BOARD OF ALDERMEN

ITEM NO. E(2)

AGENDA ITEM ABSTRACT

MEETING DATE: OCTOBER 21, 2003

TITLE: Report on Pathway Drive and Tripp Farm Connector Roads

DEPARTMENT: PLANNING	PUBLIC HEARING: YES ___NO__X__
ATTACHMENTS: A. Resolution B. Map – Carrboro Connector Roads C. Carrboro Connector Roads Policy D. Street Connectivity Timeline – 1970 to Present	**FOR INFORMATION CONTACT:** Dale McKeel – 918-7329

PURPOSE

The 2003 Action Agenda includes a report on the Pathway Drive and Tripp Farm connector roads. A report has been prepared. A resolution receiving the report is attached (Attachment A).

INFORMATION

On October 1, 2002, the Board of Aldermen reviewed the 2025 regional transportation plan then under development by the Durham-Chapel Hill-Carrboro MPO. Town staff recommended that the Carrboro connector roads be added to the regional transportation plan, in order that these roads could be incorporated into the regional transportation model and be taken into account when traffic projections are done for proposed state road projects in Carrboro, such as Estes Drive and Homestead Road.

In discussing this recommendation, the Board of Aldermen requested a map showing the connector roads that cross Bolin Creek. There are four connector roads that cross Bolin Creek:

- Pathway Drive
- Tripp Farm Road
- Seawell Connector (included on the approved Winmore VMU plan)
- Lake Hogan Farm Road (portion across Bolin Creek has been constructed)

On October 15, 2002, the Board of Aldermen again discussed the 2025 transportation plan and adopted a resolution recommending that connector roads be added to the plan, but not Pathway Drive and Tripp Farm Road. At this meeting, Mayor Nelson requested that the Board schedule a discussion of the Pathway Drive and Tripp Farm Road extensions. This item was later added to the Board's 2003 Action Agenda.

Attachment B is a map showing the Carrboro connector roads with Pathway Drive and Tripp Farm Road identified.

CARRBORO'S CONNECTOR ROADS POLICY

Since World War II, a low level of street connectivity has characterized the street network in many American communities. In recent years a number of towns and cities, including Carrboro, have adopted ordinances and policies that promote increased street connectivity. Carrboro's adopted Connector Roads Policy is Attachment C. The Overview of the Connector Roads Policy states the following:

> In 1986, when the Connector Roads Policy was conceived, Carrboro was just beginning to develop toward the north. The Connector Roads Policy was adopted by the Board of Aldermen as a guide to aid in the construction and maintenance of a sound traffic plan for the town. As stated in the introduction of the plan, the success of Carrboro's growth as a town is "ultimately dependent upon the effectiveness and continued efficiency of its transportation system."
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> The Connector Roads Policy was designed to guide an ever-changing Board of Aldermen as new projects and developments come before them for approval. The Policy's purpose was to ensure that old and new developments and businesses in the town would be connected to each other, both to disperse newly generated traffic and to give a sense of connectivity and unity to the town as it grows. The roads included on the Connector Roads Plan were intended to provide a backbone for a more intricate grid of smaller connector roads.

HISTORY OF CARRBORO'S CONNECTOR ROADS POLICY

Carrboro began planning for street connectivity in the 1970s. In 1980, the Board of Aldermen adopted the original Collector Roads Plan. The Plan included northern connectors and southern connectors as well as cross-town streets. The northern connector roads linked Hillsborough Road, Estes Drive, and a planned future arterial between Seawell School Road and Homestead Road.

On March 18, 1986, the Town of Carrboro adopted the Northern Connector Roads Plan to aid in the construction and maintenance of a sound traffic plan for the town's future growth areas. This plan included both Pathway Drive and Tripp Farm Road.

In the late 1980s and early 1990s, additional revisions were made to the Connector Roads Policy. These included the addition of Lake Hogan Farm Road between Homestead Road and Eubanks Road, the Stratford and Cates Farm Road connection, and the connector between Homestead Road and Lake Hogan Farm Road. The arterial connecting Seawell School Road and Homestead Road was modified to avoid a crossing of Bolin Creek. As these revisions were being made, Pathway Drive and Tripp Farm Road remained a part of the Connector Roads Policy.

