STATE OF DELAWARE
EXECUTIVE DEPARTMENT
OFFICE OF MANAGEMENT AND BUDGET
STATE PLANNING COORDINATION

December 13, 2006

Ben Passyn
The Yorktowne Group
127 North Washington Street
Easton, MD 21601

RE: PLUS review – PLUS 2006-11-06; The Parsonage

Dear Mr. Passyn:

Thank you for meeting with State agency planners on November 21, 2006 to discuss the proposed plans for Parsonage project to be located on the northwest side of Sand Hill road with Georgetown.

According to the information received, you are seeking a rezoning from UR1 and UR3 to RPC overlay for 705 residential units and an unspecified amount of commercial area on 147 acres.

Please note that changes to the plan, other than those suggested in this letter, could result in additional comments from the State. Additionally, these comments reflect only issues that are the responsibility of the agencies represented at the meeting. The developers will also need to comply with any Federal, State and local regulations regarding this property. We also note that as the Town of Georgetown is the governing authority over this land, the developers will need to comply with any and all regulations/restrictions set forth by the Town.

Executive Summary

The following section includes some site specific highlights from the agency comments found in this letter. This summary is provided for your convenience and reference. The

full text of this letter represents the official state response to this project. ***Our office notes that the applicants are responsible for reading and responding to this letter and all comments contained within it in their entirety.***

State Strategies/Project Location

- This project is located in Investment Levels 1, 2 and 3 according to *Strategies for State Policies and Spending.* This site is also located in the Town of Georgetown. Investment Levels 1 and 2 reflect areas that are already developed in an urban or suburban fashion, where infrastructure is existing or readily available, and where future redevelopment or infill projects are expected and encouraged by State policy. Investment Level 3 generally indicate areas where growth is expected in the longer term future, or areas in designated growth zones that contain environmental resources. In this case, the Level 3 area is present because of a portion of this parcel is adjacent to the Redden State Forest

Street Design and Transportation

- In a November 2004 letter, DelDOT's consultant, McCormick Taylor, commented on that study and provided recommendations as to how the Town should require those developers to address the transportation impacts of their projects. A copy is enclosed. As discussed below, some things that were essential to McCormick Taylor's recommendations have changed since that letter was sent.

- As shown in the table in this letter, the expected trip generation of the currently proposed use is somewhat greater than what the 2004 TIS examined. Accordingly, the numbers in it should not be used for design purposes. However, DelDOT found that the general findings of the TIS and their comments on it are still adequate. Therefore, in DelDOT's opinion a new TIS is not needed. Except as noted below, the recommendations in the November 2004 letter are still valid.

- DelDOT supports the rear loading of the lots fronting on Sand Hill as good design. To be clear, they point out that no individual driveways will be permitted on Sand Hill Road, and a note to that effect should be placed on the subdivision plan.

- DelDOT appreciates and supports the thought behind the proposed interconnections at either end of Saint Augustine Street. However, the parcel to the north has recently been subdivided and re-developed, such that Saint Augustine Street could not be extended there. For this reason, they recommend

that the stub there be eliminated and replaced with another stub further west, perhaps near the proposed commercial area. Also, they would urge consideration of a stub street to the northwest. The Town's street network lacks such connections, so a collector stub street to the northwest from All Saints Boulevard would be an important benefit for the Town.

Natural and Cultural Resources

- A significant portion of the mapped soils on subject parcel are mapped as hydric (estimated 50-60% of soils mapped as Hurlock, Mullica, and Mullica-Berryland complex). Hydric soils typically have a seasonal high water table at or near the soil surface (within one-foot of soil surface or less). Building in such soils is likely to leave prospective residents of this and adjoining properties susceptible to future flooding problems from groundwater-driven surface water ponding, especially during extended periods of high-intensity rainfall events such as tropical storms/hurricanes or "nor'easters." This is in addition to increased flooding likely from surface water runoff emanating from future created forms of structural imperviousness (roof tops, roads, and sidewalks).

- The developer should maintain a 100-foot vegetated buffer from the wetlands. There should not be any buildings or associated infrastructure within the buffer.

- The proposed plans show storm water management ponds within the wellhead area. Care should be taken in the design and management of these ponds because they are in the capture zone of Georgetown's drinking water supply. All the water entering these ponds in the form of precipitation and runoff will be drawn into public water supply.

- In addition, because the wellhead protection area is the source of public drinking water, the storage of hazardous substances or wastes should not be allowed within the area unless specific approval is obtained from the relevant state, federal, or local program.

- The engineer is encouraged to meet with downstream landowners to obtain their concerns of current drainage as well as the additional drainage impact this project will have on the area. Please notify downstream landowners if there will be a change in the volume of water released on them.

- Plans show houses built over existing ditches. Such practice may lead to future drainage problems with basements, crawlspaces, and yards. The Drainage Program recommends the reconfiguration of these lots into open space with

buffers. If the lots are developed as proposed, the Drainage Program requests that a statement placed on the deed of the lots warning the future buyers of potential drainage problems.

- DNREC has never surveyed this site; therefore, it is unknown if there are state-rare or federally listed plants, animals or natural communities at this project site. They have records of state-rare Buteo lineatus (Red-shouldered Hawk) and state-rare Psuedotriton montanus (mud salamander) in forested areas in the vicinity and they may occur within the forest on-site as well. It is believed that the decline of Buteo lineatus is partially attributed to the decline of mature forests and forested wetlands, making preservation of the forest on this site even more important. Psuedotriton montanus is a secretive amphibian that inhabits muddy wetland areas adjacent to small streams and wooded swamps. Surveys should be conducted to determine if this species is present and a plan drafted to avoid impacts.

- In order to provide more informed comments and to make recommendations, the program botanist and zoologist request the opportunity to survey the forested and wetland resources which could potentially be impacted by the project.

- According to the application, 20-30 out of 37 acres of forest will be removed, and what small percent remains will be largely fragmented by lots and infrastructure. DNREC strongly encourages the landowner to consider preservation rather than development and many new incentive-based programs are available to private landowners through this agency. Please contact the Division of Fish and Wildlife at (302) 653-2880 if the landowner(s) is interested in more information. If preservation is not going to be considered then a greater effort to preserve forest should be made. DNREC has listed ways this could be accomplished below.

The following are a complete list of comments received by State agencies:

Office of State Planning Coordination – Contact: Bryan Hall 739-3090

This project is located in Investment Levels 1, 2 and 3 according to *Strategies for State Policies and Spending.* This site is also located in the Town of Georgetown. Investment Levels 1 and 2 reflect areas that are already developed in an urban or suburban fashion, where infrastructure is existing or readily available, and where future redevelopment or infill projects are expected and encouraged by State policy. Investment Level 3 generally indicate areas where growth is expected in the longer term future, or areas in designated growth zones that contain environmental resources. In this case, the Level 3 area is present because of a portion of this parcel is adjacent to the Redden State Forest.

This project presented represents a mix of housing types including both single family and multi-family units and neighborhood commercial to support the residential units. **Our office supports these mixes in municipalities as essential to the Livable Delaware strategy of concentrating growth in and around existing communities and infrastructure.** This is the type of project that is highly desirable to allow us to meet our goals of revitalizing our already urbanized areas while protecting agricultural lands and natural resource areas from encroachment by sprawling suburban and rural development. Our office has no objections to the proposed development of this project in accordance with the relevant Town codes and ordinances.

Division of Historical and Cultural Affairs – Contact: Alice Guerrant 739-5685

This parcel contains a known early-20th-century archaeological site (S-8691). It is adjacent on the north side to a 19th-century farm house (S-3168) and across Sand Hill Rd from an early-20th-century house (S-8473). There are four early-20th-century houses to the south on Market St/Seashore Hwy (S-10126 – S-10129). The early maps show nothing within this parcel, until the 1937 USDA aerial. There is a medium to low prehistoric potential in the southeastern part of the parcel.

The Division of Historical and Cultural Affairs requests that the developer include enough landscaping to protect the nearby historic buildings from noise and visual intrusion from this development. They would also appreciate an opportunity to check for any prehistoric-period archaeological sites and to examine the historic-period site prior to any ground-disturbing activities.

Department of Transportation – Contact: Bill Brockenbrough 760-2109

1) The development of the subject land with 500 single-family detached houses, under the name Pin Oak Construction, was addressed in a 2004 traffic impact study (TIS) that examined the impacts of five developments then proposed on the east side of Georgetown. In a November 2004 letter, DelDOT's consultant, McCormick Taylor, commented on that study and provided recommendations as to how the Town should require those developers to address the transportation impacts of their projects. A copy is enclosed. As discussed below, some things that were essential to McCormick Taylor's recommendations have changed since that letter was sent. Accordingly, DelDOT would now advise the Town as follows:

    a) As shown in the table below, the expected trip generation of the currently proposed use is somewhat greater than what the 2004 TIS examined. Accordingly, the numbers in it should not be used for design purposes.

However, we find that the general findings of the TIS and our comments on it are still adequate. Therefore, in DelDOT's opinion a new TIS is not needed. Except as noted below, the recommendations in the November 2004 letter are still valid.

Proposal/Use	AM Peak Hour Trips	PM Peak Hour Trips
Pin Oak Construction 2004		
500 single-family detached houses	**359**	**456**
Yorktowne Group 2006		
356 single-family detached houses (includes duplexes)	259	336
349 townhouses and condominiums	140	168
Total	**399**	**504**

b) DelDOT's project to improve the intersection of Route 9 and Sand Hill Road is presently on indefinite hold due to budgetary constraints. The expected completion of that project was and is essential to the development of the subject land and three of the other four developments in the 2004 TIS, specifically CHEER, Georgetown East and the Racetrack Property. We would recommend that the Town require the completion of those planned improvements, by these developers or others, prior to the issuance of residential building permits or commercial certificates of occupancy.

c) Limitations on the available right-of-way affected our recommendations for improvements to Murray's Lane and figured in our recommendations to phase the development to future improvements on Route 9. DelDOT is in the process of adopting regulations that would, in such situations, allow us to acquire the right-of-way necessary for a developer to build needed transportation improvements at the developer's expense. These regulations were published in the Register of Regulations on November 2, 2006, and if they are not appealed within 30 days, they will become effective 10 days from their publication. On Murray's Lane, the improvements to be required should therefore be revisited with the assumption that right-of-way can be obtained as necessary.

The phasing recommended for this development is still valid, that is 100 houses until either Route 9 is widened to four through lanes (two each way) in the study area or a significant amount of the through traffic there

is diverted by one or more regional improvements. However, if this developer (or others) wishes to pursue the road-widening project as a means to advance their development, DelDOT can purchase rights-of-way on their behalf. If the developer wishes to pursue the townhouse or condominium portion of their project first, the Town should contact us about how that could affect the phasing. Unit for unit, townhouses and condominiums tend to generate less traffic than single-family detached houses, so we would support more of those units being constructed in a first phase.

2) DelDOT supports the rear loading of the lots fronting on Sand Hill as good design. To be clear, they point out that no individual driveways will be permitted on Sand Hill Road, and a note to that effect should be placed on the subdivision plan.

3) DelDOT appreciates and supports the thought behind the proposed interconnections at either end of Saint Augustine Street. However, the parcel to the north has recently been subdivided and re-developed, such that Saint Augustine Street could not be extended there. For this reason, they recommend that the stub there be eliminated and replaced with another stub further west, perhaps near the proposed commercial area. Also, they would urge consideration of a stub street to the northwest. The Town's street network lacks such connections, so a collector stub street to the northwest from All Saints Boulevard would be an important benefit for the Town.

4) The developer's site engineer should contact our Subdivision Manager for Sussex County, Mr. John Fiori, regarding our specific requirements for road improvements and access. Mr. Fiori may be reached at (302) 760-2157.

The Department of Natural Resources and Environmental Control – Contact: Kevin Coyle 739-9071

Green Infrastructure

Portions or all of the lands associated with this proposal are within the Livable Delaware Green Infrastructure area established under Governor Minner's Executive Order #61 that represents a network of ecologically important natural resource lands of special state conservation interest.

Green infrastructure is defined as Delaware's natural life support system of parks and preserves, woodlands and wildlife areas, wetlands and waterways, productive agricultural and forest land, greenways, cultural, historic and recreational sites and other natural areas all with conservation value. Preserving Delaware's Green Infrastructure network will support and enhance biodiversity and functional ecosystems, protect native plant and animal species, improve air and water quality, prevent flooding, lessen the disruption to natural landscapes, provide opportunities for profitable farming and forestry enterprises, limit invasive species, and foster ecotourism.

Voluntary stewardship by private landowners is essential to green infrastructure conservation in Delaware, since approximately 80 percent of the State's land base is in private hands. It is in that spirit of stewardship that the Department appeals to the landowner and development team to protect sensitive resources through an appropriate site design.

Soils

According to the Sussex County soil survey, Hammonton, Pepperbox, Klej, Hurlock, Mullica, and Mullica-Berryland complex were mapped in the immediate vicinity of the proposed parcel(s). Hammonton and Pepperbox are moderately well-drained soils of low-lying uplands that have moderate limitations for development. Klej is a somewhat poorly-drained transitional soil that is likely to have both wetland and upland soil components. Hurlock, Mullica, and Mullica-Berryland are poorly to very poorly-drained wetland associated (hydric) soils that have severe limitations for development.

As mentioned previously, a significant portion of the mapped soils on subject parcel are mapped as hydric (estimated 50-60% of soils mapped as Hurlock, Mullica, and Mullica-Berryland complex). Hydric soils typically have a seasonal high water table at or near the soil surface (within one-foot of soil surface or less). Building in such soils is likely to leave prospective residents of this and adjoining properties susceptible to future flooding problems from groundwater-driven surface water ponding, especially during extended periods of high-intensity rainfall events such as tropical storms/hurricanes or "nor'easters." This is in addition to increased flooding likely from surface water runoff emanating from future created forms of structural imperviousness (roof tops, roads, and sidewalks).

Wetlands

Based on Statewide Wetland Mapping Project (SWMP) mapping, palustrine forested wetlands were mapped over much of the western one-third of subject parcel(s). Potential unmapped headwater riparian wetlands associated with a network of ditches, is also likely in the southwest corner of subject parcel. Wetlands provide water quality benefits, attenuate flooding and provide important habitat for plants and wildlife. The developer should maintain a 100-foot vegetated buffer from the wetlands. There should not be any buildings or associated infrastructure within the buffer.

Impacts to Palustrine wetlands are regulated by the Army Corps of Engineers through Section 404 of the Clean Water Act. In situations where the applicant believes that the delineated wetlands on their parcel are nonjurisdictional isolated wetlands, the Corps must be contacted to make the final jurisdictional assessment. They can be reached by phone at 736-9763.

