STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
800 BAY ROAD
P.O. BOX 778
DOVER, DELAWARE 19903

SHANTÉ A. HASTINGS
SECRETARY

May 8, 2025

Mr. Carl Wilson Jr. P.E, PTOE, RSP
The Traffic Group, Inc.
9900 Franklin Square Dr. - Suite H
Baltimore, MD 21236

Dear Mr. Wilson,

The enclosed Traffic Impact Study (TIS) review letter for the proposed Revised **Ingram Village** (Tax Parcel: 230-26.00-75.00) residential development has been completed under the responsible charge of a registered professional engineer whose firm is authorized to work in the State of Delaware. They have found the TIS to conform to DelDOT's Development Coordination Manual and other accepted practices and procedures for such studies. The letter has been revised due to an increase in the proposed land uses and to update the requirements based on the recent changes in the area. DelDOT accepts this letter and concurs with the recommendations. If you have any questions concerning this letter or the enclosed review letter, please contact me at Annamaria.Furmato@delaware.gov.

Sincerely,

Annamaria Furmato
TIS Review Engineer

AF:km
Enclosures
cc with enclosures: Kevin Prenderville Insight Land Company, LLC
Steve Fortunato, Bohler Engineering
David L. Edgell, Office of State Planning Coordination
Jamie Whitehouse, Sussex County Planning & Zoning
Andrew J. Parker, McCormick Taylor, Inc.
Tucker Smith, McCormick Taylor, Inc.
DelDOT Distribution

DelDOT

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Lanie Clymer, Deputy Secretary
Mark Luszcz, Chief Engineer, Transportation Solutions (DOTS)
Brad Eaby, Deputy Attorney General, DOTS
Michael Simmons, Chief Project Development South, DOTS
Peter Haag, Chief Traffic Engineer, DOTS
Wendy Carpenter, Traffic Calming & Subdivision Relations Manager, Traffic, DOTS
Sean Humphrey, Traffic Engineer, Traffic, DOTS
Alistair Probert, South District Engineer, M&O
Matt Schlitter, South District Public Works Engineer, M&O
Jared Kauffman, Service Development Planner, DTC
Tremica Cherry, Service Development Planner, DTC
Anthony Aglio, Planning Supervisor, Active Transportation & Community Connections, Planning
Steve Bayer, Planning Supervisor, Statewide & Regional Planning, Planning
Anson Gock, Planner, Statewide & Regional Planning, Planning
Todd Sammons, Assistant Director, Development Coordination
Wendy Polasko, Subdivision Engineer, Development Coordination
John Pietrobono, Acting Sussex Review Coordinator, Development Coordination
Derek Sapp, Sussex Review Engineer, Development Coordination
Sireen Muhtaseb, TIS Engineer, Development Coordination
Ben Fisher, TIS Review Engineer, Development Coordination
Tijah Jones, TIS Review Engineer, Development Coordination

May 7, 2025

Ms. Sireen Muhtaseb, PE
TIS Engineer
DelDOT Division of Planning
P.O. Box 778
Dover, DE 19903

RE: Agreement No. 1404
Traffic Impact Study Services
Task No. 18A – Ingram Village

Dear Ms. Muhtaseb:

McCormick Taylor has completed its review of the Traffic Impact Study (TIS) for Ingram Village prepared by Davis, Bowen & Friedel, Inc. (DBF), dated April 2008. This review was assigned as Task Number 18A. DBF prepared the report in a manner generally consistent with DelDOT's *Rules and Regulations for Subdivision Streets*.

The TIS evaluates the impacts of Ingram Village, proposed to be located along the east side of North Old State Road (Sussex Road 213), north of the end of Washington Avenue and north of Delaware Route 16 (Sussex Road 16), in the Town of Ellendale in Sussex County, Delaware. The proposed development on which this TIS was based would consist of 132 townhouses and 268 single-family detached houses on approximately 101 acres of land. Three access points were proposed: two along North Old State Road and one as an extension of Washington Avenue. There will also be an interconnection to the proposed Forest Landing development directly north of the site, which has planned access to North Old State Road.

The TIS was originally reviewed in 2008 and 2009, the development received approvals, and much of the southern portion of the development was constructed between 2014 and 2024. The portions that have been constructed include the extension of Washington Avenue as one access and the southern site entrance (named Gladys Street) on North Old State Road as the second access. Construction of the northern site access (named Ingram Boulevard) on North Old State Road has begun but had not been completed as of Fall 2024. The developer's team met with DelDOT's Development Coordination Section in August 2024 to discuss the acquisition of an approximately 11-acre site along with changes in unit counts, among other items. The currently proposed development would now consist of 304 townhouses (increase of 172) and 243 single-family detached houses (decrease of 25) on approximately 113 acres of land. The proposed access points will remain the same. The change in the unit counts will result in a total of 319 AM peak hour trips, 407 PM peak hour trips, 385 Saturday peak hour trips, and 4,550 daily trips, which are greater numbers of trips than initially studied. However, the net increases in trips for those updated unit counts are 58 (AM), 72 (PM), 55 (Saturday), and 1,031 (daily). DelDOT's TIS criteria requires updated analysis for a net increase of greater than 200 peak hour trips or 2,000 daily trips. As the net increase in trips would not exceed these thresholds, updated analysis was not conducted. Construction is anticipated to be completed by 2029.

DelDOT reviewed a TIS in 2023 for a proposed project, Ellendale Subdivision, which would

be located on the western side of Old North State Road across from Ingram Village. This TIS was based on counts collected in November and December of 2022 and includes Ingram Village as a committed development as well as Forest Landing, Ellendale Convenience Store, Newdale Acres, and Captains Way. There are close similarities between the Ellendale Subdivision and Ingram Village developments in terms of the type and size of each development (both are residential-only developments with a total number of units between 525 and 547) and their locations (both are located on North Old State Road across from each other, within a few thousand feet north of Delaware Route 16). As such, the traffic analysis and recommendations for Ingram Village should be similar to those for Ellendale Subdivision with the exception of the intersection of Delaware Route 16 and North Old State Road as discussed below.

