOWN OF MOORESVILLE  Mount Mourne & South Iredell Master Plan
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Transportation Strategies

Highway 115 through Mount Mourne Area
APPENDIX C
Transportation Strategies

Proposed Commuter Rail

This Plan makes several specific recommendations for access to, from, and around the proposed CATS commuter rail station, to accomplish the following:

• Provide a local roadway network that allows multiple points of access from all directions: north, south, east and west.

• Provide boarding platforms on each side of the tracks to allow shared parking with both Fairview United Methodist Church to the east and new development near the station to the west. This configuration also allows access from the east or west without increasing congestion at the railroad grade crossing locations near the Fairview/NC 115 and Langtree/NC 115 intersections.

Development occurring within a ½ mile radius of the rail station will support higher development densities and strong pedestrian connections to the station area.
Proposed Commuter Rail
Vehicular and Pedestrian Connections
A conventional interchange is characterized by:

- All three flows bundled at the worst possible place.
- Weaving at the worst possible place.
- No “back door” for local trips.
- Forced linear strip.
- Commercial value erodes with traffic volume.

Better interchange options are characterized by:

- Three flows separated.
- Little or no weaving.
- Many local “back doors.”
- Centers, not strips, encouraged.
- Commercial value rises with traffic volume.

Principles for Exit 33 Interchange Improvements
Interstate 77 at Fairview Road/Exit 33
Conceptual Design

APPENDIX C
Transportation Strategies

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Transportation Strategies

Interstate 77: Langtree Interchange (Exit 32)

A preliminary design for the Langtree Road (Exit 32) interchange has been prepared by the NCDOT. Possible alternative designs were investigated that would reduce the amount of right-of-way required, disrupt surrounding property owners less, and reduce the travel distance for a pedestrian across the entire interchange up to 1/8 of a mile.

Alternate 1A illustrates the possible reduction in size, while Alternate 1B shows a possible method for beautification of the interchange and a land development pattern of a more human scale than conventional freeway interchanges.
Other Langtree Improvements

The development of the Lowe's Companies Headquarters necessitated the addition of a Langtree Road interchange at I-77. But freeway interchanges in the recent past are almost always accompanied by development of businesses that market themselves to the passing freeway traffic rather than to the surrounding community. One of the strong recommendations of the South Iredell Small Area Plan was to avoid freeway-oriented development. This plan supports that policy, and from a transportation perspective, will allow the Langtree interchange to provide freeway access to the Lowe’s campus, the surrounding dense commercial development and the residents of the Langtree peninsula, without the congestion associated with on/off freeway traffic and unnecessary local traffic drawn to the businesses at the interchange.

This emphasis on access to the Lowe’s Companies campus and surrounding businesses will cause a large increase in traffic volumes on a portion of Langtree Road, where this Plan recommends the widening of Langtree to four lanes, with turn lanes and a landscaped median. But, we recommend that the four lanes end at the entrance to the Lowe’s campus, and the road then transition back to the historic character of Beatties Ford Road (now named Langtree) near the Torrance Tavern site area near 115.

We recommend the construction of a major new road that would provide a connection from Fairview Road to Langtree, and from Langtree across the railroad (at grade) to NC 115, and from NC 115 east to NC 3 (Coddle Creek Highway). This road would be the primary access to the hospital/transit/Lowe’s area from the huge tracts of undeveloped land to the south and east where the greatest population increases are expected, and will provide a new railroad crossing to relieve congestion at Langtree where the steep grade makes the railroad crossing slow and difficult.
Recognize the importance of a roadway’s character to the quality of life in the region.

In the development of the South Iredell Small Area Plan and the development of this Master Plan during the Public Design Workshops, an overwhelming consensus developed: a strong desire by the participants to avoid strip mall type development along the major roadways in Mt. Mourne in favor of preserving the existing rural character of the major roads. Where new, denser development becomes necessary, a model similar to Main Street in downtown Mooresville was deemed desirable.

These preferences reinforced a notion that had long been espoused by the project’s transportation design team – people have begun to realize that the beauty of a roadway is as important as the utility of the roadway, that the time spent in our cars does not have to be reduced to its absolute minimum if that time is an enjoyable experience. The beauty of our roadways is very important to the quality of our lives.

With those thoughts in mind, we developed the roadway character concepts contained in this chapter.
APPENDIX C
Transportation Strategies

Proposed New Roadway Network Character
Rural Roadway Character

Rural and rural neighborhood roadways are the predominant existing roadway type in the Mt. Mourne area, and typify the community’s image of the historic character of Mt. Mourne. The preservation of this type of roadway character is a primary goal of this Master Plan, particularly along portions of NC 115 and the large, sparsely developed areas east of NC 115.
Neighborhood Residential Roadway Character

As new residential developments are created in the rural areas of Mt. Mourne, higher density housing and cluster developments will begin to be built. This roadway type represents the minimum standards for ensuring attractive streets that are safe for vehicles and pedestrians.

Two lane roadways with curbs and gutters will characterize these new developments as well as informal on-street parking, sidewalks, street trees, and front yards with uniform building setbacks.
Village Center and Transitional Roadway Character

Village Center and transitional character roadways are appropriate roadway types for the entire area defined by the quarter-mile radius around the transit station. This roadway character evokes an image of the historic Main Streets that dot NC 115 along its length. These roadways naturally calm traffic and encourage pedestrian movement appropriate to the area surrounding the transit station, post office, elementary school and hospital.

Cross-Section of Transitional Roadway Character
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Transportation Strategies

Roadway Character at Village Center

Cross-Section of Village Center Roadway Character

Village Center Roadway Character
Appendix D

Mount Mourne Transportation Assessment

Kimley-Horn & Associates
November 2006
Mount Mourne
Transportation Assessment

November 2006
Transportation Assessment for The Mount Mourne Small Area Plan Mooresville, North Carolina

Prepared for: The Town of Mooresville Mooresville, North Carolina

4651 Charlotte Park Drive, Suite 300
Charlotte, North Carolina 28217
(704) 333-5131
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**Mount Mourne Transportation Assessment**

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<td>Scenario B AM Peak Hour Volumes</td>
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<td>Scenario B PM Peak Hour Volumes</td>
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1.0 Executive Summary

The purpose of this Transportation Assessment is to evaluate the transportation impacts of the Mount Mourne & South Iredell Master Plan. The objectives of this assessment are:

- To estimate the trip generation potential for the proposed Mount Mourne & South Iredell Master Plan
- To perform intersection capacity analysis for the identified study area
- To quantify the potential traffic impacts of the build-out of the Mount Mourne area at 25, 50, and 100 percent build-out levels.
- To develop recommendations for needed roadway and operational improvements

In February of 2006, the Town of Mooresville, in conjunction with property owners and community leaders, reevaluated the Mount Mourne master plan for the area around the Langtree Road corridor, (Area 2 in the original plan). The study area generally included the area between Langtree Road and Lake Norman, exclusive of the Transco power plant, the area along NC 115 south of Fairview Road to north of Bridge Farm Road, and along Alcove Road/McKlenny Road immediately around the proposed Langtree Road interchange.

The revised Mount Mourne Master Plan includes a mixture of retail, industrial, commercial, corporate campus, and residential land uses. The development potential of the Mount Mourne & South Iredell Master Plan is depicted below in Table 1.

The recommendations from this report involve the execution of appropriate measures to lessen congestion on the Langtree Road corridor. Access should be limited on Langtree

<table>
<thead>
<tr>
<th>ITE Land Use Code</th>
<th>Land Use</th>
<th>Intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td>210</td>
<td>Single-Family Detached</td>
<td>770</td>
</tr>
<tr>
<td>230</td>
<td>Condominium/Townhouse</td>
<td>820</td>
</tr>
<tr>
<td>310</td>
<td>Hotel</td>
<td>600 Rooms</td>
</tr>
<tr>
<td>710</td>
<td>General Office Building</td>
<td>320,000</td>
</tr>
<tr>
<td>750</td>
<td>Office Park</td>
<td>2,850,000</td>
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<tr>
<td>770</td>
<td>Business Park</td>
<td>300,000</td>
</tr>
<tr>
<td>820</td>
<td>Shopping Center</td>
<td>635,000</td>
</tr>
<tr>
<td>932</td>
<td>High-Turnover (Sit-Down)</td>
<td>30,000 SF</td>
</tr>
<tr>
<td></td>
<td>Restaurant</td>
<td></td>
</tr>
</tbody>
</table>
This study has determined that the proposed build out Mount Mourne Small Area as depicted will have profound impacts on intersection operations in the study area, beyond those expected to occur as a result of background traffic growth. Therefore, the Town has constrained the level of intensity to 50% of what is depicted in the current master plan. This will effectively scale or balance travel demand (trips) with future roadway capacity. The Town should evaluate how best to distribute the resulting land use intensities.

