PROPOSED

NORTH GARNER GREENWAY/ URBAN PEDESTRIAN WAY

FEASIBILITY STUDY REPORT

JUNE 2005

GARNER PARKS &
RECREATION DEPARTMENT

WITH

OBS LANDSCAPE
ARCHITECTS

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Acknowledgements

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Jackie Johns	Town Board Liaison

Garner Town Manager

Mary Lou Todd	Town Manager

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Introduction

Why a Greenway?

Greenways provide what many Americans seek - close to home recreational areas, community meeting places, historic preservation, educational experiences and natural landscape.

The Town of Garner recognizes and understands both the importance and the benefits that a greenway system can bring to their community. A greenway was first identified in the 1998 Town of Garner Parks & Recreation Master Plan and later in the 2002 Open Space and Greenway Master Plan. The results of these efforts, through community involvement, town planning, and the positive impact of greenway implementation in other communities illustrate the benefits of greenways.

By implementing a greenway, the Town of Garner aspires to improve the communtiy and positively impact individuals by providing not only recreational and transportation opportunities, but also by influencing economic and community development. The greenway will provide a link between neighborhoods, employment centers, schools, parks and natural areas.

"TO MAKE A GREENWAY IS TO MAKE A COMMUNITY."

- CHARLES E. LITTLE, AUTHOR OF *GREENWAYS FOR AMERICA*

The North Garner greenway/urban pedestrian way will:

- provide opportunities for rest and relaxation through greenway related recreation;
- reduce auto dependency and contribute to the environmental health of the community;
- improve access to parks and recreational areas and link homes, workplaces, neighborhoods, and other community facilities;
- encourage physical fitness and healthy lifestyles;
- strengthen local economies;
- preserve culturally and historically valuable areas;
- provide a much-needed place to walk, ride a bike, run, roller skate or skateboard, observe nature, take a hike, or commute;
- be fully accessible to the disabled and to trail users of all ages.

Executive Summary

This feasibility study evaluates the potential for establishing a greenway/urban pedestrian way in the North Garner area. The intention of this study is to identify the constraints and opportunities for development and to define for the town issues related to construction of the proposed greenway/urban pedestrian way loop and sub-loop, including physical location and routing, easements required, scope of construction and anticipated probable construction costs.

The greenway will be located in the North Garner area. The identified study area encompasses various points of interest (*see Overall Site Plan, pg. 7*) that the Town of Garner required to be connected by the greenway and urban pedestrian way. During the greenway planning process, several route options were identified and evaluated at various meetings. The North Garner Greenway/Urban Pedestrian Way route was determined based on a variety of factors including user safety, accessibility, land ownership, environmental implications and cost effectiveness.

The greenway/urban pedestrian way route consists of two loops that connect neighborhoods recreational facilities, civic buildings, schools, and historic features including the historic downtown area. The loop and sub-loop have been identified in both the Parks & Recreation Master Plan and the Open Space and Greenway Master Plan. The combined total of both loops will measure 6.5 miles.

The system is made up of two trail types which are referred to as the greenway and the urban pedestrian way. The greenway sections consists of a 10' paved trail that accommodates both pedestrian and bicycle traffic. Characteristically these trails are constructed of asphalt with 2' shoulders, 10' vertical clearance and a maximum slope of 5%. Selective clearing of vegetation 5' to either side of the trail is also typical. The study recommends that wherever this trail type is feasible it should be implemented to allow for consistency and maximum use.

Greenway Section

The other trail type identified by this study is the urban pedestrian way. This refers to a typical 5' wide sidewalk either existing or proposed that is parallel to the street and setback 5' from the street curb or edge. These sidewalks should also have a 2' shoulder. Various steps can be taken including signage and special paving colors to designate them as part of the greenway system.

Urban Pedestrian Way

Implementation of the trails will also require the establishment of greenway easements across private property. In some areas this will overlay and expand the existing sewer easement, in other areas a completely new easement will be required.

Crossings

Whenever trails and roadways come together there are significant safety concerns for protecting trail users. The most desirable means of crossing is to provide grade separated crossings where the greenway trail would bridge over or tunnel under the roadway. When this is not possible, due to physical or economical constraints, then alternative means of crossing need to be developed to emphasize the greenway. Visual clues and physical elements include changes in pavement type or color, pavement markings, traffic tables, rumble strips, or signage can be used to alert motorists that they are entering a pedestrian zone or trail crossing. These visual clues also identify access for the greenway. It is recommended that crossings occur at intersections if possible. At very busy crossings the installation of a pedestrian operated traffic signal may also be warranted. These pedestrian crossings need to be evaluated individually and in accordance with the town's engineering standards and practices.