In addition, individual 404 permits and certain Nationwide Permits from the Army Corps of Engineers also require 401 Water Quality Certification from the DNREC Wetland and Subaqueous Land Section and Coastal Zone Federal Consistency Certification from the DNREC Division of Soil and Water Conservation, Delaware Coastal Programs Section. Each of these certifications represents a separate permitting process.

Because there is strong evidence that federally regulated wetlands exist on site, a wetland field delineation, in accordance with the methodology established by the Corps of Engineers Wetlands Delineation Manual, (Technical Report Y-87-1) should be conducted. Once complete, this delineation should be verified Corps of Engineers through the Jurisdictional Determination process.

In addition, the project needs a State of Delaware Subaqueous Lands Jurisdictional Determination. To find out more about permitting requirements, the applicant is encouraged to attend a Joint Permit Process Meeting. These meetings are held monthly and are attended by federal and state resource agencies responsible for wetland permitting. Contact Denise Rawding at (302) 739-9943 to schedule a meeting.

The Town should not grant any permits or approvals without the applicant demonstrating compliance with State and federal wetlands and subaqueous lands laws and regulations.

Impervious Cover

Based on a review of the PLUS application, post-development surface imperviousness is estimated to be about 26 percent. However, given the scope and density of this project,

this estimate is likely to be an **underestimate**. Use of natural areas (forests, wetlands or buffers) wetland and stormwater management acreage for the calculation of open space, as reported in the PLUS application for this project, significantly underestimates this project's actual amount of created surface imperviousness, resulting in a significant understatement of its actual environmental impacts. Therefore, it is strongly recommended that the above-mentioned areas be omitted in the finalized open-space calculation. Furthermore, the applicant should also realize that all forms of constructed surface imperviousness (i.e., rooftops, sidewalks, and roads) should be accounted for when calculating surface imperviousness. It was not clear from the information submitted whether all forms of surface imperviousness were accurately assessed or accounted for in their impervious surface calculation.

Studies have shown a strong relationship between increases in impervious cover to decreases in a watershed's overall water quality. It is strongly recommended that the applicant implement best management practices (BMPs) that reduce or mitigate some of its most likely adverse impacts. Reducing the amount of surface imperviousness through the use of pervious paving materials ("pervious pavers") in lieu of asphalt or concrete in conjunction with an increase in forest cover preservation or additional tree plantings are some examples of practical BMPs that could easily be implemented to help reduce surface imperviousness.

TMDLs

Total Maximum Daily Loads (TMDLs) for nitrogen and phosphorus have been promulgated through regulation for the Broadkill watershed. A TMDL is the maximum level of pollution allowed for a given pollutant below which a "water quality limited water body" can assimilate and still meet water quality standards to the extent necessary to support use goals such as, swimming, fishing, drinking water and shell fish harvesting. Although TMDLs are required by federal law, states are charged with developing and implementing standards to support these desired use goals. In the greater Broadkill watershed, in which this project is located, nutrient reductions" of 40 percent will be required for nitrogen and phosphorus.

TMDL Compliance through the Pollution Control Strategy (PCS)

As indicated above, Total Maximum Daily loads (TMDLs) for nitrogen and phosphorus have been proposed for the Broadkill watershed. The TMDL calls for a 40% reduction in nitrogen and phosphorus from baseline conditions. A pollution control strategy will be used as a regulatory framework to ensure that these nutrient reduction targets are attained. The Department has developed an assessment tool to evaluate how your proposed development may reduce nutrients to meet the TMDL requirements. Additional nutrient

reductions may be possible through the implementation of Best Management Practices such as wider vegetated buffers along watercourses, increasing passive, wooded open space, using enhanced nutrient removal wastewater technologies, and the use of stormwater management treatment trains. Contact Lyle Jones at 302-739-9939 for more information on the assessment tool.

Water Resource Protection Areas

The DNREC Water Supply Section has determined that a significant portion of the proposed development falls within a wellhead protection area (see following map and attached map). Wellhead protection areas are surface and subsurface areas surrounding a public water supply well where land use activities or impervious cover may adversely affect the quantity and quality of ground water moving toward such wells. The review did not find any excellent groundwater recharge areas.

The DNREC Water Supply Section recommends that the portion of the new development within the wellhead protection area not exceed 20% impervious cover (DNREC, 2005). Some allowance for augmenting ground-water recharge should be considered if the impervious cover exceeds 20% but is less than 50% of that portion of the parcel within this area. However, the development should not exceed 50% regardless. The purpose of an impervious cover threshold is to minimize loss of recharge (and associated increases in storm water) and protect the quality and quantity of ground water and surface water supplies.

The proposed development would change the impervious over from 0% to approximately 26%. The developer on the PLUS application provided these numbers. Ideally, relocating any open space areas to the part of the parcel within the wellhead protection area would decrease the total impervious area in the wellhead protection area. Augmenting the ground-water recharge with clean rooftop run-off systems are another alternative to reducing the total impervious cover (Kauffman, 2005).

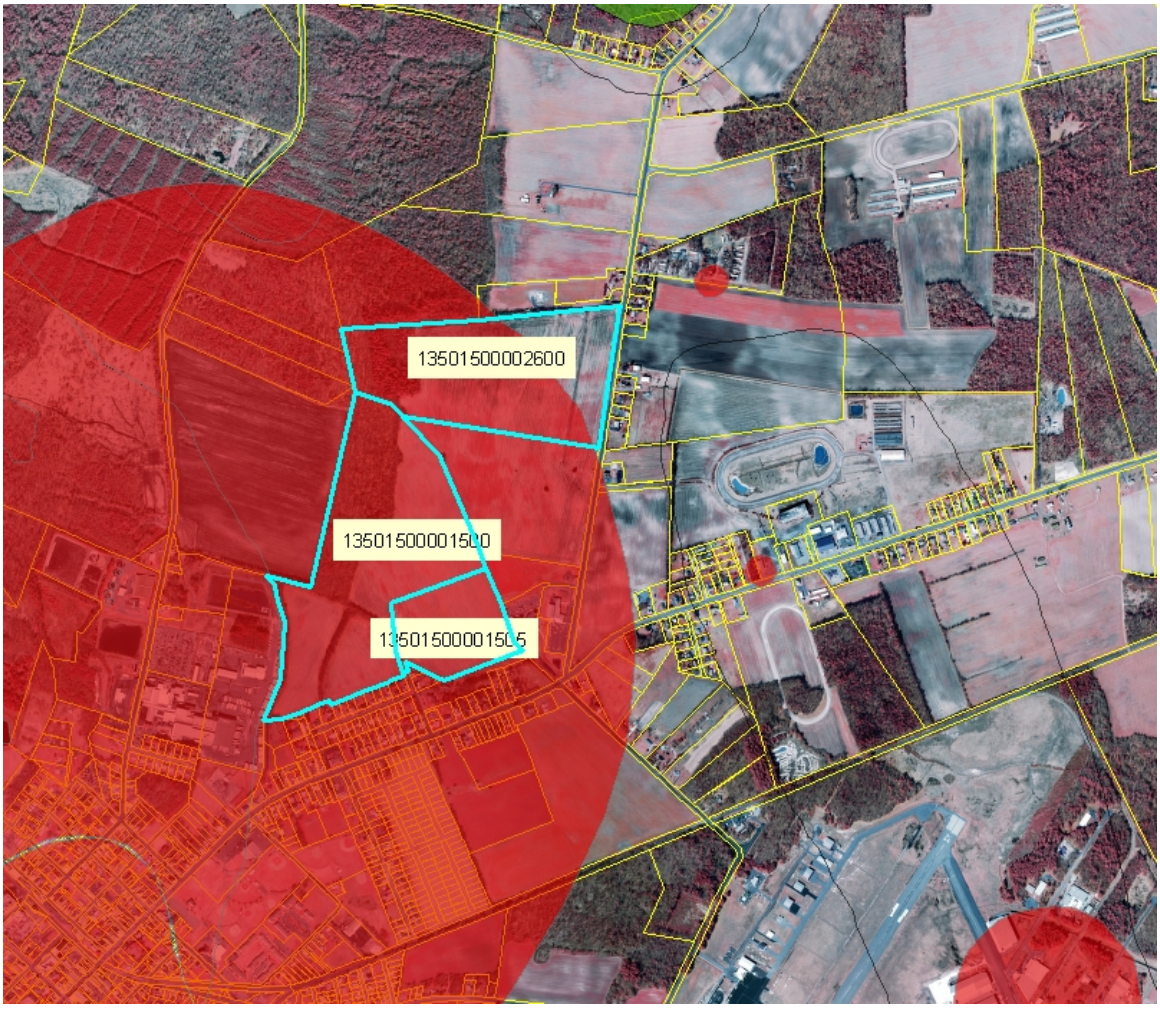
A water balance calculation will be necessary to determine the quantity of clean water to be recharged via a recharge basin (Thornthwaite, 1957). The environmental assessment must document that post-development recharge will be no less than predevelopment recharge when computed on an annual basis. Commonly, the applicant offsets the loss of recharge due to impervious cover by constructing recharge basins that convey relatively pure rooftop runoff for infiltration to ground water.

The proposed plans show storm water management ponds within the wellhead area. Care should be taken in the design and management of these ponds because they are in the

capture zone of Georgetown's drinking water supply. All the water entering these ponds in the form of precipitation and runoff will be drawn into public water supply.

In addition, because the wellhead protection area is the source of public drinking water, the storage of hazardous substances or wastes should not be allowed within the area unless specific approval is obtained from the relevant state, federal, or local program.

The Parsonage (PLUS 2006-11-06). Map of proposed development as it impacts the wellhead protection area. The dark red area indicates the wellhead protection area; the affected parcels are in light blue.



References

Delaware Department of Natural Resources and Environmental Control, 2005, Source Water Protection Guidance Manual for the Local Governments of Delaware, p. 144.
http://www.wr.udel.edu/publications/SWAPP/swapp_manual_final/swapp_guidance_manual_final.pdf

Kauffman, G.J., Wozniak, S.L., and Vonck, K.J., 2005, Delaware Ground-Water Recharge Design Manual: Newark, DE, Water Resources Agency, University of Delaware, p. 31.
Listed as: "Supplement 1 – Groundwater Recharge Design Methodology"
http://www.wr.udel.edu/swaphome/Publications/SWPguidancemanual.html

Climatic Water Budget
Thornthwaite, C. W. and Mather, J. R., 1957, Instructions and Tables for Computing Potential Evapotranspiration and the Water Balance: Drexel Institute of Technology, Laboratory of Climatology, Volume x, Number 3

Water Supply

The project information sheets state water will be provided to the project by The Town of Georgetown via a public water system. DNREC records indicate that the project is located within the public water service area granted to The Town of Georgetown under Certificate of Public Convenience and Necessity 91-CPCN-02.

Should dewatering points be needed during any phase of construction, a dewatering well construction permit must be obtained from the Water Supply Section prior to construction of the well points. In addition, a water allocation permit will be needed if the pumping rate will exceed 50,000 gallons per day at any time during operation.

All well permit applications must be prepared and signed by licensed water well contractors, and only licensed well drillers may construct the wells. Please factor in the necessary time for processing the well permit applications into the construction schedule. Dewatering well permit applications typically take approximately four weeks to process, which allows the necessary time for technical review and advertising.

Should you have any questions concerning these comments, please contact Rick Rios at 302-739-9944.

Sediment and Erosion Control/Stormwater Management

A detailed sediment and stormwater plan will be required prior to any land disturbing activity taking place on the site. The plan review and approval as well as construction inspection will be coordinated through the Sussex Conservation District. Contact the Sussex Conservation District at (302) 856-7219 for details regarding submittal requirements and fees.

A Notice of Intent (NOI) for Stormwater Discharges Associated with Construction Activity must be submitted to the Division of Soil and Water Conservation along with the $195 NOI fee prior to plan approval.

Applying practices to mimic the pre-development hydrology on the site, promote recharge, maximize the use of existing natural features on the site, and limit the reliance on structural stormwater components, such as maintaining open spaces, should be considered in the overall design of the project as a stormwater management technique. Green Technology BMPs must be given first consideration for stormwater quality management.

Limiting the clearing of forested areas on the site will help to mitigate the increase in stormwater that will be generated by the development of the site. The Sediment and Stormwater Program does not support clearing of wooded areas to construct stormwater management facilities, as is shown in the commercial area.

Each stormwater management facility should have an adequate outlet for release of stormwater. There is great concern that this site does not have an adequate outlet location to release the stormwater that will be generated from the site. Please contact Brooks Cahall with the DNREC Drainage Program at (302) 855-1930 regarding offsite drainage.

It is strongly recommended that you contact the Sussex Conservation District at (302) 856-7219 to schedule a preliminary meeting to discuss the sediment and erosion control and stormwater management components of the plan. The site topography, soils mapping, pre- and post-development runoff, and proposed method(s) and location(s) of stormwater management should be brought to the meeting for discussion. Given the site's restricted discharge locations, Drainage Program should be included in that preliminary meeting.

Drainage

There are known drainage issues with Savannah Ditch. Please contact Brooks Cahall of the DNREC Drainage Program at (302) 855-1930. The Drainage Program requests that the engineer take precautions to ensure that the project does not hinder any off site

drainage upstream of the project or create any off site drainage problems downstream by the release of on site storm water. The Drainage Program requests that the engineer check existing downstream ditches and pipes for function and blockages prior to construction. The engineer is encouraged to meet with downstream landowners to obtain their concerns of current drainage as well as the additional drainage impact this project will have on the area. Please notify downstream landowners if there will be a change in the volume of water released on them.

Plans show houses built over existing ditches. Such practice may lead to future drainage problems with basements, crawlspaces, and yards. The Drainage Program recommends the reconfiguration of these lots into open space with buffers. If the lots are developed as proposed, the Drainage Program requests that a statement placed on the deed of the lots warning the future buyers of potential drainage problems.

The Drainage Program does not support the removal of trees for the creation of stormwater management areas. However, the Drainage Program recognizes that tree removal is unavoidable in some cases. Where practical, plant native trees and shrubs to compensate for the loss of nutrient uptake and stormwater absorption the removed trees provided.

The Drainage Program does not have a clear understanding how stormwater will convey to the stormwater management areas. The Drainage Program requests that the routing of major stormwater pipes through yards be prohibited.

The Drainage Program encourages the elevation of rear yards to direct water towards the streets where storm drains are accessible for maintenance. However, the Drainage Program recognizes the need for catch basins in rear yards in certain cases. Therefore, catch basins placed in rear yards will need to be clear of obstructions and be accessible for maintenance. Decks, sheds, fences, kennels, and other structures placed along the storm drains, or within 10 feet of the catch basins, can hinder drainage patterns as well as future maintenance to the storm drains or catch basins. Deed restrictions, along with drainage easements recorded on deeds, should ensure adequate future maintenance access.