Based on the analysis contained herein, corridor recommendations/improvements are recommended that are directly related to the development of the small area plan.

Corridor Recommendations

The following recommendations are offered in an effort to assist the Town in outlining and inventorying necessary steps to achieve desired outcomes associated with the continued development of the study area:

- To accommodate the future development of surrounding tracts that may have access to Langtree Road and the East-West Connector, access management practices are recommended along both corridors. The need to limit access will protect corridor operations and prolong the life of the corridor capacity. A review of access locations and other design features should be conducted during the site plan approval and driveway permitting processes. The proposed access roads to Langtree Road and the East-West Connector should be located and constructed in a manner that meets the minimum design criteria required by NCDOT.

- All turn lanes should be design in accordance to NCDOT roadway design guidelines including required storage length and appropriate tapers. Specific storage lengths should be determined at time of approved development(s).

- Limit the number of full movement access locations along the Langtree Road corridor. This will preserve the future capacity of the corridor.

- Require connectivity between adjacent properties. This will allow for trips to travel between developments without sacrificing capacity on the major corridors.

- Require Traffic Impact Studies (TIA) for all developments to measure the impacts of the development on the corridor and determine improvements intended to mitigate the impacts of the development. Said TIA should be inclusive of all intersections in the Langtree Road corridor.

- Develop and implement an access management policy for the Mount Mourne area. The policy should outline preferred access locations along strategic corridors in the Mount Mourne area. These corridors should include but are not limited to: Langtree Road, NC 115, the proposed East/West Connector, and Alcove Road. The NCDOT Policy of Street and Driveway Access to North Carolina Highways should be included as a minimum standard.
Incremental Improvements

The following recommendations are offered in an effort to assist the Town in outlining and inventorying necessary steps to achieve desired outcomes associated with the continued development of the study area:

- Right-of-way along Langtree Road and the proposed East-West Connector should be obtained in an effort to secure space for the potential widening of Langtree Road and the construction of the East-West Connector. This can be facilitated in a myriad of ways. At the time of approval of new development along either roadway, right-of-way dedication should be a condition of the approved site plan. This practice represents a cost savings to the Town and prevents costly right-of-way purchases in the future. Furthermore, approved developments are designed in a manner that accommodates the widening, further reducing the cost of infrastructure improvements. A right-of-way width of 140 feet along Langtree Road and the East-West Connector would allow for development of turn-lanes, three travel lanes and the potential of a greenway trail.

- Turn lanes and storage lengths should be determined and required when specific developments occur. The analysis contained herein provides general recommendations on turn lanes but does not specify storage lengths. Because the length will vary with the size and type of development that occurs, storage lengths should be designated at the time of approval of specific developments.

- Signalization of the intersection of Langtree Road and Lowe’s entrance should be implemented at the time of the redesign of the intersection. The signal should be designed in accordance to NCDOT signal standards.
2.0 Background

In 2004, planners and designers collaborated with the Town of Mooresville to develop the Mount Mourne & South Iredell Master Plan. This effort included an intensive community input process and significant consideration of several alternatives. There were six guiding principles of the plan:

1. Define a land use strategy that balances conservation with residential, commercial and mixed-use development.
2. Improve transportation access throughout Mount Mourne by expanding the local street network to increase connectivity and guide appropriate development patterns.
3. Develop conceptual designs for key areas of development.
4. Locate sites for parks, greenways, and conservation of rural open space.
5. Identify and preserve historic sites and buildings.
6. Apply a zoning framework that supports various commercial, mixed-use and residential building types.

The Mount Mourne & South Iredell Master Plan had three key areas; Area 1 focused on the area along Fairview Road, Exit 33, and up to Water Lynn Road; Area 2 focused on the new Langtree Road interchange, the area south of Langtree Road, and the area adjacent to NC 115; Area 3 focused on the rural areas east of NC 115.

In February of 2006, the Town of Mooresville, in conjunction with property owners and community leaders, reevaluated the Mount Mourne master plan for the area around the Langtree Road corridor, (Area 2 in the original plan). The study area generally included...
the area between Langtree Road and Lake Norman, exclusive of the Transco power plant, the area along NC 115 south of Fairview Road to north of Bridge Farm Road, and along Alcove Road/Mcklynn Road immediately around the proposed Langtree Road interchange.

The revised Mount Mourne Master Plan includes a mixture of retail, industrial, commercial, corporate campus, and residential land uses. Two major transportation corridors – NC 115 and I-77 – bound the study area on the east and west sides.

The revised Mount Mourne Plan was developed in order to:

- Provide policy and programmatic recommendations for the development of the Mount Mourne area;
- Guide development as Mount Mourne emerges as an employment center for the Town of Mooresville.

Ultimately, these development opportunities seek to create a more vibrant community that would engage all who visit, work, and live in Mount Mourne.

For the plan to serve as a successful foundation for growth in the Town of Mooresville, several key transportation issues must be addressed, including the construction of the East-West connector (the East West connector is discussed in detail in the Current and Future Conditions section of this report), level-of-service at intersections, street network, and access management along Langtree Road. Kimley-Horn developed trip generation based on the Mount Mourne Master Plan and developed planning level capacity analysis at key intersections along Langtree Road in order to evaluate the impacts of the master plan. The results of this planning process are included in this summary report.
3.0 Current and Future Conditions

Quantifying future traffic conditions in the study area presents some special challenges. Extensive roadway construction will be occurring over the next few years. Left without a plan, the volume of traffic generated by the Langtree Road Interchange project, the current and planned development of the Lowe’s Corporate Campus, and the projected East-West connector traffic will likely result in poor traffic circulation and congestion. For this reason the Mount Mourne Master Plan serves as a land development guide that seeks to ensure adequate mobility as the area develops.

The North Carolina Department of Transportation (NCDOT) is preparing to construct an interchange at Langtree Road. The project is referred to as I-4411 in the North Carolina Transportation Improvement Program. I-4411 consists of the conversion of the existing grade separation of Langtree Road and I-77 to a diamond interchange. The construction of the interchange will create exit 32 with I-77 and provide additional interstate access to the Mount Mourne area. Prior to exit 32, all access to the Mount Mourne area was facilitated via exit 33, US 21 (Williamson Road).

According to NCDOT, I-4411 is scheduled to be let in November of 2006 with a contractor being selected in December of 2006. Construction is likely to begin in January of 2007. An 18 month construction period is projected for this project.

The corporate headquarters of Lowe’s Home Improvement is located between Farview Road and Langtree Road. Approximately 2,000 employees currently work at the Mooresville Campus. Ultimately, 12,000 employees are projected at the corporate campus. Current construction plans for Phase III include the construction of three buildings on the north side of the lake. This expansion will accommodate approximately 3,600 additional employees. Future plans include construction on the south side of the lake. Specific plans have not been determined at this time.

In 2005, a Transportation Facility Permit (TFP) was prepared for the existing and proposed Phase III parking decks. The results of the TFP analysis indicated that improvements to Langtree Road would be required to accommodate the traffic associated with the construction. As a result of conversations with NCDOT and the Town of Mooresville, Langtree Road will be realigned to provide direct access into the campus. A two-phase signalized intersection at the intersection of realigned Langtree Road/Lowe’s Campus and Langtree Road will be installed. This intersection is also the location of where the proposed East-West Connector will intersect with Langtree Road.
In 2004, the Town of Mooresville contracted with the URS Corporation to develop planning level alignments for two proposed roadways; the East-West Connector and the North-South Connector.

