



PRELIMINARY

**University of Maryland
Connector Feasibility Study**

Conducted for the MdSHA
May 3, 1999
Sverdrup Civil Inc.



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I PURPOSE

The purpose of the University of Maryland Connector is to improve access to the University of Maryland. The connector will also improve function of US Route 1 and other major arterial roadways in the College Park and Greenbelt area.

This study will address the benefits, costs and impacts of a new ~~location~~ roadway to the north of the University. This new connector will provide direct access to the Capital Beltway and I-95. The connector is also intended to complement planned improvements to US Route 1 and the other arterial roadways in the area.

US Route 1 is the principal north-south roadway in the study area. This roadway is frequently congested and operates with substantial delays in the study area. ^{MD} SR 193 (University Boulevard) and Metzgerott road are the principal east-west roadways, and generally provide acceptable service.

University traffic also uses Adelphi road to gain access to the Capital Beltway and destinations to the north. Adelphi road ends at ^{MD} SR 650 (New Hampshire Avenue) and this intersection has long delays during peak hours. ^{MD}

Traffic from University of Maryland sporting events, concerts or other special events create large backups throughout the area. Much of this traffic is dispersed once it gains access to the Capital Beltway and I-95. However, there is currently no direct access from the University to the Interstate system. Traffic must use US Route 1 or Adelphi Road / New Hampshire Avenue to gain access to the Capital Beltway and I-95.

Direct access to the Capital Beltway and I-95 will greatly improve access to the University. A connector will also help traffic conditions on US Route 1.



II EXISTING CONDITIONS

Natural Environment

General: The study area is located in an area of rolling topography near the fall line in Prince George's County. The largest body of water in the area is Paint Branch, which is a tributary of the Potomac River. Elevation ranges from 75 feet above sea level near Paint Branch to 234 feet on the PEPCO ROW behind College Park Woods. The area primarily consists of four land uses: residential development in College Park Woods and along Metzert Road, maintained transportation and utility rights-of-way, agricultural crop fields in Beltsville Agricultural Research Center, and forest land tracts of various sizes scattered throughout the study area.

Background research was performed using information from the US Fish and Wildlife Service, the Maryland-National Capital Parks and Planning Commission, the University of Maryland at College Park, the Federal Emergency Management Agency, the US Environmental Protection Agency, and the US Geologic Survey. This background research was used to initially review the study site, and identify areas that would require further investigation. Preliminary reconnaissance of the area was conducted on April 27th, 1999, to scout for potential wetlands, streams, steep slopes, forest habitat, historic structures and places, and other environmentally sensitive resources

Streams: Most of the study area is in the Paint Branch drainage area, which flows into Northeast Branch and the Anacostia River. The entire site is within the Potomac River Watershed of the Chesapeake Bay. USGS quadrangle maps show that there is one unnamed perennial tributary to Paint Branch that flows roughly west to east through College Park Woods. The field survey found numerous other small intermittent tributaries of Paint Branch.

All streams in the study area, including Paint Branch, are classified as Use-I by the Maryland Department of the Environment, and are therefore protected for water contact recreation, aquatic life, and water supply. In-stream work is prohibited in Use-I streams from March 1st to June 15th of any given year. The site is downstream of the brown trout habitat (Use-III) portion of Paint Branch, which is located in Montgomery County.

Wetlands: National Wetlands Inventory (NWI) mapping shows three wetlands in the study area. One is a palustrine forested area along an unnamed tributary in the center of College Park Woods. It is linear and extends approximately a quarter mile. The second wetland is a much larger (~3 acres) palustrine forested area located in the 500-year floodplain adjacent to the miniature golf course on Boteler Lane. The final NWI wetland is located between Metzert Road and Azalea Lane on University of Maryland property. It contains palustrine forested vegetation and lies in an area surrounding two small tributaries. This wetland has an area of about 1 acre.



