

FEASIBILITY STUDY

PINEHURST
GOLF CART/PEDESTRIAN CROSSING
ON
NC 5
BETWEEN SR 1205 AND NC 2
FS 62-92-007

Prepared by
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I. GENERAL DESCRIPTION

This preliminary study describes alternatives for improvement to the existing unsignalized golf cart/pedestrian crosswalk on NC 5 in Pinehurst. The study area and the location of the alternative improvements is shown as Figure 1. Six alternatives are examined in this study, as follows:

- Alt. I. Signalize the existing golf cart crossing.
- Alt. II. Build an underpass near the existing crossing.
- Alt. III. Build an underpass south of the existing crossing.
- Alt. IV. Build an overpass near the existing crossing.
- Alt. V. Build an overpass south of the existing crossing.
- Alt. VI. Do nothing.

Alternative VI, the Do Nothing alternative is recommended.

This study is the initial step in the planning and design process for this project and is not the product of an exhaustive environmental investigation or design effort. The purpose of this study is to describe the problem and alternative solutions including costs.

II. EXISTING CONDITIONS

Pinehurst, located in the south-central sandhills of North Carolina, is a nationally known center of golf. There are seven contiguous golf courses operated by the Pinehurst Resort as well as several other nearby courses in Moore County. For many years retirees and vacationers have been attracted to Pinehurst by the moderate climate and abundant recreational opportunities. The PGA World Golf Hall of Fame is located at Pinehurst's famous Number 2 course.

Pinehurst Course Numbers 3 and 5 are divided by NC 5, a two-way, two-lane road with a 22 foot wide pavement and 6 foot wide grassed shoulders; and by the Aberdeen, Carolina & Western Railroad whose track parallels the highway. NC 5 is classified a Major Collector in the Moore County Thoroughfare Plan. In addition to the mainline track there is a railroad siding that parallels the north portion of

NC 5 in the study area. Course number 1 is divided by SR 1205, also a two-way, two-lane paved roadway. SR 1205 is classified a Minor Collector in the Moore County Thoroughfare Plan. Please see Figure 1 for the study location. Golf cart and pedestrian crossings are currently provided on NC 5 at two locations: 1) the intersection of NC 5 and SR 1205, and 2) a point approximately 1300 feet north of the intersection of NC 5 and SR 1205. Both crosswalks are painted, at-grade, crossings. The crossing at the NC 5 - SR 1205 intersection is signalized and there are golf cart and pedestrian detectors on both approaches of the cart paths. The second crossing on NC 5 is not signalized, but is controlled with stop signs on the golf cart path approaches to NC 5.

There is a painted, at-grade crossing on SR 1205 approximately 1300 feet east of NC 5 which is controlled with stop signs on the golf cart path approaches to SR 1205.

The 1991 Average Daily Traffic (ADT) on NC 5 is estimated to be 12,500 vehicles per day (vpd) and on SR 1205 it is estimated to be 6,300 vpd.

It is estimated that there are 160 to 200 golf cart crossings made per day at the crossings on NC 5, during the spring golfing season. On the west side of NC 5 there are numerous residences clustered within the golf links. The number of cart crossings stated above includes golfers, maintenance workers, and residents traveling to and from the club house (for dining or other non-golfing activities) on the east side of NC 5.

It is estimated that there are approximately 100 cart crossings per day made at the crossing on SR 1205.

During the three year period from June 1, 1989 to May 31, 1992 there were no accidents reported involving pedestrians or golf carts at the signalized crossing on NC 5, or at the unsignalized crossing on SR 1205. During this period there was one accident reported involving a golf cart at the unsignalized crossing on NC 5. There were no injuries involved in this accident and property damage was reported at \$900. The signalized golf cart/pedestrian crossing on NC 5 and the golf cart/pedestrian crossing on SR 1205 are felt to be operating satisfactorily, however, the unsignalized crossing on NC 5 may present safety problems.

The remainder of this report examines alternatives to the currently unsignalized golf cart/pedestrian crossing on NC 5 in Pinehurst.

III. ALTERNATIVES CONSIDERED

In all of the alternatives that follow, there have been no estimates made of any right of way costs and none have been included in the cost estimates presented. It has been assumed that any required right of way or easements will be donated by the owners of the golf course and/or the owners of the railroad.

Alternative I - Install a Pedestrian / Golf Cart Actuated Traffic Signal at the Existing Unsignalized Crossing on NC 5 and Coordinate Signal with Adjacent Traffic Signals During Peak Hours.