The most significant crossings are at Creech Road, East Garner Road, and the Norfolk Southern Railroad. The greenway needs to cross each of these significant arterial streets and railway, as well as several smaller neighborhood streets.

Executive Summary

Signage

Signage will play an important role in the greenway/urban pedestrian way system. Signage will provide directional and distance information as well as educational information. Further, signage is important to insure the safety of the greenway user particularly at roadway and railway crossings.

Trail Signage

Parking

For many trail users a short walk is all that will be needed to gain access to the greenway. However, for those that need to commute in order to use the greenway, there are existing parking facilities located at Garner Recreation Park, Avery Street Park, and Downtown Main Street (*see Overall Site Plan, pg. 7*). In addition, a trail head and parking is recommended at Cloverdale Park allowing access to the northern limits of the trail system. This site would accommodate up to 10 parking spaces and would require the purchase of two parcels of land equal to approximately 1 acre.

Management & Maintenance

The greenway system is managed as other park facilities. It is not intended for night use and is therefore not lit. Maintenance of the trail system includes the following:

- Trash pick up
- Mowing & Trimming
- Pruning and debris removal
- Pavement repair

Key to ongoing maintenance is that bridge structures and other built crossings can withstand the weight of a maintenance vehicle.

Based on information from other communities it costs approximately $2,900 to maintain one mile of greenway trail annually.

Funding

There are many ways to fund a project of this type. Some of them are federal, state, local government and private grants as well as public and private partnerships. Federal funding mechanisms include not only transportation and park programs, but also brownfield, community development and arts programs. Funding through state and local governments can be found in the departments of health, parks and transportation. Some communities have also passed bond referenda to specifically fund greenway projects.

Federal funding programs include:

The Intermodal Surface Transportation Efficiency Act (ISTEA)

The primary source of federal funding and is targeted at greenway projects that serve a transportation purpose, and is administered through the State Department of Transportation.

National Recreational Trails Fund Act (NRTFA)

A component of ISTEA, the NRTFA is a funding source that assists with the development of non-motorized trails.

Federal Aid Construction Funds

The National Highway System (NHS) and the Surface Transportation Program (STP) provide funds for the construction of pedestrian and bicycle transportation facilities.

State funding sources include:

Governor's Highway Safety Program (GHSP)

Funding provided through an annual program, upon approval of specific project requests, to undertake a variety of pedestrian and bicycle safety initiatives.

Clean Water Management Trust Fund (CWMTF)

The fund is distributed in the form of grants and can be used to acquire land or easements in the form of buffers or greenways for environmental, educational, or recreational purposes.

NC Natural Heritage Trust Fund (NHTF)

Grant money that must be used to acquire land for recreational or preservation of cultural, environmental, or historic resources.

NC Parks and Recreation Trust Fund (PARTF)

A fund "dedicated to improving the quality of life in North Carolina through preservation of natural resources and development of public parks and recreational facilities".

Executive Summary

Project Implementation and Phasing

This project will be completed in several construction phases. The implementation of this project has been divided into eight manageable segments with an option for an outer loop (*see Overall Site Plan, pg. 7*). The project can be phased based on the construction of each segment or the combination of more than one segment at a time. The completion of each segment or phase will be determined by property easement, acquisitions and funding. The overall cost, the required easements and acquisitions, and the comprehensive nature of this effort make phasing a requirement for successful implementation of the North Garner greenway/urban pedestrian way.

The initial focus of this project will be to construct the proposed sub-loop for the greenway. The sub-loop is composed of segment A through segment E and will measure a distance of 3.52 miles. This section of greenway connects eleven out of the twelve indicated points of interest.

Project Cost

- The construction of the entire system as defined by this study is estimated to cost approximately $2.62 million.
- The proposed sub-loop is estimated to cost approximately $1.07 million.
- Maintenance of the entire system (6.5 miles), once constructed, is estimated to cost approximately $19,000 annually (based on per mile cost of $2,900).

Overall Site Plan

Cloverdale Park

North Garner Middle School

Avery Street Park and Recreation Center

Garner Historic Auditorium

Olde School Commons

Garner Baseball Fields

Creech Road Elementary School

Creech Road Elementary School Park

Garner Recreational Park

Garner Senior Center

Train Depot Museum

Downtown Historic District

NORTH

SCALE: 1" = 1000'

0 500 1000 2000

Legend

- Proposed Greenway/ Urban Pedestrian Way
- Option Outer Loop
- Existing Creeks
- Existing Points of Interest
- Segment Points
- Existing Trailhead/Parking
- Proposed Trailhead/Parking

