Olivet Center

Town of Dover,
New York 10533

Lead Agency Town of Dover Planning Board

Applicant **Olivet Management**

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Table of Contents

1. Introduction 1
2. Site History 1
3. Proposed Redevelopment 3
4. Previous Approvals 11
5. Full-Build Impacts 12
6. Phase 1 Impacts 27

Appendices

A. Site Exhibits
B. Letter from Evans Associates, August 24, 2015
C. Capacity Analysis
D. Water and Wastewater Design Flow Calculations
E. Letter from Historical Perspectives Inc., September 1, 2015
F. Phase I Environmental Assessment by EBI Consulting, September 3, 2013
G. Landscape Master Plan by VHB, August 1, 2015

Environmental Assessment

1. Introduction

The purpose of this Environmental Assessment ("EA") is to present an analysis of the proposed Olivet Center, a planned expansion of Olivet University.

The current proposal is to implement Phase 1 of a nine phase development plan for the project site. Provided below is a discussion on the Full Build proposal and the Phase 1 proposal for comparison.

This EA also compares the Olivet Center plan to a previously approved plan, the Knolls of Dover, which included a conceptual plan for residential communities, a new town center and public facility uses.

The project site is located in the hamlet of Wingdale at the southern end of the Town of Dover in Dutchess County. The site consists of 513.75 acres within tax parcels 7159-00-162702, 7159-00-65920, and 7059-00-814768 which were previously part of the Harlem Valley Psychiatric Center (HVPC) campus. The HVPC and the Knolls of Dover proposal included over 850 acres of land on both the east and west sides of Route 22. The Olivet Center plan includes only the 513.75 acres on the east side of Route 22. Therefore, any comparisons between the Olivet Center plan and the Knolls of Dover plan only refers to land on the east side of Route 22.

2. Site History

Harlem Valley Psychiatric Center

The Harlem Valley Psychiatric Center (HVPC) opened in 1924 and was closed 70 years later when New York State decided to sell all its Department of Mental Hygiene facilities. The HVPC contained 83 principal and accessory structures totaling approximately 2.15 million square feet of floor area.

The majority of the buildings were constructed during the 1920's and 1930's, with some earlier construction closer to the turn of the century.

Operations at the HVPC peaked in the 1950's with 5,000 patients and 5,000 around-the-clock employees at the site and continued at that level until the State began downsizing the facility in the 1970's. At that time, the NYS Division for Youth (DFY) leased some of the emptied buildings from NYS Office of Mental Health. When the HVPC closed on February 1, 1994, the remaining patients and staff were transferred to other State facilities. The State decommissioned the majority of the buildings and those buildings have since remained vacant. DFY moved their operations from the property in March 2004. The HVPC was a major employer in the region, creating a 45 million dollar payroll loss for the region when it closed. Several original HVPC structures, including garages, barns and the dam gatehouse, have since been removed.

Knolls of Dover

The entire HVPC property, as well as an adjacent parcel, was sold to the Benjamin Companies, a real estate developer, in 2003. The Benjamin Companies proposed construction of a mixed-use community on the 937-acre site centering on the existing Metro-North train station. The conceptual site plan included 1,376 dwelling units in a variety of unit types, approximately 238,500 square feet of commercial space, and approximately 70,250 square feet of community facility or recreation center space.

Although this proposed plan received Comprehensive Development Plan and Conceptual Site Plan approvals by the Dover Town Board, the real estate market in the area was apparently not strong enough to support this development. In August 2013, Benjamin Companies sold the eastern half of the property to Olivet Management. The Benjamin Companies retains ownership of the western portion of the former HVPC property.

Current Uses On-Site

Uses that had long-standing arrangements with the State and remained after the HVPC closed have all subsequently been discontinued. These limited arrangements on the Project Site included: the NYS Department of Corrections' use of three I-buildings at the southern end of the property for temporary housing of correction officers in training; the use of the Our Lady of Solace Chapel managed by the Archdiocese of New York; and the operations at Haven House, a 25-person community residence run by the NYS Office of Mental Health.

Since Olivet Management purchased the site in 2013, it has obtained Town approval to use the former Haven House and the Chapel as those buildings were never vacant for more than a year. The former Haven House (building 118) is now known as the Bethany House and serves as a residence for guests and staff. The Chapel (building 107) was renamed the Immanuel Chapel and is used for religious services, office space and classroom space. Other limited site improvements, including refurbishment of the baseball field and its grandstands, construction of an amphitheater, and landscape maintenance, have been performed by Olivet.

The site also has an internal utility system that includes the dam and reservoir; a water filter plant and supply system with a 1 million gallon per day capacity; a sewage treatment plant with the capacity and SPDES permit for 1.2 million gallons per day; and an underground electrical service system with an on-site NYSEG substation. A network of paved and gravel roads provides access to these buildings and uses, as well as fire/emergency access to the more remote portions of the site. Exhibit 1, Existing Conditions, shows the current site features.

3. Proposed Redevelopment

The proposed plan includes redevelopment of the site, on the east side of Route 22, into Olivet Center, a fully functioning university campus with educational facilities, research and development business incubators, and partner organizations. The educational facilities will include classrooms, administrative offices, faculty facilities, recreation, cafeterias, dormitories, a library and other amenities offered on a typical university campus. The business and partner organizations will work in conjunction with Olivet Center to provide its students with hands-on learning experience.

Due to its previous use as a psychiatric center, the site is already established as a stately campus with large brick buildings surrounded by open space, recreational facilities, and an internal network of sidewalks, roadways and driveways, as well as a large area left as natural open space in the eastern portion of the site. As much as feasible, Olivet plans to adaptively reuse the existing buildings and campus layout. Of the 54 existing buildings on the site, 33 are presently proposed to be rehabilitated and reused. A shed (building 99) and a garage (building 45) are proposed to be demolished. The two former medical buildings (buildings 85 and 1) may be reused at a future date if market conditions and building conditions warrant it, or they may be demolished during the final phase of the full build plan. The remaining 17 buildings will be either rehabilitated and reused or demolished and rebuilt in-kind due to poor structural conditions. Two new maintenance buildings, one new staff home, one new electrical substation, one new field house, and 13 new student dormitories, totaling approximately 613,140 square feet of new construction, are proposed to be built on the site. These new buildings will mostly be constructed in previously disturbed areas of the campus.

New parking lots are proposed to be constructed throughout the site to accommodate students, staff and visitors. The existing water supply system located on the site will be rehabilitated and expanded as necessary to serve the new uses. The existing off site wastewater treatment plant, owned and operated by Knolls of Dover, is proposed to be rehabilitated at the existing location west of Route 22. The rehabilitated treatment plan will maintain the current discharge point to the Swamp River. The existing storm water management system will be enhanced and expanded to provide water quality improvements and storm water detention for any new impervious areas of development or reconfiguration. New electrical service for the site will require establishment of a

new substation at the north end of the site and extension of a new service loop south into the campus.

As for heating and cooling, for Phase 1 individual building systems with dedicated fuel tanks will be utilized in the short term. For subsequent phases, Olivet will be exploring additional options for providing campus wide heating and cooling including establishment of a new central plant, centralized propane farm and/or extension of gas supply from the Iroquois natural gas transmission line to the northeast.

The undisturbed eastern portion of the site, which contains environmentally sensitive areas such as wetlands and steep slopes, will continue to be undisturbed natural open space.

Proposed Project Phasing

The proposed plan contemplates nine phases in redeveloping the site into the Olivet Center. These different phases and the uses proposed with each are described below and shown on Exhibit 2, Phasing Plan. The three general uses that are proposed for the site include: education, business and partner organizations. See Exhibit 3, Campus Land Use. Education uses envelop all typical components of a college campus such as: classrooms, offices, dining facilities, student recreation, libraries, housing for students and staff, and assembly spaces.

Business uses envisioned for the Olivet Center involve research and development companies that would work in collaboration with the university and would likely be started by Olivet alumni or staff. These companies would provide business incubator training for students. Partner organizations are those that work regularly with Olivet in sharing research, resources, and providing additional educational opportunities and training for students. Partner organizations include the World Evangelical Alliance (WEA) and World Evangelical Theological Institutes Association (WETIA). All business and partner organization uses would be geared toward student education, training and development and would, for zoning purposes, be considered as educational uses.

The shift in use to an educational facility serving resident and commuter populations is a departure from the previous facility design which accommodated a resident population that had minimal opportunities for external movement and community interaction. Retaining the attractive campus character of the site, while accommodating a more active use, is a high priority for the Olivet Center.

The phasing plan was developed based on a variety of factors, including:

1. Timing of demand for various uses;
2. Desire to maintain an appropriate mix of uses from the initial phase;
3. Location and condition of infrastructure;
4. Condition of buildings;
5. Provision of appropriate parking accommodations for residents and commuters;
6. Improved facility circulation and access to adjacent roadway network; and,

7. Improvement of pedestrian circulation on site and to the train station.

Building on these factors will help to ensure that the campus evolves in an efficient manner, supporting overall viability. The following table describes the proposed uses in each of the nine phases.

Table 1
Project Phasing

Phase	Building Number	Proposed Use	Square Feet	Existing Footprint	Proposed Footprint
1	2	488 Seat Dining Facility	25,024	12,766	12,766
1	3	Partner Organization Office Building	69,025	17,562	17,562
1	10	Campus Ministry (office / classroom)	17,378	7,767	7,767
1	11	Dormitory	20,830	7,402	7,402
1	12	Dormitory	20,458	5,786	5,786
1	14	WEA - Partner Organization Office	25,752	9,176	9,176
1	15	Baseball Grandstand	3,500	3,447	3,447
1	17	Partner Organization Office Building	51,296	12,457	12,457
1	18	Daycare Facility	16,282	5,880	5,880
1	19	Business Incubator / Research	35,996	9,636	9,636
1	21	Primary School (K - 12)	50,935	12,986	12,986
1	23	University Administrative Building	23,853	8,157	8,157
1	33	Family Center	10,924	4,159	4,159
1	35	Assembly Hall (Smith Hall)	49,106	15,381	15,381
1	43	100 Seat Dining Facility (enlarge structure)	5,000	660	5,000
1	46	Staff Residence	5,040	2,475	2,475
1	79*	Entrance Guard Office	600	260	600
1	91	Staff Single Family Home	2,178	1,198	1,198
1	92	Staff Single Family Home	2,178	1,226	1,226
1	93	Staff Single Family Home	2,399	1,761	1,761
1	107	Chapel (Theology Studies)	29,220	10,617	10,617
1	118	Bethany House - Residence	14,000	6,211	6,211
1	119	Temporary Construction Storage	4,302	4,302	4,302
1	134*	Storage Shed	800		800
2	20	Business Incubator / Research	35,996	9,810	9,810
2	26	Classrooms (Architecture, Engineering Music)	137,100	35,984	35,984
2	47	Staff Garage	640	739	739
2	67	Staff Apartments (2-Story)	10,600	5,300	5,300
2	68	Staff Home (relocate due to Electric Substation)	3,460	1,124	1,200
2	69	Staff Home (relocate due to Electric Substation)	3,200	536	1,200
2	120*	Dormitory	78,300		26,100
3	24	Student Union / Library / Bookstore	73,174	38,170	38,170
3	27	Classrooms (Education, Language, Theology)	137,100	35,887	35,887
3	95	Staff House	1,200	1,459	3,146
3	128*	Dormitory	34,800		11,600
3	129*	Dormitory	34,800		11,600
3	130*	Dormitory	34,800		11,600
3	135*	Maintenance Building	2,400		2,400
4	7	Staff Home	3,240	892	892
4	8	Staff Home	3,240	1,029	1,029

4	9	Staff Home	3,240	530	530
4	13	5 Family Staff House	5,396	3,284	3,284
4	25	Classrooms (Business & Journalism)	137,100	36,155	36,155
4	28	Classrooms (Art, Design, & IT)	137,100	35,341	35,341
4	31	Business Incubator/Research	29,294	8,020	8,020
4	32	University Office Building	29,294	8,006	8,006
4	94	Staff House (relocate due to Athletic Fields)	1,200	1,493	1,493
4	136*	Field House	17,190		17,190
5	121*	Dormitory	47,850		15,950
5	122*	Dormitory	47,850		15,950
5	123*	Dormitory	47,850		15,950
6	29	Business Incubator/Research	29,294	8,006	8,006
6	30	Business Incubator/Research	29,294	8,021	8,021
6	36	Staff Home	3,160	1,606	1,606
6	37	Staff Home	3,210	1,043	1,043
6	38	Staff Home	5,540	1,895	1,895
7	45	Garage to be demolished			
7	99	Shed to be demolished			
7	131*	Dormitory	34,800		11,600
7	132*	Dormitory	34,800		11,600
8	124*	Dormitory	47,850		15,950
8	125*	Dormitory	47,850		15,950
8	126*	Dormitory	47,850		15,950
8	127*	Dormitory	47,850		15,950
8	TBD	Future Staff Housing	TBD		
9	1	Education (future Medical College)	64,964	17,881	17,881
9	85	Education (future Medical College)	211,012	28,465	28,465
		Total	**2,096,915**	**421,620**	**643,374**
	70	Filter House – Water System	2,590		
	71	1 Million Gallon Clear Well			
	72	Aerator – Water System			
	73	Water Tank – Water System			
	77	Pump House – Water System			
	133*	NYSEG Substation	4,300		
	TBD	Waste Water Treatment Plant	TBD		

* New structure to be constructed.

Phase 1

The first phase of redevelopment focuses on Hutchinson Avenue and on establishment of Olivet Center in the region. It follows a logical development of utilities and incorporates two of the buildings that do not need extensive rehabilitation (Bethany House and Immanuel Chapel). All proposed uses, including classrooms, university administrative offices, dormitories, dining, staff housing, recreation, and business and partner organizations, are incorporated in the first phase which allows Olivet Center to establish a firm base of operations from which to grow. During this first phase temporary structures and facilities would be established off Hutchinson Avenue to support construction and provide additional office and classroom uses while existing buildings are being reconstructed. Existing building 119 will be temporarily reused for construction storage. New buildings proposed for Phase 1 are a small storage shed proposed by the reservoir, a guard office to

be located by the main entrance, and a guard shack also by the main entrance between the incoming and outgoing lanes to monitor and direct access.

The core of Phase 1 is Immanuel Chapel (building 107). Immanuel Chapel is located towards the center of the site and provides a spiritual anchor for Olivet Center. In this first phase, Immanuel Chapel will be used for assembly and religious purposes as well as theology studies. Building 10, a former garage tucked behind the Chapel, will be used for as the Campus Ministry office, including some classrooms.

Bethany House (building 118), the newest structure on the site, most recently functioned as Haven House, a State-operated Community Residence. It will be repurposed for staff or temporary housing. Just north of Bethany House, buildings 46, 91, 92, and 93 are planned for staff housing. Building 46 will be renovated and buildings 91, 92, and 93 will be demolished and rebuilt in-kind.

Buildings 11 and 12 will be used as student dormitories. The recently refurbished ballfield and grandstand are located behind these buildings and the new amphitheater is located on the other side of Hutchinson Avenue just south of these buildings. A soccer field and tennis courts are proposed behind these dormitories. Easy access to these recreation areas and the rest of the campus, as well as views of the hilly open space on the other side of Hutchinson Avenue, make buildings 11 and 12 well suited for student dormitories. These dormitories are also within close walking distance to the proposed dining facilities on the campus.

Buildings 43 and 2 are both proposed as dining facilities. Building 43 is located on Wheeler Road. It will be demolished and rebuilt in the same style but shifted in location and larger to accommodate a 100 seat dining facility for students and staff. Building 2 is located on Hutchison Avenue and flanked by buildings 17 and 3. These three buildings are among the older buildings on the site and the only three with marble foundations, making them a stately presence on the ridge on the east side of Hutchinson Avenue. Building 2, formerly a kitchen and dining facility for HVPC, will be reused as a 488-seat dining facility for the campus.