The land for Ingram Village is now zoned R-3 in the Town of Ellendale.

Relevant and On-Going Projects and Studies

Currently, there are three DelDOT projects within the area of study. The first initiative is DelDOT's *Corridor Capacity Preservation Program (CCPP)*, a statewide program intended to sustain the through capacity of adopted highway corridors by various means such as limiting access points and using service roads for local vehicle trips. The general purpose of the program is to ensure that existing principal arterial roadways, including this section of US Route 113, are able to efficiently carry regional traffic without impedance from the effects of local development.

The second project in the study area is DelDOT's *US Route 113 at Delaware Route 16 (Ellendale) Grade Separated Intersection Project* (T201212701). The project will replace the existing signal with a grade separated intersection to improve safety, operations, and reduce congestion. The proposed improvements were recommended as part of the Ellendale Area portion of the overall US Route 113 North/South Study. The funding for design of the interchange is planned to begin in FY 2027. The project could potentially start earlier if additional funding becomes available. More details about this project are available at the following link: https://deldot.gov/projects/index.shtml?dc=details&projectNumber=T201212701.

Finally, DelDOT's *Coastal Corridors Study* aims to study the east-west travel patterns in Sussex County including, but not limited to, Delaware Route 404 and Delaware Route 16, including the section nearest the proposed development. Initial efforts have identified the east-west routes/corridors in northern Sussex County that are currently congested or are at risk for congestion based on anticipated growth in the area. The study focuses on a number of factors including longer trips from the Chesapeake Bay Bridge to the Delaware beaches and Ocean City, Maryland, regional traffic between Maryland's Eastern Shore and Sussex County, and local east-west traffic within the northern part of Sussex County. The study report was published in June 2024 and it identified several study recommendations for further study and advancement, although none are in the immediate Ellendale area. More information about this study is available at the following link: https://deldot.gov/projects/Studies/coastalcorridors/

Summary of Analysis Results

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

Based on the Ellendale Subdivision TIS, the following intersections applicable to the Ingram Village TIS exhibit level of service (LOS) deficiencies without the implementation of physical roadway and/or traffic control improvements:

Intersection	*Existing Traffic Control*	*Situations for which deficiencies occur*
Delaware Route 16 and N. Old State Road	Unsignalized	2022 existing Saturday (Case 1) 2029 without development AM, PM and Saturday (Case 2) 2029 with development AM, PM, and Saturday (Case 3)
US Route 113 and Delaware Route 16	Signalized	2029 without development PM and Saturday (Case 2) 2029 with development PM and Saturday (Case 3)

Delaware Route 16 and N. Old State Road (See Recommendation 4)
With the Ellendale Subdivision, this unsignalized intersection experiences LOS deficiencies under existing Summer Saturday conditions and in the future without development and with development scenarios during the weekday AM, PM and summer Saturday peak periods. The deficiencies include LOS F with significant delays and lengthy queues on both the northbound and southbound stop-controlled approaches of N. Old State Road. McCormick Taylor completed Traffic Signal Justification Study (TSJS) analysis for the Ellendale Subdivision and found that a signal would be warranted at full buildout of Ellendale Subdivision. However, the TSJS analysis also indicated that the signal would not be warranted in the Ingram Village opening year of 2029, assuming the Ellendale Subdivision development is not constructed by that time. Therefore, we recommend the developer of Ingram Village make a contribution to the Traffic Signal Revolving Fund (TSRF) for a future signal at this intersection.

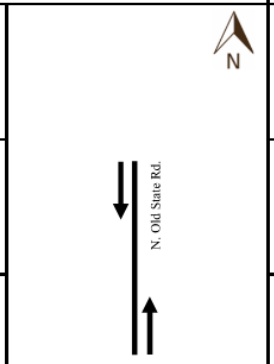
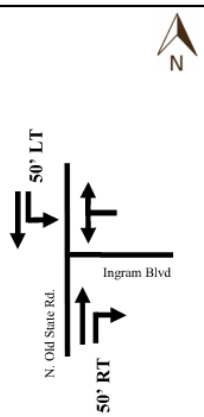
US Route 113 and Delaware Route 16 (See Recommendation 5)
This signalized intersection experiences overall LOS deficiencies in the future without development and with development scenarios during the weekday PM and summer Saturday peak periods. DelDOT's *US Route 113 at Delaware Route 16 (Ellendale) Grade Separated Intersection Project* will result in replacing the existing signal with a grade separated intersection. The developer should contribute towards that project.

Development Improvements

Should the Town of Ellendale approve the proposed development, the following items should be incorporated into the site design and reflected on the record plan by note or illustration, unless a Design Deviation is requested and approved by the Department. All applicable agreements (i.e. letter agreements for off-site improvements and traffic signal agreements) should be executed prior to entrance plan approval for the proposed development. The following items should be implemented at the same time as site construction once all agency approvals and permits are secured and completed in accordance with DelDOT's Standards and Specifications.