In the latter half of the 1990s, additional connectivity requirements were placed in the Land Use Ordinance. This language required that all roads be interconnected, to the extent practicable, and that cul-de-sacs shall not be used unless the topography of the land does not allow a design that would make an interconnecting road practicable. In addition, the ordinance was amended to require that collector and subcollector streets be designed with features to discourage speeding and cutthrough traffic, and the Residential Traffic Management Policy was adopted to provide a means for calming traffic on residential streets.

The Facilitated Plan for *Northern Study Area Plan*, adopted by Carrboro, Chapel Hill, and Orange County in 1998 and 1999, included a map of the connector roads in the northern study area. This map included Pathway Drive and Tripp Farm Road.

Carrboro Vision 2020, adopted in December 2000, includes Policy 4.12, "The Town should continue to implement its connector roads policy."

Attachment C is a Street Connectivity Timeline from 1970 through December 2000. Note that the following subdivisions/developments approved since December 2000 include street connection designs in conjunction with the connector roads initiatives: Jones Ferry Park and Ride lot, Horne Hollow subdivision, Morgan Ridge (now Rose's Walk Townhomes at University Lake), Smith Middle School Athletic Fields, Tramore West subdivision, and Winmore village mixed use development. The conditional use permits for the Rose's Walk and Winmore projects include bridges over Tom's Creek and Bolin Creek, respectively.

The following observations can be made about Carrboro's Connector Roads Policy:

- There has been a high level of commitment to implementing the Connector Roads Policy as growth has occurred in Carrboro.
- The connector roads help to disperse traffic and promote the Town's policy of not widening existing roads to provide additional lanes for automobiles.
- The community has taken steps to promote alternative modes of transportation and mitigate the environmental and neighborhood impacts of connector roads.

RESEARCH ON STREET CONNECTIVITY

The American Planning Association (APA) recently published a report entitled <u>Planning for Street Connectivity: Getting from Here to There</u>. The report discusses the history of street patterns and standards in the U.S., and profiles the street connectivity requirements in 14 communities, including the North Carolina municipalities of Cary, Huntersville, Cornelius, Conover, and Raleigh.

The report states that supporters of connectivity state that it will provide the following benefits:

- Decrease traffic on arterial streets.
- Provide for continuous and more direct routes that facilitate travel by non-motorized modes such as walking and bicycling and facilitate more efficient transit service.
- Provide greater emergency vehicle access and reduced response time, and conversely, provide multiple routes of evacuation in case of disasters such as wildfires.

- Improve the quality of utility connections, facilitate maintenance, and enable more efficient trash and recycling collection and other transport-based community services.

The report states that opponents of connectivity state it will have the following negative effects:

- Raise levels of through traffic on existing residential streets.

- Increase infrastructure costs and impervious cover.

- Require more land to develop the same number of units.

- Decrease the affordability of housing.

- Threaten the profitability of developments.

The APA report also reviews research on the potential benefits and costs of connectivity requirements, and states the following:

- Research on street connectivity tends to support the argument that greater connectivity will reduce traffic volumes on arterials due to two factors, the dispersal of vehicle trips throughout the network and a decrease in the total amount of vehicle travel. However, connectivity can increase the amount of traffic on residential streets, and communities often use traffic calming techniques to reduce these impacts.

- There is little available research on whether the shorter travel distances resulting from higher connectivity will encourage walking and bicycling. Some research has found that walking is likely to increase if there are destinations such as a retail center within walking distance, pointing to the importance of land-use planning in conjunction with connectivity.

- Greater connectivity can help to improve the quality and efficiency of emergency medical service, trash collection, police, other municipal service providers, and businesses.

- Communities often adopt narrower street requirements in conjunction with connectivity requirements to discourage through traffic by promoting lower speeds, reduce impervious surface, and help to minimize the expense to developers.

The City of Raleigh has conducted extensive research on the public benefits and costs of connectivity in four areas: (1) travel efficiency and mode choice, (2) fire response and service costs, (3) water and residential trash collection costs, and (4) environmental costs. Additional information about Raleigh's research findings is available.