The field survey also revealed other small wetlands that were not mapped by NWI (See accompanying plans). Most of these are found in small swales or next to tributaries. In general, vegetation in these smaller areas was either palustrine emergent or palustrine forested. The palustrine emergent areas occurred in mown sites, such as in the PEPCO ROW or on BARC property. Soft rush (*Juncus effusus*), cattail (*Typha latifolia*), and other emergent wetland species tolerant of disturbance dominate these sites. Palustrine forested areas are dominated by red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), willow oak (*Quercus phellos*), and arrow-wood (*Viburnum dentatum*), and are commonly found in narrow strips adjacent to streams. There are also some small (<100 ft²) isolated palustrine forested wetlands scattered throughout the 500-year floodplain near the miniature golf course on Boteler Lane.

In addition to the natural wetlands noted above, there are also two stormwater management ponds located on Greemead Rd. and a pond behind the University of Maryland Animal Sciences complex (see accompanying plans).

Floodplains: FEMA information shows that the 100-year floodplain for Paint Branch lies on the western edge of the study area. The 500-year floodplain is within the study area and contains two NWI wetlands and numerous small pockets of palustrine forested wetlands.

Woodlands / Potential Wildlife Habitat: There are several forested stands located in the study area, ranging from early successional scrub-shrub vegetation to mature second growth forest. Mature forested areas generally consist of tuliptree (*Liriodendron tulipifera*), sweetgum (*Liquidambar styraciflua*), American beech (*Fagus grandifolia*), red maple (*Acer rubrum*), white oak (*Quercus alba*), red oak (*Quercus rubra*), chestnut oak (*Quercus prinus*), and willow oak (*Quercus phellos*). Virginia pine (*Pinus virginiana*) dominates younger stands. Several of the mature stands contain specimen trees with diameters greater than 30 inches at 4.5 feet. The accompanying plans describe forested areas and possible locations of specimen trees.

The most common animals that are expected to occur in the study area are those that easily coexist with humans. These include gray squirrel, white-tailed deer, Virginia opossum, eastern chipmunk, and red fox. Bird species include American robins, northern mockingbirds, cardinals, and common grackles. A red-tailed hawk and a raccoon were observed during the field survey in the forested area across Metzert Road from Archives II.

Threatened and Endangered Species: It is unlikely that there are threatened or endangered species in the study area. However, information from the US Fish and Wildlife Service, the Maryland Department of the Environment, and the Maryland Department of Natural Resources has not yet been obtained.



Hazardous Wastes

The preliminary hazardous waste review for this project indicated that the primary site of concern within the study area is the Beltsville Agricultural Research Center (BARC).

From 1990 to 1992, the USDA conducted preliminary hazardous waste investigations at this facility, which revealed the presence of elevated polyaromatic hydrocarbon levels, pesticides, polychlorinated biphenyls (PCBs), and heavy metals in certain areas of the site. Based on these findings, the entire BARC property was placed on the National Priority List (NPL) in May of 1994. Further studies were then initiated in 1995 to pinpoint specific areas of concern (AOCs) within the property and to determine whether further investigations would be necessary (USDA 1998).

The EPA and USDA initially identified 166 potential AOCs. Additional research determined that 107 of these 166 sites would not require further action or remediation. The remaining 59 sites were then recorded, mapped, and advanced to a Site Screening Process (SSP). The SSPs will be used to determine whether hazardous substances have been released to the environment and, if so, to what extent (USDA 1998).

Three of the remaining 59 AOCs are located near the project study area. These sites include BARC 1, BARC 2, and BARC 17 (see accompanying plans). BARC 1 is an experimental wood treatment area located 200 feet southeast of Building 060. This area was used for application of wood treatment chemicals in the 1940s and 1950s. BARC 2 is a gravel pit used to dispose of municipal waste and small amounts of waste chemicals in the 1950s and 1960s. BARC 17 is a scrap site formerly used for storing materials and farm equipment (USDA 1998).