The Drainage Program requests a 15-foot side yard setback on all lots with a drainage easement on the side unless otherwise specified. A 15-foot side yard setback will allow room for equipment to utilize the entire drainage easement and maneuver free of obstructions if the drainage conveyance requires periodic maintenance or future re-construction.

The Drainage Program requests a 10-foot drainage easement around all catch basins located on private property to ensure adequate room for maintenance. The Drainage Program recommends restrictions on fences, sheds, and other structures within the easement to prevent obstructions from being placed within 10 feet of the catch basin.

Record all drainage easements on deeds and place restrictions on obstructions within the easements to ensure access for periodic maintenance or future re-construction.

Open Space

The developer is strongly urged to consider alternatives to mowed grass. Mowing and related maintenance costs can become a substantial burden for community maintenance associations. There are areas within the development that are appropriate for warm or cool season grasses, especially around storm water management ponds. Reforestation efforts could be targeted to open space areas adjacent to the forest. Once established, these ecosystems provide increased water infiltration into groundwater, decreased run-off into surface water, air quality improvements, and require much less maintenance than traditional turf grass, an important consideration when a homeowners association will take over responsibility for maintenance of community open spaces. In addition, the community should be provided with a detailed landscape management plan that outlines how to manage each open space area, as well as invasive species.

Rare Species

DNREC has never surveyed this site; therefore, it is unknown if there are state-rare or federally listed plants, animals or natural communities at this project site. They have records of state-rare Buteo lineatus (Red-shouldered Hawk) and state-rare Psuedotriton montanus (mud salamander) in forested areas in the vicinity and they may occur within the forest on-site as well. It is believed that the decline of Buteo lineatus is partially attributed to the decline of mature forests and forested wetlands, making preservation of the forest on this site even more important. Psuedotriton montanus is a secretive amphibian that inhabits muddy wetland areas adjacent to small streams and wooded swamps. Surveys should be conducted to determine if this species is present and a plan drafted to avoid impacts.

Site Visit Request

In order to provide more informed comments and to make recommendations, the program botanist and zoologist request the opportunity to survey the forested and wetland resources which could potentially be impacted by the project. This would also allow the applicant the opportunity to reduce potential impacts to rare species and unique habitats

and to ensure that the project is environmentally sensitive. In addition, a survey of the project site will give staff an opportunity to document the biodiversity of the property and add to the State database. Please contact Bill McAvoy or Kitt Heckscher at (302) 653-2880 to set up a site visit.

Forest Preservation

According to the application, 20-30 out of 37 acres of forest will be removed, and what small percent remains will be largely fragmented by lots and infrastructure. Forest fragmentation separates wildlife populations, increases road mortality, and increases "edge effects" that leave many forest dwelling species, particularly songbirds, vulnerable to predation. When forested areas are converted into a 'residential woods', wildlife must either co-exist with new residents or disperse into surrounding areas. Either scenario can result in an increase in human/animal conflicts, including interactions on the roadways. It also puts greater pressure on nearby Wildlife Areas, Nature Preserves, and other protected lands.

DNREC strongly encourages the landowner to consider preservation rather than development and many new incentive-based programs are available to private landowners through this agency. Please contact the Division of Fish and Wildlife at (302) 653-2880 if the landowner(s) is interested in more information. If preservation is not going to be considered, then a greater effort to preserve forest should be made and this could be accomplished by:

1. Downsizing the current site plan to allow for a larger, connected area of forested open space. This would entail removing lots and infrastructure that will require tree clearing or that will fragment the forest into small, disconnected areas. Currently there are numerous amenities, roadways, and housing units will require tree clearing.

2. Relocating stormwater management facilities that will require tree clearing to non-forested portions of the site or utilizing an alternate method of stormwater management. It doesn't make sense to clear trees which function in flood abatement to create a pond with the same purpose.

3. Removing unnecessary infrastructure, such as extra parking spaces or roads.

4. If tree clearing occurs despite our objections, clearing should not occur April 1st to August 31st to reduce impacts to birds and other wildlife species that utilize trees for breeding. This recommendation would only protect those species during

one breeding season, as once trees are cleared the result is an overall loss of habitat.

Plant Rescue

Since forested and/or wetland areas are to be destroyed, filled, or disturbed, we recommend that the developer/landowner contact the Delaware Native Plant Society to initiate a plant rescue. Selected plants from the site of disturbance will be collected by Society members and transplanted to the Society's nursery. Plants will then be used in restoration projects and/or sold at the Society's annual native plant sale. This can be done at no expense or liability to the developer/landowner". Please contact Lynn Redding at (302) 736-7726, (lynn_redding@ml.com) or William A. McAvoy at (302) 653-2880, (william.mcavoy@state.de.us).

Nuisance Geese

The applicant indicated that nuisance geese would be considered in the planning of this project but methods of control were not indicated. Wet ponds planned for the subdivision may attract waterfowl like resident Canada geese and mute swans. High concentrations of waterfowl in ponds create water-quality problems, leave droppings on lawn and paved areas and can become aggressive during the nesting season. Short manicured lawns around ponds provide an attractive habitat for these species. We recommend native plantings of tall grasses, wildflowers, shrubs, and trees at the edge and within a buffer area (50 feet) around the perimeter. Waterfowl do not feel safe when they can not see the surrounding area for possible predators. These plantings should be completed as soon as possible as it is easier to deter geese when there are only a few than it is to remove them once they become plentiful. The Division of Fish and Wildlife does not provide goose control services, and if problems arise, residents or the home-owners association will have to accept the burden of dealing with these species (e.g., permit applications, costs, securing services of certified wildlife professionals). Solutions can be costly and labor intensive; however, with a reduction in the number and/or size of the ponds, proper landscaping, monitoring, and other techniques, geese problems can be minimized.

Solid Waste

Each Delaware household generates approximately 3,600 pounds of solid waste per year. On average, each new house constructed generates an additional 10,000 pounds of construction waste. Due to Delaware's present rate of growth and the impact that growth will have on the state's existing landfill capacity, the applicant is requested to be aware of the impact this project will have on the State's limited landfill resources and, to the extent

possible, take steps to minimize the amount of construction waste associated with this development.

Air Quality

Once complete, vehicle emissions associated with this project are estimated to be 54.1 tons (108,210.1 pounds) per year of VOC (volatile organic compounds), 44.8 tons (89,590.7 pounds) per year of NOx (nitrogen oxides), 33.1 tons (66,101.7 pounds) per year of SO2 (sulfur dioxide), 2.9 ton (5,884.2 pounds) per year of fine particulates and 4,525.8 tons (9,051,640.6 pounds) per year of CO2 (carbon dioxide).

Emissions from area sources associated with this project are estimated to be 21.8 tons (43,646.1 pounds) per year of VOC (volatile organic compounds), 2.4 ton (4,802.4 pounds) per year of NOx (nitrogen oxides), 2.0 ton (3,985.3 pounds) per year of SO2 (sulfur dioxide), 2.6 ton (5,142.8 pounds) per year of fine particulates and 88.5 tons (176,931.4 pounds) per year of CO2 (carbon dioxide).

Emissions from electrical power generation associated with this project are estimated to be 8.6 tons (17,298.2 pounds) per year of NOx (nitrogen oxides), 30.1 tons (60,167.5 pounds) per year of SO2 (sulfur dioxide) and 4,437.4 tons (8,874,709.2 pounds) per year of CO2 (carbon dioxide).

	VOC	NOx	SO_2	$PM_{2.5}$	CO_2
Mobile	54.1	44.8	33.1	2.9	4525.8
Residential	21.8	2.4	2.0	2.6	88.5
Electrical Power		8.6	30.1		4437.4
TOTAL	75.9	55.8	65.2	5.5	9051.7

For this project the electrical usage via electric power plant generation alone totaled to produce an additional 8.6 tons of nitrogen oxides per year and 30.1 tons of sulfur dioxide per year.

A significant method to mitigate this impact would be to require the builder to construct Energy Star qualified homes. Every percentage of increased energy efficiency translates into a percent reduction in pollution. Quoting from their webpage, http://www.energystar.gov/:

“ENERGY STAR qualified homes are independently verified to be at least 30% more energy efficient than homes built to the 1993 national Model Energy Code or 15% more

efficient than state energy code, whichever is more rigorous. These savings are based on heating, cooling, and hot water energy use and are typically achieved through a combination of:

building envelope upgrades,
high performance windows,
controlled air infiltration,
upgraded heating and air conditioning systems,
tight duct systems and
upgraded water-heating equipment."

The Energy office in DNREC is in the process of training builders in making their structures more energy efficient. The Energy Star Program is excellent way to save on energy costs and reduce air pollution. They highly recommend this project development and other residential proposals increase the energy efficiency of their homes.

They also recommend that the home builders offer geothermal and photo voltaic energy options. Applicable vehicles should use retrofitted diesel engines during construction. The development should provide tie-ins to the nearest bike paths, links to mass transit, and fund a lawnmower exchange program for their new occupants.

State Fire Marshal's Office – Contact: Duane Fox 856-5298

These comments are intended for informational use only and do not constitute any type of approval from the Delaware State Fire Marshal's Office. At the time of formal submittal, the applicant shall provide; completed application, fee, and three sets of plans depicting the following in accordance with the Delaware State Fire Prevention Regulation (DSFPR):

- ***This Agency has no objection to the re-zoning request. The information provided below shall be considered when plans are being designed.***

a. **Fire Protection Water Requirements**:
   - Water distribution system capable of delivering at least 1000 gpm for 1-hour duration, at 20-psi residual pressure is required. Fire hydrants with 800 feet spacing on centers. (Assembly, Apartments, and Townhouses)
   - Where a water distribution system is proposed for single-family dwellings it shall be capable of delivering at least 500 gpm for 1-hour duration, at 20-psi residual pressure. Fire hydrants with 1000 feet spacing on centers are required. (One & Two- Family Dwelling)

- Where a water distribution system is proposed for the site, the infrastructure for fire protection water shall be provided, including the size of water mains for fire hydrants and sprinkler systems.

b. **Fire Protection Features:**
   - All structures over 10,000 sq.ft. aggregate will require automatic sprinkler protection installed.
   - Buildings greater than 10,000 sq.ft., 3-stories or more, over 35 feet, or classified as High Hazard, are required to meet fire lane marking requirements
   - Show Fire Department Connection location (Must be within 300 feet of fire hydrant), and detail as shown in the DSFPR.
   - Show Fire Lanes and Sign Detail as shown in DSFPR
   - For townhouse buildings, provide a section / detail and the UL design number of the 2-hour fire rated separation wall on the Site plan.

c. **Accessibility**
   - All premises, which the fire department may be called upon to protect in case of fire, and which are not readily accessible from public roads, shall be provided with suitable gates and access roads, and fire lanes so that all buildings on the premises are accessible to fire apparatus. This means that the access road to the subdivision from Murray Lane and Sandhill Road must be constructed so fire department apparatus may negotiate it.
   - Fire department access shall be provided in such a manner so that fire apparatus will be able to locate within 100 ft. of the front door.
   - Any dead end road more than 300 feet in length shall be provided with a turn-around or cul-de-sac arranged such that fire apparatus will be able to turn around by making not more than one backing maneuver. The minimum paved radius of the cul-de-sac shall be 38 feet. The dimensions of the cul-de-sac or turn-around shall be shown on the final plans. Also, please be advised that parking is prohibited in the cul-de-sac or turn around.
   - The use of speed bumps or other methods of traffic speed reduction must be in accordance with Department of Transportation requirements.
   - The local Fire Chief, prior to any submission to our Agency, shall approve in writing the use of gates that limit fire department access into and out of the development or property.

d. **Gas Piping and System Information:**
   - Provide type of fuel proposed, and show locations of bulk containers on plan.

e. **Required Notes**:
- Provide a note on the final plans submitted for review to read " All fire lanes, fire hydrants, and fire department connections shall be marked in accordance with the Delaware State Fire Prevention Regulations"
- Proposed Use
- Alpha or Numerical Labels for each building/unit for sites with multiple buildings/units
- Square footage of each structure (Total of all Floors)
- National Fire Protection Association (NFPA) Construction Type
- Maximum Height of Buildings (including number of stories)
- Townhouse 2-hr separation wall details shall be shown on site plans
- Note indicating if building is to be sprinklered
- Name of Water Provider
- Letter from Water Provider approving the system layout
- Provide Lock Box Note (as detailed in DSFPR) if Building is to be sprinklered
- Provide Road Names, even for County Roads

Preliminary meetings with fire protection specialists are encouraged prior to formal submittal. Please call for appointment. Applications and brochures can be downloaded from our website: www.delawarestatefiremarshal.com, technical services link, plan review, applications or brochures.

Department of Agriculture - Contact: Scott Blaier 698-4500

The Delaware Department of Agriculture has no objections to the proposed application for rezoning. The *Strategies for State Policies and Spending* encourages environmentally responsible development in Investment Level 1, 2, and 3 areas. The project is also within the incorporated limits of the Town of Georgetown.

Right Tree for the Right Place

The Delaware Department of Agriculture Forest Service encourages the developer to use the "Right Tree for the Right Place" for any design considerations. This concept allows for the proper placement of trees to increase property values in upwards of 25% of appraised value and will reduce heating and cooling costs on average by 20 to 35 dollars per month. In addition, a landscape design that encompasses this approach will avoid future maintenance cost to the property owner and ensure a lasting forest resource.

Native Landscapes

The Delaware Department of Agriculture and the Delaware Forest Service encourages the developer to use native trees and shrubs to buffer the property from the adjacent land-use activities near this site. A properly designed forested buffer can create wildlife habitat corridors and improve air quality to the area by removing six to eight tons of carbon dioxide annually and will clean our rivers and creeks of storm-water run-off pollutants. To learn more about acceptable native trees and how to avoid plants considered invasive to our local landscapes, please contact the Delaware Department of Agriculture Plant Industry Section at (302) 698-4500.

Tree Mitigation

The Delaware Forest Service encourages the developer to implement a tree mitigation program to replace trees at a 1:1 ratio within the site and throughout the community. This will help to meet the community's forestry goals and objectives and reduce the environmental impacts to the surrounding natural resources. To learn more, please contact our offices at (302) 349-5754.

Public Service Commission - Contact: Andrea Maucher 739-4247

Any expansion of natural gas or installation of a closed propane system must fall within Pipeline Safety guidelines. Contact: Malak Michael at (302) 739-4247.