Description: Semi-actuated traffic signal with loop detectors for golf carts and push buttons for pedestrians, coordinated via time-base coordinators with adjacent traffic signals during morning, noon, and afternoon peak traffic periods.

Location: NC 5 at existing unsignalized crossing.

Cost: Poles, control equipment, signal heads, loop installation, and coordination equipment..... \$50,000

Comment: The feature of coordination with adjacent traffic signal should be studied in depth during the design phase. Coordination would provide a guaranteed green band for NC 5 motorist and would require golf carts at the existing signalized crossing, and at the proposed signalized crossing to wait for their "yield point" in the signal cycle. Golf cart drivers may become impatient and disregard the signal. If the signals are not coordinated, traffic on NC 5 will be required to stop more frequently and there may be more rear-end type accidents. Signalizing the crossing does not mean, with absolute certainty, that the crossing will be safer for golf carts.

The Manual of Uniform Traffic Control Devices does not address signal displays for locations which are used exclusively by nonregistered motor vehicles. This raises the question of increased liability to the NCDOT. It is felt this must be addressed uniformly, preferably with legislation, prior to using a traffic signal here.

Alternative II - Golf Cart/Pedestrian Underpass Located Near Existing Unsignalized Crossing

Description: 14 ft. x 8 ft. x 130 ft. reinforced concrete box culvert.

Location: NC 5 approximately 60 ft. north of the existing unsignalized crossing.

Cost:\$500,000

Comment: This location fits in with the desired traffic flow for golf play but requires a longer structure and a more costly railroad detour than Alternative III because two tracks are involved here.

Alternative III - Golf Cart/Pedestrian Underpass Located South of Existing Unsignalized Crossing

Description: 14 ft. x 8 ft. x 110 ft. reinforced concrete box culvert.

Location: NC 5 approximately 350 ft. south of existing unsignalized crossing

Cost:\$370,000

Comment: Does not fit into desired flow of traffic for golf play as well as Alternative II, but is \$128,000 less expensive because only one railroad track is involved.

Alternative IV - Golf Cart/Pedestrian Overpass Located Near Existing Unsignalized Crossing

Description: composite steel and reinforced concrete structure with 110 ft. center span over RR & highway, plus 170 ft. approaches each side, total length of 450 ft.

Location: NC 5 approximately 60 ft. north of existing unsignalized crossing

Cost: \$760,000

Comment: Structure approach lengths assume 15 per cent grades.

Alternative V - Golf Cart/Pedestrian Overpass
Located South of Existing Unsignalized
Crossing

Description: composite steel and reinforced concrete structure with 90 ft. center span over RR & highway, plus 170 ft. approaches each side, total length of 430 ft.

Location: NC 5 approximately 350 ft. south of existing unsignalized crossing

Cost: \$720,000

Comment: Structure approach lengths assume 15 per cent grades.

Alternative VI - Do Nothing (Recommended)

IV. RECOMMENDATIONS

Alternative VI, the Do Nothing alternative is recommended. Among the other alternatives, Alternative I, a traffic signal, is favored because it can be implemented quickly, and is significantly less expensive than an underpass or overpass.

It is recognized that Alternative I, a traffic signal, will cause delay to motorists on NC 5 as well as to golfers. However, the crossing, being approximately mid-way between two signalized intersections is well located in terms of the ability to provide a well coordinated, progressive platoon of traffic on NC 5 during peak traffic periods.

A traffic signal is not only significantly less expensive than the other alternatives, but being a traffic operations type improvement, can be more quickly implemented. An underpass or an overpass, being a major construction project will require, at a minimum, 2.5 years to implement, while a signal may be installed within a matter of months. Also, an underpass will require sump pumps for drainage and their continual associated maintenance. After installation of the signal, if it is determined that a more comprehensive solution is required, such solution can then be pursued.

Signalizing the existing golf cart crossing is not recommended because of the uncertainty that it would be safer than the existing unsignalized crossing and because the liability to the NCDOT may be increased if a traffic signal is used to control nonregistered vehicles.