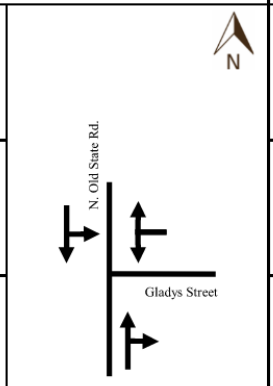
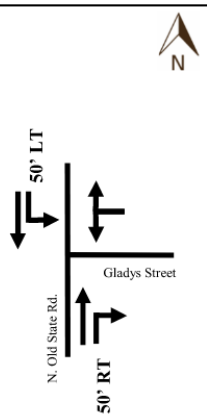
1. The developer should improve North Old State Road from Delaware Route 16 to the point where Ingram Village and Forest Landing have common boundaries to include eleven-foot travel lanes and five-foot shoulders. Note that the Forest Landing property is tax parcel 230-19.00-112.00 and is located immediately north of Ingram Village. The improvements shall include both directions of travel, regardless of whether the developer's lands are on one or both sides of the road. The developer should coordinate with DelDOT's Subdivision Section to determine final design details of the North Old State Road improvements.

2. The developer should construct the Northern Site Entrance (Ingram Boulevard) on North Old State Road to include a separate left-turn lane on the southbound approach of North Old State Road and a separate right-turn lane on the northbound approach of North Old State Road. The proposed configuration is shown in the table below.

Approach	Current Configuration		Approach	Proposed Configuration	
Northbound N. Old State Road	One through lane		Northbound N. Old State Road	One through lane and one right-turn lane.	
Southbound N. Old State Road	One through lane		Southbound N. Old State Road	One left-turn lane and one through lane.	
Eastbound	Approach does not exist		Eastbound	No change.	
Westbound	Approach does not exist		Westbound Site Entrance (Ingram Boulevard)	One shared left/ right-turn lane. Stop or yield control.	

Based on DelDOT's Auxiliary Lane Worksheet, the initial recommended minimum turn lane length (excluding taper) of the right-turn lane on northbound North Old State Road is 50 feet. The initial recommended length (excluding taper) of the left-turn lane on southbound North Old State Road is also 50 feet. The developer should coordinate with DelDOT's Development Coordination Section to determine final turn lane lengths and other design details during the site plan review.

3. The developer should modify the existing southern site entrance (Gladys Street) on North Old State Road. The proposed configuration is shown in the table below.

Approach	Current Configuration		Approach	Proposed Configuration	
Northbound N. Old State Road	One shared through/right-turn lane		Northbound N. Old State Road	One through lane and one right-turn lane.	
Southbound N. Old State Road	One shared left-turn/through lane		Southbound N. Old State Road	One left-turn lane and one through lane.	
Eastbound	Approach does not exist		Eastbound	No change.	
Westbound Gladys Street	One shared left/ right-turn lane. Stop control.		Westbound Gladys Street	One shared left/ right-turn lane. Stop control.	

Based on DelDOT's Auxiliary Lane Worksheet, modifications are warranted at this existing Site Entrance. These modifications would consist of a separate left-turn lane on the southbound approach of North Old State Road and a separate right-turn lane on the northbound approach of North Old State Road.

The initial recommended minimum turn lane length (excluding taper) of the left-turn lane on southbound North Old State Road is 50 feet. The initial recommended length (excluding taper) of the right-turn lane on northbound North Old State Road is also 50 feet. The developer should coordinate with DelDOT's Development Coordination Section to determine final turn lane lengths and other design details during the site plan review.

4. The developer should contribute to the Traffic Signal Revolving Fund (TSRF) for a future signal at the intersection of Delaware Route 16 and N. Old State Road. The amount of the TSRF contribution, as determined by DelDOT's Development Coordination Section, is $36,301.12.

5. The developer should coordinate with DelDOT regarding an equitable share contribution toward DelDOT's *US Route 113 at Delaware Route 16 (Ellendale) Grade Separated Intersection Project*. The amount of the contribution, as determined by DelDOT's Development Coordination Section, should not exceed $121,432.28.

6. The following bicycle, pedestrian, and transit improvements should be included:

    a. Per the DelDOT Development Coordination Manual section 5.2.9.2, bicycle lanes are required where right-turn lanes are being installed.

    b. Appropriate bicycle symbols, directional arrows, pavement markings, and signing should be included along bicycle facilities and turn lanes within the project limits.

    c. Utility covers should be made flush with the pavement.

    d. A minimum 15-foot-wide permanent easement from the edge of the right-of-way should be dedicated to DelDOT within the site frontage along North Old State Road. Along the frontage, a minimum of a 10-foot wide shared-use path should be constructed. The shared-use path should meet AASHTO and ADA standards. The developer shall coordinate with DelDOT's Development Coordination Section through the plan review process to determine the details of the shared-use path design and connections/terminations at or before the boundaries of the property.

    e. ADA compliant curb ramps and crosswalks should be provided at all pedestrian crossings, including all site entrances. Type 3 curb ramps are discouraged.

    f. Internal sidewalks for pedestrian safety and to promote walking as a viable transportation alternative should be constructed within the development. These sidewalks should each be a minimum of five-feet wide (with a minimum of a five-foot buffer from the roadway) and should meet current AASHTO and ADA standards. These sidewalks should be constructed to extend to the site entrances and to the proposed shared-use path along the site frontages. Additionally, these internal sidewalks should connect to proposed sidewalks within the adjacent Forest Landing development.

    g. The developer shall coordinate with the local school district to provide a covered bus stop, installed on a concrete pad. Internal sidewalks shall be connected to this stop and include parking facilities for bicyclists.

    h. The developer should coordinate with the Delaware Transit Corporation regarding the possibility of adding transit services and facilities at this location. Internal sidewalks should be connected to any new transit facilities.

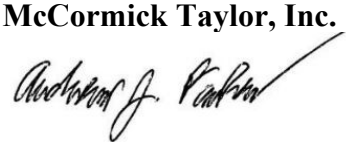
Improvements in this TIS may be considered "significant" under DelDOT's Work Zone Safety and Mobility Procedures and Guidelines. These guidelines are available on DelDOT's website at http://deldot.gov/Publications/manuals/de_mutcd/index.shtml.