Delaware State Housing Authority – Contact Vicki Walsh 739-4263

The proposal is for a site plan review of 147.3 acres for 705 residential units located on the northwest side of Sand Hill Road within Georgetown. According to the *State Strategies Map*, the proposal is located in Investment Level 1, 2 and 3 areas. As a general planning practice, DSHA encourages residential development inside growth zones, such as this, where residents will have proximity to services, markets, and employment opportunities. While the prices of the units are not known at this time, we encourage the applicant to include prices that are affordable to low- and moderate-income households. This proposal is in the Georgetown County Census Division (CCD), which has serious housing needs. The 2003 Statewide Housing Needs Assessment indicated that of the 3,514 occupied housing units in this CCD, 236 were substantially substandard, and 1,349 were occupied by low-income households earning less than 80% of the area median income. In addition, the most recent real estate data collected by DSHA indicates that the average home price in Sussex County is $236,000. However, families earning respectively 100% of Sussex County's median income only qualify for mortgages of $171,216, thus creating an affordability gap of $64,784. The provision of units within

reach of families earning at least 100% of Sussex County's median income will ensure housing that is affordable for first time homebuyers.

Department of Education – Contact: John Marinucci 739-4658

DOE offers the following comments on behalf of the Indian River School District.

1. Using the DOE standard formula, this development will generate an estimated 352 students.
2. DOE records indicate that the Indian River School Districts' *elementary schools* ***are at or beyond*** *100% of current capacity* based on September 30, 2005 elementary enrollment.
3. DOE records indicate that the Indian River School Districts' *secondary schools* ***are not at or beyond*** *100% of current capacity* based on September 30, 2005 secondary enrollment. In multiple correspondences from the Indian River School District administration, the district asserts that while the Indian River High School has capacity, the Indian River Middle Schools' student population exceeds student capacity.
4. This development will create additional elementary school and middle school student population growth which will further compound the existing shortage of space. The developer is strongly encouraged to contact the Indian River School District Administration to address the issue of elementary school over-crowding that this development will exacerbate.
5. DOE requests developer work with the Indian River School District transportation department to establish developer supplied bus stop shelter ROW and shelter structures, interspersed throughout the development as determined and recommended by the local school district.

Sussex County – Contact: Richard Kautz 855-7878

The town is encouraged to avoid the creation of new enclaves when annexing, to eliminate existing enclaves during its negotiation of the annexation agreement, and to notify the Sussex County Planning Department when the annexation become effective.

Although the site is to be entirely within the town limits the design does impact County properties outside the town limits. St. Augustine Street appears to extend directly into three newly constructed single family dwellings and there should be a appropriate agricultural buffer and notice for those lots contiguous to the active farm on the west boundary.

Following receipt of this letter and upon filing of an application with the local jurisdiction, the applicant shall provide to the local jurisdiction and the Office of State Planning Coordination a written response to comments received as a result of the pre-application process, noting whether comments were incorporated into the project design or not and the reason therefore.

Thank you for the opportunity to review this project. If you have any questions, please contact me at 302-739-3090.

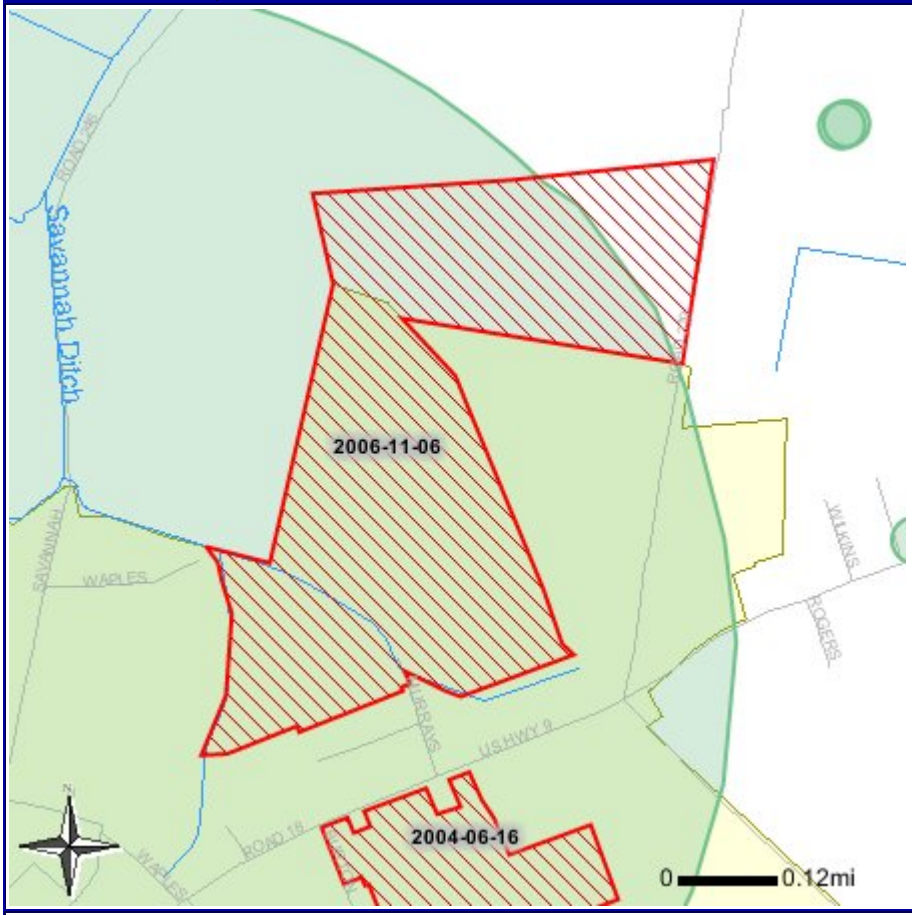
Sincerely,

Constance C. Holland, AICP
Director

CC: Town of Georgetown

Parsonage

2006-11-06



PLUS Projects
NHDFlowLine
Sussex WHPA
All Roads
Towns

This map was produced by the Delaware
Department of Natural Resources and Environmental Control.

November 15, 2004

Mr. Todd J. Sammons
Project Engineer
DelDOT Division of Planning
P.O. Box 778
Dover, DE 19903

RE: Agreement No. 1294
Traffic Impact Study Review Services
Task No. 2: East Side of Georgetown

Dear Mr. Sammons,

McCormick Taylor has completed its review of the Traffic Impact Study (TIS) for the East Side of Georgetown prepared by Davis, Bowen & Friedel, Inc. (DBF), dated September 2004. You assigned this review to us as Task 2. DBF prepared the report in a manner generally consistent with DelDOT's *Rules and Regulations for Subdivision Streets*.

The TIS evaluates the impacts of five proposed developments – Pin Oak Construction, BBC Properties (Georgetown East), Sussex County Senior Services (CHEER), Greenlea Place, and the Racetrack Property. Two build-out conditions were analyzed in the TIS: the first considered year 2007 conditions with partial development build-out, and the second considered year 2014 conditions with full development build-out. The details of each proposed development and build-out scenario are listed in ***Table 1*** on the following page.

DelDOT is currently working on a project to realign the offset and skewed intersections of Sand Hill Road and Airport Road with Route 9 into one signalized four-leg intersection. This project is currently scheduled for construction during Fiscal Year 2007, and is therefore expected to be completed by the summer of 2007.

Based on our review, we have the following comments and recommendations.

Because of the existing geometric and capacity conditions within the study area, we recommend that the Town require phasing such that no commercial certificates of occupancy or residential building permits are issued for any of the proposed developments until a contract is awarded for construction of the above referenced DelDOT project.

Based on the 2007 partial build-out scenario, additional improvements beyond the above referenced DelDOT project would be required at two intersections: Route 9 & Burton Street, and Route 9 & Murray's Lane. Based on the 2014 full build-out scenario, improvements would be required along Route 9 that are likely to be beyond the capability of the developers due to right-of-way constraints, including widening sections of Route 9 to four or five lanes.

Table 1. Proposed Development

Proposed Development	Description		Location	Access
	2007 Partial Build-Out	2014 Full Build-Out		
Pin Oak Construction	100 single-family detached houses	500 single-family detached houses	North of Route 9 and west of Sand Hill Road	Full access on Sand Hill Road (2 options) and possibly via Murray's Lane.
BBC Properties* (Georgetown East)	58,067 square feet of shopping center	58,067 square feet of shopping center, two outparcels & 40 single-family detached houses	Northeast corner of Route 9 & Sand Hill Road	Full access on Sand Hill Road and right-in/right-out access on Route 9
Sussex County Senior Services (CHEER)	36,000 square feet of medical/dental office & 120 elderly housing units	36,000 square feet of medical/dental office & 225 elderly housing units	Northwest corner of Route 9 & Sand Hill Road	Full access on Sand Hill Road
Greenlea Place	125 single-family detached houses	125 single-family detached houses	South side of Route 9, east of Burton Street	Full access on Burton Street
Racetrack Property	225 single-family detached houses	400 single-family detached houses	North side of Route 9, east of Sand Hill Road	Full access on Route 9 & full access on Sand Hill Road (60 ft easement)

* Note: The text of the Final TIS states that this development includes 68,067 sq. ft. of shopping center, two outparcels and 40 single-family detached houses. The trip generation rates in the TIS were based on those shown in the table above. Coordination with DBF confirmed that the values shown in the table above are correct.

Therefore, it is our recommendation that only the development levels indicated in the 2007 partial build-out scenario be approved at this time. Development beyond those levels should not be approved until one or more of the following takes place:

- An updated traffic analysis is performed that indicates what level of development beyond that assumed in the 2007 partial build-out scenario can be accommodated by the local road network without the need for impractical roadway improvements.

- One or more of the developers can institute the required improvements of Route 9 (including dualization at some locations) through the purchase of right-of-way. The extent of these improvements must be designed to meet DelDOT arterial roadway standards (including but not limited to lane width, shoulder width, and bicycle accommodations).

- One or more of the pending transportation projects/studies in the area, such as the Park Avenue Project, the Sussex County West/East Improvements, or the US 113 North/South Study, can be shown to reduce traffic on Route 9 to a sufficient level so as to reduce the need for the significant improvements required in the 2014 full build-out scenario.

Should the Town of Georgetown choose to approve the developments listed above consistent with the 2007 partial build-out scenario, the following items should be incorporated into the site design, and be reflected on the record plan:

1. Because of the existing geometric and capacity conditions within the study area, we recommend that the Town require phasing such that no commercial certificates of occupancy or residential building permits are issued for any of the proposed developments until a contract is awarded for construction of the above referenced DelDOT project.

2. The developers of Greenlea Place should enter into an agreement with DelDOT, whereby the developers would fund the entire cost of a traffic signal at the intersection of Route 9 and Burton Street. The costs shall include pedestrian signals and crosswalks at DelDOT's discretion and all costs associated with the interconnection of this signal with other signals along the Route 9 corridor. Also at this intersection, a left-turn lane should be provided on westbound and eastbound Route 9, and a right-turn lane should be provided on eastbound Route 9 (including a minimum five foot shoulder), and separate left and right-turn lanes should be provided on northbound Burton Street. Full access to Greenlea Place should be provided on Burton Street.

3. The developers of the Pin Oak Construction property should enter into an agreement with DelDOT, whereby the developers would fund the entire cost of a traffic signal at the intersection of Route 9 and Murray's Lane. The costs shall include pedestrian signals and crosswalks at DelDOT's discretion and all costs associated with the interconnection of this signal with other signals along the Route 9 corridor. Also at this intersection, a left-turn lane should be provided on eastbound Route 9 (while maintaining a five foot shoulder), and separate left and right-turn lanes on the southbound approach of Murray Lane should be provided.

4. Access to Pin Oak Construction should be provided to Route 9 via Murray's Lane and to Sand Hill Road via Clark Drive. Three foot buffers and five foot sidewalks should be added to Murray's Lane from the Pin Oak Construction development to Route 9. Access to Pin Oak Construction via Murray's Lane is recommended based on level of service

deficiencies at the intersection of Route 9/Sand Hill Road if this access is not provided in the 2014 condition.

5. BBC Properties (Georgetown East) should be provided right-in/right-out access to Route 9, and full access to Sand Hill Road opposite of Clark Drive (shared CHEER Center / Pin Oak Construction Access). At this intersection, separate left and right-turn lanes should be provided in each direction on Sand Hill Road (these lanes are incorporated into the DelDOT project), and a separate right-turn lane should be provided on the westbound BBC Properties site access. Reimbursement of costs to improve this intersection should be equitably shared by the CHEER Center, Pin Oak Construction, and BBC Properties, as determined by DelDOT.

6. The Racetrack Property should be given full access to Route 9 and to Sand Hill Road. At Route 9, an eastbound left-turn lane on Route 9, westbound right-turn lane on Route 9, and separate left and right-turn lanes on the southbound site access should be provided. A minimum of five foot wide shoulders should be maintained through the intersection on Route 9. On Sand Hill Road, a separate right-turn lane should be installed if so directed by DelDOT's Subdivision Engineer.

7. The developers should provide a minimum of a five-foot shoulder, three-foot buffer, and five-foot sidewalk along Route 9 and Sand Hill Road frontage, covering any frontage not already incorporated into the DelDOT project. Should the developments be granted certificates of occupancy prior to the completion of the DelDOT project, the developers should install the sidewalk, consistent with the location proposed by the DelDOT project. Bicycle lanes (minimum five feet wide) should be provided through all site entrances. Sidewalks along both sides of internal residential streets should be required. Additionally, a sidewalk connection from Greenlea Place to the recreational area to the east should be required.

8. The design of site entrances and other roadway improvements on Route 9 and Sand Hill Road shall be consistent with DelDOT's *Rules and Regulations for Subdivision Streets* and subject to the approval of DelDOT's Subdivision Engineer.

9. Bicycle racks or locked bicycle storage units should be provided at the entrance to all commercial and business sites.

Should the Town of Georgetown choose to approve the developments listed above consistent with the 2014 full build-out scenario, the following additional items should be incorporated into the site design, and be reflected on the record plan:

10. The developers of Pin Oak Construction should improve Murray's Lane from the Pin Oak Construction development to Route 9 to meet the Town of Georgetown's design standards for Collector Streets, including five foot wide sidewalks.

11. The developers of Pin Oak Construction, the CHEER Center, and BBC Properties should enter into agreements with DelDOT, whereby the developers would fund the entire cost of a traffic signal at the intersection of Sand Hill Road and Clark Drive. The costs shall include pedestrian signals and crosswalks at DelDOT's discretion and all costs associated with the interconnection of this signal with other signals along the Sand Hill Road corridor.