A search of USEPA hazardous waste databases (EDR 1999) revealed that there are at least 7 sites of concern in the study area (see accompanying plans). The first two are in Buildings 1321 and 2404 of the BARC facility, which store and/or produce hazardous waste of unknown types and quantities associated with agricultural experimentation. The remaining hazardous waste sites are primarily underground storage tanks for heating oil. These are found at the National Archives Building (also a hazardous waste generator), Buck Lodge Middle School, Cherokee Lane Elementary School, and Lone Cedar Poultry Farm (on Adelphi Road). In addition, the University of Maryland Physics Laboratory on Greemead Road is a hazardous waste handler.

Historical and Archeological Resources

The National Archives II complex is listed on the National Register by the US Department of the Interior as an historic property, presumably because of the documents contained within it. Additionally, the entire BARC property is eligible for the National



Register. The preliminary reconnaissance also revealed a residential property (c. 1900-1930) on Boteler Lane that may be eligible for the National Register.

Any undisturbed sites in the study area may potentially have archaeological significance. Areas near water sources, such as along Paint Branch and the other perennial and intermittent streams in the study area, are especially likely to contain archaeological resources. Sites located on the tops of ridges are also potentially archaeologically significant.

Manmade Resources

Beltsville Agricultural Research Center (BARC). BARC is the US Department of Agriculture's (USDA) principal research center. It contains three separate research related institutes. USDA literature states that BARC is the largest and most diversified agricultural research complex in the world.

The BARC covers approximately 2,630 hectares (6,500 acres), numerous separate facilities have been constructed on the property to conduct various research activities for animal husbandry, agronomy, human nutrition, animal diseases, and related agricultural research activities since 1910.

Utility corridor. A major utility corridor splits the area. The corridor is 400 feet wide and contains electric, gas, water, microwave towers and telephone lines.

Generally, utility corridors may be crossed by a new roadway. However, it is not a trivial matter to cross a major utility corridor. The utility companies will demand that service and access be maintained. The profile of the roadway will be constrained; either a cut or a large fill may damage the utilities.

The utility corridor also presents an opportunity for the roadway. A new roadway adjacent to an existing utility corridor is less obtrusive than one in open areas.

Pepco Substation. A large electric substation exists along the utility corridor. The substation is managed by Pepco.

University of Maryland. University of Maryland facilities are located throughout the study area. Significant facilities north of Metzert Road and University Boulevard are the Veterinary Center and the Erwin Administrative Center. The University is also planning a new dormitory just south of the Veterinary Center. See Exhibit for locations of these facilities.

Parks and Public lands. Just east of the Interstate Park and Ride lot is the Buck Lodge Community Park. The park is adjacent to the utility corridor for approximately 200 feet and includes a bike trail. Inside the College Park Woods subdivision is a park with



athletic fields and playground areas and at the north end of the subdivision a swimming pool and clubhouse. In the eastern end of the area is miniature golf course, a driving range and Paint Branch Golf Club. See Exhibit for locations of these facilities.

Residential areas: In the center of the study area is College Park Woods subdivision. This subdivision consists of single family home on $\frac{1}{4}$ to $\frac{1}{2}$ acre lots. There are over 350 homes in the subdivision. College Park Woods is over 25 years old and has an active homeowners association.

In the vicinity of the Interstate Park and Ride Lot is White Oak Manor. Homes in this subdivision are on $\frac{1}{2}$ to $\frac{3}{4}$ acre lots. See Exhibit for locations of these subdivisions.



III DESCRIPTION OF ALTERNATIVES

Description of Improvement and Typical Section

The proposed improvement is a four lane, 50 mph design speed, controlled access roadway. The proposed median is 30 feet wide and the total right of way required is 160 feet. With traffic data and more detail study these design criteria may change.

Four alternatives are identified in this study. The locations of the alternatives are shown in the following exhibit.

Alternative 1: This alternative is the eastern most alternative. The alternative stays to the west of the utility corridor. It crosses Metzertott Road and continues for 1,000 more feet to Adelphi Road. The length is just under 1.2 miles. This alternative takes full advantage of the utility corridor, however it passes through Buck Lodge Community Park.