Please note that this review generally focuses on capacity and level of service issues; additional safety and operational issues will be further addressed through DelDOT's site plan review process.

Additional details on our review of this TIS are attached. Please contact me at (610) 640-3500 or through e-mail at ajparker@mccormicktaylor.com if you have any questions concerning this review.

Sincerely,

McCormick Taylor, Inc.



Andrew J. Parker, PE, PTOE
Project Manager

Enclosure


Scope of Improvements Figure
Ingram Village TIS
99 — Intersection Number
X — Improvement Code
Color Code
Proposed Site Entrance - Frontage improvements and turn lanes as described in the review letter.
Contribution to Future Signal or Planned Project (DelDOT)
No Improvements
Improvement Code
S - Traffic Signal, R - Roundabout, E - Elimination
G - Geometric (turn lanes,widening)
Fleatown Road
Staytonville Road
N. Old State Road
US 113
Ingram Village
1
G
Ingram Blvd
2
G
Gladys St
Washington Ave.
DE 16
3
S
4
5
6
7
Sharons Road
S. Old State Road

Disclaimer: The remainder of this review letter has not been updated since it was initially finalized and issued in 2009. The following pages do not reflect all the updates and recommendations described in the first 8 pages of this letter. Note that conditions in this area have been more recently reviewed in 2023 as part of the Ellendale Subdivision TIS, which included new traffic counts and analysis.

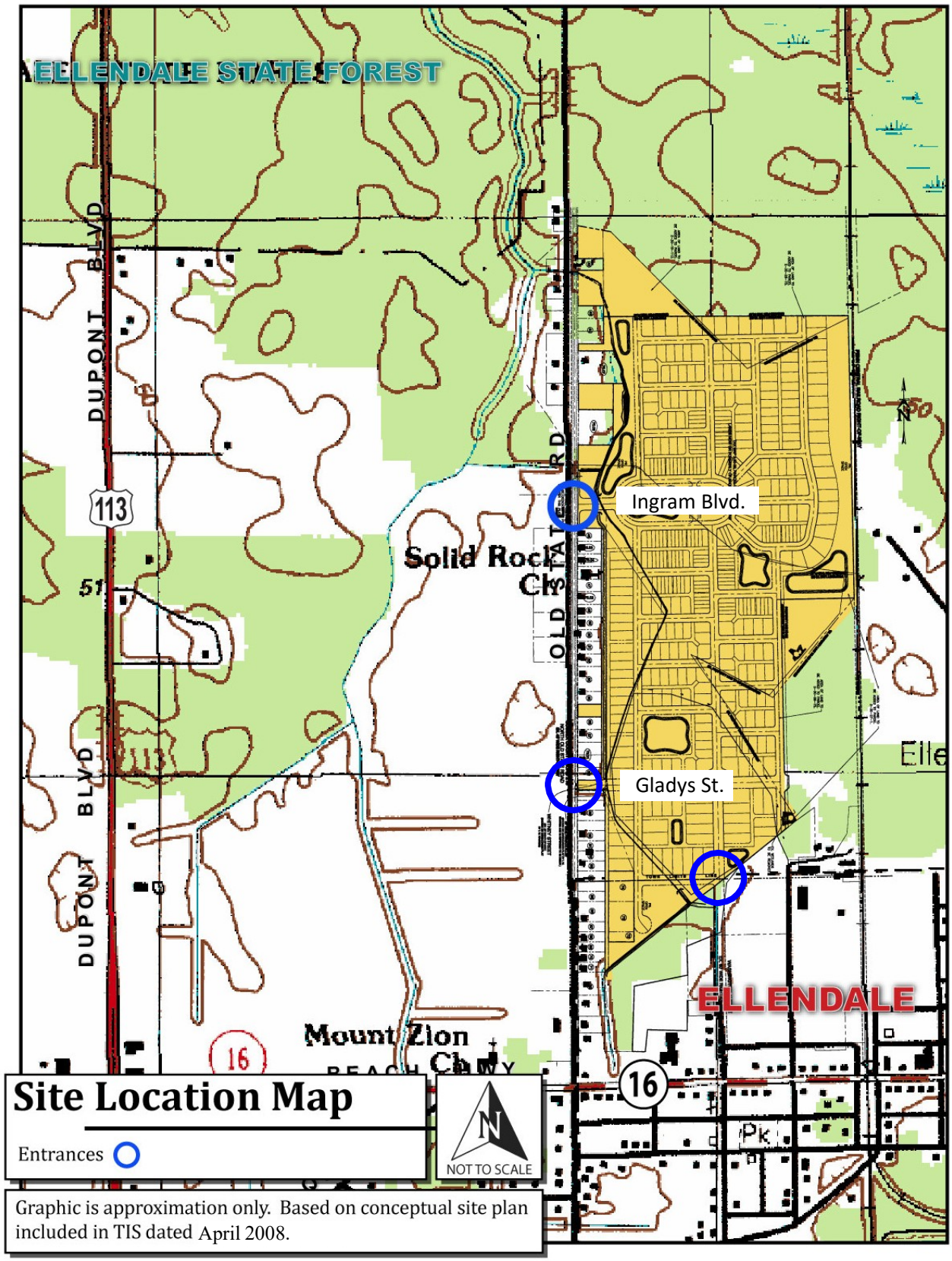
General Information

Report date: April 2008
Prepared by: Davis, Bowen & Friedel, Inc.
Prepared for: Mr. E Dale Wheatley and Mr. Doug Simpson
Tax parcels: 230-26.00-75.00
Generally consistent with DelDOT's *Rules and Regulations for Subdivision Streets*: Yes