Segments

A	Point 1 to Point 2	1.00 Miles
B_1	Point 2 to Point 3	0.50 Miles
B_2	Point 2 to Point 3	0.43 Miles
C	Point 3 to Point 4	0.44 Miles
D	Point 4 to Point 5	0.78 Miles
E	Point 5 to Point 1	0.80 Miles
F	Point 3 to Point 6	0.94 Miles
*G	Point 3A to Point 6	1.41 Miles
H	Point 6 to Point 7	0.50 Miles
I	Point 7 to Point 4	0.27 Miles

* *Optional Outer Loop*

VICINITY MAP

Segment A

Point 1 to Point 2
1.0 miles

Baseball field at Garner Recreational Park

Description

Segment A begins at the Garner Senior Center (with a connection to East Garner Road) and continues north through Garner Recreational Park to the Creech Road Elementary School Park site. The trail will meander through the park site and will work in conjunction with the existing master plan to end at the existing sidewalk along Creech Rd.

Existing trail entrance

Required Easements

No easements are required.

Probable Construction Costs

Required for the development of this segment are the following:

_5216' of 10' wide asphalt greenway
_1 creek crossing (bridge)
_1 piped crossing

Total Preliminary Construction Cost = $341,093

* refer to Preliminary Construction Costs - pg. 9

Maintenance Costs

Total estimated costs associated with maintaining segment A for one year are:

Total Annual Maintenance Costs = $2,900

Total Development Costs

Total estimated cost associated with the development of Segment A is:

Total Cost = $341,093

Preliminary Construction Cost Estimate

Segment A	Point 1 to Point 2	1.00 mile

Item #	Description of Item	Estimated Quantity	Unit	Unit Cost	Total
1	Mobilization (3% max)	1	LS	3% of job	$7,874
2	Design & Engineering	1	LS	10% of job	$26,248
3	Survey Staking	1	M	$10,000	$10,000
4	Clearing & Grubbing	0.9	AC	$7,000	$6,300
5	Construction Entrance	2	EA	$1,000	$2,000
6	Undercut Excavation	50	CY	$15	$750
7	Concrete Curb & Gutter Remove/ Replace	20	LF	$40	$800
8	10' Asphalt Trail Paving - 6" stone base	5824	SY	$24	$139,776
9	Bridge / 40' Length	1	LS	$45,000	$45,000
10	Bridge Foundation	1	LS	$15,000	$15,000
11	Concrete Bridge Approach (15')	300	SY	$58	$17,400
12	15" Reinforced Concrete Pipe	20	LF	$39	$780
13	Silt Fence	2157	LF	$4	$7,550
14	Tree Protection Fence	3007	LF	$4	$10,525
15	Trash Receptacles	2	EA	$300	$600
16	Benches	4	EA	$300	$1,200
17	No Motor Vehicles Sign	1	EA	$200	$200
18	Stop Sign	3	EA	$200	$600
19	Garner Greenway Sign	2	EA	$1,000	$2,000
20	Trail Map	2	EA	$1,000	$2,000

Subtotal	$296,602
Contingency 15%	$44,490

Segment A Total Cost =	$341,093

Unit Legend

AC - Acre
CY - Cubic Yard
EA - Each
LF- Linear Foot
LS- Lump Sum
M - Mile
SY - Square Yard

Segment B - Option 1

Point 2 to Point 3
0.50 miles

Description

Segment B begins at Creech Road Elementary School. The trail will cross Creech Road and head west along the northern edge of the Solid Rock Ministry property until it intersects with the existing sanitary sewer easement. It will continue along this easement until reaching the extension of Curtiss Drive, planned as part of a proposed subdivision.

Creech Road

Required Easements

There will be an easement required for access across the Solid Rock Ministry property to reach the existing sanitary sewer easement. The sanitary sewer easement will also need an easement for widening and an overlay greenway easement in addition.

Total Greenway Easement = 2.03 acres

Total Cost = $21,315

Solid Rock Ministry

Probable Construction Costs

Required for the development of this segment are the following:

_1 major street crossing
_2962' of 10' wide asphalt greenway
_1 creek crossing (bridge)
_450' of privacy fencing

Total Preliminary Construction Cost = $267,575

* refer to Preliminary Construction Costs - pg. 11

Maintenance Costs

Total estimated costs associated with maintaining segment B1 for one year are:

Total Annual Maintenance Costs = $1,450

Total Development Costs

Total estimated cost associated with the development of Segment B (Option 1) is:

Total Cost = $288,890

Preliminary Construction Cost Estimate

Segment B - Option 1 Point 2 to Point 3 0.50 miles

Item #	Description of Item	Estimated Quantity	Unit	Unit Cost	Total
1	Mobilization (3% max)	1	LS	3% of job	$6,177
2	Design & Engineering	1	LS	10% of job	$20,591
3	Survey Staking	0.5	M	$10,000	$5,000
4	Clearing & Grubbing	0.6	AC	$7,000	$4,200
5	Construction Entrance	2	EA	$1,000	$2,000
6	Undercut Excavation	100	CY	$15	$1,500
7	10' Asphalt Trail Paving - 6" stone base	3291	SY	$24	$78,984
8	Bridge / 20' Length	1	LS	$20,000	$20,000
9	Bridge Foundation	1	LS	$15,000	$15,000
10	Concrete Bridge Approach (15')	34	SY	$58	$1,972
11	Silt Fence	1550	LF	$4	$5,425
12	Tree Protection Fence	4150	LF	$4	$14,525
13	Trash Receptacles	2	EA	$300	$600
14	Benches	2	EA	$300	$600
15	Wooden Fence	450	LF	$12	$5,400
16	No Motor Vehicles Sign	3	EA	$200	$600
17	Stop Sign	3	EA	$200	$600
18	Garner Greenway Sign	2	EA	$1,000	$2,000
19	Trail Map	2	EA	$1,000	$2,000
20	Painted Crosswalk	2	LS	$250	$500
21	Pedestrian Controled Signal	1	LS	$45,000	$45,000

Subtotal	$232,674
Contingency 15%	$34,901

Segment B Total Cost =	$267,575

Unit Legend

AC - Acre
CY - Cubic Yard
EA - Each
LF- Linear Foot
LS- Lump Sum
M - Mile
SY - Square Yard

Segment B - Option 2

Point 2 to Point 3
0.43 miles

Creech Road

Description

Segment B begins at Creech Road Elementary School and follows Creech Road north until reaching Arelean Street. The trail will then cross Creech Road and continue through the planned subdivision, Inverness, until reaching Curtiss Drive.

Creech Road Elementary School

Required Easements

No easements are required.

Probable Construction Costs

Required for the development of this segment are the following:

_1 major street crossing
_1 minor street crossing
_350' of 10' wide asphalt greenway
_550' of 5' concrete sidewalk

Total Preliminary Construction Cost = $169,242

* refer to Preliminary Construction Costs - pg. 13

Maintenance Costs

Total estimated costs associated with maintaining segment B2 for one year are:

Total Annual Maintenance Costs = $1,247

Total Development Costs

Total estimated cost associated with the development of Segment B (Option 2) is:

Total Cost = $169,242

Preliminary Construction Cost Estimate

Segment B - Option 2	Point 2 to Point 3	0.43 miles

Item #	Description of Item	Estimated Quantity	Unit	Unit Cost	Total
1	Mobilization (3% max)	1	LS	3% of job	$3,907
2	Design & Engineering	1	LS	10% of job	$13,024
3	Survey Staking	0.43	M	$10,000	$4,300
4	Construction Entrance	2	EA	$1,000	$2,000
5	Undercut Excavation	50	CY	$15	$750
6	10' Asphalt Trail Paving - 6" stone base	389	SY	$24	$9,336
7	5' Concrete Sidewalk	2750	SF	$7	$19,250
8	Bridge / 40' Length	1	LS	$45,000	$45,000
9	Trash Receptacles	1	EA	$300	$300
10	Benches	1	EA	$300	$300
11	No Motor Vehicles Sign	1	EA	$200	$200
12	Stop Sign	4	EA	$200	$800
13	Garner Greenway Sign	1	EA	$1,000	$1,000
14	Trail Map	1	EA	$1,000	$1,000
15	Painted Crosswalk	4	LS	$250	$1,000
16	Pedestrian Controled Signal	1	LS	$45,000	$45,000

Subtotal	$147,167
Contingency 15%	$22,075

Segment B Total Cost =	$169,242

Unit Legend

AC - Acre
CY - Cubic Yard
EA - Each
LF- Linear Foot
LS- Lump Sum
M - Mile
SY - Square Yard

Segment C

Point 3 to Point 4
0.44 miles

North Garner Middle School

Description

Segment C begins at the sidewalk on the south side of the Curtiss Drive extension, part of the proposed subdivision Inverness. The sidewalk will continue along the south side of Curtiss Drive heading west until passing by North Garner Middle School and ending at the intersection of Curtiss Drive and Johnson Street.

View along Curtiss Drive

Required Easements

No easements are required.