Alternative 2: This alternative has the same initial 2,000 feet as Alternative 1. Just before Buck Lake Community Park this alternative turns into the utility corridor and uses the utility corridor for approximately 1,000 feet. The alternative ends on Metzertott Road.

The principal advantage of this alternative is that it does not pass through a community park or the BARC. In doing so this alternative weaves through the utility corridor and between the substation, College Park Woods subdivision and the University System Administration Building. It is the shortest route, just under one mile in length.

Both Alternatives 1 and 2 may require upgrade of Metzertott Road from two lanes to four lanes. This study did not analyze the need, costs or impacts of widening Metzertott Road.

Alternative 3: This alternative crosses the utility corridor into the Beltsville Agricultural Research Center (BARC). To minimize impacts to the operation of the BARC the alternative runs on the border between BARC and College Park Woods. The alternative splits the University buildings by the Veterinary school and Physics lab and connects with University Boulevard.

This alternative provides good access for University traffic to the Capital Beltway and I-95. It also minimizes impacts to BARC, however it runs close to over 30 homes in College Park Woods and impacts University facilities.

Alternative 4: This alternative is similar to Alternative 3, except that it runs further west. This alternative also goes around the Veterinary School and has greater wetland impacts.

This alternative also provides good access for University traffic to the Capital Beltway and I-95. It has less noise and visual impact for the homes in College Park Woods. It may have a larger impact to BARC operations.



IV BENEFITS, IMPACTS AND COSTS OF ALTERNATIVES

A summary of benefits, impacts and costs of each alternative are shown in the attached exhibit.

Benefits

All of the alternatives provide a direct access to the Capital Beltway and I - 95 for University of Maryland traffic. The most direct access is provided by Alternatives 3 and 4. Traffic using Alternatives 1 and 2 will need to first need to access Metzertott Road or Adelphi Road.

Alternatives 3 and 4 can also be expected to divert more US Route 1 traffic.

Natural Environment Impacts

Streams: None of the Alternatives will have a significant impact to area streams.

Based on a preliminary assessment, all streams in the study area could be crossed using culverts. Alternative 1 crosses three streams, including one perennial and two intermittent tributaries of Paint Branch. Alternative 2 crosses two streams, including the perennial tributary of Paint Branch and one intermittent tributary of Paint Branch. Alternative 3 and 4 cross four streams: one perennial tributary and three intermittent tributaries, all of which flow into Paint Branch.

Wetlands: Each of the Alternatives will impact some wetlands. Alternatives 3 and 4 will impact the largest area of wetlands. Alternatives 1 and 2 will impact smaller, isolated wetland areas.

Alternative 1 will impact some forested wetlands that are associated with stream crossings. There are also some emergent wetland areas within the ROW, but these should not be affected.

Alternative 2 would impact some palustrine emergent wetlands that are found behind College Park Woods, but otherwise will only affect forested wetlands associated with the perennial stream behind the PEPCO substation, an area that is noted on NWI mapping.

Alternative 3 and 4 would have the most wetland impact. The impacted wetlands would primarily occur between Paint Branch Dr. and Metzertott Rd., in the floodplain of Paint Branch, and along the perennial stream between the University of Maryland turf farm and College Park Woods.



Floodplains: Alternatives 3 and 4 will be within the 500 year floodplain. Only a small portion of Alternative 4 is projected to be within the 100 year floodplain.

Hazardous Waste: Alternative 1 will be the closest of the three alternatives to four possible hazardous waste sites, including the underground storage tanks at the National Archives Building, Buck Lodge Middle School, Cherokee Lane Elementary School, and Lone Cedar Poultry Farm. However, the alternative would not directly impact any of these sites and these sites are expected to be very localized.