Phase 1 includes office and assembly space for partner organizations through reuse of buildings 14, 17 and 3. These buildings are all located on Hutchinson Avenue with close proximity to the chapel and building 35, which will provide assembly space for the campus. The Partner Organizations and Business Incubator space will provide research and development in collaboration with the university alumni or staff. Space will also be provided for business incubator training for students sharing research, resources, and providing additional educational opportunities for students. All business and partner organization uses would be geared toward student education, training and development and would, for zoning purposes, be considered as educational uses.

Building 35 is located on the western side of Hutchinson Avenue near the center of the campus and is easily accessible from all other areas of the campus. It was previously called Smith Hall and used as an assembly center for the HVPC. Olivet Center proposes to reuse this grand hall as an assembly

space, with occupancy of approximately 845 people, for conferences, meetings, lectures, and other special events.

Buildings 21, 23 and 19 are also included in Phase 1. These buildings are prominently located on Route 22 and will provide a community presence for the Olivet Center. Building 21 will be reconstructed into a private primary school serving grades pre-kindergarten through 12, although in Phase 1 the building is anticipated to only include elementary students with additional grades added in subsequent phases. The building's location on Wheeler Road, just past the campus entrance, is ideal for this use. A small guard office will be constructed in the parking lot of the school at this main entrance. The office will be built in the same location as a previous guard shack (building 79).

Building 23, also called the Administration Building, will be used for university administration. Given its prominence on campus and its proposed use, this building will become one of the focal points for the campus. Building 19, located south of the Administration Building, is one of six distinct I-shaped buildings in the southwestern corner of the site. It will be used for incubator and research businesses that would complement Olivet's academic programs.

On the southern portion of the site off Hutchinson Avenue, buildings 18 and 33 will be reused as a daycare facility and family center, respectively. These facilities will be provided to support the families of Olivet's students and staff.

Lastly, this phase will also provide a small picnic and passive recreation area by the existing reservoir in the eastern portion of the site. A new storage shed (building 134) will be built and will likely contain maintenance storage along with kayaks and canoes for student and staff use.

Phase 2

Phase 2 expands on Phase 1 with steady growth of the various educational uses. The largest buildings on the site, other than the former hospital, are the four H-shaped buildings (buildings 25, 26, 27, and 28) located in the heart of the campus. These buildings will eventually form the core of the university with each building hosting a different school of instruction. In Phase 2, building 26 will be rehabilitated for classroom use and other uses such as staff offices, study areas and student and staff amenities, with a capacity of 457 people. In the future, this building will house the architecture, engineering and music departments.

In the southwest corner of the site is building 20 which will be used for more business incubator/research enterprises. This is the first visible building when traveling north on Route 22, therefore, rehabilitation of this building in Phase 2 will show steady progression of the Olivet full build plan.

In the northern portion of the site, additional staff housing will be built during this phase. Building 67 will be rebuilt with a second story into staff apartments for 24 occupants. Serving building 67 is

building 47 which will be reused as a garage. Buildings 68 and 69 resemble single-family homes that were previously used as staff housing. Due to poor condition and the need to construct an electrical substation in this location, these houses will be demolished and rebuilt to the south of their current location, just north of building 93. Behind these residences, a community garden and landscape nursery will be established in a previously farmed area.

The university's first new building, a student dormitory, building 120, will be constructed during Phase 2, in a previously disturbed location just north of building 11. This new dormitory will be approximately 78,300 square feet with occupancy for 261 people. A parking lot will also be built next to the dormitory.

Phase 3

Phase 3 includes expansion of classroom space with the reconstruction of building 27, one of the 137,100 square feet H-shaped buildings. This building will house the education, language and theology programs. Just south is building 24, a large X-shaped building located in the center of the proposed classroom buildings. Building 24 will contain a student union, library and bookstore, all key staples of a university campus.

With the additional classroom space and student amenities comes the need for more student dormitories. Three new dormitories are proposed for the east side of Hutchinson Avenue, near the terminus of Wheeler Road. Buildings 128, 129, and 130 will each be approximately 34,800 square feet with a capacity for 116 occupants. These buildings are to be constructed on a previously disturbed section of the campus.

At the northern portion of the site, a new two-family staff home, building 95, will be constructed just south of the Bethany House residence. And, behind building 95 further down the gravel access road, a 2,400 square foot maintenance facility will be constructed (building 135).

Phase 4

Phase 4 further develops the southern portion of the site. More classrooms will be added in buildings 25 and 28, the remaining H-shaped buildings. Building 25 will house the business and journalism programs while building 28 will contain the art, design and IT schools.

Just south of the H shaped buildings are the I shaped buildings 31 and 32. Building 31 will be reused as business incubator and research offices. Building 32, which is located closer to the classrooms in the H shaped buildings, will become a university office building.

Buildings 7, 8, and 9, located east of Hutchinson Avenue, are smaller buildings resembling single-family homes. These will be rebuilt for staff housing. Building 13 is located in the same area but is a larger structure that will also be utilized as staff housing with five housing units.

This phase also focuses on a small area on the northeast side of Hutchinson Avenue. A new field house for recreation will be constructed (building 136) to complement the outdoor recreational facilities proposed on the opposite side of Hutchinson Avenue to the south. Building 94, an existing house just north of building 136, will be rebuilt for staff housing.

Phase 5

Now that the proposed development plan is more than half-way implemented, phase 5 will start the dismantling of some of the temporary uses established in Phase 1. Three new dormitory buildings will be constructed on the east side of Hutchinson Avenue, near the terminus of Wheeler Road, where the temporary parking, construction staging and university office and classrooms were located. Each of these three new structures, buildings 121, 122, and 123, will be approximately 47,850 square feet with a capacity of 160 people. The existing roadway located east of this area will be relocated to the east to accommodate this construction.

This phase also includes construction of a parking lot for long term parking and special events. The lot will be located off of the gravel roadway that provides access to the far eastern portion of the site.

Phase 6

Phase 6 returns to rehabilitation of existing buildings in the southern portion of the site. Buildings 29 and 30 are both I shaped buildings to be reused as business incubator and research offices, each 29,294 square feet with capacity for 195 people. The rehabilitation of these buildings completes the proposed development of business uses on the site.

Buildings 36, 37 and 38 are single-family homes located on the western side of Hutchinson Avenue. These will be rebuilt as single-family staff residences. This phase will complete the development of staff housing.

Phases 7 and 8

These phases feature construction of more student dormitories. It is envisioned that six new dormitory buildings will be built with additional capacity for 872 occupants. Phase 7 proposed buildings 131 and 132 will each be 34,800 square feet. Access to these buildings is via the roadway that leads to the former psychiatric center medical buildings. These two dormitories are to be constructed within a previously disturbed area which currently contains a shed (building 99) and a garage (building 45), both of which will be demolished. Phase 7 further includes construction of open athletic fields behind the proposed field house, building 136, constructed in Phase 4.

The final four dormitories proposed for the campus will be constructed in Phase 8. Buildings 124, 125, 126, and 127 will be built behind dormitory buildings 121, 122 and 123. These new dormitories will also each be 47,850 square feet. New site disturbance, including moving the current roadbed (Westchester Road) to the east, is necessary to complete this phase. If necessary, Phase 8 would also include construction of a new staff housing building with 12 units. This building would be located east of buildings 91, 92, 93, and 118. It is not currently anticipated that Olivet will need the additional staff housing, however, the land has been set aside in case this housing is eventually needed.

Phase 9

Phase 9 includes potential reuse of buildings 1 and 85. Building 85 was originally constructed as a hospital with nine stories and over 200,000 square feet. Although one of the newer buildings on the campus, built in 1964, it has sustained substantial water damage, which may prohibit reconstruction. If feasible, Olivet Center may consider reusing these buildings for additional educational use, including a medical school and hospital.

Also in this phase, existing building 119, which will be reused temporarily for construction storage from Phase 1, will be permanently refurbished as the campus computer server building.

4. Previous Approvals

The previous development plan for the site, Knolls of Dover, had received various approvals, all of which have now expired. Provided below is a description of the Knolls of Dover project and a comparison of the impacts anticipated from that project and those of the proposed Olivet Center.

The previous plan for the site, Knolls of Dover, envisioned a comprehensive redevelopment of the former Harlem Valley Psychiatric Center property and an adjacent parcel, a land area totaling 973 acres. The approved Master Plan for the site included a mixed-use community centering on the existing Metro-North train station and exhibiting traditional neighborhood design principles. The overall development program included 1,376 dwellings in a variety of unit types, approximately 238,500 square feet of commercial space, and approximately 70,250 square feet of community facility or recreation center space.

The Dover Town Board granted Conditional Final Site Plan Approval for the Knolls of Dover Project, Conditional Final Subdivision Approval for Phase 1A of the Project, and Chapter 65 Approval for the Phase 1A on June 29, 2011. The Town approvals for the Knolls of Dover application have since expired. Any development on the west side of the former HVPC property, whether associated with the Knolls of Dover or not, would be subject to applicable SEQRA regulations and would need to obtain all relevant municipal approvals.

Knolls of Dover development specifically proposed for the east side of the former HVPC property, or the Olivet Center Site, included a new town center area located across from the Metro North train station with higher density residential, commercial and community facility uses. New residential neighborhoods were proposed north and east of the new town center. Total proposed development on the east side of the Knolls of Dover site included: 1,010 residential units with a mix of single-family homes, townhomes, and apartments, 251 of which would have been age-restricted; 164,000 square feet of commercial space; and, 87,100 square feet of community facility space.

Where Knolls of Dover impacts are discussed below, only impacts to the east side of the former HVPC site (the Olivet Center site) are presented. The source of information for the Knolls of Dover project are the accepted Draft and Final Environmental Impact Statements and Findings Statement.

5. Full Build Impacts

5.1 Consistency with Community Plans

Land Use

The predominant land uses surrounding the site include residential uses, open space, and commercial uses with some public and industrial uses. The residential uses are mostly single family houses, however, there are areas with apartment buildings and two- and three-family homes. Mobile home parks are located to the south of the site.

The proposed project would introduce a new use, college campus, to the area. This use, however, is compatible with surrounding existing uses. No new buildings would be constructed near existing off-site uses.

The Knolls of Dover would have also been compatible with local land uses. The new town center would have been located along Route 22 and the proposed residential uses would have been located in neighborhoods off the main road.

Zoning

The project site is located within multiple zoning districts: Commercial/Industry/Office-Mixed Use (CO); Hamlet Mixed Use (HM); Hamlet Residential (HR); and Rural (RU). Educational uses are permitted by special permit issued by the Planning Board in all four districts that apply to the site (Section 145-10.B.). The site is also located within the Mixed-Use Institutional Conversion

Overlay District (MC) which was created to facilitate redevelopment of the former Harlem Valley Psychiatric Center site as a mixed-use community. Two other overlay districts apply to various portions of the site: Floodplain Overlay District (FP) and Stream Corridor Overlay District (SC). The FP Overlay District restricts construction in the 100-year floodplain and the SC Overlay District requires watercourse setbacks and additional review scrutiny within 150 feet of the Swamp River and other New York State Department of Environmental Conservation (NYSDEC) streams.

As per Section 145-10 of the Zoning Law, the project's proposed uses are all permitted by either special permit or site plan approval.

In contrast, the Knolls of Dover plan required zoning text and map modifications to the MC Overlay District which were adopted by the Town Board on May 12, 2010.

Town of Dover Master Plan

The Town of Dover Master Plan, created in 1993, seeks to reinforce the traditional settlement pattern in the Town and preserve the Town's natural features and scenic beauty. The Olivet Center plan would preserve community values, historic resources, and natural features. It would also provide adaptive reuse of the existing buildings on the site, another goal of the Town's Master Plan. The Town's Master Plan recommends reuse of the site for a hamlet center with public facilities, commercial uses and residential areas. While the reuse of the site for a university is not what was envisioned for the site, it still satisfies many elements of the Town's Master Plan. The proposed plan will preserve the site's natural and historic resources with minimal impacts to land and will create a significant employment opportunity in the region.

The Knolls of Dover plan also would have been consistent with the Town's vision for the site. Market conditions, however, could not sustain the project.

Demographics

At its full build-out, the Olivet Center would have a site population of approximately 3,600 people. It is estimated that 80% of students will live on campus and the remaining 20% of students will commute. University staff will total approximately 500 employees while the partner organizations would have approximately 200 staff members. The pre-kindergarten to 12th grade private school is expected to have an enrollment of approximately 210 students with 42 staff members.

Table 2
Olivet Center Site Population

Description	Classification	Quantity
University Dormed Students (80%)	Dormed Student	2,000
University Day Students (20%)	Day Student	500
University Staff (1 staff / 5 students)	Staff	500
Resident Staff Families	Resident	156
Partner Organization/Incubator Business	Staff	200
K-12 Primary School Students	Day Student	210
K-12 Primary School Staff	Staff	42
Total		**3,608**

An increase of approximately 2,156 residents at full-build represents a 25% increase in the Town's current population of 8,643 (U.S. Census, 2009-2013 American Community Survey 5-Year Estimates). The new residents will be phased in gradually over the course of 20 to 25 years. In the first phase of development, there will be 126 students and staff living on the site. New dormitories and staff housing will be added in each subsequent phase.

The Knolls of Dover, in comparison, expected a residential population of approximately 2,560 from the development proposed on the east side. These residents would have been phased in over approximately 10 years. This plan would have also included approximately 515 employees from the proposed commercial development.

5.2 Visual Conditions

The Olivet Center plan seeks to retain and improve as much of the current visual conditions as feasible. Many elements within the existing campus landscape contribute to the 'park' like feel of the campus, most importantly the change in topography, open lawns defined by large shade trees and the native woodlands. The open areas consist of ground plane of lawn that are framed by a canopy of trees, roads and parking, buildings and woodlands. They are mainly located in the center of the campus property along Route 22.

The buildings located along the east side of Route 22 will all be rehabilitated and reused. All of the larger buildings that are visible from Route 22 will also be rehabilitated and reused. A small guard shack (building 79) is proposed to be

constructed at the entrance to the site on Wheeler Road. This building, however, will use the same approximate location and footprint as a previous guard shack that had existed here. The other proposed new buildings will be located on Hutchinson Avenue. The east side of Hutchinson Avenue is higher in elevation that the west, so the new buildings will be visible from Route 22. The new buildings will be designed in a way to preserve the existing campus character and to ensure that the size and architecture of the new buildings compliments the existing institutional buildings.

Access to and throughout the site will remain the same, although some roadways will be widened and driveways will be added. The large mature trees that line the roadways will remain where feasible. The current campus landscaping will be improved with additional plantings and regular maintenance. However, some portions of the large lawn along Route 22 may be paved to accommodate parking. A landscaped buffer will remain directly along Route 22 and planting strips will be incorporated into the parking lots. Although new parking lots will be required throughout the site, landscaping that emulates the existing campus character will be incorporated into all new designs. It is the intention of the Olivet Center full build plan to preserve the current campus views from Route 22 and the Metro North train while serving the new educational uses on the site.

The forested hillside on the eastern portion of the site and the wetland areas on the northern portion of the site adjacent to Route 22, will both remain undisturbed and left to their natural state.

A Landscape Master Plan (see Appendix G) has been drafted for the site and provides a wide approach to integrating the site conditions: slopes and topography, geology, vegetation (wetlands, woodlands, grasslands), pedestrian and vehicular circulation, and the proposed building program. Implementation of this plan allows for new and refreshed use of the campus while preserving the attractive, historic and functional elements that create a comprehensive campus.