With the construction of the Langtree Road interchange at I-77 a parallel facility to I-77 on the east side was viewed as a benefit for circulation between Exits 32 and 33. This proposed North-South connector would mirror the connection on the west side of the Interstate (Alcove Road), thereby completing a box network between the two interchanges. The resulting series of street was thought to be an improvement to the area’s traffic circulation since access to Fairview Road from Exit 33 is constrained due to the right-in/right-out condition on US 21. This new roadway was known as the North-South Connector. The North-South connector would also improve the emergency response time from the Hospital. However, upon further review of the existing conditions, and after months of coordination with the Town, adjacent property owners, and NCDOT it was determined that the North-South Connector was not feasible. Environmental constraints, problematic northern terminus, geographic constraints and availability of suitable property contributed to this conclusion; for these reasons it is unlikely that the North-South Connector will be constructed.

The 1998 Thoroughfare Plan calls for the construction of a multi-lane facility connecting the Langtree Road interchange with I-77 to NC 3 to the east. The multi-lane facility will improve circulation throughout the southeastern portion of the Town and County.

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**Mount Mourne Transportation Assessment**

**APPENDIX D**

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**Mount Mourne & South Iredell Master Plan**

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TOWN OF MOORESVILLE

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improving access to I-77. The initial concept for the East-West connector, depicted Langtree Road turning south to intersect with NC 115 south of its current location with the subsequent connection to NC 3 occurring at a later time.

Upon review of the projected traffic volumes entering the Lowe’s campus, it was agreed by NCDOT and the Town of Mooresville that Langtree Road would be diverted into the campus to eliminate the significant left-turning volume, (approximately 4,400 left-turns at full build-out). The East-West connector would then intersect Langtree Road at an at-grade intersection. The interim at-grade intersection would be design as a T-intersection with free flowing right-turns onto the East-West connector and traffic signal operations would be limited to two-phases to reduce delay for both approaches. It is likely that the ultimate build-out of the intersection will be grade separated once necessary capacity and delay thresholds are met.

The North Carolina Department of Transportation (NCDOT) is preparing to start construction of a spot-safety project at the intersection of NC 115 and Langtree Road. With the opening of the interchange between I-77 and Langtree Road, this intersection will experience addition demand and delay. In an effort to reduce delay and improve safety at the intersection, NCDOT is going to install a traffic signal at the intersection and left-turn lanes on NC 115. In addition, Hobbs Lane will be realigned to create the fourth leg at the intersection. Construction for this project is expected to begin in late 2006/early 2007.
4.0 Transportation Operations

Given the intensity of development proposed along the Langtree Road corridor, this transportation study was conducted to assess the potential impacts of the proposed master plan.

4.1 Trip Generation

The amount of traffic generated by a new development is a function of the size, type, and mix of development. The traffic generation potential of the Mount Mourne master plan was determined using the trip generation rates published in Trip Generation (Institute of Transportation Engineers, Seventh Edition, 2003) for all land uses. The Mount Mourne master plan, as depicted, is proposed to include the following land uses and intensities:

- 770 Single Family Homes
- 820 Residential Condominiums
- 600 Room Hotel
- 320,000 SF of General Office
- 2,850,000 SF of Office Park
- 300,000 SF of Business Park
- 635,000 SF of Shopping Center
- 30,000 SF of Restaurant Space

These land use intensities were provided by the Town of Mooresville and Burgess and Associates and were based on the results of the charrette conducted in February of 2006.
### APPENDIX D

# Mount Mourne Transportation Assessment

The trip generation potential for the proposed Mount Mourne & South Iredell Master Plan by Area is depicted in Table 2.

<table>
<thead>
<tr>
<th>ITE Land Use Code</th>
<th>Land Use</th>
<th>Intensity</th>
<th>Daily Trips Total</th>
<th>AM Peak Hour</th>
<th>PM Peak Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>In</td>
<td>Out</td>
<td>In</td>
</tr>
<tr>
<td>210</td>
<td>Single-Family Detached</td>
<td>150 DU</td>
<td>1,510</td>
<td>114</td>
<td>29</td>
</tr>
<tr>
<td>230</td>
<td>Residential Condominium/Townhouse</td>
<td>50 DU</td>
<td>356</td>
<td>30</td>
<td>5</td>
</tr>
<tr>
<td>310</td>
<td>Hotel</td>
<td>300 rooms</td>
<td>2,312</td>
<td>160</td>
<td>98</td>
</tr>
<tr>
<td>710</td>
<td>General Office Building</td>
<td>50,000 SF</td>
<td>782</td>
<td>108</td>
<td>95</td>
</tr>
<tr>
<td>820</td>
<td>Shopping Center</td>
<td>75,000 SF</td>
<td>5,633</td>
<td>132</td>
<td>81</td>
</tr>
</tbody>
</table>

**Area A Subtotal**: 10,593, 544, 308, 236, 1,018, 486, 532

|                   |                              |           |           |               |             |               |               |               |               |               |
| 230               | Residential Condominium/Townhouse | 300 DU   | 1,633     | 124         | 21           | 103          | 148          | 99           | 49           |
| 820               | Shopping Center              | 210,000 SF | 11,000   | 244         | 149          | 95           | 1,022        | 491          | 531          |

**Area B Subtotal**: 12,833, 368, 170, 198, 1,170, 590, 560

|                   |                              |           |           |               |             |               |               |               |               |               |
| 210               | Single-Family Detached       | 140 DU    | 1,417     | 107         | 27           | 80           | 145          | 91           | 54           |
| 230               | Residential Condominium/Townhouse | 420 DU   | 2,174     | 163         | 28           | 135          | 195          | 131          | 64           |
| 310               | Hotel                        | 300 rooms | 2,312     | 160         | 98           | 62           | 177          | 94           | 83           |
| 710               | General Office Building      | 170,000 SF | 7,007    | 787         | 743          | 94           | 769          | 46           | 773          |
| 820               | Shopping Center              | 200,000 SF | 10,656   | 237         | 145          | 92           | 980          | 475          | 514          |
| 932               | High-Turnover (Sit-Down) Restaurant | 30,000 SF | 3,815  | 346         | 180          | 166          | 328          | 200          | 128          |

**Area C Subtotal**: 22,381, 1,300, 731, 569, 2,103, 1,037, 1,066

|                   |                              |           |           |               |             |               |               |               |               |               |
| 210               | Single-Family Detached       | 410 DU    | 3,979     | 310         | 78           | 232          | 398          | 251          | 147          |
| 750               | Office Park                  | 850,000 SF | 9,266    | 1,308       | 1,164        | 144          | 1,135        | 159          | 976          |
| 750               | Office Park                  | 1,000,000 SF | 10,829  | 1,499       | 1,334        | 165          | 1,316        | 184          | 1,132        |

**Area D Subtotal**: 24,074, 3,117, 2,576, 541, 2,849, 394, 2,253

|                   |                              |           |           |               |             |               |               |               |               |               |
| 770               | Business Park                | 300,000 DU | 3,972    | 420         | 353          | 67           | 415          | 95           | 320          |
| 820               | Shopping Center              | 50,000 SF  | 4,328    | 103         | 63           | 40           | 396          | 190          | 206          |

**Area E Subtotal**: 8,300, 523, 416, 197, 811, 283, 526

|                   | Lowe's Corporate Campus      | 10,850 employees | 23,384 | 6,856 | 6,683 | 173 | 5,529 | 269 | 5,260 |

**Area F Subtotal**: 23,384, 6,856, 6,683, 173, 5,529, 269, 5,260

|                   |                              |           |           |               |             |               |               |               |               |               |
| 210               | Single-Family Detached       | 50 DU    | 550       | 44          | 11           | 33           | 57           | 36           | 21           |
| 230               | Residential Condominium/Townhouse | 50 DU   | 356       | 30          | 5            | 25           | 34           | 23           | 11           |
| 710               | General Office Building      | 100,000 SF | 1,334  | 188         | 165          | 23           | 191          | 32           | 159          |
| 820               | Shopping Center              | 100,000 SF | 6,791   | 157         | 96           | 61           | 626          | 300          | 326          |

**Area H Subtotal**: 9,031, 419, 277, 142, 908, 391, 517

|                   |                              |           |           |               |             |               |               |               |               |               |
| 750               | Office Park                  | 1,000,000 SF | 10,829  | 1,499       | 1,334        | 165          | 1,316        | 184          | 1,132        |

**Area G Subtotal**: 10,829, 1,499, 1,334, 165, 1,316, 184, 1,132

**Total Project Generated Trips**: 121,275, 14,626, 12,495, 2,131, 15,704, 3,836, 11,668
APPENDIX D

Mount Mourne Transportation Assessment

Given the size of the Mount Mourne study area, development areas were developed using geographic boundaries, which created areas A through H. The areas then grouped into pods based on their proximity for the internal capture calculations. Table 3 summarizes the trip generation potential of the Mount Mourne area.