Alternative 2 would have a terminus near the Archives II site, but should not impact it. This alternative would follow the western edge of the BARC property (all of which has been placed on the National Priority List) and may impact portions of it. Specifically, BARC-2, which is a gravel pit formerly used for waste disposal, could be affected.

Alternative 3 would affect the most hazardous waste area, as it would largely be placed on BARC property. Specific sites impacted include Buildings 1321 and 2404 and BARC 1, 2, and 17.

Woodlands / Potential Wildlife Habitat: None of the Alternatives will have a significant impact on woodlands or wildlife.

Alternative 1 would probably affect the largest area of woodland. Nearly the entire length of the alignment is forested. The forest in this area is mostly comprised of white oak and tulip poplar in a mid-successional growth stage.

Alternative 2 affects the least amount of forested area. It currently uses a portion of the cleared utility corridor.

Alternatives 3 and 4 would impact forest in the Paint Branch floodplain, next to the UM turf farm, and in some portions of the BARC property. The most drastic impacts would occur in the forest stand located behind the College Park Woods swimming pool. This stand is on a steep slope and consists of large tuliptrees, American beeches, and oaks, some of which have diameters of 40 to 50 inches. It is the most mature forest stand in the study area.

Threatened and Endangered Species: Threatened and Endangered Species are not likely to be impacted by any of the alternatives.

Historical and Archaeological Resources: Alternatives 3 and 4 use BARC property. The BARC is eligible to be on the National Register of Historic Places. There are no significant impacts to the other historic or archaeological resources in the study area.

Alternative 1 and 2 will affect views from the National Archives II property, which is on the National Register, but will not otherwise affect any known historical resources.



Alternative 3 and 4 will have the greatest impact to historical resources. It will enter a large portion of BARC property, and possibly cause the removal of some BARC buildings. Alternative 3 is within 300 feet of the residence on Boteler Lane that may be eligible for the National Register. Alternative 4 is within 500 feet of this residence.

Manmade Resources

Beltsville Agricultural Resource Center (BARC): Alternatives 3 and 4 will impact the function of BARC. Alternative 3 impacts are less significant than 4. Contacting BARC personnel to obtain detailed information about the operation and the potential impacts of a roadway was outside the scope of this preliminary study.

Utility Corridor: Alternative 1 is the only alternative that does not cross the Utility Corridor. Alternative 2 uses the corridor for a short distance to avoid entering BARC and the Buck Lodge Community Park. Alternatives 3 and 4 both cross the Utility Corridor.

The impact of crossing the utility corridor is unknown at this time. It is expected that the only impact will be increased construction costs.

University of Maryland: Alternative 3 has a direct impact on University facilities. Alternative 1 avoids University facilities, and Alternative 2 and 4 pass in close proximity to University facilities.

Alternative 3 minimizes wetland impacts by passing between the Veterinary School and physics lab. This may be disruptive to the operation of those facilities and will require relocation of at grade parking lots. Alternative 3 also goes through an existing miniature golf course. This area is also planned for a future University of Maryland dormitory.

Parks and Public Lands. Only Alternative 2 avoids Park lands. Alternative 1 crosses Buck Lodge Community Park, and Alternatives 3 and 4 are on BARC. Alternative 3 runs on the edge of BARC and close to the College Park Woods swim club. Alternative 4 crosses BARC on a diagonal near the turf farm construction area.

Costs

Costs of each alternative were estimated using the MdSHA per mile guidelines. Each alternative has comparable costs. Total costs, including MdSHA overhead, are shown in the following exhibit. Costs for upgrading Metzert Road are not included.

Alternative 3 is expected to be the most expensive alternative with a cost of \$23.9 million. Alternative 1 is the least expensive with an estimated cost of \$21.4 million.



V FINDINGS AND CONCLUSIONS

Findings

1. Alternative 1 has a direct connection with roadways to the west of campus. It uses the utility corridor, but impacts a community park.
2. Alternative 2 is the only alternative to avoid all parks and the BARC. However it follows a circuitous route and terminates on the two lane Metzert Road. It also runs inside the utility corridor.
3. Alternative 3 provides the best access to the University Campus. It minimizes impacts to BARC and wetlands, however it bisects University facilities.
4. Alternative 4 also provides excellent access to the Campus. It avoids University facilities, however it dissects BARC and has greater wetland impacts than Alternative Three.