The Knolls of Dover project, in contrast, would have significantly altered views along Route 22 and the current campus character. The project would have retained some of the former HVPC buildings along Route 22, including buildings 19, 20, 21, and 23 and the large landscaped buffer between Route 22 and Brewster Drive would have been mostly retained. The rest of the current campus area, however, would have been demolished and replaced with residential communities and a town center with mixed uses including a grocery store and other commercial and public facility uses. The character of this area, therefore, would have changed from institutional campus to residential community and town center.

5.3 Natural Resources

Steep Slopes

The site slopes up to the east, so the views from Route 22 show a relatively flat main campus with forested slopes as a backdrop. The western portion of the site, as well as the existing wetlands area, is fairly level with slopes less than 15 percent. In general, elevations range from 420 feet to 520 feet. In the middle of the site, to the west of the existing wetlands and east of the campus, the grades quickly rise in a swath of land with 15% and greater slopes. In general, elevations range from 520 feet to 940 feet.

The proposed full build project will result in the disturbance of limited steep slope areas beyond the previous disturbed site area. Dormitory buildings 124 through 132 are proposed to be placed to the east of Hutchinson Avenue on the slope extending into the existing tree line. The proposed Long Term Parking Area east of Hutchinson Avenue will be placed on a sloped area within an existing clearing which will result in disturbance of steep slopes. Also, proposed staff housing to the east of buildings 118, 91, 92, and 93 would also result in the impact of steep slopes. The total steep slopes to be disturbed outside of the existing area of disturbance is 18 acres.

Areas of steep slope disturbance will be mitigated by utilizing retaining walls, stabilized slope treatments and storm water management techniques to ensure preservation of adjacent steep slope areas. Regraded areas will be stabilized with pavement, vegetation or other stabilization techniques to minimize erosion.

The former Knolls of Dover project would have impacted approximately 52 acres of steep slopes.

Vegetation and Wildlife

Based on the attached letter presented in Appendix B, The Biological Assessment Report prepared by Evans Associates in 2013 for the Knolls of Dover project is still valid for the Olivet project.

Since the 2013 letter from the United States Fish and Wildlife Service (US FWS), the northern long-eared bat (Myotis eptentrionalis) was added as a threatened species under the Endangered Species Act on May 4, 2015. In addition, a review letter from the US FWS on the 2013 report recommended protection of the eastern small-footed bat (Myotis leibii), which is currently listed as a Species of Special Concern in New York State.

Based on this survey, it is assumed that suitable summer habitat is present on the site for these species, and a variety of conservation measures were proposed in the

Biological Assessment Report to avoid or minimize impacts to these bat species. The recommended conservation measures guidance from Appendix D of the US FWS Northern Long-eared Bat Interim Conference and Planning Guidance document, published January 6, 2014, is consistent with the recommendations made in the Biological Assessment Report for the Indiana bat. The measures outlined in the Biological Assessment Report will be implemented to avoid potential significant adverse impacts to endangered, threatened or special concern species on the site.

Wetlands

The subject site contains 31 wetlands, including a reservoir and several associated streams and drainage channels. In total, the wetlands add up to approximately 60 acres, approximately 12% of the site. Of the 31 wetlands, 25 are regulated by the US Army Corps of Engineers (USACOE) and nine are regulated by the New York State Department of Environmental Conservation (NYSDEC). The largest wetlands on the site are Wetland U (18.88 acres) located adjacent to Route 22; Wetland GG (12.33 acres), which includes the reservoir and is located in the eastern portion of the site; and Wetland VV (14.15 acres) located east of the reservoir. The site drains to the Swamp River which flows north to the Tenmile River which is a tributary to the Housatonic River.

The proposed project is not anticipated to impact any wetlands. A wetland buffer, however, will be impacted due to construction of a storage shed and minor site regrading to serve a proposed recreation area near the reservoir. The shed will be constructed within the buffer area so that it can be accessible from an existing trail. Constructing the shed outside of the buffer would require additional environmental impacts due to the existing slopes and forests in this area of the site. Any necessary permits for encroachment in the wetland buffer will be obtained and mitigation will be performed as required.

The Knolls of Dover project, in contrast, would have impacted approximately 1.7 acres of wetlands (USACOE and NYSDEC regulated) and approximately 0.8 acres of wetland buffers (NYSDEC regulated).

5.4 Traffic

A trip generation comparison was conducted to compare the trips generated from the proposed project to the trips generated by the previously approved Knolls of Dover project. This comparison, provided in Table 3 below, indicates that the Olivet

Center will result in significantly fewer site generated trips than the previously approved Knolls of Dover development.

Table 3
Trip Generation Comparison

Development	AM Peak Hour New Trips	PM Peak Hour New Trips	Saturday Peak Hour New Trips
Approved Knolls of Dover Project (1)	795	1293	1291
Olivet Center	590	744	347
Reduction in Trips (% reduction)	***-205 (-26%)***	***-549 (-42%)***	***-944 (-73%)***

(1) Approved project trip generations are from Table 10 from the *Knolls of Dover Statement of Findings*, accepted May 12, 2010

To determine whether the reduction in development trips would require the same level of mitigation that was identified for the approved Knolls at Dover project, new traffic counts were conducted and No-Build and Build traffic volumes developed for the Full Buildout condition for the Olivet Center development. Capacity analyses were then performed for each analysis condition for the AM and PM peak hours to assess future traffic operating conditions with and without the proposed project and to identify the mitigation measures required, if any. The capacity analyses are provided in Appendix C and summarized below.

At the Route 22/55 intersection with Wheeler Road, the mitigation previously required for the Knolls of Dover project included construction of a separate left-turn lane and a separate right-turn lane on each approach of Route 22/55 and a separate left-turn lane on both Wheeler Road approaches. For the Full Buildout condition, capacity analyses indicates less mitigation is required than for the previous project.

The Full Buildout mitigation for Olivet Center consists of northbound and southbound left-turn lanes and a northbound right-turn lane on Route 22/55 and a westbound left-turn lane on Wheeler Road. The previously identified southbound right-turn lane and westbound left-turn lane are no longer required. With this mitigation, under the Full Build-out condition, the intersection will operate at acceptable level of service "C" during each peak hour.

At the Route 22 and Pleasant Ridge Road intersection, the mitigation previously required for the Knolls of Dover project included signal timing modifications. Capacity analyses for the Full Buildout condition for the Olivet Center project indicate that the intersection will operate at good levels of service (LOS "B") during each peak hour with the existing signal timings.

Therefore, it can be concluded that the proposed Olivet Center development will generate significantly fewer trips than the approved Knolls at Dover project and will require less mitigation at the key intersections. Acceptable operating conditions will prevail during the Full Buildout condition.

5.5 Parking

It is anticipated that the campus at full build will be predominantly a resident campus with 80 percent of students living on site and the remaining 20 percent as commuters traveling to the site either by train or car.

For the full build campus, the parking need has been estimated to be 1,443 parking spaces to support all campus operations, based on the following need.

Required Full Build Parking:

Resident Students	400 spaces (200 students, 0.2 cars per student)
Commuter Students	450 spaces (500 students, 90% drive, 10% train)
Business/Incubator	200 spaces (1 per employee)
Business/Incubator Students	40 spaces (1 per driving commuter student)
University Administration	212 spaces (3 per 1,000 sf)
PreK-12 School	53 spaces (42 staff + visitor/commuter)
Daycare	57 spaces (3.5 per 1,000 sf)
Family Center	21 spaces (2 per 1,000 sf)
Total	**1,433 Spaces**

The site provides ample locations for siting of parking areas to support the full build parking need. At this time, final locations for all parking required under the full build have not been determined. Locations will be formalized as site plans for each phase are developed. Parking locations will be placed to the extent practical in presently cleared and disturbed areas. It is not anticipated that parking for the full build will result in any significant impacts.

5.6 Utilities

Since the closure of the Harlem Valley Psychiatric Center, aspects of the site infrastructure have either been cut off, not maintained or operated at significantly reduced below design, all of which potentially compromises the integrity of the systems. As a result, the existing site infrastructure to be used in the proposed development will require significant assessment and functional analysis to

determine current condition, capacity and required replacement, upgrades and reconditioning. See Appendix D, Water and Wastewater Design Flow Calculations.

Water

Water for the site is currently supplied by the existing reservoir on the east side of the site above building 85. Based on conversations with the Owner's operational consultant, Severn Trent Environmental Services, Inc. (STES), the reservoir, water treatment system and a portion of the water main piping network have been maintained in operational condition. The water supply and distribution system will need to be evaluated and rehabilitated as required to meet the anticipated domestic and fire need for the campus for each phase. At this time only building 107 (Immanuel Chapel) and building 118 (Bethany House) are actively using the water system. Service lines for each building proposed for occupation in each phase will need to be tested and water quality samples collected in accordance with New York State and Dutchess County Departments of Health requirements. Service lines to each building will also need to be reviewed for adequate supply for domestic and sprinkler flow.

Water main branches for subsequent phases and total project need will need to be evaluated as necessary based on final expected occupancy and firefighting need. System flow should be monitored at the source and each building to assess when leaks or breaches occur in the piping network.

The anticipated need for the full build campus is 209,990 gallons per day. According to the Reservoir Yield Analysis ("Yield Analysis") prepared by Delaware Engineering, P.C., dated 9/23/09, the existing reservoir can safely sustain a withdrawal rate of 171 gallons per minute or 246,000 gallons per day during the drought of record in New York State, which occurred during the mid-1960's. The analysis also demonstrated that the reservoir is capable of sustaining a withdrawal rate of 332 gallons per minute during non-drought conditions. The calculated yield is well in excess of the anticipated need, therefore water need for the proposed full build campus will not result in any significant impacts.

Sewer

The existing sewer network has been largely unused since the closure of the facility. Portions of the system were utilized during the past few years for partial occupation by state agencies. Currently the on-site use has been limited to the Chapel and Bethany House.

The campus sewer system conveys wastewater by gravity to a pump station located within the previous power plant on the west side of Route 22. Sewage is then conveyed via force main to the treatment plant located off site to the northwest across Route 22. This system was reportedly constructed in the 1930's with its last upgrade around 1990. Based on discussions with Olivet and the plant operator, the Dover Knolls Sewage-Works Corp., the plant is in poor condition and will require rehabilitation or replacement to meet the needs of the proposed campus. The existing sewage treatment plant discharges to the Swamp River on the west of Route 22.

The Olivet Center will contract with the Dover Knolls Sewage-Works Corp. to replace the existing sewage treatment system. In order to meet current New York State Department of Environmental Conservation and Dutchess County Department of Health standards it has been decided that it will be completely replaced. The design will incorporate a new expandable package plant that will be installed in phases as the flow grows with the increase in population. The existing outfall will continue to be used and therefore the existing SPDES permit which allows for the discharge of up to 1.2 million gallons per day (gpd) of treated water will be modified and utilized. The new plant will be a Membrane Bio-Reactor (MBR) which generally consists of a conventional biological treatment process and membranes that provide microfiltration of the final effluent. The MBR facility will be capable of meeting stringent nutrient limits and will produce a high quality effluent.

It is anticipated that the MBR Facility will consist of three units each capable of treating up to 70,000 gpd of sewage for a total capacity of 210,000 gpd. The first phase will consist of the installation of a single 70,000 gpd MBR Unit.

For each phase the existing gravity sewer network will need to be verified throughout the phase and to the downstream collection point. Anticipated flows from each phase will need to be compared to the determined capacity of the existing lines and upgrades and improvements performed as necessary to accommodate required capacity.

The existing sewage treatment plant operates under a permit that allows discharge of up to 1.2 million gallons per day. The anticipated need for the full build campus is 209,990 gallons per day. There is no anticipated impact from sanitary collection and treatment for the full build development.

Storm Water Management

Development of the proposed campus will require enhancements to the existing storm water management system to provide water quality improvements and storm

water detention for any new impervious areas of development or reconfiguration. Currently the site provides minimal storm water management facilities and no storm water treatment of runoff from paved areas. Significant portions of the site discharge overland directly to surface drainage channels and streams.

Under the full build plan there are proposed parking areas and road improvements to accommodate the proposed educational use resulting in increased impervious areas. The new and reconfigured parking areas and any roadway improvements will require the provision of storm water detention and treatment in accordance with New York State Department of Environmental Conservation (NYSDEC) requirements. The existing open space and topography appear to provide sufficient opportunities to meet the required improvements based on conceptual locations. The final locations and size of storm water management facilities will be based on the engineered storm water collection system and required detention and treatment requirements. The proposed storm water management system will utilize low impact measures such as bio swales, rain gardens and pervious pavement where appropriate to meet NYSDEC requirements.

Under the proposed full build development, the storm water system will provide required storm water detention and storm water treatment not currently provided. It is anticipated that the upgrades will improve water quality from the site storm water discharge. Therefore, no adverse impacts are anticipated.

Electric

Electricity to the facility had previously been provided by the power house located to the west of Route 22. The power house fed to a substation located adjacent to the power house and to the facility via an underground electrical network. Since closure of the facility, and the shutdown of the powerhouse, New York State Electric and Gas (NYSEG) provided direct service to a panel in the powerhouse which provides service to the chapel and other minor site lighting needs. An additional service was added by NYSEG in the 1980's to building 118 (Bethany House) extending along Hutchinson Avenue from the north. The remainder of the electrical network is not operational and the condition is unknown.

Based on preliminary discussions with NYSEG, the intent is to construct a new 13.2kV substation and refeed both the existing buildings and the proposed new buildings through an underground electrical feeder system with appropriate sectionalizing switches and replace the old 2.4kV substation and distribution system. The existing underground electrical system is in poor condition and must be replaced. The expected final campus load is calculated at 10MVA. Primary electrical power at 13.2kV will be distributed throughout campus through new underground

circuits. Pad mounted transformers connected to the underground primary will provide secondary electrical power at 480V/208 to buildings.

5.7 Historic Resources

During the approval process for the Knolls of Dover project, it was concluded that there are no areas of archaeological sensitivity on the project site. See Appendix E for memo from Historical Perspectives Inc.

In 1993, the New York State Historic Preservation Office (SHPO) staff determined that the HVPC complex was eligible for listing on the New York State and National Registers of Historic Places. The determination identified, at that time, thirty-two buildings considered to be structures contributing to the property's significance, 20 of which are located on the Olivet project site. The remaining 12 buildings are located on the west side of Route 22. In addition, the HVPC campus was determined significant for the integrity of its landscape plan and extant planting from its early twentieth century period of significance.

The proposed Olivet plan to adaptively reuse the HVPC buildings within the extant campus setting substantially addresses the historic preservation concerns of SHPO by embracing the HVPC built resources and the landscaped campus, and introducing designs that require minimal visual and/or contextual alterations. These minimal building and campus adjustments include the following.

- The Olivet initiative does not rely on destruction of the HVPC complex as prior development concepts; HVPC and Olivet are a "fit." Olivet will transform the HVPC features into a future service that maximizes existing resources. Olivet's programs need dormitories, a chapel, recreational fields, family homes, business offices, and classrooms. HVPC provides these same components, as noted in the Phase I Site Plan.
- Specific changes are required to the HVPC buildings due to the Fire Safety and Building Codes; these changes include windows, doors, elevators, ADA access ramps, etc. Olivet is performing Code Studies on the buildings to identify the minimum alterations necessary to meet regulations so that unnecessary damage to the original fabric can be avoided. Olivet's intent is to retain the historic "look" of each of the buildings to the extent possible. The introduction of new windows and the access ramps will be handled with sensitivity; the size of openings will be maintained, as will the rhythm of the fenestration.
- The interior roads and parking lots must also be slightly re-configured to meet Town Code which dictates parking space counts for the various uses

and corridors that meet the fire department minimum widths and radii. The HVPC never functioned as a fully trafficked, public campus and therefore, additional asphalt coverage will be required. Olivet intends to celebrate the rural nature of the campus and only introduce the minimum required pavement.