Project Description and Background

Description: The proposed development would consist of 132 townhouses and 268 single-family detached houses.
Location: Ingram Village is proposed to be located along the east side of North Old State Road (Sussex Road 213), north of the end of Washington Avenue and north of Delaware Route 16 (Sussex Road 16), along the border of the Town of Ellendale in Sussex County, Delaware. A small portion of the proposed development is located within the Town of Ellendale. A site location map is included on Page 10.
Amount of land to be developed: approximately 101 acres of land
Land use approval(s) needed: Subdivision approval. The land is currently zoned GR (General Residential) in Sussex County and UR (Urban Residential) in the Town of Ellendale. The developer is seeking to develop the property under the Moderately Priced Housing Unit (MPHU) Program of Sussex County.
Proposed completion date: 2013
Proposed access locations: Three access points are proposed: two along North Old State Road and one as an extension of Washington Avenue. There would also be interconnection to the proposed Forest Landing development directly north of the site, which has planned access to North Old State Road.
Daily Traffic Volumes:

- 2007 Average Annual Daily Traffic on North Old State Road: 1,384 vpd



Site Location Map

Entrances ○

Graphic is approximation only. Based on conceptual site plan included in TIS dated April 2008.

Livable Delaware
(Source: Delaware Strategies for State Policies and Spending, July 2004)

Location with respect to the Strategies for State Policies and Spending Map of Delaware: The proposed Ingram Village is located within Investment Level 2, with a small portion in an Investment Level 3 area. Based on the Concept Plan for the proposed development, it appears that few, if any, of the proposed buildings will be constructed within the Investment Level 3 area.

Investment Level 2

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

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

Investment Level 3

These areas are portions of the county designated for growth, development districts, or long-term annexation. Areas classified as an Investment Level 3 will be considered for state investing after the Level 1 and 2 areas are substantially built out or when the facilities are logical extensions of existing systems and deemed appropriate to serve a particular area. Many of the areas within the Investment Level 3 designation include important farmland and natural resources along with portions of roadways that are designated for corridor capacity protection. Therefore the character pattern and timing of growth along with federally mandated air and water quality goals should be considered on a case-by-case basis for areas within this designation.

In Investment Level 3 Areas, the state will continue to invest in the regional roadway network and roadway safety while continuing to protect the capacity of major transportation corridors. Roadway improvements to support new development are not encouraged in Investment Level 3 and funds will not be allocated for these types of improvements until they have been allocated to Level 1 and 2 areas.

Proposed Development's Compatibility with Livable Delaware: The proposed Ingram Village falls primarily within Investment Level 2 and is to be developed with a mix of housing types, consistent with the character of Investment Level 2 areas. It is therefore concluded that the proposed development generally complies with the policies stated in the 2004 update of the

Livable Delaware "Strategies for State Policies and Spending."

Comprehensive Plans

Sussex County Comprehensive Plan:
(Source: 2003 Sussex County Comprehensive Plan Update)

The Sussex County Comprehensive Plan indicates that the future land use of the parcels for the proposed development is in a Developing Area, which encourages a mixed-use growth pattern supported by public and private investments to provide a variety of economic development and housing opportunities. By encouraging higher residential densities, and commercial and industrial uses in these Developing Areas, the pressure for development in the Low Density Areas will be reduced. Appropriate housing types in a developing area include single-family detached houses, townhouses, apartments, condominiums and manufactured housing where permitted by ordinance.

Town of Ellendale Comprehensive Plan:
(Source: Greater Ellendale Comprehensive Plan, June 2004)

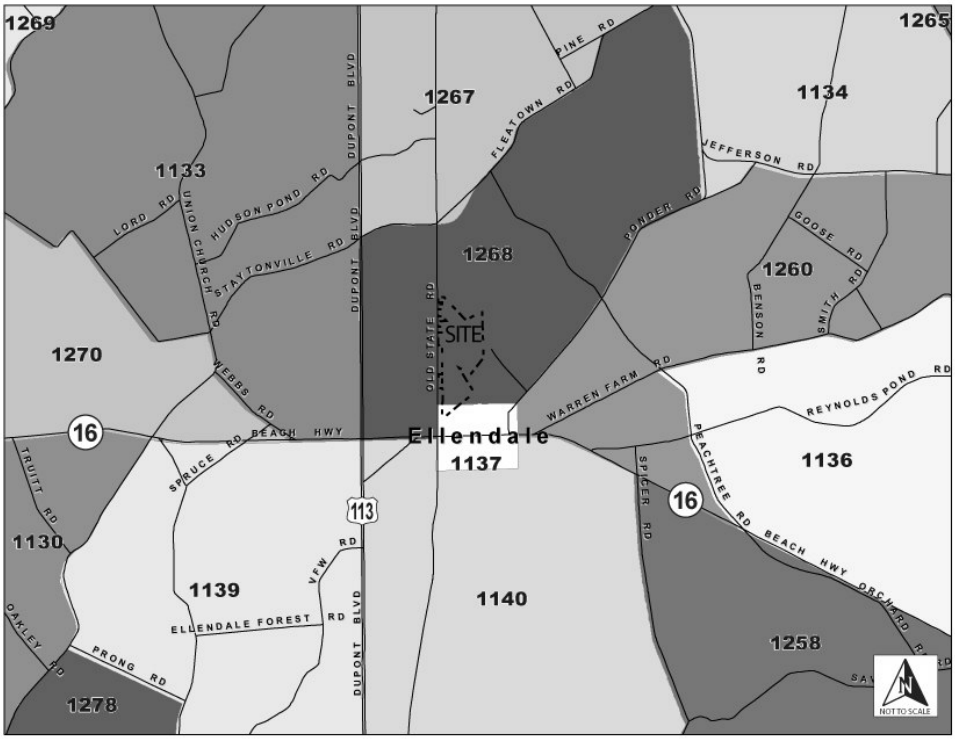
On the Existing Land Use Map, the proposed development area is marked as Agriculture / Natural Resources. The Future Land Use Map shows the area as Residential – Single and located within Phase 1 of the potential growth and annexation boundary.