Conclusions

None of the Alternatives appear to have a significant impact to natural, historical or man made resources. The costs of each are comparable.

Each Alternative has a separate advantage over the other three. As such, none can be judged the best without making value judgements. Furthermore, additional research and analysis necessary to make these value judgements.



REFERENCES

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Decision Matrix

	Alt 1	Alt 2	Alt 3	Alt 4
Natural Environment				
Stream Crossings	2	2	4	5
Wetlands (acres)	0.1	0.3	1.1	3.8
100 year floodplain (acres)	0	0	0	0
Listed species habitat	none	none	none	none
Forested Lands (acres)	18.9	10.0	11.6	14.9
Hazardous Waste Sites within 500 feet				
	0	0	2	2
Historical and Archeological Resources				
Historic Structures within 1/2 mile	0	0	1	1
Acres in eligible property	0	0	12.4	14.0
Manmade Resources				
Acres in BARC	0.0	0.0	12.4	14.0
Length in Utility Corridor (feet)	0.0	1425.4	292.8	292.8
U of MD Facilities within 500 feet	0	2	3	2
Residences within 500 feet	15	53	91	66
Acres in Public Parks	2.4	0.0	0.0	0.0
Traffic Benefits				
Direct Connection to Campus	no	no	yes	yes
Proximity to US Route 1 (miles)	1.7	1.4	0.5	0.5
Cost				
Length (miles)	1.31	1.02	1.5	1.52
Construction and Engineering	\$14,836	\$15,074	\$16,922	\$16,889
Overhead	\$6,572	\$6,678	\$7,496	\$7,482
Total Costs	\$21,408	\$21,752	\$24,419	\$24,371



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Cost Estimate

	Basis	Alt 1	Alt 2	Alt 3	Alt 4
Roadway per mile costs	\$4,750 per mile	\$6,223	\$4,845	\$7,125	\$7,220
Termini					
Northern	\$500 each	\$500	\$500	\$500	\$500
Southern at grade intersection	\$250 each	\$500	\$250	\$250	\$250
Through Vet School	\$250 each	\$0	\$0	\$250	\$0
Crossing Structures					
Intermittent Stream	\$300 each	\$600	\$600	\$600	\$600
Bridges	\$7.2 per LF	\$0	\$0	\$0	\$0
Signing, lighting, marking and beautification					
Signing	\$1.1 per mile	\$1	\$1	\$2	\$2
Marking	\$21.1 per mile	\$28	\$22	\$32	\$32
Lighting	\$290.0 per mile	\$380	\$296	\$435	\$441
Utility relocation					
Outside of Utility Corridor	15.0%	\$1,235	\$977	\$1,379	\$1,357
In Utility Corridor	\$9,500 per mile	\$0	\$2,159	\$0	\$0
Right-of-way	\$100 per acre	\$0	\$0	\$220	\$220
Environmental Mitigation and Replacement					
Wetland replacement	\$50 per acre	\$5	\$15	\$55	\$190
Reforestation	\$5 per acre	\$85	\$45	\$52	\$87
Sound barriers	\$0.7 per LF	\$0	\$0	\$0	\$0
Subtotal: Construction, ROW and Mitigation		\$9,556	\$9,710	\$10,900	\$10,879
Engineering, contingency and overhead					
Engineering	15.00%	\$1,433	\$1,456	\$1,635	\$1,632
Contingency	35.00%	\$3,846	\$3,908	\$4,387	\$4,379
Subtotal		\$14,836	\$15,074	\$16,922	\$16,889
Overhead	44.30%	\$6,572	\$6,678	\$7,496	\$7,482
Total		\$21,408	\$21,752	\$24,419	\$24,371