- The landscaped campus and particularly the large caliper trees are recognized assets both from within the campus perspective and from the public vehicular traffic. Olivet's landscape plans will include long overdue maintenance care of the existing tree cover and efforts to save all healthy specimens by working around the trees.

As the Olivet rehabilitation plans progress, Olivet will continue to consult with SHPO to ensure cultural resource compliance. These state regulations will ensure that Olivet's thoughtful program of balancing preservation with adherence to current codes will not pose a significant adverse effect on the historic HVPC.

In comparison, the Knolls of Dover plan would have demolished most of the contributing buildings and would have significantly altered the existing campus setting. The table below compares the proposed plan for each of these structures for the Olivet Center plan and the Knolls of Dover plan.

Table 4
Structures Eligible for Listing on Registers of Historic Places

Building #	Name	Knolls of Dover	Olivet Center
19	Staff 19	Reuse	Reuse
20	Staff 20	Reuse	Reuse
21	Industrial	Reuse	Reuse
23	Administration Building	Reuse	Reuse
24	Kitchen 24 (kitchen and dining hall)	Demolish	Reuse
25	Office of Mental Retardation (patient housing)	Demolish	Reuse
26	Building #26 (patient housing)	Demolish	Reuse
27	Building #27 (patient housing)	Demolish	Reuse
28	Patient Building	Demolish	Reuse
29	Patient Building	Demolish	Reuse
30	Staff 30	Demolish	Reuse
31	Staff 31	Demolish	Reuse
32	Staff 32	Demolish	Reuse
33	Staff 33	Reuse	Reuse
35	Smith Hall (assembly hall)	Reuse	Reuse
46	Staff 46	Reuse	Reuse
47	Staff Garage	Demolish	Rebuild In-Kind

Building #	Name	Knolls of Dover	Olivet Center
91	Staff House	Demolish	Rebuild In-Kind
92	Staff House	Demolish	Rebuild In-Kind
93	Staff House	Demolish	Rebuild In-Kind

5.8 Community Facilities and Services

Emergency Services

The site is served by the New York State Police and the Dutchess County Sheriff's Office for police services and by the J. H. Ketcham Hose Company, an all-volunteer fire department, for fire services. The J.H. Ketcham Hose Company and Northern Dutchess Paramedics provide emergency medical services.

On-site campus security will be provided by the University. Open access to the Administration Building (building 23) will permitted through the main entrance at Route 22 and Wheeler Road, but access to any other location on the site will require either a key card, Olivet ID or permission from security. A new guard booth is proposed at the main site entrance on Wheeler Road just past Brewster Drive. An arm gate will be located here and on Brewster Drive past the Administration Building. Access to the site from Hutchinson Avenue will be closed, however, emergency entrances will be provided at both the north and south ends. Another entrance to the site is located off Route 22 in between buildings 19 and 20. This entrance will be accessible only via key card.

Although security will be provided by the University, the increase in resident, employee and visitor population will result in additional demand for police, fire, and other emergency services.

During the approval process for the previously proposed Knolls of Dover project, neither the Sheriff's Office nor the State Police anticipated a significant increase in calls for service or criminal activity. Both agencies anticipated being able to serve the project without significant additional staffing or equipment. The Town Board, however, determined that the Knolls of Dover project would have increased calls to the fire department, thereby creating additional pressure on the department staff. The Town Board further concluded that the increase in the project population, as with the Olivet Center population, would be gradual, allowing the fire department and the Town time to monitor and evaluate the needs of the department. It was also acknowledged that the project may have required the fire department to purchase additional equipment to ensure adequate fire safety. Final details of any mitigation would have required additional consultation during the site planning

process with the Fire Company regarding information specific to the design of individual buildings such as access to each side of the buildings, location and size of parking areas, landscaping, driveways, and building frontage, as well as placement of fire hydrants.

A study was done in 2010 by East West Fire Apparatus Consultants to determine if the fire department needed a 100-foot aerial device for firefighting. The report determined that building 85 on the site, proposed by Olivet to be reconstructed into a medical school during the last phase of the proposed plan, is the tallest building in the fire district and requires a 100-foot aerial device for adequate firefighting. At such time as Olivet determines whether the redevelopment of this building is viable, it will coordinate with the fire department.

Schools

Olivet Center includes construction of a new pre-kindergarten to 12th grade private school on the site. It is anticipated that the children of staff and students residing on the site will utilize this new school, which will be built in the first phase. Therefore, no new students are expected to attend the Town of Dover public schools.

The Knolls of Dover plan would have added approximately 337 school children to the Town of Dover public schools. The Dover Union Free School District current total enrollment is approximately 1,300 students, down from approximately 1,800 students at its peak enrollment in the 2001-2002 school year. The Dover Knolls Final Environmental Impact Statement noted that the declining enrollment is a regional trend that is expected to continue and that the District's current and projected excess building capacity would have allowed the District to absorb that project's new students.

5.9 Hazardous Material

Attached in Appendix F is the Phase 1 report prepared by EBI Consulting and dated September 3, 2013. The report provides findings for the entire Knolls of Dover site on both the east and west side of Route 22. The project site does not include the most eastern parcels of the previous Harlem Valley Psychiatric Center property which contain the identified landfill site. The Phase 1 recommendations for the project site (Page 65 of the Phase 1 report) include further investigation of identified underground storage tanks and the former garage and notes the asbestos containing materials identified within the buildings. Olivet has indicated that recommendations for the project site are being addressed. Identified

environmental issues will be closed out in each phase prior to commencement of construction in that phase.

5.10 Construction Phasing

Full build-out of the Olivet Center is expected to take place in nine phases over approximately 25 years. Phase 1 will take approximately three years to complete, with the remaining nine phases spread out over the next 20 years. The phasing plan anticipates natural growth of the campus with additional classrooms and dormitories opening in each phase.

Construction staging would take place in an area at the terminus of Wheeler Road. In later phases, the construction staging and temporary uses will be removed and permanent student dormitories will be constructed in this area.

Ordinary construction impacts including noise, dust and additional truck traffic will be experienced. These impacts are unavoidable and temporary and are not considered to be significantly adverse.

The Knolls of Dover project would have been constructed over a 10 year period in two phases. This project included development in previously undisturbed areas and more demolition than the proposed project.

5.11 Economic Impact

Redevelopment of the former psychiatric center property will provide positive impacts for the local economy in a variety of ways:

- At full build out Olivet and its partners will employ approximately 750 professional staff plus hundreds more additional staff in the areas of food service, maintenance, security, etc.

- Total construction for the overall redevelopment project is anticipated to cost approximately $250,000,000. In addition, the total cost of the lead and asbestos abatement for all 54 buildings is estimated to be approximately $15,000,000. A substantial portion of the dollars spent on construction and abatement will be used to hire local contractors and to purchase supplies locally.

- Since purchasing the property in 2013, Olivet has provided both short and long term employment for many local residents. In fact, Olivet already

utilizes a host of local service providers and contractors. As the operation expands, Olivet will continue to do so whenever possible.

- Olivet's students, staff, faculty, visitors and partner organizations will spend substantial amounts of money locally to purchase a complete range of goods and services both for the college and for personal use. This activity centered in the heart of the Harlem Valley will generate new business and retail and stimulate consumer spending that will significantly help expand the tax base in the Town of Dover and the surrounding area.

5.12 Comparison Summary

The table below provides a brief comparison of the proposed Olivet Center plan with the previous Knolls of Dover plan.

Table 5
Project Comparison Summary

	Knolls of Dover	Olivet
Land Use	Residential, Commercial, community facility	Education, business, partner organization
Zoning	Required re-zoning	Development fits within current zoning
Visual	Change from all large institutional structures in campus setting to mixed use downtown character with some remaining campus elements along Route 22.	Campus setting with large institutional structures would remain in tact
Steep slope impacts (> 15%)	52 Ac	18 Ac
Residential population	2,560	2,156
Day-time population (Maximum)	3,100	3,608
Public school children generated	337	0
Historic preservation	7 buildings to be reused	52 buildings to be reused or reconstructed in-kind
Traffic – Trip Generation Weekday Peak Hour Weekend Peak Hour	 1,293 1,291	 744 347
Water/Sanitary Need	407,000 gallons per day	209,990 gallons per day

6.0 Phase 1 Impacts

Phase 1, as described above, establishes Olivet on the site and provides space for each of the proposed uses. While it is the largest phase, it includes only minimal new construction and thus, has few impacts. Phase 1 proposes the rehabilitation of 16 existing buildings. Four existing structures will be demolished and rebuilt in-kind (buildings 46, 91, 92, and 93 to be used for staff residences). Building 43 will also be demolished and will be rebuilt larger within the vicinity of the existing footprint. The existing footprint is 660 square feet and the new dining facility will be 5,000 square feet. Although the new building will be in a slightly different location and enlarged, it will be constructed within a previously disturbed area and its style will reflect the architectural characteristics of the original building and of the campus. A new guard office will be constructed in the same location where a previous guard office once stood (building 79 to be located in the parking lot for building 21). Lastly, a new storage shed of approximately 800 square feet will be constructed near the reservoir.

Potential impacts associated with the construction of Phase 1 are discussed below.

6.1 Consistency with Community Plans

As described above, the plan at full-build will be consistent with community plans including land use, zoning and the Town of Dover Master Plan. Phase 1 will also be consistent with community plans.

As per Section 145-10 of the Zoning Law, the project's proposed uses are all permitted by either special permit or site plan approval.

The expected site population upon completion of Phase 1, as outlined in the table below, is 365 people, of which 165 (105 students, 20 staff members and 40 members of resident staff families) will reside on the site.

Table 6
Phase 1 Site Population

Description	Classification	Phase 1
University Dorm Students (80%)	Dorm Student	105
University Day Students (20%)	Day Student	26
University Staff (1 staff / 5 students)	Staff	50
Resident Staff and Family	Resident	60
Partner Organization / Business Incubator	Staff	100

K-12 Primary School Students	Day Student	20
K-12 Primary School Staff	Staff	4
	Total	**365**

6.2 Visual Conditions

During Phase 1, the visual conditions of the site are expected to improve. Buildings 21, 23, and 19, located on Route 22, will be rehabilitated and the campus landscaping will be maintained and improved as per the Landscape Master Plan (see Appendix G). These improvements will change the current view of vacant property to an active and maintained college campus. As noted in the Visual Conditions and Historic Preservation sections above, while Olivet will need to replace windows, add access ramps and make other necessary adjustments to make the buildings compliant with local building code, they will retain the historic look of each of the buildings to the extent possible. Likewise, roads will have to be widened and new parking lots will have to be constructed, however, the general appearance of the campus will remain the same.

6.3 Natural Resources

Steep Slopes

Phase 1 includes limited new construction, none of which would impact areas of steep slopes outside previously disturbed areas.

Vegetation and Wildlife

Impacts to vegetation and wildlife and not anticipated during Phase 1. The new construction on the site is limited to areas that have previously been disturbed, except for the proposed 800 square feet storage shed to be constructed to serve a recreation area near the existing reservoir. This new construction will be small enough that no permanent significant impacts are expected. Minor impacts during construction due to noise and dust may occur. These impacts, however, will be temporary and unavoidable and are not considered to be significantly adverse.

Wetlands

Phase 1 includes construction of building 134, an 800 square foot storage shed that will be used to store maintenance and recreation equipment for a new picnic and

recreation area to the established near the reservoir. This building will be constructed within a wetland buffer to provide access from an existing trail. Minor regrading within the wetland buffer will be necessary in order to connect the proposed shed to the trail. The building will be located approximately 55 feet from the wetland. Other than the new building, no new impervious surfaces will be added to the wetland buffer. All necessary permits for construction within the wetland buffer will be obtained and mitigation will be performed as required.

6.4 Traffic

Traffic counts were conducted and No-Build and Build traffic volumes developed for the Olivet Center Phase 1 development. Capacity analyses were then performed for each analysis condition for the AM and PM peak hours to assess future traffic operating conditions with and without the proposed project and to identify the mitigation measures required, if any. The capacity analyses are provided in Appendix C and summarized below.

At the Route 22/55 intersection with Wheeler Road, capacity analyses for the Phase 1 condition for the Olivet Center project indicate that no mitigation would be required for Phase 1 as the intersection will operate at good levels of service (LOS "B") during each peak hour.

At the Route 22 and Pleasant Ridge Road intersection, capacity analyses for the Phase 1 condition for the Olivet Center project indicate that the intersection will operate at good levels of service (LOS "B") during each peak hour with the existing signal timings.

Therefore, it can be concluded that the proposed Olivet Center Phase 1 development will result in an acceptable operating conditions with no adverse impacts.

6.5 Parking

The parking requirements for the proposed Phase 1 have been determined based on anticipated need based on discussions with Olivet representatives and parking standards. The following provides the rational for the provided parking for each building.

Building 118

Building 118 is currently being used by Olivet as Bethany House, a residence for staff and guests. It will be further rehabilitated during Phase 1 and will have an occupancy of up to 25 people. The intent of this house is to accommodate visitors to the campus who plan to stay the night so the anticipated parking requirement is 1 parking space per occupant.

As shown on the Phase 1 Site Plans, a total of 32 parking spaces are being provided with approximately 10 existing spaces next to the house and 22 new parking spaces on the west side of Hutchinson Avenue, adjacent to the building.

Temporary Classrooms and Office

Two classrooms and one office building, sized approximately 1,440 square feet each, are being provided with temporary doublewide (24' x 60') trailers with the option to double, if deemed necessary.

Based upon Town parking requirements for offices of 3 spaces per 1,000 square feet of gross floor area, 9 parking spaces are required. It is anticipated that there will be approximately 36 students and 2 faculty per classroom (144 people in total). It is anticipated that the temporary classroom would be one of the very first structures to be installed on-site with no available resident living space. As such, the worst-case scenario for parking assumes that all the students housed in these classrooms will be driving into the campus. The Institute of Transportation Engineers (ITE) recommended parking requirement for a University/College in a suburban setting is 0.4 spaces per total number of students/faculty/staff. Staff is already considered herein under the office space.

Therefore, it is anticipated that 58 parking spaces will be required for the four classrooms and adding the 9 parking spaces required for the offices, a total of 67 is needed. As shown on the Phase 1 Site Plans, 71 spaces are provided.

Buildings 11, 12, and Recreation Area

Building 11 is proposed to be rehabilitated into a dormitory with a potential occupancy of up to 51 people. Building 12 is proposed to be rehabilitated into a dormitory with a potential occupancy of up to 54 people. The proposed outdoor recreation area includes a soccer field and four tennis courts.

It is anticipated that the recreation area will primarily be used by students and faculty who currently reside or work on-campus. It is assumed that the occupants

will walk to these courts from another area of the campus, so it is anticipated that no parking spaces are needed.

The ITE recommended parking requirement for a University/College in a suburban setting is 0.4 spaces per total number of students. Based upon this information a total of 42 parking spaces will be required. As shown on the Phase 1 Site Plans, 78 spaces are provided.

If the case arises that this parking area becomes full due to an infrequent increase in the recreation area's use (i.e. for events being played at the soccer field or tennis courts) overflow event parking will be accommodated/redirected to park in the flat grassed area that is to the north of the soccer field and Building #11 or building 85's parking lot.

Building 21, Guard Office and Guard Shack

Building 21 is proposed to be a private prekindergarten-12 school serving the campus. It is anticipated that the children of the campus's staff/employees and partner organizations will be attending this private prekindergarten-12 facility.

Estimations on the Initial populations to the campus anticipate that the school will receive approximately 20 elementary students along with 6 staff members in Phase 1. It is anticipated that approximately 4 employees are to occupy the guard office and shack.

Therefore, assuming that parking is only needed for the staff and not the children students at this time, a total of 10 parking spaces is required. As shown on the Phase 1 Site Plans, 62 spaces are provided.