12. The developers of the Racetrack Property should enter into an agreement with DelDOT, whereby the developers would fund the entire cost of a traffic signal at the intersection of Route 9 and the Racetrack entrance. The costs shall include pedestrian signals and crosswalks at DelDOT's discretion and all costs associated with the interconnection of this signal with other signals along the Route 9 corridor.

Additional details on our review of this TIS are attached. Please contact me at (302) 738-0203 or through e-mail at mluszcz@mtmail.biz if you have any questions concerning this review.

Sincerely,
McCormick Taylor, Inc.

Mark Luszcz, P.E., PTOE, AICP
Associate

Enclosures

General Information

Report date: September 2004
Prepared by: Davis, Bowen & Friedel, Inc.
Prepared for: The Town of Georgetown
Generally consistent with DelDOT's *Rules and Regulations for Subdivision Streets*: Yes

Project Description and Background

Description: Five proposed projects on east side of Georgetown (see ***Table 1*** below)
Location: All proposed projects surround the intersection of US Route 9/Sand Hill Road/Airport Road (see **Table 1** below)
Amount of land to be developed: approximately 270 acres
Land use approval(s) needed: Subdivision approval
Proposed completion date: 2014 for full development of all five proposed projects (see ***Table 1*** below for 2007 partial build-out scenario)
Proposed access locations: See ***Table 1*** below

Table 1. Proposed Development

Proposed Development	Description		Location	Access
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Sussex County Senior Services (CHEER)	36,000 square feet of medical/dental office & 120 elderly housing units	36,000 square feet of medical/dental office & 225 elderly housing units	Northwest corner of Route 9 & Sand Hill Road	Full access on Sand Hill Road
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Livable Delaware
(Source: Delaware Strategies for State Policies and Spending, July 2004)

Location with respect to the Strategies for State Policies and Spending Map of Delaware:
Greenlea Place, most of Sussex County Senior Services (CHEER), about half of BBC Properties (Georgetown East), and about half of Pin Oak Construction are located within Investment Level 1. The remaining development is located within Investment Level 2.

Description of Investment Level:

Investment Level 1
These areas are often municipalities or urban/urbanizing places where density is generally higher than in surrounding areas. Areas classified as Investment Level 1 are population centers built around a traditional central business district, which offers a wide range of opportunities for employment, shopping and recreation. Investment Level 1 areas are considered to drive Delaware's economy and therefore reinvestment and redevelopment are encouraged.

In Investment Level 1 Areas, state investments and policies should support and encourage a wide range of uses and densities, promote other transportation options, foster efficient use of existing public and private investments, and enhance community identity and integrity. Typical transportation projects included new or expanded facilities and services for all modes of transportation, including public transportation facilities and services. Projects will also include those that manage traffic flow and congestion, support economic development and redevelopment efforts, and encourage connections between communities and the use of local streets for local trips.

Investment Level 2
These areas, generally adjacent to Investment Level 1 Areas, include less developed areas within municipalities, rapidly growing areas that have or will have public water and wastewater services, and may include smaller towns, rural villages, and suburban areas. These areas typically include single-family detached housing developments, commercial and office uses serving primarily local residents, and a limited range of entertainment, parks and recreation, cultural and institutional facilities.

In Investment Level 2 Areas, state investments and policies should be based on available infrastructure to accommodate orderly growth, encourage departure from the typical single-family-dwelling developments and promote a broader mix of housing types and commercial sites, and encourage development that is consistent with the character of the area. Transportation projects should expand or provide roadways, public transportation, pedestrian walkways, bicycle paths, and other transportation modes that manage flow, support economic development efforts, and encourage connections between communities and the use of local streets for local trips.

Proposed Developments Compatibility with Livable Delaware: The developments included in the "East of Georgetown" TIS generally adhere to the policies stated in the 2004 update of the Livable Delaware "Strategies for State Policies and Spending." However, accommodations should be made (as listed above) to existing intersections in order to safely handle the additional traffic that the five proposed developments will generate. In addition, final development plans should encourage multi-modal connections between communities and the use of local roads for local trips.

Comprehensive Plans

Part of the proposed developments are within the Town of Georgetown (Greenlea Place, Sussex County Senior Services (CHEER), and about half of Pin Oak Construction) while the remaining developments are in Sussex County.

Sussex County Comprehensive Plan: *(Source: Sussex County Comprehensive Plan Update, Shaffer Consulting, January 2003)* This plan indicates that the proposed developments are located in an area of existing agricultural land use. Future land use is expected to be a Developing Area or Commercial.

Town of Georgetown Comprehensive Plan: (Source: Town of Georgetown Comprehensive Plan, Institute for Public Administration, University of Delaware, February 2002) This plan indicates that the proposed developments are located in an area currently noted as vacant, except for the existing CHEER Center which is noted as a Community Use. Future land use within the town borders is noted to be Residential. The area is part of the plan's Eastern Development Area, which seeks the following: small/professional businesses no farther east than Burton Street, continuation of the CHEER project, commercial growth of small retail or other low intense commercial uses along Route 9, zoning for areas adjacent to CHEER that support the CHEER facility, community facilities to act as a buffer between commercial uses and single-family residential areas, single-family housing, and careful consideration of newly proposed subdivisions. Desired transportation conditions relevant to the proposed developments include: development in the northern portion of this district should consider alternate access to Sand Hill Road, multi-modal linkages, consideration of a future bypass from the north to connect to Route 9 east of Sand Hill Road, and traffic impact studies for new subdivisions.

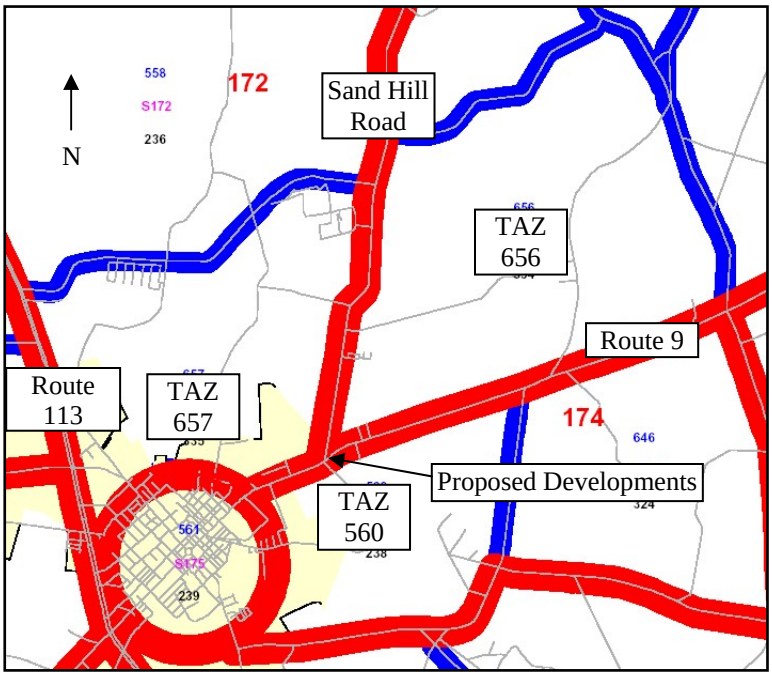
Proposed Developments Compatibility with Comprehensive Plans: The proposed developments are generally consistent with both comprehensive plans. The mixed use BBC Properties may not have the desired buffer between commercial and residential uses. The referenced "future bypass from the north to connect to Route 9 east of Sand Hill Road" is likely no longer a transportation option, given the DelDOT investment in improvements to existing Sand Hill Road and the slight realignment of its intersection with Route 9.

Regional Transportation Plan

The Mobility Element of the Sussex County Comprehensive Plan includes an examination of conditions in 2025. DelDOT forecasts 2025 conditions by dividing the county into zones, which we refer to as Transportation Analysis Zones. For each zone we estimate population, dwellings

and employment. Using those estimates, we calculate the number of trips beginning and ending in each zone, distribute those trips from each zone to the other zones in the county (actually we combine Kent and Sussex Counties) and around the edges of the county, and finally we assign those trips to the road network.

Transportation Analysis Zones (TAZ) where development would be located: 560, 656, and 657 (Peninsula code designation)
TAZ Boundaries:



Current employment estimate for TAZs: 1,362 jobs in 2000.
Future employment estimate for TAZs: 2,463 jobs in 2025.
Current population estimate for TAZs: 2,708 in 2000.
Future population estimate for TAZs: 6,189 in 2025.
Current household estimate for TAZs: 971 in 2000.
Future household estimate for TAZs: 2,206 in 2025.
Relevant committed developments in the TAZs: Delmarva Christian High School
Would the addition of committed developments to current estimates exceed future projections: No.
Would the addition of committed developments and the proposed development to current estimates exceed future projections: Yes.

<u>Relevant Projects in the DelDOT Capital Transportation Program (2004-2009)</u>

DelDOT is currently working on a project to realign the offset and skewed intersections of Sand Hill Road and Airport Road (Road 319) with Route 9 into one signalized four-leg intersection. This project is currently scheduled for construction during Fiscal Year 2007, and is therefore expected to be completed by the summer of 2007. Details include:

- Project limits: Route 9 from approximately 800' west of Sand Hill Road to approximately 900' east of Sand Hill Road; Sand Hill Road from Route 9 to approximately 700' north of Clark Drive; Airport Road from Route 9 to approximately 200' south of Delmarva Christian High School entrance.
- Provide separate lanes for each movement at the Route 9/Sand Hill Road/Airport Road intersection, including dual left-turn lanes for the eastbound Route 9 approach. Signal would operate with protected only left-turn phasing on Route 9 and protected/permissive left-turn phasing on Sand Hill Road and Airport Road.
- On Airport Road, a left-turn lane will be provided into the Sterling Center, and a right-turn lane will be provided into Delmarva Christian High School.
- On Sand Hill Road, separate left and right-turn lanes will be provided at Clark Drive in both directions. In the northbound direction, there will two lanes exiting the intersection from Route 9 (receiving the eastbound dual left-turn traffic from Route 9); the right lane of these two lanes will become a right-turn lane at Clark Drive into the BBC Properties (Georgetown East) entrance.

Trip Generation

Trip generation for the proposed development was computed using comparable land uses and equations contained in Trip Generation, Seventh Edition, published by the Institute of Transportation Engineers (ITE). Where applicable, internal trip capture and pass-by trip procedures were based on the *ITE Trip Generation Handbook*. The following land uses were utilized to estimate the amount of new traffic generated for the five projects:

- Single-Family Detached Houses - Land Use Code 210
- Senior Adult Housing (Detached) – Land Use Code 251
- Senior Adult Housing (Attached) – Land Use Code 252
- Medical/Dental Office Building – Land Use Code 720
- Specialty Retail Center – Land Use Code 814 (Saturday data not available; therefore Land Use Code 820, Shopping Center, was used)
- Shopping Center – Land Use Code 820
- Pharmacy/Drugstore with drive-thru window – Land Use Code 881

Table 2. Greenlea Place Trip Generation

Land Use	Morning Peak Hour			Evening Peak Hour			Saturday Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
125 Single-Family Detached Houses	24	73	97	83	48	131	66	56	122

Table 3. BBC Properties (Georgetown East) Trip Generation

Land Use	Morning Peak Hour			Evening Peak Hour			Saturday Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
40 Single-Family Detached Houses	9	28	37	30	17	47	25	22	47
Internal Capture	0	0	0	9	9	18	8	12	20
Primary Residential Trips	**9**	**28**	**37**	**21**	**8**	**29**	**17**	**10**	**27**
58,067 sq. ft. Shopping Center	69	44	113	210	227	437	316	292	608
Internal Capture	0	0	0	6	7	13	9	6	15
Net External Trips	69	44	113	204	220	424	307	286	593
Pass-By Trips	0	0	0	94	101	195	80	74	154
Primary Shopping Center Trips	**69**	**44**	**113**	**110**	**119**	**229**	**227**	**212**	**439**
5,100 sq. ft. Specialty Retail	68	73	141	15	19	34	65	60	125
Internal Capture	0	0	0	0	1	1	2	1	3
Net External Trips	68	73	141	15	18	33	63	59	122
Pass-By Trips	0	0	0	5	6	11	16	15	31
Primary Specialty Retail Trips	**68**	**73**	**141**	**10**	**12**	**22**	**47**	**44**	**91**
12,000 sq. ft. Pharmacy Drugstore w/drive-thru	18	14	32	50	53	103	47	47	94
Internal Capture	0	0	0	2	2	4	1	1	2
Net External Trips	18	14	32	48	51	99	46	46	92
Pass-By Trips	0	0	0	24	25	49	23	22	45
Primary Pharmacy Trips	**18**	**14**	**32**	**24**	**27**	**50**	**23**	**24**	**47**
TOTAL PRIMARY TRIPS	**164**	**159**	**323**	**165**	**165**	**330**	**314**	**290**	**604**

Table 4. Pin Oak Construction Trip Generation

Land Use	Morning Peak Hour			Evening Peak Hour			Saturday Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
100 Single-Family Detached Houses (Partial Build-Out)	20	59	79	67	40	107	54	46	100
500 Single-Family Detached Houses (Full Build-Out)	90	269	359	287	169	456	246	210	456

Table 5. Sussex County Senior Services (CHEER) Trip Generation

Land Use	Morning Peak Hour			Evening Peak Hour			Saturday Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
54 Senior Adult Detached Houses (Partial Build-Out)	6	10	16	20	12	32	7	8	15
66 Senior Adult Attached Houses (Partial Build-Out)	2	3	5	4	3	7	10	10	20
Partial Build-Out Residential Total	**8**	**13**	**21**	**24**	**15**	**39**	**17**	**18**	**35**
105 Senior Adult Detached Houses (Full Build-Out)	11	18	29	31	20	51	13	15	28
120 Senior Adult Attached Houses (Full Build-Out)	5	5	10	8	5	13	16	16	32
Full Build-Out Residential Total	**16**	**23**	**39**	**39**	**25**	**64**	**29**	**31**	**60**
36,000 sq. ft. Medical/Dental Office	70	19	89	33	89	122	75	56	131
Partial Build-Out Total	**78**	**32**	**110**	**57**	**104**	**161**	**92**	**74**	**166**
Full Build-Out Total	**86**	**42**	**128**	**72**	**114**	**186**	**104**	**87**	**191**

Table 6. Racetrack Property

Land Use	Morning Peak Hour			Evening Peak Hour			Saturday Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
225 Single-Family Detached Houses (Partial Build-Out)	42	125	167	140	82	222	114	97	211
400 Single-Family Detached Houses (Full Build-Out)	72	217	289	235	138	373	198	169	367

Overview of TIS

Intersections examined:

1) US Route 9 & Burton Street
2) US Route 9 & Murray's Lane
3) US Route 9 & Sand Hill Road/Airport Road (Sussex Road 319)
4) US Route 9 & BBC Properties (Georgetown East) Site Entrance
5) US Route 9 & Racetrack Property Site Entrance
6) Sand Hill Road & Sussex County Senior Services (CHEER) Site Entrance (Clark Drive/BBC Properties (Georgetown East) Site Entrance
7) Sand Hill Road & Pin Oak Construction Site Entrance
8) Sand Hill Road & Racetrack Property Site Entrance

Conditions examined:

1) 2004 Existing conditions
2) 2007 Future conditions with committed development and without proposed development

3) 2007 Future conditions with committed development and with partial build-out of the proposed developments (see ***Table 1***)
4) 2014 Future conditions with committed development and without proposed development
5) 2014 Future conditions with committed development and full build-out of the proposed development (see ***Table 1***)

Peak hours evaluated: weekday morning and evening and summer Saturday peak hours

Committed developments considered:

- Delmarva Christian High School (1000 student High School) located on southwest corner of US Route 9/Sand Hill Road/Airport Road
- Sports at the Beach (previously known as Softball World) located on the south side of US Route 9, just east of the Racetrack Property site

Intersection Descriptions

US Route 9 & Burton Street:

Type of Control: stop-controlled on Burton Street. Applicant proposes installation of traffic signal.