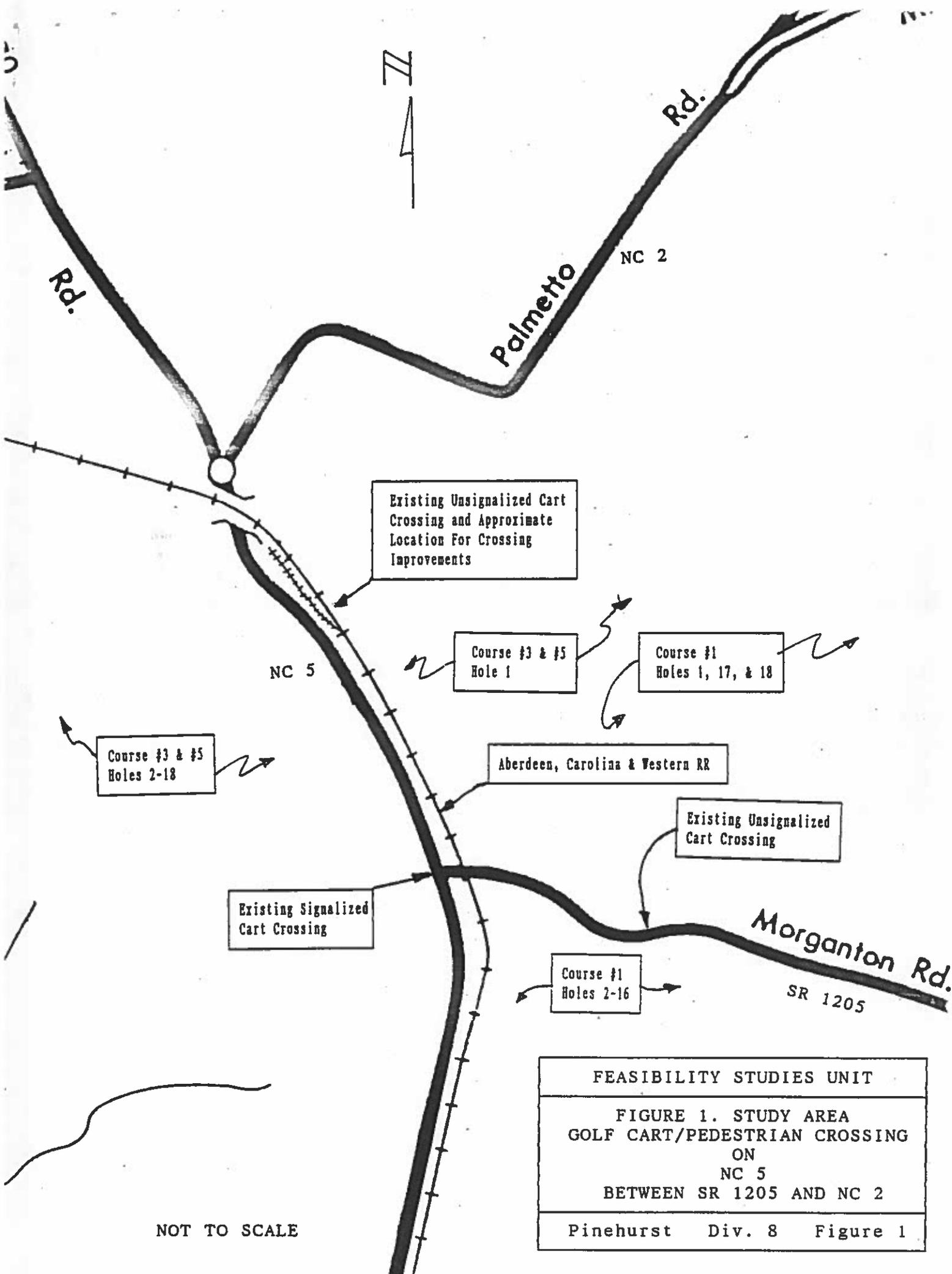
VI. ADDITIONAL COMMENTS

During the course of this study the possibility of utilizing the existing railroad structure end-bents as a foundation for a golf cart/pedestrian overpass was raised by a representative of the Pinehurst Resort. This was considered because of the relatively short bridge span (30 feet) required on the existing foundation and resultant relative small structure cost which is estimated to be \$100,000.

On the negative side, is the proximity of the cart overpass to the railroad tracks. Would cart passengers and pedestrians be comfortable so close (10 feet) to a moving train? In addition to the structure, this will require construction of approximately 1200 feet of new golf cart path which is not included in the above cost.

This discussion is included here for information only. The NCDOT would not be a party to expanding the existing structure since the structure is owned by the railroad. Pinehurst Resorts may choose to pursue this idea with the railroad.

If, in the future, the NCDOT undertakes to replace the entire existing railroad bridge, consideration may be given to including a golf cart/pedestrian overpass in the project.



NOT TO SCALE

FEASIBILITY STUDIES UNIT
FIGURE 1. STUDY AREA GOLF CART/PEDESTRIAN CROSSING ON NC 5 BETWEEN SR 1205 AND NC 2
Pinehurst Div. 8 Figure 1