Building 43

Building 43 is proposed to be demolished and rebuilt into a 5,000 square foot 100-seat dining facility. It is anticipated that approximately 5 employees will be staffed at this building, which will primarily be used by students/faculty who currently reside/work on-campus. It is assumed that this dining facility is an accessory use and the patrons will walk to this dining facility from another area of the campus, so it is anticipated that no parking spaces are needed for patrons. Therefore, it is anticipated that only 5 parking spaces are required for the dining facility. As shown on the Phase 1 Site Plans, 9 spaces are provided.

Building 23

Building 23 was previously used as a 23,853 SF administrative building and is proposed to be rehabilitated into the campus's main administrative building. It is assumed that this building will act similarly to that of a typical office facility, so a parking requirement of 3 spaces per 1,000 SF GFA is being applied. Based upon this information, it is anticipated that 72 parking spaces are required for the administrative building. As shown on the Phase 1 Site Plans, 128 spaces are provided.

Building 19

Building 19 was previously a 35,996 square foot staff housing building and is proposed to be a business incubator / research facility with an estimated occupancy of 25 employees along with 25 students.

It is assumed that 80 percent of these students will be coming from on campus while 20 percent from off campus, thus only 20 percent of the required parking for the student portion is anticipated to be needed. Therefore, it is anticipated that 25 parking spaces will be required for the business incubator and 5 spaces will be required for students for a total of 30 spaces required. As shown on the Phase 1 Site Plans, 42 spaces are provided.

Buildings 18 and 33

Building 18 is a 16,282 square foot building proposed to be rehabilitated into a day care. Building 33 is a 10,294 square foot building proposed to be rehabilitated into a family center.

The ITE recommended parking requirement for a "day care center" is 3.5 parking spaces per 1,000 square foot. An approximate 50 percent reduction is assumed between those already on campus that will walk to these buildings (not needing to park their cars next to the building) versus those coming from off-campus who will be using these facilities, so it is assumed that 50 percent of the required parking will be needed. As such, a parking requirement of 2.0 parking spaces per 1,000 square feet is applied.

Based upon this information, it is anticipated that approximately 57 parking spaces will be required for the day care and approximately 21 parking spaces will be required for the family center for a total requirement of 78. As shown on the Phase 1 Site Plans, 83 parking spaces are provided between one lot to the northeast of building 18 and another lot to the northeast of building 18.

Building 2

Building 2 is proposed to be rehabilitated into a 488 seat dining facility. It is anticipated that approximately 20 employees will be staffed at this building which will primarily be used by students and faculty who currently reside or work on-campus. It is assumed that this dining facility is an accessory use and the patrons will walk to this dining facility from another area of the campus, so it is anticipated that no parking spaces are needed for patrons. Therefore, it is anticipated that only 20 parking spaces are required for the dining facility. As shown on the Phase 1 Site Plans, 20 spaces are provided.

Building 3

Building 3 is a 69,025 square foot proposed to be rehabilitated into partner organization offices with an estimated occupancy of 25 employees along with 25 students. It is assumed that 80 percent of these students will be coming from on-campus while 20 percent from off campus, thus only 20 percent of the required parking for the student portion is anticipated to be needed.

Based upon the above information, it is anticipated that 25 parking spaces will be required for the offices and 5 spaces will be required for students for a total of 30 spaces required. As shown on the Phase 1 Site Plans, 30 spaces within the 59 space parking lot that is located south of building 35 will provide the required parking for building 3.

Building 17

Building 17 is a 51,296 square foot building proposed to be rehabilitated into partner organization offices with an estimated occupancy of 25 employees along with 25 students. It is assumed that 80 percent of these students will be coming from on-campus while 20 percent from off campus, thus only 20 percent of the required parking for the student portion is anticipated to be needed.

Based upon the above information, it is anticipated that 25 parking spaces will be required for the offices and 5 spaces will be required for students for a total of 30 spaces required. As shown on the Phase 1 Site Plans, 30 spaces within the 47 space parking lot that is located north of building 35 will provide the required parking for building 17.

Building 10

Building 10, a 17,378 square foot building, is proposed to be rehabilitated into the campus's ministry office with supportive classroom. It is assumed that this building

will act similarly to that of a typical office facility, so a parking requirement of 3 spaces per 1,000 square feet is being applied.

Based upon this information, it is anticipated that 53 parking spaces are required. As shown on the Phase 1 Site Plans, 39 spaces within the parking lot that is located east of building 10 and 16 spaces within the middle of the 32-space parking lot to the south of building 14, for a total of 55 spaces will provide the required parking for building 10.

Building 14

Building 14 is a 25,752 square foot building proposed to be rehabilitated into partner organization offices with an estimated occupancy of 25 employees along with 25 students. It is assumed that 80 percent of these students will be coming from on-campus while 20 percent from off campus, thus only 20 percent of the required parking for the student portion is anticipated to be needed.

Therefore, it is anticipated that 25 parking spaces will be required for the offices and 5 spaces will be required for students for a total of 30 spaces required. As shown on the Phase 1 Site Plans, 25 spaces within the parking lot that is located east of building 14 and the 8 closest parking spaces within the parking lot to the south of building 14, for a total of 32 spaces, will provide the required parking for building 14.

Buildings 35 and 107

Building 35 was previously used as a 49,106 square foot assembly hall and is proposed to be rehabilitated into the campus's assembly hall. Building 107 is the campus's 29,220 square foot chapel.

Approximately 54 spaces within the three parking lots located in the vicinity of buildings 35 and 107 are being provided for support staff/employee parking. It is assumed that the assembly hall and chapel are accessory uses and the patrons will come walking from another area of the campus, so it is anticipated that no parking spaces are needed for said patrons.

It is anticipated that the peak parking demand for these two buildings will occur on the campus's off-peak hours. If the case arises that the parking lots around the two buildings becomes full, overflow event parking will be accommodated/redirected to park in the flat grassed area that is to the north of the soccer field and building 11 or building 85's parking lot.

6.6 Utilities

For Phase 1, the first step in the utility upgrades will be performed as outlined above for the full build development. The below provides a summary of each site utility for Phase 1.

Water

As mentioned above, the reservoir, water treatment system and a portion of the water main piping network have been maintained in operational condition. The water supply and distribution system will need to be evaluated and rehabilitated as required to meet the anticipated domestic and fire need for the campus for each phase. For Phase 1 the main should be inspected from the treatment system to the distribution lines within the Phase 1 area to ensure competency and adequacy of domestic and fire supply prior to occupation. Phase 1 lines will need to be tested and water quality samples collected in accordance with New York State and Dutchess County Departments of Health requirements. Service lines to each building will also need to be reviewed for adequate supply for domestic and sprinkler flow.

The anticipated need for Phase 1 is 42,345 gallons per day. According to the Reservoir Yield Analysis ("Yield Analysis") prepared by Delaware Engineering, P.C., dated 9/23/09 the existing reservoir can safely sustain a withdrawal rate of 171 gallons per minute or 246,000 gallons per day during the drought of record in New York State, which occurred during the mid-1960's. The analysis also demonstrated that the reservoir is capable of sustaining a withdrawal rate of 332 gallons per minute during non-drought conditions. The calculated yield is well in excess of the anticipated need for Phase 1, therefore water need for the proposed Phase 1 campus will not result in any significant impacts.

Sewer

The project site is currently served by a network of sewer mains that collected the sanitary sewer loads of the former Harlem Valley Psychiatric Center. The sewer mains extend through the site and connect to all the existing buildings on the parcel. The majority of the existing sewer main network appears to have been constructed in the 1930's and consists of both clay and cement pipes with brick manholes.

For Phase 1 those portions of the sewage collection system that shall be utilized will be upgraded and replaced. It is anticipated that the easily accessible portions of the collection network will be replaced with new SDR-35 PVC pipe and that inaccessible

portions of the system will be repaired with either heat activated resin liner or a fold and form liner based on the pipe size and condition.

Currently there is a 20-inch sanitary sewer pipe that crosses under Route 22 and extends offsite into the old Harlem Valley Power House building where an old pump station is located in the lower levels. From there the untreated sewage was pumped to the wastewater treatment plant via a force main pipe that extends over the Swamp River via the existing bridge on Wheeler Road. This old pump station and force main pipe will be removed from service as part of this project.

As part of the collection system upgrade a new central pump station will be installed on the east side of Route 22 where sewage will be screened and pumped to the new sewage treatment system via a new force main pipe that extends under Route 22 through an existing service tunnel and under the Swamp River via a directional bore.

Storm Water Management

For the Phase 1 development of the proposed campus, enhancements to the existing storm water management system are proposed to provide water quality improvements and storm water detention for any new impervious areas of development or reconfiguration. Currently the site provides minimal storm water management facilities and no storm water treatment of runoff from paved areas. Significant portions of the site discharge overland directly to surface drainage channels and streams.

Under the Phase 1 plan there are proposed parking areas and road improvements to accommodate the proposed educational use resulting in increased impervious areas. The new and reconfigured parking areas and any roadway improvements will require the provision of storm water detention and treatment in accordance with NYSDEC requirements.

It is anticipated that the upgrades will improve water quality from the site storm water discharge. Therefore, no adverse impacts are anticipated.

Electric

As discussed in the full build impacts, NYSEG intends to construct a new 13.2kV substation and refeed both the existing buildings and the proposed new buildings through an underground electrical feeder. For Phase 1 a portion of the proposed campus feeder system will be installed appropriate to meet Phase 1 power requirements. Olivet Management is currently coordinating with NYSEG to determine the extent and scope of the installation for Phase 1. It is anticipated that

NYSEG will be able to meet the electrical supply required for Phase 1 and that it will not result in any significant impact.

6.7 Historic Resources

As noted in the Historic Resources section above for full build, no impacts to historic resources are anticipated.

6.8 Community Facilities and Services

Emergency Services

When Phase 1 is complete, the site population is expected to be approximately 365 people during the day with 165 students and staff residing on-site. This increase is not anticipated to be large enough to significantly impact emergency services, including police, fire and ambulance services. Phase 1 includes the development of on-site security and emergency access to the site. Olivet will consult with the fire department to ensure proper building access, location and size of parking areas, and placement of fire hydrants, among other potential issues.

Schools

Phase 1 includes the reuse of building 21 as a private primary school. At full build, the school will include grades prekindergarten to 12. Phase 1, however, will only develop the elementary grades (grades prekindergarten to 5th grade), with additional grades added gradually through the remaining phases. Some staff members living on the site may have children in middle school and high school grades who may attend the Dover Union Free School District schools. This population will be minimal and can be readily absorbed by the school district. As previously noted, enrollment in the school district has been declining in recent years and has excess capacity.

6.9 Hazardous Material

Attached in Appendix F is the Phase 1 report prepared by EBI consulting and dated September 3, 2013. The report provides findings for the entire Knolls of Dover site on both the east and west side of Route 22. Olivet has indicated that all report recommendations (page 65) relative to the Phase 1 project site have been addressed.

APPENDIX A

Site Exhibits

APPENDIX B

Letter from Evans Associates

August 24, 2015

August 24, 2015

Evans Associates
Environmental Consulting, Incorporated

David Wylock, Chairman
Town of Dover Planning Board
Dover Town Hall
126 East Duncan Hill Road
Dover Plains, New York 12522

RE: Olivet Management, LLC
Redevelopment of the former Harlem Valley Psychiatric Center / Dover Knolls Project Site

Dear Chairman Wylock and Members of the Planning Board:

At the request of Kathleen Schibanoff, I have reviewed the Biological Assessment Report that our office prepared in 2013 for the Dover Knolls Project to determine if the report is still valid for the site. The Biological Assessment Report was submitted to the U.S. Fish & Wildlife Service (US FWS) for review in May of 2013, and a response letter was received on August 28, 2013 offering comments and recommendations for the Dover Knolls Project. Shortly after receipt of the US FWS letter, ownership of the property changed to Olivet Management LLC, and the permit applications to NYS DEC and ACOE were withdrawn.

Since the 2013 letter from US FWS, the northern long-eared bat (*Myotis septentrionalis*) was added as a threatened species under the Endangered Species Act on May 4, 2015. The purpose of this letter is to provide your Board with information and recommendations regarding protection of this species, as well as information on the eastern small-footed bat (*Myotis leibii*), which is also mentioned in the August 2013 US FWS letter, and is currently listed as a Species of Special Concern in New York State.

In July of 2008 a summer mist net woodland bat survey was conducted on the subject property as part of the site analysis for the former Dover Knolls Project. A total of one hundred and twelve (112) bats were captured during the 2008 survey, including two (2) Indiana bats (*Myotis soldalis*), nine (9) northern long-eared bats, and one (1) eastern small-footed bat. Based on this survey, it is assumed that suitable summer habitat is present on the site for these species, and a variety of conservation measures were proposed in the Biological Assessment Report to avoid or minimize impacts to these bat species. The recommended conservation measures guidance from Appendix D of the US FWS *Northern Long-eared Bat Interim Conference and Planning Guidance* document, published January 6, 2014, is attached for your reference, and is consistent with the recommendations made in the Biological Assessment Report for the Indiana bat.

205 Amity Road
Bethany, CT 06524
Tel: 203.393.0690
Fax: 203.393.0196

Based on this review and update, it is our professional opinion that the information contained in the March 2013 Biological Assessment Report is still valid for this site, and that implementation of the mitigation measures outlined in the report will serve to protect all endangered, threatened, or special concern species found on the property. Should you have any questions regarding this assessment, please do not hesitate to contact me at 203-393-0690 x112.

Respectfully submitted,
Evans Associates Environmental Consulting, Inc.

Beth Evans

Beth Evans, PWS
Principal

Attachments

Cc: Kathleen Schibanoff, Olivet Management, LLC

United States Department of the Interior

FISH AND WILDLIFE SERVICE
3817 Luker Road
Cortland, NY 13045

August 28, 2013

Ms. Beth Evans
Principal
Evans Associates
205 Amity Road
Bethany, CT 06524

Dear Ms. Evans:

This is in response to your May 21, 2013, letter regarding the proposed 937-acre Knolls of Dover mixed-use community development project (Project) located along NYS Route 22 in the Hamlet of Windgale in the Town of Dover, Dutchess County, New York. The proposed project is a redevelopment of the former Harlem Valley Psychiatric Center and an adjacent parcel and includes 1,376 dwellings, as well as approximately 238,500 square feet of commercial space and 70,250 square feet of community facility or recreation center space.

We understand the U.S. Army Corps of Engineers (Corps) will be involved through authorizations under Section 404 of the Clean Water Act. As you are aware, federal agencies have responsibilities under Section 7(a)(2) of the Endangered Species Act (ESA) to consult with the U.S. Fish and Wildlife Service (Service) regarding projects that may affect federally-listed species or designated critical habitat, and confer with the Service regarding projects that may adversely affect federally-proposed species or proposed critical habitat. Enclosed with your letter was a biological assessment (BA) written to assist the Corps with their final determinations pursuant to the ESA.

The BA addressed the following species under the Service's jurisdiction: the dwarf wedgemussel (*Alasmidonta heterodon;* endangered), Indiana bat (*Myotis sodalis;* endangered), and the bog turtle (*Glyptemys [=Clemmys] muhlenbergii*; threatened), as well as the New England cottontail (*Sylvilagus transitionalis*), a federal candidate for listing.

Dwarf Wedgemussel

We agree with your assessment that no effects to dwarf wedgemussel are anticipated as there is no suitable habitat for this species in the vicinity of the Project.

Indiana Bat

As you are aware, two male Indiana bats were captured at the Project site in July 2008 (Bat Conservation and Management, Inc. 2008). In addition, there is likely a maternity colony within

5 miles from the site. In our December 18, 2009, letter to the Town of Dover for this Project, the Service recommended "that environmental documentation should have an expanded discussion regarding this species and the project's potential for impacts."