STREAM CROSSINGS

The extension of Tripp Farm Road and Pathway Drive would cross Bolin Creek. The following information on stream crossings was prepared by former environmental planner Phil Prete in June of this year. Note that this information does not address the

Stream Crossings

Any stream crossing will cause some environmental degradation. Proper site selection, timing of construction work, and design and installation best management practices (BMPs) will minimize the environmental damage if adhered to. The following are BMPs for any stream crossing work:

- Select the crossing site to minimize disturbance to any sensitive features.
- Select a location that has firm banks and fairly level approaches.
- Install the stream crossing at right angles to the channel whenever possible.
- Adjust the grade of the road to reduce the concentration of water carried along the road surface to the stream crossing. Ideally, the lowest point of the road should not be at the crossing.
- Redirect road drainage off the road at least 50 to 100 feet before the crossing, using sheet flow into the stream buffer where practical, to allow for maximizing filtration through vegetation.
- Minimize stream channel disturbances and related sediment problems during road construction and stream crossing structure installation.
- Do not place erodible material into stream channels. Remove stockpiled material from high water zones.
- Locate temporary construction bypass roads in locations where they will cause minimal disturbance to the stream course.
- Design stream crossings to handle peak runoff and flood passage.

Timing of In-stream Work:

Installation, modification, and improvements of stream crossings should be done when stream flows and expectancy of rain are low. Ideally, the entire installation process, from beginning to end, should be completed before the next rain event. All existing and/or reasonable potential stream flows should be diverted while the crossing is being installed. This will help reduce or avoid sedimentation below the installation site.[1]

- Complete the work as fast as possible during a time of year when the least damage can occur to protect fisheries and water quality

[1] http://www.epa.gov/owow/nps/unpavedroads/ch3.pdf

- Do not install crossings during sensitive fish spawning or incubation periods. (Check with the appropriate Fish and Wildlife Agent.)
- To protect fisheries and water quality, complete work during low flows.
- Installation should not be done in frozen ground.

Selecting the Proper Stream Crossing Method - Culverts or Bridges:

A wrong choice of stream crossing method can result in major damage to the immediate site as well as downstream and upstream areas.

Bridges are best for large streams and areas with floatable debris problems. Bridges also have less effect on fisheries and habitat than other methods. In addition, they can be sized and designed to allow for a streamside wildlife and greenway corridor. For these reasons, bridges should be required at any sites that currently or in the future would be crossing an existing or planned wildlife corridor or trail.

Culverts are the most common stream crossing structure used on smaller streams. They are easy to install and are relatively inexpensive. However, they need to be sized and installed appropriately to prevent adverse effects on the stream. They also require maintenance to prevent plugging.

Multiple Culverts used at a crossing site placed side-by-side are not recommended. Use a single large-diameter culvert rather than several small culverts. A stream that is too wide or too large for a single culvert is better suited to a bridge crossing.

Bridge Crossings

Bridges pose the least potential for creating barriers to aquatic and terrestrial life and are favored in streams where fish spawn or migrate. Normally, bridge construction causes the least disturbance to the streambed and stream banks[2] when compared to the other types of stream crossings, but they can cause the greatest damage if they are not adequately designed, installed, and maintained.

Bridges are usually constructed of wood, metal, or other materials that can span across a stream or waterway. Bridges should not cause a significant water level difference between the upstream and downstream water surface elevations.

Bridge Design Considerations[3]

Bridge Length

The length of the bridge span should exceed the width of the stream floodway at the crossing site. Otherwise, the abutments will encroach into the stream channel and constrict flows.

[2] http://www.engr.utk.edu/research/water/erosion/chapter10.html
[3] Ibid

Bridge Height

The height of the bridge should be adequate to pass high water, and debris. Too low of a bridge becomes a constant maintenance problem to the bridge owner and restricts stream flows. The lowest part of the bridge (i.e., support structures) must be a minimum of 2 feet above the highest flood flows of that creek to avoid repeated damage. If the bridge is to accommodate under-passing a pedestrian corridor, that will factor into the height consideration as well.

Use of Center Piers

Avoid center piers whenever possible on a stream crossing. They obstruct stream flows and catch floating debris.

Bridge Installation

Avoid crossing the stream with equipment and materials if possible during installation of the abutments, wing walls, and bridge itself. If this is not possible, limit the number of crossings to the minimum necessary. If the stream must be forded with equipment during installation, restore the stream banks and vegetation to their previous condition following construction.

All disturbed areas and road fill should be revegetated to stabilize the disturbed area and prevent erosion and stream sedimentation. Diversions should be installed in the road approach sections to divert runoff away from the bridge. A silt fence, straw bales, or slash filter windrow should be placed at the toe of the banks to prevent sediment from entering the stream while bank vegetation is reestablishing.

FISCAL IMPACT

Acceptance of the report carries with it no known fiscal impacts.

RECOMMENDATION

The Administration recommends that the Board of Aldermen adopt the resolution receiving the report (Attachment A).