<table>
<thead>
<tr>
<th>TABLE 3</th>
<th>MT. MOURNE TRANSPORTATION ASSESSMENT</th>
<th>TRIP GENERATION (BY POD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITE Land Use Code</td>
<td>Land Use</td>
<td>Intensity</td>
</tr>
<tr>
<td>210</td>
<td>Single-Family Detached</td>
<td>150 DU</td>
</tr>
<tr>
<td>230</td>
<td>Residential Condominium/Townhouse</td>
<td>50 DU</td>
</tr>
<tr>
<td>310</td>
<td>Hotel</td>
<td>300 rooms</td>
</tr>
<tr>
<td>710</td>
<td>General Office Building</td>
<td>50,000 SF</td>
</tr>
<tr>
<td>820</td>
<td>Shopping Center</td>
<td>75,000 SF</td>
</tr>
<tr>
<td>Pod 1 Total Generated Trips</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pod 1 Driveway Volume</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local Capture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pod 1 Net New External Trips</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pod 2 (Area B)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>230</td>
<td>Residential Condominium/Townhouse</td>
<td>300 DU</td>
</tr>
<tr>
<td>820</td>
<td>Shopping Center</td>
<td>210,000 SF</td>
</tr>
<tr>
<td>Pod 2 Total Generated Trips</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pod 2 Driveway Volume</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local Capture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pod 2 Net New External Trips</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pod 3 (Areas C, D, E, &amp; G)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>210</td>
<td>Single-Family Detached</td>
<td>570 DU</td>
</tr>
<tr>
<td>230</td>
<td>Residential Condominium/Townhouse</td>
<td>420 DU</td>
</tr>
<tr>
<td>310</td>
<td>Hotel</td>
<td>300 rooms</td>
</tr>
<tr>
<td>710</td>
<td>General Office Building</td>
<td>170,000 SF</td>
</tr>
<tr>
<td>750</td>
<td>Office Park</td>
<td>2,850,000 SF</td>
</tr>
<tr>
<td>770</td>
<td>Business Park</td>
<td>300,000 SF</td>
</tr>
<tr>
<td>820</td>
<td>Shopping Center</td>
<td>250,000 SF</td>
</tr>
<tr>
<td>932</td>
<td>High Turnover (Sit-Down) Restaurant</td>
<td>30,000 SF</td>
</tr>
<tr>
<td>Pod 3 Total Generated Trips</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pod 3 Driveway Volume</td>
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<tr>
<td>Local Capture</td>
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<td>Pod 3 Net New External Trips</td>
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<td></td>
</tr>
<tr>
<td>Pod 4 (Area F)</td>
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</tr>
<tr>
<td>210</td>
<td>Single-Family Detached</td>
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</tr>
<tr>
<td>230</td>
<td>Residential Condominium/Townhouse</td>
<td>50 DU</td>
</tr>
<tr>
<td>710</td>
<td>General Office Building</td>
<td>100,000 SF</td>
</tr>
<tr>
<td>820</td>
<td>Shopping Center</td>
<td>100,000 SF</td>
</tr>
<tr>
<td>Pod 4 Total Generated Trips</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pod 4 Driveway Volume</td>
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<td>Local Capture</td>
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<tr>
<td>Pod 4 Net New External Trips</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Project Generated Trips</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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APPENDIX D

Mount Mourne Transportation Assessment

Mount Mourne Transportation Study

The trip generation associated with the Mount Mourne Master Plan is projected to generate 89,317 daily trips, 7,500 AM peak hour trips, and 8,251 PM peak hour trips. Area F, the Lowe’s Campus was calculated separately since it is an existing development. The Trip Generation of the Lowe’s Campus is depicted in Table 4.

### TABLE 4
LOWE’S CORPORATE CAMPUS TRIP GENERATION

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Intensity</th>
<th>Daily Trips</th>
<th>AM Peak Hour</th>
<th>PM Peak Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>In</td>
<td>Out</td>
</tr>
<tr>
<td>Proposed Site Traffic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Parking Deck 1</td>
<td>1,250 employees</td>
<td>2,657</td>
<td>790</td>
<td>770</td>
</tr>
<tr>
<td>New Parking Deck 2</td>
<td>1,250 employees</td>
<td>2,657</td>
<td>790</td>
<td>770</td>
</tr>
<tr>
<td>New Parking Deck 3</td>
<td>1,250 employees</td>
<td>2,657</td>
<td>790</td>
<td>770</td>
</tr>
<tr>
<td>New Parking Deck 4</td>
<td>1,250 employees</td>
<td>2,657</td>
<td>790</td>
<td>770</td>
</tr>
<tr>
<td>New Parking Deck 5</td>
<td>1,250 employees</td>
<td>2,657</td>
<td>790</td>
<td>770</td>
</tr>
<tr>
<td>New Parking Deck 6</td>
<td>1,250 employees</td>
<td>2,657</td>
<td>790</td>
<td>770</td>
</tr>
<tr>
<td>New Parking Deck 7</td>
<td>1,250 employees</td>
<td>2,657</td>
<td>790</td>
<td>770</td>
</tr>
<tr>
<td>Existing Parking Deck 8</td>
<td>285 employees</td>
<td>794</td>
<td>181</td>
<td>176</td>
</tr>
<tr>
<td>Existing Expanded Parking Deck 9</td>
<td>400 employees</td>
<td>1,016</td>
<td>252</td>
<td>246</td>
</tr>
<tr>
<td>Existing Expanded Parking Deck 10</td>
<td>1,415 employees</td>
<td>2,975</td>
<td>893</td>
<td>871</td>
</tr>
<tr>
<td>Net New External Trips</td>
<td></td>
<td>23,384</td>
<td>6,856</td>
<td>6,683</td>
</tr>
</tbody>
</table>

The trip generation associated with the Lowe’s Corporate Campus is projected to generate 23,384 daily trips, 6,856 AM peak hour trips, and 5,529 PM peak hour trips. With the addition of the Lowe’s Campus, the total Mount Mourne area is projected to generate 112,701 daily trips, 14,356 AM peak hour trips, and 13,780 PM peak hour trips. As a comparison, the I-77 corridor near Mt. Mourne has a reported average annual traffic volume of 77,000 vehicles per day in the year 2004. Likewise, Langtree Road has a reported annual traffic volume of 2,600 per day in the year 2004.

Internally captured trips are trips that begin and end within one particular area of the project site and do not access the external roadway network outside that area. Internal capture was calculated for each area of the development using rates published in the Institute of Transportation Engineers (ITE) Trip Generation Handbook (2nd Edition, 2004).

Pass-by trip reductions were not applied to this study.
4.2 Study Intersections

In order to assess the traffic operations of the network, a number of intersections were studied, including:

- I-77 SB Ramp at Langtree Road
- I-77 NB Ramp at Langtree Road
- Langtree Road at RIRO #1
- Langtree Road at A Street
- Langtree Road at RIRO #2
- Langtree Road at Lowe’s/East-West Connector
- East-West Connector at B Street
- East-West Connector at C Street
- East-West Connector at NC 115

4.3 Directional Distribution

The directional distribution and assignment for trips was based on existing peak hour turning movements as well as land uses and population densities surrounding the Mount Mourne area. The following overall distribution was used for the proposed Mount Mourne area:

- 10% to and from the north on NC 115
- 10% to and from the south on NC 115
- 20% to and from the north on I-77
- 43% to and from the south on I-77
- 5% to and from the west on Langtree Road
- 10% to and from the north on Alcove Road
- 2% to and from the south on Mecklynn Road
5.0 Capacity Analysis

Capacity analyses were performed for the AM and PM peak hours for the 2010 horizon year with 25% build-out of Mount Mourne Master Plan, the 2015 horizon year with 50% build-out of Mount Mourne Master Plan, and the 2025 horizon year with 100% build-out of Mount Mourne Master Plan using the Synchro Version 5 software to determine the operating characteristics of the adjacent road network and the impacts of the Mount Mourne Master Plan.