The BA generally provides this discussion. We understand that approximately 43.2 acres of upland deciduous forest and 2 acres of upland mixed forest will be impacted by the proposed Project. However, the impacts are not planned within a contiguous patch of forest, but are spread among smaller patches of forest throughout the Project. In addition, approximately 406 acres of forest will remain after full build-out of the Project and tree plantings are included as part of wetland mitigation plans. We request additional information about the proposed mechanism for permanently protecting this area.

We appreciate the inclusion of our 2009 minimization measures in the Project plans. To minimize potential impacts to Indiana bats from increased lighting in the area, we understand that all outdoor lighting will have full cut-off optics. To avoid direct effects to Indiana bats associated with tree clearing, tree removal will occur between October 1 and March 31. Also, bright orange fencing/flagging will demarcate trees to be protected compared with those to be cut prior to the initiation of any construction activities at the site.

Other Bat Species

Since our 2009 letter, we have an additional recommendation for your consideration. In addition to the Indiana bat, we recommend considering whether the project has the potential to impact other bats such as the northern long-eared bat (*Myotis septentrionalis*) and eastern small-footed bat (*Myotis leibii*). The Service was petitioned to list the northern long-eared and eastern small-footed bat and published a positive 90-day finding for both species in June 29, 2011[1]. This means that sufficient information was provided to conduct a more thorough analysis of their status. We anticipate publishing a 12-month finding for these species in the fall of 2013. In that document, the Service will determine whether the northern long-eared bat or eastern small-footed bat warrant protection under the ESA. If so, the Service will publish a proposal for their listing and solicit public comments on the proposal. The Service is also conducting a status assessment for the little brown bat (*Myotis lucifugus*). In 2008, all three of these species were captured at the Project site. If any of these species are proposed for listing pursuant to the ESA, this will mean that further consultation will be required between the Corps and Service for the Project.

Bog Turtle

Similar to the Indiana bat, the Service previously provided comments on the bog turtle to the Town of Dover in our 2009 letter. In that letter, we requested results of Phase 1 bog turtle habitat surveys. The BA provides a copy of those results. We understand that wetland T constitutes extensive and high quality bog turtle habitat and wetlands E and N each contain bog turtle habitat in a matrix of wetland areas.

As was the case in 2009, we understand that Phase 2 surveys for bog turtles were not conducted and, therefore, the applicant is assuming presence of bog turtles at the site. We continue to believe this is an appropriate decision given that the wetlands identified above are all part of New York State Department of Environmental Conservation (NYSDEC) wetland DP-22, an

[1] Available at http://www.fws.gov/midwest/es/soc/mammals/pdf/FR90DayFnding2Bats29June2011.pdf

extensive wetland system with known bog turtle habitat within 1.5 miles south and 1 mile north of the proposed project.

We then recommended that efforts be made to avoid direct and indirect effects to the wetlands within and offsite of the proposed Project area. We provided a list of potential adverse impacts to bog turtles associated with residential and commercial development such as fragmentation of habitat and alterations to bog turtle dispersal routes; introduction of contaminated surface water runoff into the wetland from pesticides, herbicides, fertilizers, road deicers, etc.; alteration of wetland hydrology; introduction of nutrients from septic systems or wastewater treatment plants; introduction of yard and other waste materials into wetlands; introduction of people, pets, and recreational vehicles into wetlands; and death/injury of bog turtles that wander onto lawns and roads. We recommended a minimum 300-foot buffer around all wetlands (not just the sections with identified habitat) with known or likely bog turtle populations.

We understand that there is no development activity proposed directly within wetlands E or T. However, there are proposed grading activities within wetland N associated with widening of Wheeler Road. The BA does not adequately consider the potential for adverse effects to bog turtles or their habitat from these activities. Additional information is needed regarding the timing and duration of specific activities that will be part of the road widening project. Also, there is no assessment of future road crossings by bog turtles and the potential for death or injury of bog turtles (at Wheeler Road or other roads within the Project).

We understand there is no development planned within 300 feet of wetland T. However, this is not the case for wetlands E and N. Development around wetland E includes recreational trails, a residential development, a community center, and improvements to roads and bridges. Development around wetland N includes residential units and roads, stormwater basins, and part of a recreational trail. The BA does not adequately consider the potential for adverse effects to bog turtles or their habitat from these activities. Additional information is needed including the timing, duration, and location of specific activities associated with these parts of the Project. Also, there is no assessment of future adverse impacts to bog turtles (e.g., collection, predation) or their habitat.

We appreciate the minimization measures already proposed by the Project sponsor. The BA includes several measures to minimize impacts to bog turtles such as installing silt fencing to isolate work areas, keeping heavy equipment and other disturbance >100 feet from wetlands (except wetland N grading activities), and measures to reduce the likelihood of accidentally trapping turtles during construction activities or around homes. The BA also includes a brief description of proposed wetland restoration and enhancement plantings. It is important to keep in mind that wetland restoration activities may have the potential for limited adverse effects to bog turtles in the short term even though there are expected long-term benefits. For example, the Service issued a Biological Opinion (Service 2012) to address this potential for "take" [2] of bog turtles during Service-sponsored bog turtle habitat restoration activities. Please provide detailed plans for the proposed restoration project so that it can be determined whether any incidental take authorization may be required for this aspect of the Project.

[2] Take is defined in Section 3 of the ESA as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.

At this time, it appears that adverse effects to bog turtles cannot be fully avoided and formal consultation between the Corps and Service is necessary. However, we will review any additional information provided before coordinating with the Corps on a final determination.

New England Cottontail

New England cottontail (NEC) may also be within the vicinity of the proposed Project area. While the NEC is not currently federally listed, it is a candidate for listing. As stated in our September 2009 letter, known locations are approximately 3 miles to the southwest, but it is less clear if NEC are using early successional habitat within or adjacent to the Project area. We encourage proactive conservation that promotes the growth of dense shrub thickets (e.g., areas with brush, shrubs, and densely growing young trees). Such efforts across the landscape may reduce the likelihood of future listing of this species. We applaud your efforts of developing an invasive species management plan that proposes to remove such invasive species as mile-a-minute (*Persicaria perfoliata*), Oriental bittersweet (*Celastrus orbiculatus*), and Japanese barberry (*Berberis thunbergii*) from the Project area. In addition to invasive species management, we encourage development of a mowing regime for the shrubby old field that is to be left undisturbed. This will promote the long-term presence of dense vegetation that is required by NEC and prevent succession to mature forest. If amenable, we can assist with development of a mowing regime, rotational schedule for invasive species removal, and application of best management practices.

As a reminder, the most recent compilation of federally-listed and proposed endangered and threatened species in New York is available for your information. Until the proposed project is complete, we recommend that you check our website every 90 days from the date of this letter to ensure that listed species presence/absence information for the proposed project is current.*

The above comments pertaining to endangered species under our jurisdiction are provided as technical assistance pursuant to the ESA. This response does not preclude additional Service comments under other legislation. Any changes in project plans or new information regarding the potential for impacts to listed species should be coordinated with both this office and with the New York State Department of Environmental Conservation (NYSDEC).

In summary, we have concerns about potential impacts to federally-listed species from the proposed Project. We recommend additional coordination among the Corps, NYSDEC, the applicant, and the Service regarding these potential impacts. Thank you for your time. If you require additional information please contact Robyn Niver at (607) 753-9334. Future correspondence with us on this project should reference project file 61166.

Sincerely,

for Patricia Cole
David A. Stilwell
Field Supervisor

*Additional information referred to above may be found on our website at: http://www.fws.gov/northeast/nyfo/es/section7.htm

References:

Bat Conservation and Management, Inc. 2008. Summer woodland bat survey, Knolls of Dover. Bat Conservation and Management, Inc., Carlisle, PA.

U.S. Fish and Wildlife Service. 2012. Biological opinion on the effects of habitat restoration practices by the U.S. Fish and Wildlife Service on the Northern Population of the Bog Turtle. U.S. Fish and Wildlife Service Region 5.

cc: NYSDEC, New Paltz, NY (Attn: L. Masi)
NYSDEC, Albany, NY (Wildlife Diversity)
COE, New York, NY (Attn: B. Orzel)

Northern Long-Eared Bat

Myotis septentrionalis

The northern long-eared bat is federally listed as a threatened species under the Endangered Species Act. ***Endangered*** species are animals and plants that are in danger of becoming extinct. ***Threatened*** species are animals and plants that are likely to become endangered in the foreseeable future. Identifying, protecting and restoring endangered and threatened species is the primary objective of the U.S. Fish and Wildlife Service's Endangered Species Program.

Photo by Steve Taylor, University of Illinois

This northern long-eared bat, observed during an Illinois mine survey, shows visible symptoms of white-nose syndrome.

What is the northern long-eared bat?

Appearance: The northern long-eared bat is a medium-sized bat with a body length of 3 to 3.7 inches and a wingspan of 9 to 10 inches. Their fur color can be medium to dark brown on the back and tawny to pale-brown on the underside. As its name suggests, this bat is distinguished by its long ears, particularly as compared to other bats in its genus, *Myotis*.

Winter Habitat: Northern long-eared bats spend winter hibernating in caves and mines, called hibernacula. They use areas in various sized caves or mines with constant temperatures, high humidity, and no air currents. Within hibernacula, surveyors find them hibernating most often in small crevices or cracks, often with only the nose and ears visible.

Summer Habitat: During the summer, northern long-eared bats roost singly or in colonies underneath bark, in cavities or in crevices of both live trees and snags (dead trees). Males and non-reproductive females may also roost in cooler places, like caves and mines. Northern long-eared bats seem to be flexible in selecting roosts, choosing roost trees based on suitability to retain bark or provide cavities or crevices. They rarely roost in human structures like barns and sheds.

Reproduction: Breeding begins in late summer or early fall when males begin to swarm near hibernacula. After copulation, females store sperm during hibernation until spring. In spring, females emerge from their hibernacula, ovulate and the stored sperm fertilizes an egg. This strategy is called delayed fertilization.

After fertilization, pregnant bats migrate to summer areas where they roost in small colonies and give birth to a single pup. Maternity colonies of females and young generally have 30 to 60 bats at the beginning of the summer, although larger maternity colonies have also been observed. Numbers of bats in roosts typically decrease from the time of pregnancy to post-lactation. Most bats within a maternity colony give birth around the same time, which may occur from late May or early June to late July, depending where the colony is located within the species' range. Young bats start flying by 18 to 21 days after birth. Maximum lifespan for the northern long-eared bat is estimated to be up to 18.5 years.

Feeding Habits: Like most bats, northern long-eared bats emerge at dusk to feed. They primarily fly through the understory of forested areas feeding on moths, flies, leafhoppers, caddisflies, and beetles, which they catch while in flight using echolocation or by gleaning motionless insects from vegetation.

Range: The northern long-eared bat's range includes much of the eastern and north central United States, and all Canadian provinces from the Atlantic Ocean west to the southern Yukon Territory and eastern British Columbia. The species' range includes 37 States and the District of Columbia: Alabama, Arkansas, Connecticut, Delaware, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Vermont, Virginia, West Virginia, Wisconsin, and Wyoming.

Why is the northern long-eared bat in trouble?

White-nose Syndrome: No other threat is as severe and immediate as

this. If this disease had not emerged, it is unlikely that northern long-eared bat populations would be experiencing such dramatic declines. Since symptoms were first observed in New York in 2006, white-nose syndrome has spread rapidly from the Northeast to the Midwest and Southeast; an area that includes the core of the northern long-eared bat's range, where it was most common before this disease. Numbers of northern long-eared bats (from hibernacula counts) have declined by up to 99 percent in the Northeast. Although there is uncertainty about the rate that white-nose syndrome will spread throughout the species' range, it is expected to continue to spread throughout the United States in the foreseeable future.

Other Sources of Mortality:

Although no significant population declines have been observed due to the sources of mortality listed below, they may now be important factors affecting this bat's viability until we find ways to address WNS.

Impacts to Hibernacula: Gates or other structures intended to exclude people from caves and mines not only restrict bat flight and movement, but also change airflow and microclimates. A change of even a few degrees can make a cave unsuitable for hibernating bats. Also, cave-dwelling bats are vulnerable to human disturbance while hibernating. Arousal during hibernation causes bats to use up their energy stores, which may lead to bats not surviving through winter.

Loss or Degradation of Summer Habitat: Highway construction, commercial development, surface mining, and wind facility construction permanently remove habitat and are activities prevalent in many areas of this bat's range. Many forest management activities benefit bats by keeping areas forested rather than converted to other uses. But, depending on type and timing, some forest management activities can cause mortality and temporarily remove or degrade roosting and foraging habitat.

Wind Farm Operation: Wind turbines kill bats, and, depending on the species, in very large numbers. Mortality from windmills has been documented for northern long-eared bats, although a small number have been found to date. However, there are many wind projects within a large portion of the bat's range and many more are planned.

What Is Being Done to Help the Northern Long-Eared Bat?

Disease Management: Actions have been taken to try to reduce or slow the spread of white-nose syndrome through human transmission of the fungus into caves (e.g. cave and mine closures and advisories; national decontamination protocols). A national plan was prepared by the Service and other state and federal agencies that details actions needed to investigate and manage white-nose syndrome. Many state and federal agencies, universities and non-governmental organizations are researching this disease to try to control its spread and address its affect. See www.whitenosesyndrome.org/ for more.

Addressing Wind Turbine Mortality: The Service and others are working to minimize bat mortality from wind turbines on several fronts. We fund and conduct research to determine why bats are susceptible to turbines, how to operate turbines to minimize mortality and where important bird and bat migration routes are located. The Service, state natural resource agencies, and the wind energy industry are developing a Midwest Wind Energy Habitat Conservation Plan, which will provide wind farms a mechanism to continue operating legally while minimizing and mitigating listed bat mortality.

Listing: The northern long-eared bat is listed as a threatened species under the federal Endangered Species Act. Listing a species affords it the protections of the Act and also increases the priority of the species for funds, grants, and recovery opportunities.

Hibernacula Protection: Many federal and state natural resource agencies and conservation organizations have protected caves and mines that are important hibernacula for cave-dwelling bats.

What Can I Do?

Do Not Disturb Hibernating Bats: To protect bats and their habitats, comply with all cave and mine closures, advisories, and regulations. In areas without a cave and mine closure policy, follow approved decontamination protocols (see http://whitenosesyndrome.org/topics/decontamination). Under no circumstances should clothing, footwear, or equipment that was used in a white-nose syndrome affected state or region be used in unaffected states or regions.

Leave Dead and Dying Trees Standing: Like most eastern bats, the northern long-eared bat roosts in trees during summer. Where possible and not a safety hazard, leave dead or dying trees on your property. Northern long-eared bats and many other animals use these trees.

Install a Bat Box: Dead and dying trees are usually not left standing, so trees suitable for roosting may be in short supply and bat boxes may provide additional roost sites. Bat boxes are especially needed from April to August when females look for safe and quiet places to give birth and raise their pups.

Support Sustainability: Support efforts in your community, county and state to ensure that sustainability is a development goal. Only through sustainable living will we provide rare and declining species, like the northern long-eared bat, the habitat and resources they need to survive alongside us.

Spread the Word: Understanding the important ecological role that bats play is a key to conserving the northern long-eared and other bats. Helping people learn more about the northern long-eared bat and other endangered species can lead to more effective recovery efforts. For more information, visit www.fws.gov/midwest/nleb and www.whitenosesyndrome.org

Join and Volunteer: Join a conservation group; many have local chapters. Volunteer at a local nature center, zoo, or national wildlife refuge. Many state natural resource agencies benefit greatly from citizen involvement in monitoring wildlife. Check your state agency websites and get involved in citizen science efforts in your area.