Northbound approach: (Burton Street) shared left/through/right-turn lane (the north side of the intersection is one-way away from the intersection). Applicant proposes separate left/through and right-turn lanes.

Eastbound approach: (US Route 9) shared left/through/right-turn lane. Applicant recommends an additional through lane. If this is not feasible, applicant proposes a separate right-turn lane.

Westbound approach: (US Route 9) shared left/through/right-turn lane. Applicant recommends an additional through lane.

US Route 9 & Murray's Lane:

Type of Control: unsignalized tee intersection, stop-controlled on Murray's Lane. Applicant proposes installation of traffic signal.

Southbound approach: (Murray's Lane) shared left/right-turn lane. Applicant proposes separate left and right-turn lanes.

Eastbound approach: (US Route 9) shared through/left-turn lane. Applicant recommends an additional through lane. If this is not feasible, applicant proposes a separate left-turn lane.

Westbound approach: (US Route 9) shared through/right-turn lane. Applicant recommends an additional through lane. If this is not feasible, applicant proposes a separate right-turn lane.

US Route 9 & Sand Hill Road/Airport Road (Sussex Road 319):

Type of Control: unsignalized slightly offset four-leg intersection, stop-controlled on Sand Hill Road and Airport Road. DelDOT proposes to realign the intersection to form one four-leg signalized intersection.

Northbound approach: (Airport Road) shared left/through/right-turn lane. DelDOT proposes separate left, through, and right-turn lanes.
Southbound approach: (Sand Hill Road) shared left/through/right-turn lane. DelDOT proposes separate left, through, and right-turn lanes.
Eastbound approach: (US Route 9) shared left/through/right-turn lane. DelDOT proposes separate left, through, and right-turn lanes.
Westbound approach: (US Route 9) shared left/through/right-turn lane. DelDOT proposes separate left, through, and right-turn lanes.

US Route 9 & BBC Properties (Georgetown East) Site Entrance:

Type of Control: future unsignalized, right-in/right-out tee intersection, stop-controlled on site driveway.
Southbound approach: (site driveway) right-turn lane
Eastbound approach: (US Route 9) single through lane
Westbound approach: (US Route 9) separate through and right-turn lanes.

US Route 9 & Racetrack Property Site Entrance:

Type of Control: future unsignalized tee intersection, stop-controlled on site driveway. Applicant proposes installation of traffic signal.
Southbound approach: (site driveway) shared left/through lane and separate right-turn lane
Eastbound approach: (US Route 9) single through lane. Applicant proposes the addition of a separate left-turn lane.
Westbound approach: (US Route 9) single through lane. Applicant proposes the addition of a separate right-turn lane.

Sand Hill Road & Sussex County Senior Services (CHEER) Site Entrance (Clark Drive)/BBC Properties (Georgetown East) Site Entrance:

Type of Control: unsignalized tee intersection, stop-controlled on site driveway. The proposed BBC Properties site driveway is proposed to add the fourth leg to this intersection. The applicant examined several access options for BBC Properties and Pin Oak Construction. Our recommendation is to connect the Pin Oak Construction site to the CHEER Center, so that all Pin Oak Construction traffic accesses Sand Hill Road via Clark Drive. Additionally, BBC Properties should be aligned with Clark Drive. Provisions for future signalization should also be made.
Northbound approach: (Sand Hill Road) shared left/through lane. DelDOT proposes separate left, through, and right-turn lanes.
Southbound approach: (Sand Hill Road) shared through/right-turn lane. DelDOT proposes separate left, through, and right-turn lanes.
Eastbound approach: (Clark Drive/site driveway) shared left/right-turn lane. After the addition of the BBC Properties driveway, the lane will become a shared left/through/right-turn lane.
Westbound approach: (site driveway) shared left/through lane and separate right-turn lane.

Sand Hill Road & Pin Oak Construction Site Entrance:

Although options for allowing Pin Oak Construction to directly access Sand Hill Road were examined, our recommendation is to allow access to Sand Hill Road through the CHEER Center and Clark Drive. Therefore, there would be no separate Sand Hill Road/Pin Oak Construction intersection.

Sand Hill Road & Racetrack Property Site Entrance:

Type of Control: future unsignalized tee intersection, stop-controlled on site driveway.
Northbound approach: (Sand Hill Road) single through lane. Will become a shared through/right-turn lane after the site driveway is constructed. A separate right-turn lane should be provided if required by DelDOT's Subdivision Engineer.
Southbound approach: (Sand Hill Road) single through lane. Will become a shared left/through lane after the site driveway is constructed.
Westbound approach: (site driveway) shared left/right-turn lane

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: DART First State currently operates two weekday transit routes that pass through the study area, but neither makes a stop within the study area. The Route 206 and 210 buses operate along Route 9; there are no DART fixed-route buses that use Road 319. The CHEER Center also operates bus service throughout the day, providing transportation to a variety of facilities within the County.

Planned transit service: No changes to the existing transit service are currently planned.

Existing bicycle and pedestrian facilities: The *Bicycle Touring in Delaware* map for Kent and Sussex counties designates Route 9, Sand Hill Road, and Airport Road as having above average cycling conditions. There are currently no sidewalks within the vicinity of the proposed development.

Planned bicycle and pedestrian facilities: As indicated through previous correspondence between the Applicant and DelDOT, the following bicycle and pedestrian enhancements should be made as part of this project:

- Maintain a minimum of five foot wide shoulders (beyond turn lanes) at all site entrances.
- Provide a three foot buffer and five foot sidewalk along all Route 9 and Sand Hill Road site frontage (outside of that to be provided by the DelDOT project).
- Internal sidewalks in residential developments are suggested.
- A pedestrian connection from Greenlea Place to the recreational area to the east is suggested.

Previous Comments

All comments from DelDOT's preliminary TIS review letter dated June 17, 2004 were addressed by DBF in the Final TIS submission. In the Final TIS, four additional figures were included (Figures 64, 65, 74, and 75) that detailed the development of traffic projections at two intersections on Sand Hill Road. These were included to analyze different development access options on Sand Hill Road. McCormick Taylor checked these figures and found them to be accurate.

HCS Analysis Comments

General

1) The TIS has used heavy vehicle percentages per movement. McCormick Taylor runs used heavy vehicle percentages per lane group. McCormick Taylor runs used 2% minimum heavy vehicle percentages where increases in volumes are projected.
2) Signal cycle lengths and timings were developed based on feasible DelDOT signal operations.

US Route 9 & Burton Street

3) The TIS has coded an incorrect lane configuration on northbound Burton Street approach. McCormick Taylor runs corrected this.
4) The TIS has coded overlap right turn in northbound Burton Street phase. McCormick Taylor runs corrected this.
5) The TIS has coded an eastbound US Route 9 right turn lane only in Saturday peak hour in case of 2007 with development. McCormick Taylor analyzed this case only without eastbound Route 9 right turn lane. McCormick Taylor separately analyzed a case with additional turn lanes.
6) McCormick Taylor analyzed a signalized option with additional left-turn lanes on US Route 9, an additional right-turn lane on eastbound US Route 9, and an additional northbound right-turn lane on Burton Street in cases with developments.
7) The TIS examined inconsistent improvements in different peak hours. McCormick Taylor analyzed the improved condition with two through lanes in each direction on US Route 9, a westbound and eastbound left-turn lanes on US Route 9, an eastbound right-turn lane on US Route 9, and a separate northbound right-turn lane on Burton Street for all time periods of the 2014 signalized option.
8) McCormick Taylor runs assumed coordinated signal operations at Burton Street, Murray's Lane, Sand Hill Rd / Airport Rd, and Racetrack Property Site Entrance on US Route 9 in 2014 with development case.

US Route 9 & Murray's Lane

9) PHF values were corrected in order to be consistent with the minutes of the TIS scoping meeting.

10) The TIS examined inconsistent improvements in different peak hours. McCormick Taylor analyzed the improved condition with two through lanes in each direction on US Route 9, a eastbound left-turn lane on US Route 9, and a separate southbound right-turn lane on Murray's Lane for all time periods of the 2014 signalized option.
11) McCormick Taylor analyzed a signalized option with an additional left-turn lane on eastbound US Route 9 and an additional southbound right-turn lane on Murray's Lane in cases with developments.
12) McCormick Taylor runs assumed coordinated signal operations at Burton Street, Murray's Lane, Sand Hill Rd / Airport Rd, and Racetrack Property Site Entrance on US Route 9 in 2014 with development case.

US Route 9 & Sand Hill Road / Airport Road (Sussex Road 319)

13) Volume was corrected to match the TIS figure.
14) Westbound US Route 9 permissive left was coded in the TIS runs. McCormick Taylor analyzed the intersection with protected only operations for the westbound US Route 9 left-turn phase.
15) McCormick Taylor runs used PHF 0.92 or higher for US Route 9 and Sand Hill Road approaches in projected cases.
16) McCormick Taylor runs assumed coordinated signal operations at Burton Street, Murray's Lane, Sand Hill Rd / Airport Rd, and Racetrack Property Site Entrance on US Route 9 in 2014 with development case.

US Route 9 & BBC Properties (Georgetown East) Site Entrance

17) McCormick Taylor runs used PHF values calculated from the traffic count sheets for US Route 9 and Sand Hill Road / Airport Road intersection.

US Route 9 & Racetrack Property Site Entrance

18) McCormick Taylor runs used PHF values calculated from the traffic count sheets for US Route 9 and Sand Hill Road / Airport Road intersection.
19) PHF values were corrected in order to be consistent with the minutes of the TIS scoping meeting.
20) Saturday signal phasing did not match afternoon peak signal phasing in the 2014 improved case. McCormick Taylor runs used consistent signal phasing.
21) McCormick Taylor analyzed the signal operation for morning peak hour in 2014 with developments.
22) McCormick Taylor analyzed a signalized option with an additional left-turn lane on eastbound US Route 9 and an additional southbound right-turn lane on Racetrack Property in 2014 with development case.
23) McCormick Taylor runs assumed coordinated signal operations at Burton Street, Murray's Lane, Sand Hill Rd / Airport Rd, and Racetrack Property Site Entrance on US Route 9 in 2014 with development case.

Sand Hill Road & Sussex County Senior Services (Cheer) Site Entrance (Clark Drive) / BBC Properties (Georgetown East) Site Entrance

24) The TIS did not input the upstream signal data. McCormick Taylor included upstream signal data.

Sand Hill Road & Sussex County Senior Services (Cheer) and Pin Oak Construction Site Entrance (Clark Drive) / BBC Properties (Georgetown East) Site Entrance

25) The TIS did not input the upstream signal data. McCormick Taylor included upstream signal data.
26) McCormick Taylor analyzed the morning peak hour operation with an additional right-turn lane on BBC Properties approach in 2014 with development case.

Sand Hill Road & Sussex County Senior Services (Cheer) Site Entrance (Clark Drive) and Pin Oak Construction Site Entrance

27) The TIS did not input the upstream signal data. McCormick Taylor included upstream signal data.

Sand Hill Road and BBC Properties

28) The TIS did not input the upstream signal data. McCormick Taylor included upstream signal data.

Sand Hill Road & Pin Oak Construction Site Entrance

29) McCormick Taylor runs used PHF values calculated from the traffic count sheets for Sand Hill Road and Clark Drive Intersection.

Sand Hill Road & Racetrack Property Site Entrance

30) McCormick Taylor runs used PHF values calculated from the traffic count sheets for Sand Hill Road and Clark Drive Intersection.

Table 7
PEAK HOUR LEVELS OF SERVICES (LOS)
Based on Traffic Impact Study of East Side of Georgetown
Report Dated September, 2004
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection[1]	LOS per TIS[2]			LOS per McCormick Taylor Review[3]		
US Route 9 & Burton Street	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
2004 Existing Conditions						
Eastbound US Route 9	A (9.7)	A (9.4)	A (8.7)	A (10.0-)	A (9.5)	A (8.7)
Westbound US Route 9	A (8.7)	B (10.3)	A (10.1)	A (8.8)	B (10.5)	B (10.2)
Northbound Burton Street	D (25.4)	F (53.4)	D (27.2)	D (25.4)	F (53.4)	D (27.2)
2007 without Development						
Eastbound US Route 9	B (10.3)	A (9.9)	A (8.9)	B (10.6)	A (9.9)	A (8.9)
Westbound US Route 9	A (9.6)	B (10.6)	B (10.7)	A (9.7)	B (10.8)	B (10.7)
Northbound Burton Street	E (45.1)	F (69.7)	D (33.1)	E (45.1)	F (70.8)	D (33.1)
2007 with Development						
Eastbound US Route 9	B (11.7)	B (11.3)	B (10.3)	B (12.2)	B (11.5)	B (10.3)
Westbound US Route 9	B (10.8)	B (13.5)	B (14.0)	B (11.0)	B (13.8)	B (14.2)
Northbound Burton Street	F (692.9)	F (1067)	F (776.0)	F (692.9)	F (1067)	F (811.5)
2007 with Development (Additional Right-Turn Lane on Northbound Burton Street Approach)						
Eastbound US Route 9	B (11.7)	B (11.3)	B (10.3)	B (12.2)	B (11.5)	B (10.3)
Westbound US Route 9	B (10.8)	B (13.5)	B (14.0)	B (11.0)	B (13.8)	B (14.2)
Northbound Burton Street	F (508.5)	F (857.6)	F (571.0)	F (508.5)	F (857.7)	F (603.4)
2014 without Development						
Eastbound US Route 9	B (11.0)	B (10.4)	A (9.2)	B (11.4)	B (10.5)	A (9.2)
Westbound US Route 9	A (10.0)	B (11.5)	B (11.5)	B (10.1)	B (11.6)	B (11.6)
Northbound Burton Street	F (67.3)	F (119.0)	E (45.4)	F (67.3)	F (119.0)	E (45.4)
2014 with Development						
Eastbound US Route 9	B (14.7)	B (13.3)	B (11.9)	C (15.4)	B (13.4)	B (11.9)
Westbound US Route 9	B (11.9)	C (18.3)	C (18.4)	B (12.1)	C (18.8)	C (18.6)
Northbound Burton Street	F (2230)	F (4336)	F (3086)	F (*)	F (*)	F (*)
2014 with Development (Additional Right-Turn Lane on Northbound Burton Street Approach)						
Eastbound US Route 9	B (14.7)	B (13.3)	B (11.9)	C (15.4)	B (13.4)	B (11.9)
Westbound US Route 9	B (11.9)	C (18.3)	C (18.4)	B (12.1)	C (18.8)	C (18.6)
Northbound Burton Street	F (1667)	F (3507)	F (2439)	F (*)	F (*)	F (63.5)

[1] For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.
[2] The TIS has coded an incorrect lane configuration on northbound Burton Street approach. McCormick Taylor runs corrected this.
[3] The TIS has used heavy vehicle percentages per movement. McCormick Taylor runs used heavy vehicle percentages per lane group. McCormick Taylor runs used 2% minimum heavy vehicle percentages where increases in volumes are projected.