Probable Construction Costs

Required for the development of this segment are the following:

_3 street crossings
_950' of 5' wide concrete sidewalk

Total Construction Cost = $51,655

* refer to Preliminary Construction Costs - pg. 15

Maintenance Costs

Total estimated costs associated with maintaining segment C for one year are:

Total Annual Maintenance Costs = $1,276

Total Development Costs

Total estimated cost associated with the development of Segment C is:

Total Cost = $51,655

Preliminary Construction Cost Estimate

Segment C	Point 3 to Point 4	0.44 miles

Item #	Description of Item	Estimated Quantity	Unit	Unit Cost	Total
1	Mobilization (3% max)	1	LS	3% of job	$1,193
2	Design & Engineering	1	LS	10% of job	$3,975
3	Survey Staking	0.44	M	$10,000	$4,400
4	Undercut Excavation	50	CY	$15	$750
5	Concrete Curb & Gutter Remove/ Replace	15	LF	$40	$600
6	5' Concrete Sidewalk	4750	SF	$7	$33,250
7	Painted Crosswalk	3	LS	$250	$750

Subtotal	$44,918
Contingency 15%	$6,738

Segment C Total Cost =	$51,655

Unit Legend

AC - Acre
CY - Cubic Yard
EA - Each
LF- Linear Foot
LS- Lump Sum
M - Mile
SY - Square Yard

Segment D

Point 4 to Point 5
0.78 miles

Description
Segment D begins at the north-west corner of North Garner Middle School and will continue along the school property and Johnson Street. The route will turn left on Powell Drive and continue on the north side to Avery Street Park. It will then cross over Powell Drive and continue through the Avery Street Park and Recreation Center eventually making its way to Avery Street. The route will then continue south along the west side of Avery Street to East Garner Road passing by the Garner Historic Auditorium and the Olde School Commons.

View along North Garner Middle School

Required Easements
There will be an easement required for access across North Garner Middle School property.

Total Greenway Easement = 0.52 acres

Total Cost = $5,460

Avery Street Park and Recreation Center

Probable Construction Costs
Required for the development of this segment are the following:

_2 street crossings
_900' of 5' wide concrete sidewalk
_2100' of 10' wide asphalt greenway

Total Preliminary Construction Cost = $144,364

* refer to Preliminary Construction Costs - pg. 17

Maintenance Costs
Total estimated costs associated with maintaining segment D for one year are:

Total Annual Maintenance Costs = $2,262

Total Development Costs
Total estimated cost associated with the development of Segment D is:

Total Cost = $149,824

Preliminary Construction Cost Estimate

Segment D	Point 4 to Point 5	0.78 miles

Item #	Description of Item	Estimated Quantity	Unit	Unit Cost	Total
1	Mobilization (3% max)	1	LS	3% of job	$3,333
2	Design & Engineering	1	LS	10% of job	$11,109
3	Survey Staking	0.78	M	$10,000	$7,800
5	Construction Entrance	2	EA	$1,000	$2,000
6	Undercut Excavation	50	CY	$15	$750
7	Concrete Curb & Gutter Remove/ Replace	10	LF	$40	$400
8	10' Asphalt Trail Paving - 6" stone base	2333	SY	$24	$55,992
9	5' Concrete Sidewalk	4500	SF	$7	$31,500
10	Silt Fence	950	LF	$4	$3,325
11	Tree Protection Fence	750	LF	$4	$2,625
12	Trash Receptacles	2	EA	$300	$600
13	Benches	4	EA	$300	$1,200
14	No Motor Vehicles Sign	1	EA	$200	$200
15	Stop Sign	1	EA	$200	$200
16	Garner Greenway Sign	2	EA	$1,000	$2,000
17	Trail Map	2	EA	$1,000	$2,000
18	Painted Crosswalk	2	LS	$250	$500

Subtotal	$125,534
Contingency 15%	$18,830

Segment D Total Cost =	$144,364

Unit Legend

AC - Acre
CY - Cubic Yard
EA - Each
LF- Linear Foot
LS- Lump Sum
M - Mile
SY - Square Yard

Segment E

Point 5 to Point 1
0.80 miles

Description
Segment E begins at the intersection of Avery Street and East Garner Road. This segment will continue along Avery Street, crossing East Garner Road and the existing level crossing of the Norfolk and Southern Railroad until reaching Main Street. The trail will then continue along the south side of Main Street passing by the Garner Baseball Fields, the Downtown Historic District and the Train Depot until reaching New Rand Road. At this point the trail will cross back over the train tracks (taking advantage of the level crossing) and East Garner Road before heading back to the Garner Recreation Park.

Downtown Historic District

Required Easements
There will be an easement required for access along the Norfolk and Southern Railroad.