US FISH AND WILDLIFE SERVICE

NORTHERN LONG-EARED BAT INTERIM CONFERENCE AND PLANNING GUIDANCE

USFWS Regions 2, 3, 4, 5, & 6

January 6, 2014

Appendix D: Conservation Measures for the NLEB

This appendix provides a list of recommended conservation measures for the NLEB. Conservation measures are considered any measures that contribute to the conservation of the NLEB and include, but are not limited to, avoidance measures, minimization measures, mitigation measures, and proactive measures. The basis for these suggestions come from our knowledge and experience with the Indiana bat, and may change in the future as we learn more about the specific needs of the NLEB.

These conservation measures should further be considered as advisory recommendations by the FWS since there are no requirements to avoid or minimize impacts to a proposed species unless it becomes listed. Also, note that application of any of these measures should be based on the anticipated effects of a specific project on the NLEB in a specific area; therefore, not all measures will be appropriate for all projects.

The seasonality of NLEB habitat use varies somewhat throughout its range, and thus the time periods associated with conservation measures varies accordingly. These differences are due to local and regional variability in climate, which are known or anticipated to drive NLEB seasonal habitat use. For example, the summer maternity season may be longer in the southerly portions of the species' range versus the northerly portions. <u>When referenced in a conservation measure, please see the table at the end of this appendix for the appropriate time period based on the project location.</u>

The FWS may adjust the seasonal dates or other aspects of these conservation measures based on site-specific and project-specific information.

<u>Conservation Measures for NLEB Hibernacula and 5-mile Buffer:</u>
NLEB may be present in hibernacula during the regional or local hibernation season (see Table 1). They may also be present in larger numbers within a 5-mile radius of hibernacula during spring staging and fall swarming. However, males and non-reproductive females may be closer to hibernacula year-round.

1. Take actions to protect NLEB hibernacula. Where a known NLEB hibernaculum is experiencing threats, work with the FWS and other partners to provide the necessary protections (e.g. limit human disturbance, install bat-friendly gates, ensure the use of "clean" clothing and gear).

2. Participate in actions to manage and reduce the impacts of WNS on NLEB. A national plan was prepared by the FWS and other state and federal agencies that details actions needed to investigate and manage white-nose syndrome. Many

state and federal agencies, universities and non-governmental organizations are researching this disease in an attempt to control its spread and address its effects.

3. Avoid disturbing/injuring hibernating bats.
    - Avoid entering NLEB hibernacula during the hibernation season, unless authorized for survey, research, or other management purposes.
    - Comply with all cave and mine closures, advisories, and regulations.
    - Avoid burning or other sources of smoke within 0.25 mile of known or assumed NLEB hibernacula during hibernation season, or coordinate with the local FWS office.
    - Activities involving continuing (i.e., longer than 24 hours) noise disturbances greater than 75 decibels measured on the A scale (e.g., loud machinery) should be avoided within a one-mile radius of known or assumed NLEB hibernacula.

4. Avoid destruction/alteration (e.g., fill, cause collapse of) of caves/mines that may support hibernating bats.
    - Avoid woody vegetation or spoil (e.g., soil, rock, etc.) disposal within 100 feet of known or assumed NLEB hibernacula entrances and associated sinkholes, fissures, or other karst features.
    - When blasting within 0.5 miles of a known or presumed occupied hibernacula entrances and passages, coordinate with the local FWS office to ensure that the blasting will be conducted in a manner that will not compromise the structural integrity or alter the karst hydrology of the hibernacula.
    - When drilling or fracking within 0.5 miles of a known or presumed occupied hibernacula entrances and passages, coordinate with the local FWS office to ensure that the drilling will be conducted in a manner that will not compromise the structural integrity or alter the karst hydrology of the hibernacula Since fracking can affect lateral geology for much greater distances, a wider buffer may be necessary to protect hibernacula from this activity.
    - Avoid modifying cave or mine entrances that may support hibernating bats. If there are safety concerns or concerns about bats (e.g., disturbance, vandalism) at a site, install only "bat friendly" cave/mine gates. Consult the FWS office in your state for more information on "bat friendly" cave/mine gates.

5. Avoid/minimize alterations of clean drinking water and foraging areas.
    - Protect potential recharge areas of cave streams and other karst features that are hydrologically connected to known or assumed hibernacula.

        - Set back equipment servicing and maintenance areas at least 300 feet away from streambeds, sinkholes, fissures, or areas draining into sinkholes, fissures, or other karst or mine features.
        - Follow available standards on spill prevention, containment, and control.
    - Restrict use of herbicides for vegetation management near known or assumed NLEB hibernacula to those specifically approved for use in karst (e.g., sinkholes) and water (e.g., streams, ponds, lakes, wetlands).
    - Implement strict adherence to sediment and erosion control measures, ensure restoration of pre-existing topographic contours after any ground disturbance, and restore native vegetation (where possible).

6. Avoid disturbing/killing/injuring NLEBs during spring staging/fall swarming.
    - Avoid clearing of suitable spring staging and fall swarming habitat within a 5-mile radius of known or assumed NLEB hibernacula during the staging and swarming seasons.
    - Activities involving continuing (i.e., longer than 24 hours) noise disturbances greater than 75 decibels measured on the A scale (e.g., loud machinery) within a five-mile radius of known or assumed NLEB hibernacula should be avoided during the spring staging and fall swarming seasons.
    - During spring staging and fall swarming, use tanks to store waste fluids to ensure no loss of bats by entrapment in waste pits within 5 miles of known or presumed hibernacula or assumed NLEB hibernacula.
    - Avoid prescribed burning or other sources of smoke in known or assumed NLEB habitat during the swarming/staging or hibernation season, or coordinate with the local FWS office.
    - Operate wind turbines during periods (e.g., months, hours, wind speeds) when NLEB activity is unlikely.

7. Avoid or minimize the spread of White-Nose Syndrome (WNS).
    - If you must enter a cave or mine that could harbor hibernating bats, and it does not have a cave and mine closure policy, follow approved WNS decontamination protocols (see whitenosesyndrome.org/topics/decontamination). Under no circumstances should clothing, footwear, or equipment that was used in a WNS-affected state or region be used in unaffected states or regions.

8. Maintain spring staging/fall swarming forested habitat within a 5-mile radius of known or assumed NLEB hibernacula.
    - Retain snags, dead/dying trees, and trees with exfoliating (loose) bark ≥3-inch diameter at breast height (dbh) in areas ≤ one mile from water.
    - Minimize impacts to all forest patches.

- Maintain forest patches and forested connections (e.g., hedgerows, riparian corridors) between patches.
- Maintain natural vegetation between forest patches/connections and developed areas.

<u>Conservation Measures for NLEB in Known or Potential Summer Habitat</u>
NLEB may be present in suitable summer habitat during the regional or local summer season (see Table 1). See the main guidance document for a description of suitable NLEB summer habitat. See Appendix C for assistance in establishing a NLEB home range based on capture records.

9. Determine where NLEB occur in the summer.
    - Coordinate with partners to gather and evaluate NLEB location information.
        - Review both positive and negative data (e.g., acoustic transect surveys).
        - For wind facilities, review project pre-construction surveys and post-construction fatality reports for detection of NLEB.
    - We recommend that large landholders (e.g., U.S. Forest Service, Department of Defense, National Wildlife Refuges, state natural resource agencies) perform baseline bat surveys.

10. Take actions to protect NLEB and their habitat within known NLEB homeranges.

11. Avoid killing or injuring NLEB during tree clearing activities.
    - Do not clear maternity colony summer habitat during the summer maternity season to avoid direct effects to females (pregnant, lactating, and post-lactating) and juveniles (non-volant and volant).

12. Minimize other direct effects to NLEB.
    - Avoid clearing of summer habitat during the time of year when females are pregnant or the pups are non-volant (consult the FWS office for these times).
    - Minimize use of pesticides (e.g., rodenticides, sticky traps) in and around structures with roosting bats.
    - During prescribed burns, where the proposed perimeter fire line is constructed by hand, construct it at least two tree-lengths away from any known NLEB habitat, or potential roost trees that have been identified. If such trees are adjacent to a fixed part of the fire line such as the road, a trail, or the river, they will have fire line constructed around the bases, so long as their remaining in place does not jeopardize firefighter safety.

- Whenever possible, conduct prescribed burns outside of the summer maternity season. Burns conducted during the summer maternity season should be low/moderate intensity to minimize direct impacts to NLEB.
- Fire-effects monitoring should be used before, during, and after the burns to ensure that burning conditions and effects are within the desired ranges.
- Use tanks to store waste fluids to ensure no loss of bats by entrapment in waste pits.
- Avoid conducting construction activities after sunset in known or suitable summer habitat to avoid harassment of foraging NLEBs.
- Operate wind turbines during periods (e.g., months, hours, wind speeds) when NLEB activity is unlikely.

13. Avoid/minimize altering clean drinking water and foraging areas.
    - Minimize use of herbicides and pesticides. If necessary, spot treatment is preferred over aerial application.
    - Minimize use of chemicals (e.g., colorants) in/around storm water detention basins.
    - Minimize potential lighting impacts (e.g., reduce the number of lights, use motion sensors, use shields/full cut-off lens, angle lights downward and away from forest).
    - Contaminants, including but not limited to oils and solvents, should be strictly controlled so the quality, quantity, and timing of prey resources are not affected.
    - Implement sediment and erosion control measures, ensure restoration of pre-existing topographic contours after any ground disturbance, and restore native vegetation (where possible).
    - Site equipment servicing and maintenance areas at least 300 feet away from waterbodies (e.g., wetlands, streams). Follow available standards on spill prevention, containment, and control.
    - Avoid filling, channelizing, or degrading streams, wetlands, and other watering areas.

14. Maintain summer maternity habitat.
    - Retain and avoid impacting potential roost trees, which includes live or dead trees and snags ≥3 inches dbh that have exfoliating bark, cracks, crevices, or cavities. Do not remove trees surrounding potential roosts to maintain the microclimate.
    - Where possible and not a safety hazard, leave dead or dying trees standing.
    - Avoid reducing the suitability of forest patches with known NLEB use.
    - Maintain or improve forest patches and forested connections (e.g., hedgerows, riparian corridors) between patches.

- Clearly demarcate trees to be protected vs. cut to help ensure that contractors do not accidentally remove more trees than anticipated.
- Avoid/minimize tree clearing that fragments large forested areas or tree lined corridors. For example, route linear features along the edge of a woodlot instead of through the middle of it; use horizontal directional drilling for pipeline crossings of wooded stream corridors and upland tree lines.

15. Conduct humane exclusion of NLEB in structures.
    - Minimize use of pesticides (e.g., rodenticides, sticky traps) in and around structures with roosting bats.
    - If bats (of any species) are using structures (e.g., barns or other out-buildings) as roosts, and these structures are proposed for removal, removal should be performed outside of the summer maternity season, unless there are human health or safety concerns associated with the structure. Consult a nuisance wildlife specialist for humane exclusion techniques[1].
    - Prior to the initiation of any construction activities on bridges, including the removal of any bridge structures, we recommend the underside of each bridge be carefully examined for the presence of bats. If any bats are found roosting in the bridge, contact your state FWS office.

<u>Conservation Measures for NLEB During Migration</u>

16. During spring and fall migration, operate wind turbines during periods (e.g., months, hours, wind speeds) when NLEB activity is unlikely.
17. Use of feathering below a cut-in speed of 6.9 m/s at night during migratory seasons has been used to avoid mortality of the Indiana bat. When NLEB are potentially exposed to wind turbines, we suggest that this cut-in speed be used to avoid mortality of migrating NLEBs.

[1] Ensure that all required state and federal permits are in place.

Table 1. Estimated annual NLEB seasonal habitat use time periods by state. Dates currently unavailable for some states (blank cells). Contact those FWS offices for more information.

State/Region	Hibernation Season	Spring Staging Season	Summer Maternity Season	Fall Swarming Season
Maine				
Vermont				
New Hampshire				
Massachusetts				
Connecticut				
New York	Oct 1-May 1		Apr 1-Sep 30	Aug 1-Oct 30
New Jersey (Northern)	Nov 15-Apr 1		Apr 1-Sep 30	Aug 16-Nov 15
Minnesota	Oct 1-May 15		Apr 1-Sep 30	
Wisconsin	Oct 1-May 15	Apr 1-May 15	Apr 1-Sep 30	Aug 15-Oct 15
Michigan			Apr 1-Sep 30	
North Dakota	Oct 1-May 15		Apr 1-Sep 30	
South Dakota	Oct 1-Apr 1		Apr 1-Sep 30	
Montana	Oct 1-May 15		Apr 1-Sep 30	
Wyoming	Oct 1-Apr 1		Apr 1-Sep 30	
Nebraska	Nov 15-Mar 15		Apr 1-Sep 30	
Ohio	Nov 15-Mar 15	Mar 16-May 14	Apr 1-Sep 30	Aug 16-Nov 15
Iowa	Nov 1-Mar 31		Apr 1-Sep 30	
Indiana	Nov 15-Mar 31	Apr 1-May 14	Apr 1-Sep 30	Aug 16-Nov 15
Pennsylvania				
Illinois	Nov 1–Mar 31		Apr 1-Sep 30	Aug 16-Nov 15
Kentucky	Nov 15-Mar 31	Apr 1-May 14	May 15-Aug 15	Aug 16-Nov 15
Missouri	Nov 1-Mar 31	Apr 1-May 14	May 15-Aug 15	Aug 16-Nov 15
North Carolina	Oct 15-Apr 15	Apr 1-May 14	May 15-Aug 15	Aug 16-Nov 15
Virginia	Nov 15-Mar 31	Apr 1-May 14	Apr 15-Sep 15	Aug 16-Nov 15
West Virginia	Nov 15-Mar 31	Apr 1-May 14	Apr 1-Nov 14	Aug 15-Nov 14
Tennessee	Oct 15-Mar 31	Mar 16-May 14	May 15-Aug 15	Aug 16-Nov 15
Kansas	Nov 1-Mar 31		May 15-Aug 15	
Oklahoma	Nov 1-Mar 31	Apr 1-May 14	May 15-Aug 15	Aug 16-Nov 15
Arkansas	Dec 1-Mar 15	Apr 1-May 14	Apr 1-Aug 15	Aug 16-Nov 30
Louisiana	Dec 1-Mar 15	Apr 1-May 14	May 15-Aug 15	Aug 16-Nov 30
Mississippi	Dec 1-Mar 15	Apr 1-May 14	May 15-Aug 15	Aug 16-Nov 30
Alabama	Dec 1-Mar 15	Apr 1-May 14	May 15-Aug 15	Aug 16-Nov 30
Georgia	Dec 1-Mar 15	Apr 1-May 14	May 15-Aug 15	Aug 16-Nov 30

Eastern Small-footed Myotis

Small-footed Myotis

Photo credits: *Alan Hicks*

Scientific Name *Myotis leibii* (Audubon and Bachman, 1842)

Family Name Vespertilionidae Evening Bats and Vesper Bats

Did you know?
The Eastern Small-footed Myotis is the smallest Myotis in the eastern United States. It differs from other bats in that it typically roosts in rock crevices and talus, rather than trees.

Summary

Protection Species of Special Concern in New York State, not listed federally.

This level of state protection means: A native species at risk of becoming Threatened; does not qualify as Endangered or Threatened, but have been determined to require some measure of protection or attention to ensure that the species does not become threatened. NYSDEC may regulate the takin

Rarity G1G3, S2

A global rarity rank of G1G3 means: Critically Imperiled, Imperiled, or Vulnerable globally -- Conservation status is uncertain, and could range from very high to moderate risk of extinction due to rarity or other factors. More information is needed to assign a single conservation status.
A state rarity rank of S2 means: Typically 6 to 20 occurrences, few remaining individuals, acres, or miles of stream, or factors demonstrably make it very vulnerable in New York State.