Capacity is defined as the maximum number of vehicles that can pass over a particular road segment or through a particular intersection within a set time duration. Capacity is described by Level-of-Service (LOS) for the operating characteristics of a road segment or intersection. LOS is defined as a qualitative measure that describes operational conditions and motorist perceptions within a traffic stream. The Highway Capacity Manual defines six levels of service, LOS A through LOS F, with A being the best and F being the worst. LOS D is the typically accepted standard for signalized intersections in urban and suburban areas.

For signalized intersections, LOS is defined for the overall intersection operation. For unsignalized intersections, only the movements that must yield right-of-way experience control delay. Therefore, LOS criteria are defined for individual approaches and not the overall intersection operation. It is typical for stop sign controlled side streets and driveways intersecting major streets to experience long delays during peak hours, particularly for left-turn movements. The majority of the traffic moving through the intersection on the major street experiences little or no delay.

Table 5 lists the LOS control delay thresholds published in the Highway Capacity Manual (HCM) for signalized intersections. Synchro Version 5 software uses the same LOS thresholds as those published in the HCM.

<table>
<thead>
<tr>
<th>Level-of-Service</th>
<th>Control Delay per Vehicle [sec/veh]</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>&lt; 10</td>
</tr>
<tr>
<td>B</td>
<td>&gt; 10 – 20</td>
</tr>
<tr>
<td>C</td>
<td>&gt; 20 – 35</td>
</tr>
<tr>
<td>D</td>
<td>&gt; 35 – 55</td>
</tr>
<tr>
<td>E</td>
<td>&gt; 55 – 80</td>
</tr>
<tr>
<td>F</td>
<td>&gt; 80</td>
</tr>
</tbody>
</table>

Table 6 lists the LOS control delay thresholds published in the HCM for unsignalized intersections.
APPENDIX D

Mount Mourne Transportation Assessment

Table 6
Level-of-Service Control Delay Thresholds for Unsignalized Intersections

<table>
<thead>
<tr>
<th>Level-of-Service</th>
<th>Control Delay per Vehicle [sec/veh]</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>&lt; 10</td>
</tr>
<tr>
<td>B</td>
<td>&gt; 10 – 15</td>
</tr>
<tr>
<td>C</td>
<td>&gt; 15 – 25</td>
</tr>
<tr>
<td>D</td>
<td>&gt; 25 – 35</td>
</tr>
<tr>
<td>E</td>
<td>&gt; 35 – 50</td>
</tr>
<tr>
<td>F</td>
<td>&gt; 50</td>
</tr>
</tbody>
</table>

LOS reports generated by Synchro Version 5 software summarizing capacity analyses are included in Appendix F and are briefly summarized in the following sub-sections. Horizon year traffic volumes were determined using the traffic projections developed for the I-4411 interchange project between Langtree Road and I-77.

5.1 Scenarios

In an effort to understand the increased impacts of the proposed development, a traffic analysis was performed for 2010, 2015 and 2025 warrants. During the charrette, local property owners and developers expressed circulation and access concerns. Therefore, two scenarios were evaluated for the Langtree Road corridor. Scenario A considers a full movement, signalized intersection at the mid-point between the northbound I-77 ramps and the East-West Connector, A Street. Scenario B considers grade separating the intersection of A Street and Langtree Road. Under this configuration, the left-turning movements would be facilitated using right-in/right-out access locations to the bridge structure.

5.2 2010 Horizon Year

Planning level-of-service analyses were conducted for the 2010 horizon year with 25% build-out of the Mount Mourne Small Area Plan. Analysis was performed for both the at-grade signalized intersection and the grade separation scenarios.

5.3 2015 Horizon Year

Planning level-of-service analyses were conducted for the 2015 horizon year with 50% build-out of the Mount Mourne Small Area Plan. Analysis was performed for both the at-grade signalized intersection and the grade separation scenarios.
5.4 2025 Horizon Year
Planning level-of-service analyses were conducted for the 2025 horizon year with 100% build-out of the Mount Mourne Small Area Plan. Analysis was performed for both the at-grade signalized intersection and the grade separation scenarios.

Peak hour traffic volumes are depicted in Figures 1-4 for Scenarios A and B.
APPENDIX D

TOWN OF MOORESVILLE
Mount Mourne & South Iredell Master Plan

Mount Mourne Transportation Assessment

Figure 2
Traffic Volumes
Projected PM Peak Hour Scenario A
Small Area Plan Mount Mourne

Legend

[Diagram showing traffic volumes and projected PM peak hour scenario A for Mount Mourne with small area plan.]
APPENDIX D

Mount Mourne Transportation Assessment

LEGEND

BACKGROUND TRAFFIC
SITE TRAFFIC
TOTAL TRAFFIC

MOUNT MOURNE
SMALL AREA PLAN
TRANSPORTATION STUDY

PROJECTED PM PEAK HOUR TRAFFIC VOLUMES

FIGURE 4

NOT TO SCALE

TOWN OF MOORESVILLE  Mount Mourne & South Iredell Master Plan
## Table 7
### Scenario A
#### Level-of-Service Summary

<table>
<thead>
<tr>
<th>Condition</th>
<th>AM Peak-Hour LOS (Delay)</th>
<th>PM Peak-Hour LOS (Delay)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Langtree Road at I-77 NB Ramps</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projected (2010) 25% Build out</td>
<td>C</td>
<td>D</td>
</tr>
<tr>
<td>Projected (2015) 50% Build out</td>
<td>D</td>
<td>F</td>
</tr>
<tr>
<td>Projected (2025) 100% Build out</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td><strong>Langtree Road at I-77 SB Ramps</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projected (2010) 25% Build out</td>
<td>F</td>
<td>C</td>
</tr>
<tr>
<td>Projected (2015) 50% Build out</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Projected (2025) 100% Build out</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td><strong>Langtree Road at RIRO #1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projected (2010) 25% Build out</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Projected (2015) 50% Build out</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Projected (2015) 50% Build out (improved)</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Projected (2025) 100% Build out</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td><strong>Langtree Road at A Street</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projected (2010) 25% Build out</td>
<td>F</td>
<td>F</td>
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<tr>
<td>Projected (2015) 50% Build out</td>
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<td>F</td>
</tr>
<tr>
<td>Projected (2015) 50% Build out (improved)</td>
<td>D</td>
<td>F</td>
</tr>
<tr>
<td>Projected (2025) 100% Build out</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td><strong>Langtree Road at RIRO #2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projected (2010) 25% Build out</td>
<td>C</td>
<td>F</td>
</tr>
<tr>
<td>Projected (2015) 50% Build out</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Projected (2015) 50% Build out (improved)</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>Projected (2025) 100% Build out</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td><strong>Langtree Road at Lowe’s / East-West Connector</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projected (2010) 25% Build out</td>
<td>B</td>
<td>E</td>
</tr>
<tr>
<td>Projected (2015) 50% Build out</td>
<td>C</td>
<td>F</td>
</tr>
<tr>
<td>Projected (2015) 50% Build out (improved)</td>
<td>B</td>
<td>E</td>
</tr>
<tr>
<td>Projected (2025) 100% Build out</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td><strong>East-West Connector at B Street</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projected (2010) 25% Build out</td>
<td>B</td>
<td>B</td>
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<tr>
<td>Projected (2015) 50% Build out</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Projected (2025) 100% Build out</td>
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<td>F</td>
</tr>
<tr>
<td><strong>East-West Connector at C Street</strong></td>
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</tr>
<tr>
<td>Projected (2010) 25% Build out</td>
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<td>B</td>
</tr>
<tr>
<td>Projected (2015) 50% Build out</td>
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<td>B</td>
</tr>
<tr>
<td>Projected (2025) 100% Build out</td>
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<td>C</td>
</tr>
<tr>
<td><strong>East-West Connector at NC 115</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projected (2010) 25% Build out</td>
<td>D</td>
<td>B</td>
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<tr>
<td>Projected (2015) 50% Build out</td>
<td>E</td>
<td>C</td>
</tr>
<tr>
<td>Projected (2015) 50% Build out (improved)</td>
<td>C</td>
<td>B</td>
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<tr>
<td>Projected (2025) 100% Build out</td>
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</tbody>
</table>
## Table 8
### Scenario B
#### Level-of-Service Summary