Table 8
PEAK HOUR LEVELS OF SERVICES (LOS)
Based on Traffic Impact Study of East Side of Georgetown
Report Dated September, 2004
Prepared by Davis, Bowen & Friedel, Inc.

Signalized Intersection[4]	LOS per TIS			LOS per McCormick Taylor Review[5,6,7]		
US Route 9 & Burton Street	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
2007 with Development	D (0.95)	D (0.95)	D (0.94)[8]	B (0.90)	E (0.97)	E (0.99)
2007 with Development (Additional Left Turn Lanes on both US Route 9 Approach, and additional Right-Turn Lanes on Eastbound US Route 9 Approach and Northbound Burton Street Approach)[9]	N/A	N/A	N/A	B (0.87)	B (0.89)	C (0.93)
2014 with Development	F (1.09)	F (1.19)	F (1.18)	F (1.09)	F (1.19)	F (1.19)
2014 with Development (Additional Right-Turn Lanes on US Route 9 Approaches and Northbound Burton Street Approach)	F (1.07)	F (1.12)	F (1.12)	F (1.07)	F (*)	F (*)
2014 with Development (Improved)[10]	D (0.95)[11]	A (0.79)	D (0.95)	B (0.58)	B (0.64)	B (0.65)
2014 with Development (Additional Left Turn Lanes on both US Route 9 Approach, and additional Right-Turn Lanes on Eastbound US Route 9 Approach and Northbound Burton Street Approach)[9]	N/A	N/A	N/A	F (1.06)	F (*)	F (*)

[4] For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.
[5] The TIS has used heavy vehicle percentages per movement. McCormick Taylor runs used heavy vehicle percentages per lane group. McCormick Taylor runs used 2% minimum heavy vehicle percentages where increases in volumes are projected.
[6] Signal cycle lengths and timings were developed based on feasible DelDOT signal operations.
[7] McCormick Taylor runs assumed coordinated signal operations at Burton Street, Murray's Lane, Sand Hill Rd / Airport Rd, and Racetrack Property Site Entrance on US Route 9 in 2014 with development case.
[8] The TIS has coded an eastbound US Route 9 right turn lane only in Saturday peak hour in case of 2007 with development. McCormick Taylor analyzed this case only without eastbound Route 9 right turn lane. McCormick Taylor separately analyzed a case with additional turn lanes.
[9] McCormick Taylor analyzed a signalized option with additional left-turn lanes on US Route 9, an additional right-turn lane on eastbound US Route 9, and an additional northbound right-turn lane on Burton Street in cases with developments.
[10] The TIS examined inconsistent improvements in different peak hours. McCormick Taylor analyzed the improved condition with two through lanes in each direction on US Route 9, a westbound and eastbound left-turn lanes on US Route 9, an eastbound right-turn lane on US Route 9, and a separate northbound right-turn lane on Burton Street for all time periods of the 2014 signalized option.
[11] The TIS has coded overlap right turn in northbound Burton Street phase. McCormick Taylor runs corrected this.

Table 9
PEAK HOUR LEVELS OF SERVICES (LOS)
Based on Traffic Impact Study of East Side of Georgetown
Report Dated September, 2004
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection[12]	LOS per TIS			LOS per McCormick Taylor Review[13]		
US Route 9 & Murray's Lane	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
2004 Existing Conditions						
Eastbound US Route 9	A (9.6)	A (9.7)	A (8.8)	A (9.9)	A (9.6)	A (8.8)
Southbound Murray's Lane	C (17.7)	C (17.5)	D (26.9)	C (17.7)	C (17.5)	D (26.9)
2007 without Development						
Eastbound US Route 9	B (10.3)	B (10.2)	A (9.1)	B (10.6)	A (10.0-)	A (9.1)
Southbound Murray's Lane	C (22.5)	C (19.6)	D (33.1)	C (22.5)	C (19.6)	D (33.1)
2007 with Development						
Eastbound US Route 9	B (11.6)	B (12.2)	B (10.9)	B (12.0)	B (11.9)	B (10.9)
Southbound Murray's Lane	E (43.9)	E (43.8)	F (89.6)	E (44.7)	E (45.1)	F (89.6)
2007 with Development (Additional Right-Turn Lane on Southbound Murray's Lane Approach)						
Eastbound US Route 9	B (11.6)	B (12.2)	B (10.9)	B (12.0)	B (11.9)	B (10.9)
Southbound Murray's Lane	E (36.1)	E (37.9)	F (66.7)	E (36.7)	E (38.8)	F (66.8)
2014 without Development						
Eastbound US Route 9	B (11.0)	B (10.9)	A (9.4)	B (11.3)	B (10.6)	A (9.5)
Southbound Murray's Lane	D (27.8)	C (24.0)	E (46.7)	D (27.8)	C (24.0)	E (46.7)
2014 with Development						
Eastbound US Route 9	B (14.4)	C (17.0)	B (13.7)	C (15.1)	C (16.2)	B (13.9)
Southbound Murray's Lane	F (720.0)	F (958.1)	F (1496)	F (720.0)	F (958.1)	F (1496)
2014 with Development (Additional Right-Turn Lane on Southbound Murray's Lane Approach)						
Eastbound US Route 9	B (14.4)	C (17.0)	B (13.7)	C (15.1)	C (16.2)	B (13.9)
Southbound Murray's Lane	F (242.0)	F (211.0)	F (326.5)	F (245.4)	F (211.7)	F (327.6)
2014 with Development (No Pin Oak Access to Murray's Lane)						
Eastbound US Route 9	B (14.6)[14]	B (14.1)	B (12.6)[14]	C (15.3)	B (13.7)	B (12.7)
Southbound Murray's Lane	F (82.3)[14]	F (72.3)	F (477.7)[14]	F (77.3)	F (72.3)	F (621.5)

[12] For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.
[13] The TIS has used heavy vehicle percentages per movement. McCormick Taylor runs used heavy vehicle percentages per lane group. McCormick Taylor runs used 2% minimum heavy vehicle percentages where increases in volumes are projected.
[14] PHF values were corrected in order to be consistent with the minutes of the TIS scoping meeting.

Table 10
PEAK HOUR LEVELS OF SERVICES (LOS)
Based on Traffic Impact Study of East Side of Georgetown
Report Dated September, 2004
Prepared by Davis, Bowen & Friedel, Inc.

Signalized Intersection[15]	LOS per TIS			LOS per McCormick Taylor Review[16,17,18]		
US Route 9 & Murray's Lane	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
2007 with Development	B (0.89)[19]	D (0.95)	D (0.95)	B (0.85)	D (0.95)	E (1.00)
2007 with Development (Additional Left-Turn Lane on Eastbound US Route 9 Approach and additional Right Turn Lane on Southbound Murray's Lane Approach)[20]	N/A	N/A	N/A	B (0.84)	A (0.85)	D (0.94)
2014 with Development	F (1.05)	F (1.55)	F (1.46)	F (1.06)	F (1.58)	F (1.49)
2014 with Development (Additional Right-Turn Lane on Westbound US Route 9 Approach and Southbound Murray's Lane Approach)	F (1.04)	F (1.53)	F (1.45)	F (1.05)	F (1.60)	F (1.52)
2014 with Development (Improved)[21]	B (0.75)	D (0.95)	D (0.94)	B (0.65)	B (0.60)	B (0.65)
2014 with Development (Additional Left-Turn Lane on Eastbound US Route 9 Approach and additional Right Turn Lane on Southbound Murray's Lane Approach)[20]	N/A	N/A	N/A	F (1.04)	F (1.08)	F (1.16)

[15] For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.
[16] The TIS has used heavy vehicle percentages per movement. McCormick Taylor runs used heavy vehicle percentages per lane group. McCormick Taylor runs used 2% minimum heavy vehicle percentages where increases in volumes are projected.
[17] Signal cycle lengths and timings were developed based on feasible DelDOT signal operations.
[18] McCormick Taylor runs assumed coordinated signal operations at Burton Street, Murray's Lane, Sand Hill Rd / Airport Rd, and Racetrack Property Site Entrance on US Route 9 in 2014 with development case.
[19] PHF values were corrected in order to be consistent with the minutes of the TIS scoping meeting.
[20] McCormick Taylor analyzed a signalized option with an additional left-turn lane on eastbound US Route 9 and an additional southbound right-turn lane on Murray's Lane in cases with developments.
[21] The TIS examined inconsistent improvements in different peak hours. McCormick Taylor analyzed the improved condition with two through lanes in each direction on US Route 9, a eastbound left-turn lane on US Route 9, and a separate southbound right-turn lane on Murray's Lane for all time periods of the 2014 signalized option.

Table 11
PEAK HOUR LEVELS OF SERVICES (LOS)
Based on Traffic Impact Study of East Side of Georgetown
Report Dated September, 2004
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection[22]	LOS per TIS			LOS per McCormick Taylor Review[23]		
US Route 9 & Sand Hill Road / Airport Road	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
2004 Existing Conditions						
Eastbound US Route 9	A (9.4)	A (9.8)	A (9.0)[24]	A (9.6)	A (9.9)	A (9.0)
Westbound US Route 9	A (9.1)	A (9.9)	A (9.7)[24]	A (8.7)	A (9.5)	A (9.7)
Northbound Airport Road	E (37.9)	F (554.9)	F (87.2)[24]	E (40.9)	F (595.2)	F (90.7)
Southbound Sand Hill Road	F (51.7)	F (178.0)	E (35.7)[24]	F (52.2)	F (170.5)	E (38.9)

[22] For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.
[23] The TIS has used heavy vehicle percentages per movement. McCormick Taylor runs used heavy vehicle percentages per lane group. McCormick Taylor runs used 2% minimum heavy vehicle percentages where increases in volumes are projected.
[24] Volume was corrected to match the one in the TIS figure.

Table 12
PEAK HOUR LEVELS OF SERVICES (LOS)
Based on Traffic Impact Study of East Side of Georgetown
Report Dated September, 2004
Prepared by Davis, Bowen & Friedel, Inc.

Signalized Intersection[25]	LOS per TIS			LOS per McCormick Taylor Review[26,27,28,29]		
US Route 9 & Sand Hill Road / Airport Road	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
2007 without Development	C (0.72)	C (0.73)	C (0.69)[30]	C (0.72)	C (0.77)	C (0.71)
2007 with Development	C (0.84)	D (0.82)	D (0.80)	D (0.84)	D (0.81)	D (0.77)
2014 without Development	C (0.79)	C (0.74)	C (0.77)[30]	C (0.78)	D (0.79)	C (0.76)
2014 with Development	D (0.95)	D (0.95)	D (0.94)	D (0.94)	D (0.93)	D (0.89)
2014 with Development (Permissive Left only on Northbound Airport Road and Southbound Sand Hill Road Approaches)	D (0.90)	D (0.95)	D (0.95)	D (0.86)	D (0.93)	D (0.90)
2014 with Development (No Pin Oak Access to Murray's Lane)	N/A	N/A	N/A	F (1.04)	E (0.96)	E (0.94)
2014 with Development (No Pin Oak Access to Murray's Lane, Permissive left only on Airport Rd and Sand Hill Road Approaches)	N/A	N/A	N/A	E (0.96)	E (0.96)	D (0.93)

[25] For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.
[26] The TIS has used heavy vehicle percentages per movement. McCormick Taylor runs used heavy vehicle percentages per lane group. McCormick Taylor runs used 2% minimum heavy vehicle percentages where increases in volumes are projected.
[27] Signal cycle lengths and timings were developed based on feasible DelDOT signal operations.
[28] McCormick Taylor runs assumed coordinated signal operations at Burton Street, Murray's Lane, Sand Hill Rd / Airport Rd, and Racetrack Property Site Entrance on US Route 9 in 2014 with development case.
[29] McCormick Taylor runs used PHF 0.92 or higher for US Route 9 and Sand Hill Road approaches in projected cases.
[30] Westbound US Route 9 permissive left was coded in the TIS runs. McCormick Taylor analyzed the intersection with protected only operations for the westbound US Route 9 left-turn phase.

Table 13
PEAK HOUR LEVELS OF SERVICES (LOS)
Based on Traffic Impact Study of East Side of Georgetown
Report Dated September, 2004
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection[31]	LOS per TIS			LOS per McCormick Taylor Review[32,33]		
US Route 9 & BBC Properties (Georgetown East) Site Entrance	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
2007 with Development						
Southbound BBC Properties	C (20.0)	C (21.7)	C (19.1)	C (20.0)	C (21.7)	C (19.1)
2007 with Development						
Southbound BBC Properties	D (26.5)	D (32.1)	D (27.4)	D (26.5)	D (32.1)	D (27.4)

[31] For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.
[32] The TIS has used heavy vehicle percentages per movement. McCormick Taylor runs used heavy vehicle percentages per lane group. McCormick Taylor runs used 2% minimum heavy vehicle percentages where increases in volumes are projected.
[33] McCormick Taylor runs used PHF values calculated from the traffic count sheets for US Route 9 and Sand Hill Road / Airport Road intersection.