Total Greenway Easement = 0.05 acres

Total Cost = $525

Railroad Crossing

Probable Construction Costs
Required for the development of this segment are the following:

_2 major street crossings
_5 minor street crossings
_2000' of 5' wide concrete sidewalk

Total Preliminary Construction Cost = $239,888

* refer to Preliminary Construction Costs - pg. 19

Maintenance Costs
Total estimated costs associated with maintaining segment E for one year are:

Total Annual Maintenance Costs = $2,320

Total Development Costs
Total estimated cost associated with the development of Segment E is:

Total Cost = $240,413

Preliminary Construction Cost Estimate

Segment E	Point 5 to Point 1	0.80 miles

Item #	Description of Item	Estimated Quantity	Unit	Unit Cost	Total
1	Mobilization (3% max)	1	LS	3% of job	$5,538
2	Design & Engineering	1	LS	10% of job	$18,460
3	Survey Staking	0.62	M	$10,000	$6,200
4	Construction Entrance	2	EA	$1,000	$2,000
5	Undercut Excavation	50	CY	$15	$750
6	Concrete Curb & Gutter Remove/ Replace	60	LF	$40	$2,400
7	5' Concrete Sidewalk	10000	SF	$7	$70,000
8	Trash Receptacles	2	EA	$300	$600
9	Benches	2	EA	$300	$600
10	Retaining Wall @ Avery St. & Garner Rd.	1	LS	$5,000	$5,000
11	Relocate Fence @ Garner Baseball Fields	1	LS	$2,500	$2,500
12	No Motor Vehicles Sign	2	EA	$200	$400
13	Stop Sign	2	EA	$200	$400
14	Garner Greenway Sign	1	EA	$1,000	$1,000
15	Trail Map	1	EA	$1,000	$1,000
16	Painted Crosswalk	7	LS	$250	$1,750
17	Pedestrian Controled Signal	2	LS	$45,000	$90,000

Subtotal	$208,598
Contingency 15%	$31,290

Segment E Total Cost =	$239,888

Unit Legend

AC - Acre
CY - Cubic Yard
EA - Each
LF- Linear Foot
LS- Lump Sum
M - Mile
SY - Square Yard

Segment F

Point 3 to Point 6
0.94 miles

Description
Segment F begins at the south side of Curtiss Drive in the proposed subdivision Inverness. After crossing such street the trail will continue along the existing sanitary sewer easement and the required land acquisitions until reaching Cloverdale Park.

In addition to the trail segment there will be a trail-head provided off of Meadowbrook Drive, adjacent to Cloverdale Park. The trail-head will provide a maximum of ten parking spaces and restroom facilities.

View along sewer easement

Required Easements
An additional 10' wide easement will be required along the sanitary sewer easement with a greenway overlay easement as well. Also there will be a 30' wide easement required to reach Meadow brook Dr.

Total Greenway Easement = 3.22 acres

Total Cost = $33,810

Land Acquisition
Two parcels are identified for purchase to construct a parking area.

Total Cost = $48,000

Creek crossing

Probable Construction Costs
Required for the development of this segment are the following:

_1 street crossing
_550' of 5' wide concrete sidewalk
_4675' of 10' wide asphalt greenway
_1 creek crossings (bridge)
_2 creek crossings (piped)

Total Preliminary Construction Cost = $560,341

* refer to Preliminary Construction Costs - pg. 21

Maintenance Costs
Total estimated costs associated with maintaining segment F for one year are:

Total Annual Maintenance Costs = $2,726

Total Development Costs
Total estimated cost associated with the development of Segment F is:

Total Cost = $642,151

Preliminary Construction Cost Estimate

Segment F — Point 3 to Point 6 — 0.94 mile

Item #	Description of Item	Estimated Quantity	Unit	Unit Cost	Total
1	Mobilization (3% max)	1	LS	3% of job	$12,936
2	Design & Engineering	1	LS	10% of job	$43,120
3	Survey Staking	1	M	$10,000	$10,000
4	Clearing & Grubbing	2	AC	$7,000	$14,000
5	Construction Entrance	2	EA	$1,000	$2,000
6	Undercut Excavation	100	CY	$15	$1,500
7	Concrete Curb & Gutter Remove/ Replace	20	LF	$40	$800
8	10' Asphalt Trail Paving - 6" stone base	5195	SY	$24	$124,680
9	5' Concrete Sidewalk	2750	SF	$7	$19,250
10	Bridge / 40' Length	1	LS	$45,000	$45,000
11	Bridge Foundation	1	LS	$15,000	$15,000
12	Concrete Bridge Approach (15')	34	SY	$58	$1,972
13	Culvert Improvements	1	LS	$12,000	$12,000
14	15" Reinforced Concrete Pipe	20	LF	$39	$780
15	Silt Fence	2025	LF	$4	$7,088
16	Tree Protection Fence	7325	LF	$4	$25,638
17	Trash Receptacles	2	EA	$300	$600
18	Benches	2	EA	$300	$600
19	No Motor Vehicles Sign	1	EA	$200	$200
20	Stop Sign	1	EA	$200	$200
21	Garner Greenway Sign	1	EA	$1,000	$1,000
22	Trail Map	2	EA	$1,000	$2,000
23	Painted Crosswalk	1	LS	$250	$250
24	Restroom Facility	1	LS	$30,000	$30,000
25	Asphalt Parking Lot - 10 Spaces	4860	SF	$24	$116,640