<table>
<thead>
<tr>
<th>Condition</th>
<th>AM Peak-Hour LOS</th>
<th>PM Peak-Hour LOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Langtree Road at I-77 SB Ramps</td>
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</tr>
<tr>
<td>Projected (2010) 25% Build out</td>
<td>C</td>
<td>D</td>
</tr>
<tr>
<td>Projected (2015) 50% Build out</td>
<td>D</td>
<td>F</td>
</tr>
<tr>
<td>Projected (2025) 100% Build out</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Langtree Road at I-77 NB Ramps</td>
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<td></td>
</tr>
<tr>
<td>Projected (2010) 25% Build out</td>
<td>F</td>
<td>C</td>
</tr>
<tr>
<td>Projected (2015) 50% Build out</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Projected (2025) 100% Build out</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Langtree Road at RIRO #1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projected (2010) 25% Build out</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Projected (2015) 50% Build out</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Projected (2015) 50% Build out (improved)</td>
<td>C</td>
<td>F</td>
</tr>
<tr>
<td>Projected (2025) 100% Build out</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Langtree Road at RIRO #2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projected (2010) 25% Build out</td>
<td>E</td>
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<tr>
<td>Projected (2015) 50% Build out</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Projected (2015) 50% Build out (improved)</td>
<td>D</td>
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</tr>
<tr>
<td>Projected (2025) 100% Build out</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Langtree Road at Lowe’s / East-West Connector</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projected (2010) 25% Build out</td>
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<td>E</td>
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<tr>
<td>Projected (2015) 50% Build out</td>
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<td>F</td>
</tr>
<tr>
<td>Projected (2015) 50% Build out (improved)</td>
<td>B</td>
<td>E</td>
</tr>
<tr>
<td>Projected (2025) 100% Build out</td>
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<tr>
<td>East-West Connector at B Street</td>
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<td>Projected (2010) 25% Build out</td>
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<td>B</td>
</tr>
<tr>
<td>Projected (2015) 50% Build out</td>
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<tr>
<td>Projected (2025) 100% Build out</td>
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<tr>
<td>East-West Connector at C Street</td>
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<tr>
<td>Projected (2010) 25% Build out</td>
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<td>B</td>
</tr>
<tr>
<td>Projected (2015) 50% Build out</td>
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<td>B</td>
</tr>
<tr>
<td>Projected (2025) 100% Build out</td>
<td>D</td>
<td>C</td>
</tr>
<tr>
<td>East-West Connector at NC 115</td>
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<td>Projected (2010) 25% Build out</td>
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<td>B</td>
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<td>Projected (2015) 50% Build out</td>
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<td>C</td>
</tr>
<tr>
<td>Projected (2015) 50% Build out (improved)</td>
<td>C</td>
<td>B</td>
</tr>
<tr>
<td>Projected (2025) 100% Build out</td>
<td>F</td>
<td>E</td>
</tr>
</tbody>
</table>
The results of the capacity analyses indicate that the build-out of the Mount Mourne Master Plan as depicted will generate a significant amount of traffic that the planned roadway infrastructure cannot accommodate. In 2010 with 25% of the master plan as proposed, traffic operations along Langtree Road with will operate below acceptable limits during the PM peak hour. The northbound ramp at I-77 fails to operate at an acceptable level-of-service for the AM peak hour. Conversely, the southbound ramp at I-77 would operate at an acceptable level-of-service for both peak hours. The proposed East-West connector is projected to operate at acceptable levels-of-service in 2010.

In 2015 with 50% build-out of the master plan, intersection levels-of-service are projected to decrease as congestion and delay increase. With 50% build-out of the master plan, all intersections along Langtree Road will fail to operate at an acceptable level-of-service in both peak hours. Both ramps at I-77 will fail to operate at LOS D or better with the exception of the southbound ramps in the AM peak hour. The East-West connector is projected to operate at an acceptable level-of-service.

At full-build out of the master plan, capacity analyses indicate gridlock along Langtree Road. The lack of available capacity along Langtree Road in combination with increased demand are the contributing factors to poor level-of-service. The interchange with I-77 fails to operate at an acceptable level-of-service in both peak hours.

Under both scenarios, extreme congestion is present along Langtree Road. Scenario B which considers the grade separation, provides some increase in available capacity along Langtree Road but it still cannot displace the entire demand. More importantly, this option provides trip alternatives to destinations north and south of Langtree Road and effectively eliminates a conflict point along the corridor.
6.0 Langtree Road

The major spine through the southern portion of the Mount Mounre area is Langtree Road. As Mount Mounre develops and intensifies, Langtree Road will experience congestion and delay, resulting in the need to grow in size. The growth of Langtree Road will mature through two roadway section. The interim section will be constructed by the Lowe’s Companies. The ultimate section will be constructed as additional development occurs throughout the corridor. The vision for the Langtree Corridor is to create a gateway for the Mount Mounre area that includes a planted median with street trees and a generous planting strip separating the sidewalk from the travel lane. The ultimate section will provide efficient capacity for the motor vehicle as well as accommodate the pedestrian movements throughout the corridor.

At present, Lowe’s Companies, as a part of their Phase III development, plans to widen Langtree Road from the end of I-4411 to the entrance of the campus. This interim section will include the construction of a 24-foot landscaped median, two 12-foot travel lanes in each direction, shoulder and ditch section.

The ultimate section includes an additional travel lane, curb and gutter, planting strip, and sidewalk on each side.

Langtree Road currently has a 60 foot right-of-way. The construction of the interim section requires an additional 30 feet of right-of-way beyond the existing right-of-way. This dimension could vary depending on cut and fill slopes required to match grade. The ultimate section requires an additional 50 feet of right-of-way beyond the right-of-way required for the interim section. The acquisition of right-of-way for the ultimate 6-lane section should occur incrementally as development occurs along the Langtree Road corridor.
APPENDIX D

Mount Mourne Transportation Assessment

7.0 Congestion Management

Aside from the inconvenience of added travel delay, traffic congestion can have many negative impacts on a community. As levels of service worsen, congestion causes traffic to divert onto nearby neighborhood roads, which are not designed to handle large volumes of traffic. Excessive speeds and high traffic volumes on local streets may impede travel safety and 'cut-through' traffic. Roadways that operate near capacity generally lead to a hazardous environment for drivers, bicyclists, and pedestrians.

Congestion also can hinder economic growth. The proximity of an area to a safe and efficient roadway network is crucial for local companies considering an expansion of their business and the attraction of new industries to the region. Congestion slows the movement of goods and services, which hinders economic development and productivity.

Additionally, congestion is often associated with the deteriorating vitality of an area. Many people who move into the suburbs do so in order to escape the congestion of an urban region. As the congestion moves into the suburbs, it brings with it a declining quality of life. The excessive pollution created by stop-and-go traffic is detrimental to air quality and increases noise levels.

Congestion has a negative impact on highway safety, noise, and air quality, but numerous cost effective strategies (e.g., congestion management, access management, intelligent transportation systems (ITS), and signal systems) are available to assist communities in reducing congestion and its effects. A general description of congestion management strategies follows.

7.1 On-Site Traffic Circulation

One way to reduce traffic congestion is to promote on-site traffic circulation. Pushing back the throat of an entrance, as shown in the figures to the left, helps to avoid spillback onto the arterial. This measure improves both the safety and efficiency of the roadway.

Another aspect of on-site traffic circulation involves limiting access points into a development by considering developments with multiple lots and land uses as one property for the purposes of access regulation.

Only the minimum number of connections necessary to provide reasonable access should be permitted. For those situations where outparcels are under separate ownership, easements for shared access can be used to reduce the number of necessary connections. Reducing the number of access points also decreases the number of conflict points, making the arterial safer and more efficient.
7.2 Non-Traversable Median Treatment

A non-traversable median treatment is a raised or depressed barrier that physically separates opposing traffic flows. Advantages include increased safety due to separation of opposing flows, pedestrian refuge, and restricting left turns to designated locations. Where sufficient storage bays are provided, the removal of left-turning vehicles from through lanes can increase safety and reduce delay to through vehicles. Disadvantages include slowed response time for emergency vehicles, increased travel distance for left turns, and public opposition due to the possibility of detrimental effects on the business community.