Conservation Status in New York

Although the species has been recorded from 40 hibernacula, there are just nine overwintering locations with approximately 50 or more individuals (including one site with a high count of 46). Many of the hibernacula contain few individuals. The small number of total individuals statewide and the small number of high-quality occurrences are the primary ranking considerations.

Short-term Trends

The population appears to be stable. The total maximum count, using high counts from each of the 40 known hibernacula between 1982 and 2006, is 3,396.

Long-term Trends

The long-term trends are unknown.

Conservation and Management

Threats

Some mines may suffer from collapse or closure and a few cave occurrences are probably threatened or reduced in quality due to the commercialization or frequent winter visitation by spelunkers. The main threat is disturbance during the winter hibernation period and, although this currently does not appear to be a major threat at the best sites (mines), it could be a problem at some of the cave sites.

Conservation Strategies and Management Practices

Cave or mine gating should be given serious consideration at sites that may otherwise receive heavy winter usage. Fencing around openings may be sufficient at some of the more remote locations. Gates or fences will need monitoring to ensure that they remain effective. Gates over entrances must be designed in accordance with specifications that allow easy entrance by bats and do not restrict or alter air movement patterns within subterranean systems.

Research Needs

Determination of the percentage of the wintering population that is visible during hibernacula counts is necessary to develop population estimates and trends. Determining the summer distribution and habitat preferences of reproductive females is also a research need (New York State Department of Environmental Conservation 2006).

Habitat

This species winters in caves and mines with the largest overwintering populations currently known from mines in the northern part of the state. Several individuals, including a few lactating females, have been mist-netted in deciduous forests during the summer months in southeastern and central New York, but the species is likely to be more widespread in the state during the summer months. Several studies in the northeast and southeast have indicated that Small-footed Myotis roost and form maternity colonies in fractures in rock ledges and talus. This type of roosting behavior may contribute to the low numbers observed during winter hibernacula counts in New York because many individuals may not be readily detectable on cave or mine walls, but additional research is needed to confirm this.

Associated Ecological Communities

Acidic Talus Slope Woodland
An open to closed canopy woodland that occurs on talus slopes (slopes of boulders and rocks, often at the base of cliffs) composed of non-calcareous rocks such as granite, quartzite, or schist.

Appalachian Oak-hickory Forest
A hardwood forest that occurs on well-drained sites, usually on ridgetops, upper slopes, or south- and west-facing slopes. The soils are usually loams or sandy loams. This is a broadly defined forest community with several regional and edaphic variants. The dominant trees include red oak, white oak, and/or black oak. Mixed with the oaks, usually at lower densities, are pignut, shagbark, and/or sweet pignut hickory.

Beech-maple Mesic Forest
A hardwood forest with sugar maple and American beech codominant. This is a broadly defined community type with several variants. These forests occur on moist, well-drained, usually acid soils. Common associates are yellow birch, white ash, hop hornbeam, and red maple.

Calcareous Cliff Community
A community that occurs on vertical exposures of resistant, calcareous bedrock (such as limestone or dolomite) or consolidated material; these cliffs often include ledges and small areas of talus.

Chestnut Oak Forest
A hardwood forest that occurs on well-drained sites in glaciated portions of the Appalachians, and on the coastal plain. This forest is similar to the Allegheny oak forest; it is distinguished by fewer canopy dominants and a less diverse shrublayer and groundlayer flora. Dominant trees are typically chestnut oak and red oak.

Cliff Community

A community that occurs on vertical exposures of resistant, non-calcareous bedrock (such as quartzite, sandstone, or schist) or consolidated material; these cliffs often include ledges and small areas of talus.

Hemlock-northern Hardwood Forest
A mixed forest that typically occurs on middle to lower slopes of ravines, on cool, mid-elevation slopes, and on moist, well-drained sites at the margins of swamps. Eastern hemlock is present and is often the most abundant tree in the forest.

Limestone Woodland
A woodland that occurs on shallow soils over limestone bedrock in non-alvar settings, and usually includes numerous rock outcrops. There are usually several codominant trees, although one species may become dominant in any one stand.

Maple-basswood Rich Mesic Forest
A species rich hardwood forest that typically occurs on well-drained, moist soils of circumneutral pH. Rich herbs are predominant in the ground layer and are usually correlated with calcareous bedrock, although bedrock does not have to be exposed. The dominant trees are sugar maple, basswood, and white ash.

Red Cedar Rocky Summit
A community that occurs on warm, dry, rocky ridgetops and summits where the bedrock is calcareous (such as limestone or dolomite, but also marble, amphibolite, and calcsilicate rock), and the soils are more or less calcareous. The vegetation may be sparse or patchy, with numerous lichen covered rock outcrops.

Shale Cliff And Talus Community
A community that occurs on nearly vertical exposures of shale bedrock and includes ledges and small areas of talus. Talus areas are composed of small fragments that are unstable and steeply sloping; the unstable nature of the shale results in uneven slopes and many rock crevices.

Shale Talus Slope Woodland
An open to closed canopy woodland that occurs on talus slopes composed of shale. These slopes are rather unstable, and they are usually very well-drained, so the soils are shallow and dry. The canopy cover is usually less than 50%, due to the instability of the substrate.

Associated Species

Big Brown Bat (*Eptesicus fuscus*)
Little Brown Bat (*Myotis lucifugus*)
Northern Myotis (*Myotis septentrionalis*)
Indiana Bat (*Myotis sodalis*)
Eastern Pipistrelle (*Pipistrellus subflavus*)

Identification Comments

Identifying Characteristics

This is a very small bat with tiny feet. Measurements are as follows: total length of 72-84 mm, tail length of 30-39 mm, hind foot length 6- 8 mm, forearm length of 30-36 mm, and wingspread of 212-248 mm; the weight of an adult is 3-8 g (Banfield 1974, Godin 1977, Schwartz and Schwartz 1981, Merritt 1987). The dorsal pelage is pale yellowish brown to golden brown, the ears are black, and the face has a black mask. The tragus, a fleshy projection at the entrance to the ear, is long and pointed. There are no prominent chin or nose flaps. The belly hair varies from pale buff to whitish. The bases of the hairs on the back are blackish and the wing and tail membranes are very dark brown. The tail reaches the edge of the interfemoral membrane (the membrane that stretches between the legs of bats that is used for flight and for catching insects). The base of this membrane and the undersurfaces of the wing membranes are sparsely furred. The calcar (a cartilaginous extension of the ankle) has a definitive keel. The sexes are similar in appearance.

Characteristics Most Useful for Identification

The combination of the small size, golden-yellow pelage, and lack of a mask make this bat readily distinguishable from other species of bats in New York. The small hind foot and long-keeled calcar are also diagnostic.

Behavior

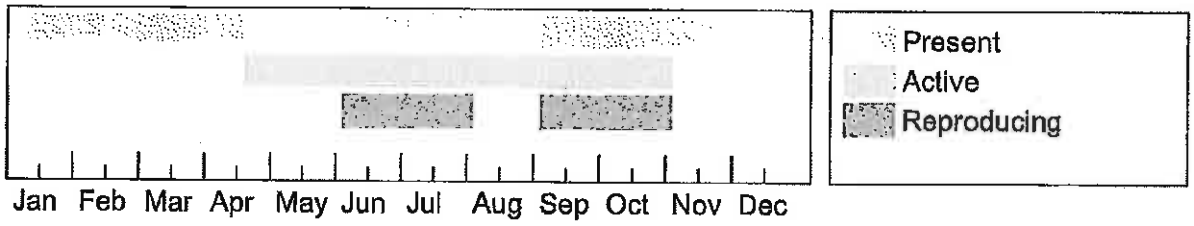
Mating behavior is similar to that of the Little Brown Bat (Myotis lucifugus) (Wimsatt 1945) and so, probably, are other facets of reproduction (Banfield 1974). Breeding may occur in the fall, with the sperm stored in the uterus over the winter. Active gestation lasts probably two months, with a single offspring born annually, probably in early July (Merritt 1987). Survival rates are significantly lower for females (42%) than for males (76%) (van Zyll de Jong 1985). One individual is reported to have lived 12 years (Hitchcock 1965). Colonies are usually small (fewer than 15 individuals), although a few number in the hundreds up to approximately 2,000.

Diet

The diet consists almost exclusively of flying insects, but specific data are lacking. Feeding flights are relatively slow and fluttery and often occur over ponds and streams and along roads.

The Best Time to See

Emerges from its daytime retreat shortly after sunset, while there is still some light. In the northeastern U.S., seldom enters hibernation caves before mid-November; departs by March, or possibly earlier in Vermont (Godin 1977).



The time of year you would expect to find Eastern Small-footed Myotis in New York.

Similar Species

Eastern Pipistrelle(Pipistrellus subflavus): The Eastern Pipistrelle can be distinguished from the Small-footed Myotis by its pink forearms and lack of a black mask.

Indiana Bat(Myotis sodalis): The Indiana Bat can be distinguished from the Small-footed Myotis by its slightly larger size, uniform gray-brown pelage, pink nose, and lack of a black mask.

Northern Myotis(Myotis septentrionalis): The Northern Myotis can be distinguished from the Small-footed Myotis by its slightly larger size, gray-brown pelage, long ears, unkeeled calcar, and lack of a black mask.

Little Brown Bat(Myotis lucifugus): The Little Brown Bat can be distinguished from the Small-footed Myotis by its slightly larger size, brown-white bi-colored pelage, unkeeled calcar, and lack of a black mask.

Taxonomy

Kingdom Animalia
└ **Phylum** Craniata
└ **Class** Mammals (Mammalia)
└ **Order** Bats (Chiroptera)
└ **Family** Vespertilionidae (Evening Bats and Vesper Bats)

Additional Resources

Links

NatureServe Explorer
http://natureserve.org/explorer/servlet/NatureServe?searchName=MYOTIS+LEIBII
Google Images
http://images.google.com/images?q=MYOTIS+LEIBII
Bat Conservation International
http://www.batcon.org/home/default.asp

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APPENDIX C

Capacity Analysis

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	0	20	5	6	12	16	331	0	6	490	46
Satd. Flow (prot)	0	1709	0	0	1715	0	0	1859	0	0	1840	0
Flt Permitted		0.865			0.965			0.969			0.996	
Satd. Flow (perm)	0	1523	0	0	1672	0	0	1805	0	0	1835	0
Satd. Flow (RTOR)		36			13						11	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	54	0	0	25	0	0	377	0	0	590	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	25.0	25.0		25.0	25.0		35.0	35.0		35.0	35.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		20.0			20.0			30.0			30.0	
Actuated g/C Ratio		0.33			0.33			0.50			0.50	
v/c Ratio		0.10			0.04			0.42			0.64	
Control Delay		8.0			9.8			11.3			14.8	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		8.0			9.8			11.3			14.8	
LOS		A			A			B			B	
Approach Delay		8.0			9.8			11.3			14.8	
Approach LOS		A			A			B			B	
Queue Length 50th (ft)		4			3			80			142	
Queue Length 95th (ft)		24			17			136			238	
Internal Link Dist (ft)		1394			1015			902			1804	
Turn Bay Length (ft)												
Base Capacity (vph)		531			566			902			923	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.10			0.04			0.42			0.64	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 29 (48%), Referenced to phase 6:, Start of Green
Control Type: Pretimed
Maximum v/c Ratio: 0.64
Intersection Signal Delay: 13.1 — Intersection LOS: B
Intersection Capacity Utilization 45.5% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 1: Route 55 & Wheeler Road/Wheeler Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	81	40	20	10	40	75	16	237	16	46	235	40
Satd. Flow (prot)	0	1776	0	0	1705	0	0	1842	0	0	1818	0
Flt Permitted		0.766			0.975			0.974			0.920	
Satd. Flow (perm)	0	1400	0	0	1669	0	0	1800	0	0	1685	0
Satd. Flow (RTOR)		9			82			6			15	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	153	0	0	136	0	0	292	0	0	348	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		25.0			25.0			55.0			55.0	
Actuated g/C Ratio		0.28			0.28			0.61			0.61	
v/c Ratio		0.39			0.26			0.26			0.34	
Control Delay		28.2			12.7			8.7			9.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		28.2			12.7			8.7			9.2	
LOS		C			B			A			A	
Approach Delay		28.2			12.7			8.7			9.2	
Approach LOS		C			B			A			A	
Queue Length 50th (ft)		66			23			69			84	
Queue Length 95th (ft)		122			67			109			133	
Internal Link Dist (ft)		846			419			539			621	
Turn Bay Length (ft)												
Base Capacity (vph)		395			522			1102			1035	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.39			0.26			0.26			0.34	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 42 (47%), Referenced to phase 6:, Start of Green
Control Type: Pretimed
Maximum v/c Ratio: 0.39
Intersection Signal Delay: 12.7 Intersection LOS: B
Intersection Capacity Utilization 53.2% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 2: Route 22 & Pleasant Ridge Rd

Existing PM
1: Route 55 & Wheeler Road/Wheeler Rd

9/3/2015

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	26	4	20	5	4	4	12	438	0	6	314	35
Satd. Flow (prot)	0	1716	0	0	1751	0	0	1861	0	0	1837	0
Flt Permitted		0.887			0.938			0.988			0.992	
Satd. Flow (perm)	0	1561	0	0	1674	0	0	1840	0	0	1824	0
Satd. Flow (RTOR)		22			4						13	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	54	0	0	13	0	0	489	0	0	386	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	25.0	25.0		25.0	25.0		35.0	35.0		35.0	35.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		20.0			20.0			30.0			30.0	
Actuated g/C Ratio		0.33			0.33			0.50			0.50	
v/c Ratio		0.10			0.02			0.53			0.42	
Control Delay		10.1			11.8			12.9			10.9	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		10.1			11.8			12.9			10.9	
LOS		B			B			B			B	
Approach Delay		10.1			11.8			12.9			10.9	
Approach LOS		B			B			B			B	
Queue Length 50th (ft)		8			2			111			78	
Queue Length 95th (ft)		28			12			186			135	
Internal Link Dist (ft)		1394			1015			902			1804	
Turn Bay Length (ft)												
Base Capacity (vph)		535			560			920			918	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.10			0.02			0.53			0.42	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 29 (48%), Referenced to phase 6 : Start of Green
Control Type: Pretimed
Maximum v/c Ratio: 0.53
Intersection Signal Delay: 11.9 — Intersection LOS: B
Intersection Capacity Utilization 42.1% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 1: Route 55 & Wheeler Road/Wheeler Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	26	57	15	5	35	44	16	243	8	64	223	46
Satd. Flow (prot)	0	1802	0	0	1725	0	0	1850	0	0	1809	0
Flt Permitted		0.916			0.988			0.973			0.886	
Satd. Flow (perm)	0	1672	0	0	1710	0	0	1805	0	0	1619	0
Satd. Flow (RTOR)		10			48			3			16	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	106	0	0	91	0	0	290	0	0	362	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		25.0			25.0			55.0			55.0	
Actuated g/C Ratio		0.28			0.28			0.61			0.61	
v/c Ratio		0.23			0.18			0.26			0.36	
Control Delay		24.2			14.3			8.8			9.6	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		24.2			14.3			8.8			9.6	
LOS		C			B			A			A	
Approach Delay		24.2			14.3			8.8			9.6	
Approach LOS		C			B			A			A	
Queue Length 50th (ft)		42			18			69			89	
Queue Length 95th (ft)		84			54			109			142	
Internal Link Dist (ft)		846			419			539			621	
Turn Bay Length (ft)												
Base Capacity (vph)		471			509			1104			995	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.23			0.18			0.26			0.36	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 42 (47%), Referenced to phase 6 : Start of Green
Control Type: Pretimed
Maximum v/c Ratio: 0.36
Intersection Signal Delay: 11.6 — Intersection LOS: B
Intersection Capacity Utilization 56.7% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 2: Route 22 & Pleasant Ridge Rd