Subtotal	$487,253
Contingency 15%	$73,088
Segment F Total Cost =	$560,341

Unit Legend

AC - Acre
CY - Cubic Yard
EA - Each
LF- Linear Foot
LS- Lump Sum
M - Mile
SY - Square Yard

Segment G - Optional Outer Loop

Point 3A to Point 6
1.41 miles

Creek Crossing

Description
Segment G begins were segment F diverts from the sanitary sewer easement. From there it will travel north along the sanitary sewer easement, making two creek crossings before heading south. The trial will travel through Cloverdale Park and end at Meadowbrook Drive.

Cloverdale Park

Required Easements
An additional 10' wide easement will be required along the sanitary sewer easement with a greenway overlay easement as well.

Total Greenway Easement = 4.41 acres

Total Cost = $46,305

Probable Construction Costs

Required for the development of this segment are the following:

_2 creek crossings (bridges)
_3 creek crossings (piped)
_7400' of 10' wide asphalt greenway

Total Preliminary Construction Cost = $592,863

* refer to Preliminary Construction Costs - pg. 23

Maintenance Costs

Total estimated costs associated with maintaining segment G for one year are:

Total Annual Maintenance Costs = $4,089

Total Development Costs

Total estimated cost associated with the development of Segment G is:

Total Cost = $639,168

Preliminary Construction Cost Estimate

Segment G - Optional Outer Loop	Point 3A to Point 6	1.41 miles

Item #	Description of Item	Estimated Quantity	Unit	Unit Cost	Total
1	Mobilization (3% max)	1	LS	3% of job	$13,687
2	Design & Engineering	1	LS	10% of job	$45,622
3	Survey Staking	1.4	M	$10,000	$14,000
4	Clearing & Grubbing	0.5	AC	$7,000	$3,500
5	Construction Entrance	2	EA	$1,000	$2,000
6	Undercut Excavation	250	CY	$15	$3,750
7	10' Asphalt Trail Paving - 6" stone base	7500	SY	$24	$180,000
8	10' Asphalt Trail Paving - 20" stone base	722	SY	$45	$32,490
9	Bridge / 40' Length	2	LS	$45,000	$90,000
10	Bridge Foundation	2	LS	$15,000	$30,000
11	Concrete Bridge Approach (15')	68	SY	$58	$3,944
12	Culvert Improvements	3	LS	$12,000	$36,000
13	15" Reinforced Concrete Pipe	60	LF	$39	$2,340
14	Silt Fence	8400	LF	$4	$29,400
15	Tree Protection Fence	6400	LF	$4	$22,400
16	Trash Receptacles	4	EA	$300	$1,200
17	Benches	4	EA	$300	$1,200
18	Garner Greenway Sign	2	EA	$1,000	$2,000
19	Trail Map	2	EA	$1,000	$2,000

Subtotal	$515,533
Contingency 15%	$77,330

Segment G Total Cost =	$592,863

Unit Legend

AC - Acre
CY - Cubic Yard
EA - Each
LF- Linear Foot
LS- Lump Sum
M - Mile
SY - Square Yard

Segment H

Point 6 to Point 7
0.50 miles

Meadowbrook Drive

Description
Segment H will leave Cloverdale Park, cross Meadowbrook Drive and travel south on the existing sanitary sewer easement until reaching Curtiss Drive.

Probable Construction Costs

Required for the development of this segment are the following:

_1 street crossing
_350' of 5' wide concrete sidewalk
_2650' of 10' wide asphalt greenway

Total Preliminary Construction Cost = $190,164

* refer to Preliminary Construction Costs - pg. 25

View along sewer easement

Maintenance Costs

Total estimated costs associated with maintaining segment H for one year are:

Total Annual Maintenance Costs = $1,450

Required Easements

An additional 10' wide easement will be required along the sanitary sewer easement with a greenway overlay easement as well.