Table 14
PEAK HOUR LEVELS OF SERVICES (LOS)
Based on Traffic Impact Study of East Side of Georgetown
Report Dated September, 2004
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection[34]	LOS per TIS			LOS per McCormick Taylor Review[35,36]		
US Route 9 & Racetrack Property Site Entrance	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
2007 with Development						
Eastbound US Route 9	A (10.0-)	B (10.5)	A (9.5)	B (10.3)	B (10.5)	A (9.5)
Southbound Racetrack Property	D (32.1)	E (38.0)	D (32.1)	D (31.9)	E (35.5)	D (32.1)
2007 with Development (Additional Right-Turn Lane on Westbound US Route 9 and Southbound Racetrack Property's Approach)						
Eastbound US Route 9	N/A	B (10.5)	N/A	N/A	B (10.5)	N/A
Southbound Racetrack Property	N/A	D (29.4)	N/A	N/A	D (28.0)	N/A
2014 with Development						
Eastbound US Route 9	B (10.9)	B (12.5)	B (10.5)[37]	B (11.2)	B (12.5)	B (10.7)
Southbound Racetrack Property	F (154.8)	F (263.7)	F (165.3)[37]	F (152.4)	F (221.0)	F (232.8)
2014 with Development (Additional Right-Turn Lane on Westbound US Route 9 and Southbound Racetrack Property's Approach)						
Eastbound US Route 9	B (10.9)	B (12.5)	B (10.5)	B (11.2)	B (12.5)	B (10.7)
Southbound Racetrack Property	E (46.8)	F (84.5)	F (55.9)	E (46.3)	F (77.3)	F (71.4)

[34] For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.
[35] The TIS has used heavy vehicle percentages per movement. McCormick Taylor runs used heavy vehicle percentages per lane group. McCormick Taylor runs used 2% minimum heavy vehicle percentages where increases in volumes are projected.
[36] McCormick Taylor runs used PHF values calculated from the traffic count sheets for US Route 9 and Sand Hill Road / Airport Road intersection.
[37] PHF values were corrected in order to be consistent with the minutes of the TIS scoping meeting.

Table 15
PEAK HOUR LEVELS OF SERVICES (LOS)
Based on Traffic Impact Study of East Side of Georgetown
Report Dated September, 2004
Prepared by Davis, Bowen & Friedel, Inc.

Signalized Intersection[38]	LOS per TIS			LOS per McCormick Taylor Review[39,40,41,42]		
US Route 9 & Racetrack Property Site Entrance	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
2014 with Development	B (0.87)	F (1.19)	F (1.16)	B (0.75)	F (1.13)	F (1.13)
2014 with Development (Additional Left-Turn Lane on Eastbound US Route 9 Approach)	N/A	B (0.89)	C (0.92)[43]	C (0.82)[44]	B (0.78)	B (0.80)
2014 with Development (Additional Left-Turn Lane on Eastbound US Route 9 Approach, additional Right-Turn Lane on Westbound US Route 9 approach and Southbound Racetrack Property Approach)[45]	N/A	N/A	N/A	C (0.79)	B (0.74)	B (0.79)

[38] For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.
[39] The TIS has used heavy vehicle percentages per movement. McCormick Taylor runs used heavy vehicle percentages per lane group. McCormick Taylor runs used 2% minimum heavy vehicle percentages where increases in volumes are projected.
[40] Signal cycle lengths and timings were developed based on feasible DelDOT signal operations.
[41] McCormick Taylor runs assumed coordinated signal operations at Burton Street, Murray's Lane, Sand Hill Rd / Airport Rd, and Racetrack Property Site Entrance on US Route 9 in 2014 with development case.
[42] McCormick Taylor runs used PHF values calculated from the traffic count sheets for US Route 9 and Sand Hill Road / Airport Road intersection.
[43] Saturday signal phasing did not match afternoon peak signal phasing in the 2014 improved case. McCormick Taylor runs used consistent signal phasing.
[44] McCormick Taylor analyzed the signal operation for morning peak hour in 2014 with developments.
[45] McCormick Taylor analyzed a signalized option with an additional left-turn lane on eastbound US Route 9 and an additional southbound right-turn lane on Racetrack Property in 2014 with developments case.

Table 16
PEAK HOUR LEVELS OF SERVICES (LOS)
Based on Traffic Impact Study of East Side of Georgetown
Report Dated September, 2004
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection[46]	LOS per TIS[47]			LOS per McCormick Taylor Review[48]		
Sand Hill Road & Sussex County Senior Services (Cheer) Site Entrance (Clark Drive) / BBC Properties (Georgetown East) Site Entrance	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
2004 Existing Conditions						
Eastbound Clark Drive	A (9.2)	A (9.1)	A (9.8)	A (9.2)	A (9.1)	A (9.8)
Northbound Sand Hill Road	A (7.6)	A (7.4)	A (7.4)	A (7.6)	A (7.5)	A (7.4)
2007 without Development						
Eastbound Clark Drive	A (9.5)	A (9.1)	A (9.6)	A (9.5)	A (9.1)	A (9.6)
Northbound Sand Hill Road	A (7.7)	A (7.4)	A (7.4)	A (7.7)	A (7.5)	A (7.4)
2007 with Development						
Eastbound Clark Drive	B (10.6)	B (11.0)	B (11.4)	B (10.6)	B (10.8)	B (11.2)
Westbound BBC Properties	C (15.7)	C (23.1)	D (26.6)	C (15.1)	C (21.0)	C (23.2)
Northbound Sand Hill Road	A (8.0)	A (7.6)	A (7.7)	A (8.0)	A (7.6)	A (7.7)
Southbound Sand Hill Road	A (7.8)	A (8.2)	A (8.4)	A (7.7)	A (8.3)	A (8.4)
2014 without Development						
Eastbound Clark Drive	A (9.6)	A (9.2)	A (9.7)	A (9.6)	A (9.2)	A (9.7)
Northbound Sand Hill Road	A (7.7)	A (7.4)	A (7.4)	A (7.8)	A (7.5)	A (7.4)
2014 with Development						
Eastbound Clark Drive	B (11.9)	B (13.1)	B (13.5)	B (11.9)	B (13.1)	B (13.5)
Westbound BBC Properties	C (23.8)	F (66.5)	F (78.5)	C (23.1)	F (64.2)	F (69.8)
Northbound Sand Hill Road	A (8.4)	A (7.9)	A (7.9)	A (8.4)	A (7.9)	A (7.9)
Southbound Sand Hill Road	A (7.9)	A (8.7)	A (8.8)	A (7.9)	A (8.8)	A (8.9)
2014 with Development (Additional Right-Turn Lane on Westbound BBC Properties' Approach)						
Eastbound Clark Drive	N/A	B (13.1)	B (13.5)	N/A	B (13.1)	B (13.5)
Westbound BBC Properties	N/A	F (57.5)	F (64.3)	N/A	F (56.7)	F (58.4)
Northbound Sand Hill Road	N/A	A (7.9)	A (7.9)	N/A	A (7.9)	A (7.9)
Southbound Sand Hill Road	N/A	A (8.7)	A (8.8)	N/A	A (8.8)	A (8.9)

[46] For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.
[47] The TIS did not input the upstream signal data. McCormick Taylor included upstream signal data.
[48] The TIS has used heavy vehicle percentages per movement. McCormick Taylor runs used heavy vehicle percentages per lane group. McCormick Taylor runs used 2% minimum heavy vehicle percentages where increases in volumes are projected.

Table 17
PEAK HOUR LEVELS OF SERVICES (LOS)
Based on Traffic Impact Study of East Side of Georgetown
Report Dated September, 2004
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection[49]	LOS per TIS[50]			LOS per McCormick Taylor Review[51]		
Sand Hill Road & Sussex County Senior Services (Cheer) and Pin Oak Construction Site Entrance (Clark Drive) / BBC Properties (Georgetown East) Site Entrance	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
2007 with Development						
Eastbound Cheer/ Pin Oak	B (11.1)	B (11.2)	B (11.7)	B (11.0)	B (11.1)	B (11.5)
Westbound BBC Properties	C (16.1)	D (25.7)	D (30.3)	C (15.5)	C (23.3)	D (26.3)
Northbound Sand Hill Road	A (8.0)	A (7.7)	A (7.7)	A (8.0)	A (7.7)	A (7.7)
Southbound Sand Hill Road	A (7.7)	A (8.2)	A (8.3)	A (7.7)	A (8.1)	A (8.3)
2014 with Development						
Eastbound Cheer/ Pin Oak	B (14.5)	C (17.2)	C (17.6)	B (14.3)	C (17.6)	C (18.1)
Westbound BBC Properties	D (29.3)	F (170.9)	F (189.8)	D (28.5)	F (192.2)	F (195.2)
Northbound Sand Hill Road	A (8.2)	A (8.2)	A (8.1)	A (8.2)	A (8.2)	A (8.1)
Southbound Sand Hill Road	A (7.8)	A (8.3)	A (8.4)	A (7.7)	A (8.3)	A (8.4)
2014 with Development (Additional Right-Turn Lane on Westbound BBC Properties' Approach)						
Eastbound Cheer/ Pin Oak	N/A	C (17.2)	C (17.6)	B (14.3)[52]	C (17.6)	C (18.1)
Westbound BBC Properties	N/A	F (147.2)	F (156.0)	D (27.3)[52]	F (164.3)	F (158.5)
Northbound Sand Hill Road	N/A	A (8.2)	A (8.1)	A (8.2)[52]	A (8.2)	A (8.1)
Southbound Sand Hill Road	N/A	A (8.3)	A (8.4)	A (7.7)[52]	A (8.3)	A (8.4)

[49] For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.
[50] The TIS did not input the upstream signal data. McCormick Taylor included upstream signal data.
[51] The TIS has used heavy vehicle percentages per movement. McCormick Taylor runs used heavy vehicle percentages per lane group. McCormick Taylor runs used 2% minimum heavy vehicle percentages where increases in volumes are projected.
[52] McCormick Taylor analyzed the morning peak hour operation with an additional right-turn lane on BBC Properties approach in 2014 with development case.

Table 18
PEAK HOUR LEVELS OF SERVICES (LOS)
Based on Traffic Impact Study of East Side of Georgetown
Report Dated September, 2004
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection[53]	LOS per TIS[54]			LOS per McCormick Taylor Review[55]		
Sand Hill Road & Sussex County Senior Services (Cheer) and Pin Oak Construction Site Entrance (Clark Drive)	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
2014 with Development						
Eastbound Cheer / Pin Oak	B (13.4)	B (14.0)	B (13.7)	B (13.3)	B (14.1)	B (13.7)
Northbound Sand Hill Road	A (8.2)	A (8.2)	A (8.2)	A (8.2)	A (8.2)	A (8.2)

[53] For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.
[54] The TIS did not input the upstream signal data. McCormick Taylor included upstream signal data.
[55] The TIS has used heavy vehicle percentages per movement. McCormick Taylor runs used heavy vehicle percentages per lane group. McCormick Taylor runs used 2% minimum heavy vehicle percentages where increases in volumes are projected.

Table 19
PEAK HOUR LEVELS OF SERVICES (LOS)
Based on Traffic Impact Study of East Side of Georgetown
Report Dated September, 2004
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection[56]	LOS per TIS[57]			LOS per McCormick Taylor Review[58]		
Sand Hill Road & BBC Properties (Georgetown East) Site Entrance	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
2014 with Development (Separate Entrance for BBC Properties)						
Westbound BBC Properties	N/A	E (35.0+)	E (47.7)	N/A	E (37.5)	F (50.7)
Southbound Sand Hill Road	N/A	A (9.1)	A (9.2)	N/A	A (9.3)	A (9.5)
2014 with Development (Separate Entrance for BBC Properties with Additional Right-Turn Lane on Northbound Sand Hill Road Approach)						
Westbound BBC Properties	N/A	D (27.4)	D (29.1)	N/A	D (27.4)	D (27.0)
Southbound Sand Hill Road	N/A	A (9.1)	A (9.2)	N/A	A (9.3)	A (9.5)

[56] For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.
[57] The TIS did not input the upstream signal data. McCormick Taylor included upstream signal data.
[58] The TIS has used heavy vehicle percentages per movement. McCormick Taylor runs used heavy vehicle percentages per lane group. McCormick Taylor runs used 2% minimum heavy vehicle percentages where increases in volumes are projected.

Table 20
PEAK HOUR LEVELS OF SERVICES (LOS)
Based on Traffic Impact Study of East Side of Georgetown
Report Dated September, 2004
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection[59]	LOS per TIS			LOS per McCormick Taylor Review[60,61]		
Sand Hill Road & Pin Oak Construction Site Entrance	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
2007 with Development						
Eastbound Pin Oak	B (10.3)	A (9.8)	A (9.7)	B (10.3)	A (9.8)	A (9.7)
Northbound Sand Hill Road	A (7.8)	A (7.6)	A (7.6)	A (7.8)	A (7.6)	A (7.6)
2014 with Development						
Eastbound Pin Oak	B (11.9)	B (11.6)	B (11.4)	B (11.9)	B (11.7)	B (11.4)
Northbound Sand Hill Road	A (8.0)	A (8.0)	A (7.9)	A (8.0)	A (8.0)	A (7.9)

[59] For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.
[60] The TIS has used heavy vehicle percentages per movement. McCormick Taylor runs used heavy vehicle percentages per lane group. McCormick Taylor runs used 2% minimum heavy vehicle percentages where increases in volumes are projected.
[61] McCormick Taylor runs used PHF values calculated from the traffic count sheets for Sand Hill Road and Clark Drive Intersection.

Table 21
PEAK HOUR LEVELS OF SERVICES (LOS)
Based on Traffic Impact Study of East Side of Georgetown
Report Dated September, 2004
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection[62]	LOS per TIS			LOS per McCormick Taylor Review[63,64]		
Sand Hill Road and Racetrack Property Site Entrance	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
2007 with Development						
Westbound Racetrack Property	B (10.4)	B (10.9)	B (10.3)	B (10.4)	B (10.9)	B (10.3)
Southbound Sand Hill Road	A (7.5)	A (7.9)	A (7.7)	A (7.5)	A (7.9)	A (7.7)
2014 with Development						
Westbound Racetrack Property	B (11.6)	B (12.8)	B (12.0)	B (11.6)	B (12.8)	B (12.0)
Southbound Sand Hill Road	A (7.6)	A (8.3)	A (8.0)	A (7.6)	A (8.3)	A (8.0)

[62] For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.
[63] The TIS has used heavy vehicle percentages per movement. McCormick Taylor runs used heavy vehicle percentages per lane group. McCormick Taylor runs used 2% minimum heavy vehicle percentages where increases in volumes are projected.
[64] McCormick Taylor runs used PHF values calculated from the traffic count sheets for Sand Hill Road and Clark Drive Intersection.