Non-traversable median treatments should be considered for multi-lane urban arterials with average daily traffic (ADT) volumes greater than 20,000 and all multi-lane roadways with high pedestrian volumes, high collision rates, or where aesthetics are a priority. Consideration should be given to providing sufficient space for u-turning vehicles at median openings when non-traversable median treatments are used. Divided roadway facilities are generally safer than undivided facilities or roadways with a two-way left turn lane (TWLTL).

7.3 Median U-Turn Treatment

Median u-turn treatments involve the prohibition of minor street direct left turns at signalized intersections in favor of right turns followed by median u-turns, as shown in the figure on the next page. Advantages of this treatment include reduced delay, improved progression, and fewer stops for through traffic as well as fewer and more separated conflict points for vehicles and pedestrians along the arterial. Disadvantages include increased delay, travel distances, and stops for left-turning traffic as well as the potential for driver confusion. These treatments can increase the safety and efficiency of arterials with high through volumes. However, they should only be used where sufficient space is available for u-turning maneuvers at median openings.

Installing median u-turn treatments at multiple locations along a corridor can help to alleviate driver confusion. Much consideration should be given to locations of median openings in order to provide adequate weaving space without creating excessive travel distances for left-turning vehicles.
7.4 Consolidated Driveways

Consolidating adjacent driveways using shared access easements can increase safety and efficiency of corridors by reducing the number of access points and thus conflict points. Additionally, trips between adjacent land uses are then possible without using the arterial.

7.5 Relocated Driveways

Driveways that are located too close to an intersection can cause operational, safety, and capacity problems resulting from traffic backing up across the driveway entrance or into the intersection from the driveway. Additionally, the distance between the driveway and the intersection may not provide a sufficient weaving distance. Relocating driveways that are too close to intersections can improve safety and efficiency of the intersection by separating conflict points and lengthening weaving distances.

7.6 Connectivity

Collector streets are the tributaries of the local transportation network. They provide critical connections throughout the transportation network and bridge the gap between local streets and the arterials of a community. An interconnected street pattern tends to allow for a greater dispersion of traffic, resulting in less congestion. Likewise, the resulting periphery network provides the framework for the continued infill of connecting streets within the study corridor. While there are issues related to the implementation of collector streets, the benefits are numerous and include:

**Benefits:**
- More reliable and timely emergency response—more and direct routes
- Better public services/utilities—interconnected service networks (that generally follow the street) contribute to even and reliable distribution
- More efficient refuse collection—less back-tracking
- Potential for congestion reduction—short trips can be made without using thoroughfares, protecting their capacity for longer trips
- Improved access—located driveways on collectors, rather than thoroughfares
- Improved local mobility—collectors are frequently ideal corridors for pedestrians, bicyclists, and transit services
- Cost—can be shared between public and private entities, may reduce the need for costly roadway improvements

**Issues:**
- Impacted water quality—more stream crossings and potential wetland impacts
- Affected wildlife—streets can be barriers and change plant and animal spread/movement and migratory patterns
- Perception—connections may not always be viewed positively by those concerned
- Cost—who pays and how much is contributed by each?
From a broader perspective, collector streets play an intricate role in the overall transportation network. Nationally, there are interstates and major US Routes that provide movement between regions of the country; within the state, these same facilities are joined by State Highways and thoroughfares to accommodate longer distance and cross-town travel. While the local network works in conjunction with collector streets to facilitate access to the higher order streets and to facilitate local trips and land access. In recent years, continued emphasis on thoroughfare planning has overshadowed the importance and benefits of a well integrated network of collector streets.

8.0 Access Management

Access Management provides for the safe movement of traffic along any type roadway facility as a part of the highway and street plan for a given metropolitan area. It should include the development and implementation of codes which protect the rights of property owners while assuring the best operation of the roadway.

There are at least three reasons why access management is needed. The first is the need for organized movement through an urban area. The need for safe and efficient movement of traffic at reasonable speeds can be in conflict with access needs.

The second reason is that research has shown that access control provides acceptable capacity and safety. For a four-lane arterial with a 45-mph speed limit, the street capacity is reduced by 1% to 2% per mile of traffic that turns into and out of a driveway.¹

And finally, access management reduces the chance that an arterial will need to be improved or relocated. When a roadway is first constructed there tends to be little or no commercial development throughout the corridor, as with the Langtree Road corridor. However, over time as traffic volumes increase due to increased employment, housing or other, so does the market demand for commercial development along the corridor. Without proper access management policy and appropriate zoning, the roadway will begin to fail in operational capacity and safety. Because of this failure it may be then necessary to perform costly improvements or ultimately realign the roadway.

8.1 Access Management Policy Guidelines

The Town of Mooresville like many communities in North Carolina, has historically relied on the NCDOT to be concerned with managing access point (driveway) location and spacing throughout major urban corridors. The result of this practice is a deferment of decision-making to standards outlines in the 2003 Driveway Ordinance. This ordinance, A Policy on Street and Driveway Access to North Carolina Highways, is not designed to preserve capacity but rather to balance the access rights of private property owners against accepted safety measures. Also, in the absence of strong local government preference, cross-sections for road improvements have typically been selected based on the expected (rather than planned) land use. This practice has contributed to a continued strip development pattern that occurs in response to the ease of access afforded by the lack of positive control (median). Interestingly, this pattern of development is counterproductive to the goal of providing a seamless, integrated transportation system, as it
tends to preclude the success of pedestrian and transit elements. Over time, safety, aesthetics, streetscape, and capacity have been compromised.

The Langtree Road corridor is by no means stagnant. Development along the corridor is anticipated to remain dynamic with properties expanding and redeveloping. The continued infill and redevelopment of the remaining frontage parcels represent opportunities for increased circulation, connectivity, and access management.

It is recommended that a policy of both general and specific access management guidelines should be developed for the Langtree Road corridor and other identified thoroughfares throughout the Mooresville street network. Consideration should be given to the Town of Mooresville Mount Mourne Planning Area Development Ordinance during the development of these criteria. In addition, resources including the NCDOT Driveway Manual, NCDOT Median Crossover Guidelines, as well as Transportation Research Board (TRB) and the Institute of Transportation Engineers (ITE) publications that describe and compare policies across the nation should be considered. The following represent preliminary recommendations that should also be considered during the development of a corridor access management policy.

New non-residential developments located adjacent to each other should be required to provide cross-access so that parking lots and driveways are connected and shared.

Encouraging cross-access between adjacent developments reduces the number of vehicles that are required to reenter the major roadway. Keeping additional turning traffic off the major roadway enhances efficient and safe operation.

Large developments such as shopping centers should be required to provide internal access to outparcels.

Providing access to outparcels is another facet of cross-access that encourages internal circulation and keeps unnecessary turning off the major roadways.

For developments that front both a major street and a minor street, primary access via the minor street should be required.

Restricting major road access to right-in/right-out driveways where other reasonable access can be accommodated should be sought. This reduces the impact of turning vehicles on the major roadway.

Right-In/Right-Out driveways should be encouraged as access on major roadways for non-residential development.

If appropriate, the feasibility of installing right-in/right-out connections to Langtree Road should be utilized to minimize left-turning movements into and out of the potential development.
9.0 Alternative Access

The Mount Mourne & South Iredell master plan listed seven major traffic improvement priorities for the area:

1. Add to capacity by increasing street connections throughout the study area.
2. Ensure excellent access to and from the proposed commuter rail station from all sectors of the study area.
3. Improve circulation around Exit 33, especially from Fairview Road, NC 115, Lowe’s and Lake Norman Regional Medical Center.
4. Investigate the design of a Fairview Road bridge over I-77 to relieve congestion at Exit 33.
5. Investigate the design of a new interchange at I-77 and Langtree Road.
6. Investigate the design of Langtree Road to handle increased traffic volumes from the new interchange.
7. Recognize the importance of a roadway’s physical appearance and character to the quality of life in the area.

The resulting priorities are still applicable for the area with the exception of number 5. Unfortunately, with I-4411 construction starting later this winter, little can be done to improve or change the design as proposed. Minimal improvements have been made to the original design plans which will result in marginal gains in capacity at the intersections. Beyond a complete redesign of the interchange, little can be done to improve the operations of the interchange ramps and Langtree Road.