Proposed Development's Compatibility with Comprehensive Plans: The proposed development includes a mix of residential types and seems to be compatible with both the Developing Area designation in the Sussex County Comprehensive Plan and the Residential – Single designation in the Town of Ellendale Comprehensive Plan.

Transportation Analysis Zones (TAZ)

Transportation Analysis Zones (TAZ) where development would be located: 1268 and 1137

TAZ Boundaries:



Current employment estimate for TAZ 1268 and 1137: 44 and 0 jobs in 2005
Future employment estimate for TAZ 1268 and 1137: 58 and 0 jobs in 2030
Current population estimate for TAZ 1268 and 1137: 219 and 344 people in 2005
Future population estimate for TAZ 1268 and 1137: 287 and 403 people in 2030
Current household estimate for TAZ 1268 and 1137: 84 and 132 houses in 2005
Future household estimate for TAZ 1268 and 1137: 111 and 156 houses in 2030
Relevant committed developments in the TAZ: None
Would the addition of committed developments to current estimates exceed future projections: No
Would the addition of committed developments and the proposed development to current estimates exceed future projections: Yes

Relevant Projects in the DelDOT Capital Transportation Program (FY 2008 – FY 2013)

DelDOT currently has two relevant projects within the study area. The first is the US Route 113, North/South Improvements project (aka US 113 North/South Study) (State Contract No. 22-127-01). The US 113 North/South Study seeks to address the existing and future transportation needs along the US Route 113 (Sussex Road 113 / DuPont Boulevard) corridor while preserving environmental and historic resources, preserving the existing north/south corridor in Sussex

County, and accommodating planned economic growth. The project team coordinates with Sussex and Kent Counties and the affected municipalities and continues to study viable alternatives for north/south capacity improvements throughout Sussex County. Many alternatives are being studied, both on and off existing alignments.

In June 2007, after evaluating input from the public, conducting analyses and working to refine the alternatives, DelDOT announced a Recommended Preferred Alternative for the Ellendale Area of the US Route 113 North/South Study. For more information, please see the project web site at http://www.deldot.gov/information/projects/us113/. While the On-Alignment Alternative (the Recommended Preferred Alternative in the Ellendale Area) is not expected to have direct impacts to the proposed development, it may affect improvements at the intersections of US Route 113 and Delaware Route 16 and US Route 113 and Fleatown Road (Sussex Road 224) / Staytonville Road (also Sussex Road 224). An interchange could potentially be constructed to replace the intersection of US Route 113 and Delaware Route 16, and such a design would also eliminate direct access to/from US Route 113 via Fleatown Road / Staytonville Road.

The second project is the Corridor Capacity Preservation Program (CCPP), which is a statewide program intended to sustain the capacity of adopted highway corridors by various means such as limiting access points and using service roads for local vehicle trips. The general purpose of the program is to ensure that the existing principal arterial highways, such as US Route 113, are able to efficiently carry regional traffic without impedance from the effects of local development.

Additionally, regarding DelDOT's Highway Safety Improvement Program (HSIP), the intersection of US Route 113 and Fleatown Road / Staytonville Road is within Site O of the 2006 HSIP. The HSIP committee has developed and considered several potential alternatives to improve safety and reduce conflicts without significantly increasing travel times through the area. While each potential alternative was found to have advantages and disadvantages, the committee's recommendation at this time is to install median channelization to accommodate southbound left turns and westbound left turns but prohibit westbound through movements, eastbound left-turn and through movements, and northbound left-turn movements. An acceleration lane should also be provided for westbound Fleatown Road left turns to merge with southbound US Route 113 traffic. Additionally, the committee recommends a number of interim signing and pavement marking improvements within the area.

The intersection of US Route 113 and Delaware Route 16 is within Site F of the 2008 HSIP. However, as of November 2008, the HSIP committee had not released any findings or recommendations for this site.

Trip Generation

Trip generation for the proposed development was computed using comparable land uses and equations contained in Trip Generation, Seventh Edition, published by the Institute of Transportation Engineers (ITE). The following land use was utilized to determine the amount of new traffic generated for this development:

- 268 single-family detached houses (ITE Land Use Code 210)
- 132 townhouses (ITE Land Use Code 230)

Table 1
INGRAM VILLAGE TRIP GENERATION

Land Use	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
268 single-family detached houses	49	148	197	164	96	260	134	115	249
132 townhouses	11	53	64	50	25	75	44	37	81
TOTAL TRIPS	**60**	**201**	**261**	**214**	**121**	**335**	**178**	**152**	**330**

Overview of TIS

Intersections examined:

i. North Old State Road & Northern Site Entrance
ii. North Old State Road & Southern Site Entrance
iii. North Old State Road & Delaware Route 16
iv. Washington Avenue & Delaware Route 16
v. US Route 113 & Delaware Route 16
vi. North Old State Road & Fleatown Road
vii. US Route 113 & Fleatown Road / Staytonville Road

Conditions examined:

1) 2007 existing conditions (Case 1)
2) 2013 without Ingram Village (Case 2)
3) 2013 with Ingram Village (Case 3)
4) 2013 with Ingram Village and the Villages of Elizabethtown (Case 4)

Peak hours evaluated: Weekday morning and evening, and Saturday mid-day peak hours

Committed developments considered:

1) Captain's Run (494 single-family detached houses)
2) Hummingbird Meadows (104 single-family detached houses)
3) Royal Farms (5,222 square-foot convenience store with 20 fueling stations)
4) Walker Property (358 single-family detached houses)
5) Hayfield (350 single-family detached houses)
6) Sandstone (49 single-family detached houses)
7) Villages of Elizabethtown* (1,187 single-family detached houses, 2,523 townhouses and condominiums, and 413,000 square feet of commercial space)

** Note: Villages of Elizabethtown was only included in the Case 4 analyses*

Intersection Descriptions

1) **North Old State Road & Northern Site Entrance**
Type of Control: proposed two-way stop-controlled (T-intersection)
Westbound approach: (Northern Site Entrance) proposed one shared left/right-turn lane, stop-controlled
Northbound approach: (North Old State Road) existing one through lane, proposed one through lane and one right-turn lane
Southbound approach: (North Old State Road) existing one through lane, proposed one shared through/left-turn lane and one bypass lane

2) **North Old State Road & Southern Site Entrance**
Type of Control: proposed two-way stop-controlled (T-intersection)
Westbound approach: (Southern Site Entrance) proposed one shared left/right-turn lane, stop-controlled
Northbound approach: (North Old State Road) existing one through lane, proposed one through lane and one right-turn lane
Southbound approach: (North Old State Road) existing one through lane, proposed one shared through/left-turn lane and one bypass lane

3) **North Old State Road & Delaware Route 16**
Type of Control: two-way stop-controlled
Eastbound approach: (Delaware Route 16) one shared left/through/right-turn lane
Westbound approach: (Delaware Route 16) one shared left/through/right-turn lane
Northbound approach: (North Old State Road) one shared left/through/right-turn lane, stop-controlled
Southbound approach: (North Old State Road) one shared left/through/right-turn lane, stop-controlled

4) **Washington Avenue & Delaware Route 16**
Type of Control: two-way stop-controlled
Eastbound approach: (Delaware Route 16) one shared left/through/right-turn lane
Westbound approach: (Delaware Route 16) one shared left/through/right-turn lane
Northbound approach: (Washington Avenue) one shared left/through/right-turn lane, stop-controlled
Southbound approach: (Washington Avenue) one shared left/through/right-turn lane, stop-controlled

5) **US Route 113 & Delaware Route 16**
Type of Control: signalized four-leg intersection
Eastbound approach: (Delaware Route 16) one left-turn lane, one through lane, and one right-turn lane
Westbound approach: (Delaware Route 16) one left-turn lane, one through lane, and one right-turn lane
Northbound approach: (US Route 113) one left-turn lane, two through lanes, and one right-turn lane

Southbound approach: (US Route 113) one left-turn lane, two through lanes, and one right-turn lane

6) North Old State Road & Fleatown Road
Type of Control: two-way stop-controlled
Eastbound approach: (Fleatown Road) one shared left/through/right-turn lane, stop-controlled
Westbound approach: (Fleatown Road) one shared left/through/right-turn lane, stop-controlled
Northbound approach: (North Old State Road) one shared left/through/right-turn lane
Southbound approach: (North Old State Road) one shared left/through/right-turn lane

7) US Route 113 & Fleatown Road / Staytonville Road
Type of Control: two-way stop-controlled
Eastbound approach: (Staytonville Road) one shared left/through/right-turn lane, stop-controlled
Westbound approach: (Fleatown Road) one shared left/through/right-turn lane, stop-controlled
Northbound approach: (US Route 113) one left-turn lane, two through lanes, and one right-turn lane
Southbound approach: (US Route 113) one left-turn lane, two through lanes, and one right-turn lane

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: There is currently no transit service along North Old State Road in front of the site. However, DART Bus Route 303, connecting Dover, Milford, and Georgetown, travels near the site along US Route 113 and Delaware Route 16. This route has a stop along Delaware Route 16 at McCaulley Avenue, just east of Washington Avenue, and it offers year-round weekday service with eight round trips per day.

Planned transit service: McCormick Taylor contacted Ms. Lisa Collins, a Service Development Planner for the Delaware Transit Corporation (DTC), via email on May 2, 2008 to determine whether DTC has any plans to extend the existing transit system in the vicinity of the development. No comments were received from DTC.

Existing bicycle and pedestrian facilities: According to the *Delaware Kent and Sussex Counties Bicycle Touring Map*, North Old State Road is designated as having average cycling conditions with low traffic volumes (less than 2,000 ADT). US Route 113 is designated as having average cycling conditions with high traffic volumes (greater than 10,000 ADT). Delaware Route 16 is designated as having above average cycling conditions with moderate volumes. Fleatown Road and Staytonville Road are each designated as having above average cycling conditions with low traffic volumes. There are currently no designated bicycle lanes or sidewalks along the site frontage on North Old State Road.

Planned bicycle and pedestrian facilities: DelDOT's Bicycle and Pedestrian Facilities Team

indicated, in a letter from Stephen Bayer dated May 9, 2008, that the following bicycle and pedestrian facilities should be required. In the letter, Mr. Bayer commented that Livable Delaware's updated State Strategies for Spending Map indicates the site is located in an Investment Level 2 area, where all transportation modes should be included. If the development does occur, the following requests should be incorporated into the project to facilitate bicycle and pedestrian transportation:

a. A 5' shoulder should be added Old State Road along the property frontage.
b. A 15' wide easement from the edge of the roadway should be dedicated to DelDOT. This easement should include a 10' multiuse path set back 5' from the roadway.
c. All internal streets to be built with this development should include 5' wide ADA compliant sidewalks set back 5' from the roadway. These internal sidewalks should extend to the project's entrance points and connect with the frontage multiuse path.
d. The developer should contact DART regarding the addition of a transit stop at the entrance points to this development.

Mr. Bayer also indicated the State's Bicycle Plan designates Old State Road as a bike route.