Total Greenway Easement = 1.83 acres

Total Cost = $19,215

Total Development Costs

Total estimated cost associated with the development of Segment H is:

Total Cost = $209,379

Preliminary Construction Cost Estimate

Segment H — Point 6 to Point 7 — 0.50 miles

Item #	Description of Item	Estimated Quantity	Unit	Unit Cost	Total
1	Mobilization (3% max)	1	LS	3% of job	$4,390
2	Design & Engineering	1	LS	10% of job	$14,634
3	Survey Staking	0.5	M	$10,000	$5,000
4	Clearing & Grubbing	0.5	AC	$7,000	$3,500
5	Construction Entrance	2	EA	$1,000	$2,000
6	Undercut Excavation	250	CY	$15	$3,750
7	10' Asphalt Trail Paving - 6" stone base	2944	SY	$24	$70,656
8	5' Concrete Sidewalk	1750	SF	$7	$12,250
9	Culvert Improvements	2	LS	$12,000	$24,000
10	15" Reinforced Concrete Pipe	20	LF	$39	$780
11	Silt Fence	2650	LF	$4	$9,275
12	Tree Protection Fence	2650	LF	$4	$9,275
13	Trash Receptacles	2	EA	$300	$600
14	Benches	2	EA	$300	$600
15	No Motor Vehicles Sign	1	EA	$200	$200
16	Stop Sign	1	EA	$200	$200
17	Garner Greenway Sign	2	EA	$1,000	$2,000
18	Trail Map	2	EA	$1,000	$2,000
19	Painted Crosswalk	1	LS	$250	$250

Subtotal	$165,360
Contingency 15%	$24,804

Segment H Total Cost = $190,164

Unit Legend

AC - Acre
CY - Cubic Yard
EA - Each
LF- Linear Foot
LS- Lump Sum
M - Mile
SY - Square Yard

Segment I

Point 7 to Point 4
0.27 miles

View along Curtiss Drive

Description
Segment I will travel east on the north side of Curtiss Drive, and upon crossing Johnson Street, will cross to the south side of Curtiss Drive allowing for the connection to Segment D.

Probable Construction Costs

Required for the development of this segment are the following:

_3 street crossings
_700' of 5' wide concrete sidewalk

Total Preliminary Construction Cost = $41,194

* refer to Preliminary Construction Costs - pg. 27

Intersection of Curtiss Drive and Johnston Street

Maintanence Costs

Total estimated costs associated with maintaining segment I for one year are:

Total Annual Maintanence Costs = $783

Required Easements
No easements required.

Total Development Costs

Total estimated cost associated with the development of Segment I is:

Total Cost = $41,194

Preliminary Construction Cost Estimate

Segment I	Point 7 to Point 4	0.27 miles

Item #	Description of Item	Estimated Quantity	Unit	Unit Cost	Total
1	Mobilization (3% max)	1	LS	3% of job	$951
2	Design & Engineering	1	LS	10% of job	$3,170
3	Survey Staking	0.27	M	$10,000	$2,700
5	Undercut Excavation	50	CY	$15	$750
6	Concrete Curb & Gutter Remove/ Replace	25	LF	$40	$1,000
7	5' Concrete Sidewalk	3500	SF	$7	$24,500
8	Garner Greenway Sign	1	EA	$1,000	$1,000
9	Trail Map	1	EA	$1,000	$1,000
10	Painted Crosswalk	3	LS	$250	$750

Subtotal	$35,821
Contingency 15%	$5,373

Segment I Total Cost =	$41,194

Unit Legend

AC - Acre
CY - Cubic Yard
EA - Each
LF- Linear Foot
LS- Lump Sum
M - Mile
SY - Square Yard

Map 1

Segments

A — Point 1 to Point 2 — 1.00 Miles

D — Point 4 to Point 5 — 0.78 Miles

E — Point 5 to Point 1 — 0.80 Miles

VICINITY MAP

Legend

- Stream Crossing
- Street Crossing
- Railroad Crossing
- Segment Point
- Proposed Sidewalk
- Existing Sidewalk
- Proposed Trail
- Existing Trail

NORTH

SCALE: 1" = 500'

0 250 500 1000

Map 2

Segments

A	Point 1 to Point 2	1.00 Miles
B_1	Point 2 to Point 3	0.50 Miles
B_2	Point 2 to Point 3	0.43 Miles
C	Point 3 to Point 4	0.44 Miles
D	Point 4 to Point 5	0.78 Miles
F	Point 3 to Point 6	0.94 Miles
H	Point 6 to Point 7	0.50 Miles

VICINITY MAP

Legend

- Stream Crossing
- Street Crossing
- Railroad Crossing
- Segment Point
- Proposed Sidewalk
- Existing Sidewalk
- Proposed Trail
- Existing Trail

NORTH

SCALE: 1" = 500'

0 250 500 1000

Map 3

Segments

F — Point 3 to Point 6 — 0.94 Miles

*G — Point 3A to Point 6 — 1.41 Miles

I — Point 7 to Point 4 — 0.27 Miles

* *Optional Outer Loop*

VICINITY MAP

Legend

- Stream Crossing
- Street Crossing
- Railroad Crossing
- Segment Point
- Proposed Sidewalk
- Existing Sidewalk
- Proposed Trail
- Existing Trail

NORTH

SCALE: 1" = 500'

0 250 500 1000