In lieu of rebuilding the Exit 32, a reconfiguration of Exit 33 access should be evaluated. The Mount Mourne & South Iredell master plan depicted additional access from I-77. As the traffic volumes increase in the Mount Mourne area, the existing interchanges at Exits 32 and 33 will become the choking points for the surrounding roadway network.

The Mount Mourne & South Iredell Master Plan suggests that the one possible solution to improving access throughout the Mount Mourne area is the modification of access to I-77 at Exit 33. The master plan recommends the installation of a bridge connection between Fairview Road on the east side and Alcove Road on the west side. In addition to the bridge connection, the plan discusses the relocation of the northbound exit ramp to Williamson Road/US 21 (Exit 33) to the proposed Fairview Road bridge connector. The relocation of the ramp will provide improved access to Fairview Road, improve access to Lake Norman Regional Hospital, as well as properties along the Fairview Road corridor. The installation of the bridge will provide greater circulation throughout the area and will provide choices for motorists.

The Town of Mooresville has secured funding from the federal government to study the circulation, bridge/interchange concept design, and practicality of the proposed
improvements to Exit 33. NCDOT project R-4757 has been established in the TIP for the evaluation of the project.

The results of the analysis contained herein further confirm the importance of R-4757, so that stakeholders can evaluate this potential improvement and work towards the implementation of a preferred alternative. Simply stated, R-4757 is likely the most important project impacting the future of the Mount Mourne area.

9.1 FHWA Proposed Access Criteria

Prior to the installation or modification, of access to the interstate system, FHWA requires that the proposed access meet the following eight specific criteria:

1) The existing interchanges and/or local roads and streets in the corridor can neither provide the necessary access nor be improved to satisfactorily accommodate the design-year traffic demands while at the same time providing the access intended by the proposal.

2) All reasonable alternatives for design options, location, and transportation system management type improvements (such as ramp metering, mass transit, and HOV facilities) have been assessed and provided for it currently justified, or provisions are included for accommodating such facilities if a future need is identified.

3) The proposed access point does not have significant adverse impacts on the safety and operation of the interstate facility based on analysis of current and future traffic. The operational analysis for existing conditions shall, particularly in urbanized areas, include an analysis of sections of interstate to an including at least the first adjacent existing or proposed interchange on either side. Crossroads and other roads and streets shall be included in the analysis to the extent necessary to assure their ability to collect and distribute traffic to and from the interchange with new or revised access points.

4) The proposed access connects to a public road only and will provide for all traffic movements. Less that “full interchanges” or special purpose access for transit vehicles, for HOVs, or into park and ride lots may be considered on a case-by-case basis. The proposed access will be designed to meet or exceed current standards for Federal-Aid projects in the Interstate System.
5) The proposal considers and is consistent with local and regional land use and transportation plans. Prior to final approval, all requests for new or revised access must be consistent with the metropolitan and/or statewide transportation plan, as appropriate; the applicable provisions of 23 CFR part 450; and the transportation conformity requirements of 40 CFR parts 51 and 93.

6) In areas where the potential exists for future multiple interchange additions, all requests for new or revised access are supported by a comprehensive interstate network study with recommendations that address all proposed and desired access within the context of long-term plans.

7) The request for new or revised access generated by new or expanded development demonstrates appropriate coordination between the development and related otherwise required transportation system improvements.

8) The request for new or revised access contains information relative to the planning requirement and status of the environmental processing of the proposal.

— FHWA, Federal-Aid Policy Statement on Additional Access Points to the Interstate System, Transmittal 6 (23 CFR 830)

With any interstate project, federal, state, and local approval is needed. The initial steps recommended for this location are as follows:

- **Prepare a feasibility study** – The feasibility study will determine the design and constructability of an interchange, modification of existing access to I-77, or a bridge crossing. The study will evaluate the potential of modifying existing Exit 33 to include access to and from I-77 on Fairview Road. A simple bridge crossing of I-77 should likewise be evaluated and considered as an alternative. This study will consider environmental features, land use information, and cost of implementation.

- **Prepare and interchange justification study** – if an interchange or modification to the existing interchange is desired, a justification study will be required in order to evaluate the preferred configuration as determined in the feasibility study against the eight criteria of the FHWA access policy. The study will evaluate the interchange, adjacent interchanges at Exit 32 (Langtree Road) and Exit 35 (Brawley School Road), and the surrounding roadway network to determine the existing and future years impacts of the proposed interchange.

It is recommended that the Town coordinate with appropriate agencies, NCDOT, Lake Norman RPO, and FHWA to undertake the critical steps. While it is uncertain whether an interchange or interchange modification to existing Exit 33 would be approved by FHWA, it is likely that a grade separation could be constructed in the vicinity. A bridge crossing I-77 remains a desirable feature of the future transportation system for the Mount Mourne area. Working in concert with local connector streets, a bridge crossing would enhance east-west mobility and provide options for trips with origins or destinations in the vicinity.
10.0 Summary Recommendations

This study has determined that the proposed build out Mount Mourne Small Area as depicted will have profound impacts on intersection operations in the study area, beyond those expected to occur as a result of background traffic growth. Therefore, the Town has constrained the level of intensity to 50% of what is depicted in the current master plan. This will effectively scale or balance travel demand (trips) with future roadway capacity. The Town should evaluate how best to distribute the resulting land use intensities.

Based on the analysis contained herein, corridor recommendations/improvements are recommended that are directly related to the development of the small area plan.

Corridor Recommendations

The following recommendations are offered in an effort to assist the Town in outlining and inventorying necessary steps to achieve desired outcomes associated with the continued development of the study area:

- To accommodate the future development of surrounding tracts that may have access to Langtree Road and the East-West Connector, access management practices are recommended along both corridors. The need to limit access will protect corridor operations and prolong the life of the corridor capacity. A review of access locations and other design features should be conducted during the site plan approval and driveway permitting processes. The proposed access roads to Langtree Road and the East-West Connector should be located and constructed in a manner that meets the minimum design criteria required by NCDOT.

- All turn lanes should be design in accordance to NCDOT roadway design guidelines including required storage length and appropriate tapers. Specific storage lengths should be determined at time of approved development(s).

- Limit the number of full movement access locations along the Langtree Road corridor. This will preserve the future capacity of the corridor.

- Require connectivity between adjacent properties. This will allow for trips to travel between developments without sacrificing capacity on the major corridors.

- Require Traffic Impact Studies (TIA) for all developments to measure the impacts of the development on the corridor and determine improvements intended to mitigate the impacts of the development. Said TIA should be inclusive of all intersections in the Langtree Road corridor.

- Develop and implement an access management policy for the Mount Mourne area. The policy should outline preferred access locations along strategic corridors in the Mount Mourne area. These corridors should include but are not
limited to: Langtree Road, NC 115, the proposed East-West Connector, and Alcove Road. The NCDOT Policy of Street and Driveway Access to North Carolina Highways should be included as a minimum standard.

Incremental Improvements

The following recommendations are offered in an effort to assist the Town in outlining and inventorying necessary steps to achieve desired outcomes associated with the continued development of the study area:

- Right-of-way along Langtree Road and the proposed East-West Connector should be obtained in an effort to secure space for the potential widening of Langtree Road and the construction of the East-West Connector. This can be facilitated in a myriad of ways. At the time of approval of new development along either roadway, right-of-way dedication should be a condition of the approved site plan. This practice represents a cost savings to the Town and prevents costly right-of-way purchases in the future. Furthermore, approved developments are designed in a manner that accommodates the widening, further reducing the cost of infrastructure improvements. A right-of-way width of 140 feet along Langtree Road and the East-West Connector would allow for development of turn-lanes, three travel lanes and the potential of a greenway trail.

- Turn lanes and storage lengths should be determined and required when specific developments occur. The analysis contained herein provides general recommendations on turn lanes but does not specify storage lengths. Because the length will vary with the size and type of development that occurs, storage lengths should be designated at the time of approval of specific developments.

- Signalization of the intersection of Langtree Road and Lowe’s entrance should be implemented at the time of the redesign of the intersection. The signal should be designed in accordance to NCDOT signal standards.