Previous Comments

All comments from DelDOT's Revised Scoping Letter, Traffic Count Review and Preliminary TIS Review were addressed in the Final TIS submission, with the following exceptions:

- There were no indications that the applicant contacted the DelDOT Bicycle and Pedestrian Coordinator for bicycle and pedestrian comments.
- There were no indications that the applicant contacted the Service Development Planner at the Delaware Transit Corporation for transit comments.
- There were no indications that the applicant contacted Mr. Charles Altevogt, DelDOT's Corridor Capacity Preservation Program (CCPP) Project Manager for comments.

General HCS Analysis Comments
(see table footnotes on the following pages for specific comments)

1) The TIS calculated the existing heavy vehicle factors (HV%) per lane group for signalized intersections and per movement for unsignalized intersections. For future conditions where increases in volume are projected, the TIS adjusted the HV% by applying 2% to the background growth and site traffic, but assumed no minimum future HV%. McCormick Taylor adopted DBF's assumptions except calculated HV% per lane group and assumed a minimum future HV% of 2%.

2) For future conditions, where the lane group volume increased from the existing volume, the TIS and McCormick Taylor generally assumed a peak hour factor (PHF) of either existing PHF or 0.92, whichever was greater, at intersections within the Ellendale limits, and either existing PHF or 0.88, whichever is greater, at other intersections. The TIS also conducted

some analysis using greater PHF values for US Route 113 through movements at the intersection of US Route 113 and Delaware Route 16.

3) The HCS analyses included in the TIS did not always reflect the lane widths observed in the field by McCormick Taylor. McCormick Taylor's HCS analyses incorporated the field- measured lane widths.

4) The TIS and McCormick Taylor used different cycle lengths and/or signal timing parameters when analyzing the signalized intersections in some cases.

Table 2
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Ingram Village
Report dated April 2008
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection [1] Two-Way Stop Control (T-intersection)	**LOS per TIS**			**LOS per McCormick Taylor**		
North Old State Road & Northern Site Entrance	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
2013 with Ingram Village (Case 3)						
Westbound Northern Site Entrance	A (9.8)	B (10.1)	B (10.2)	A (9.8)	B (10.1)	B (10.2)
Southbound North Old State Road – Left	A (7.5)	A (7.6)	A (7.6)	A (7.5)	A (7.6)	A (7.6)
2013 with Ingram Village plus Villages of Elizabethtown (Case 4)						
Westbound Northern Site Entrance	A (9.8)	B (10.1)	B (10.2)	A (9.8)	B (10.1)	B (10.2)
Southbound North Old State Road – Left	A (7.5)	A (7.6)	A (7.6)	A (7.5)	A (7.6)	A (7.6)

[1] For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.

Table 3
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Ingram Village
Report dated April 2008
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection [2] **Two-Way Stop Control (T-intersection)**	**LOS per TIS**			**LOS per McCormick Taylor**		
North Old State Road & **Southern Site Entrance**	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
2013 with Ingram Village (Case 3)						
Westbound Southern Site Entrance	A (9.7)	B (10.1)	B (10.2)	A (9.7)	B (10.1)	B (10.2)
Southbound North Old State Road – Left	A (7.4)	A (7.6)	A (7.6)	A (7.4)	A (7.6)	A (7.6)
2013 with Ingram Village plus Villages of Elizabethtown (Case 4)						
Westbound Southern Site Entrance	A (9.7)	B (10.1)	B (10.2)	A (9.7)	B (10.1)	B (10.2)
Southbound North Old State Road – Left	A (7.4)	A (7.6)	A (7.6)	A (7.4)	A (7.6)	A (7.6)

[2] For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.

Table 4
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Ingram Village
Report dated April 2008
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection [3] Two-Way Stop Control	**LOS per TIS**			**LOS per McCormick Taylor [4]**		
North Old State Road & Delaware Route 16	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
2007 Existing (Case 1)						
Eastbound Delaware Route 16 – Left	A (7.9)	A (7.8)	A (8.0)	A (7.9)	A (7.7)	A (8.0)
Westbound Delaware Route 16 – Left	A (7.8)	A (7.8)	A (8.0)	A (7.8)	A (7.8)	A (8.0)
Northbound North Old State Road	B (13.2)	B (13.2)	C (16.8)	B (13.2)	B (13.1)	C (16.9)
Southbound North Old State Road	B (13.2)	B (13.4)	C (15.5)	B (13.2)	B (13.4)	C (15.5)
2013 without Ingram Village (Case 2)						
Eastbound Delaware Route 16 – Left	A (8.4)	A (8.2)	A (8.6)	A (8.4)	A (8.1)	A (8.5)
Westbound Delaware Route 16 – Left	A (8.0)	A (8.5)	A (8.7)	A (8.0)	A (8.6)	A (8.8)
Northbound North Old State Road	C (19.9)	D (27.5)	E (48.5)	C (20.8)	D (27.7)	F (56.0)
Southbound North Old State Road	C (19.6)	D (29.6)	E (37.7)	C (20.2)	D (30.8)	F (42.2)
2013 with Ingram Village (Case 3)						
Eastbound Delaware Route 16 – Left	A (8.4)	A (8.4)	A (8.8)	A (8.6)	A (8.4)	A (8.9)
Westbound Delaware Route 16 – Left	A (8.0)	A (8.6)	A (8.7)	A (8.0)	A (8.7)	A (8.9)
Northbound North Old State Road	C (24.6)	E (45.5)	F (111.8)	D (26.2)	F (50.3)	F (149.6)
Southbound North Old State Road	C (22.2)	F (50.7)	F (85.0)	C (23.4)	F (61.5)	F (113.6)
2013 with Ingram Village plus Villages of Elizabethtown (Case 4)						
Eastbound Delaware Route 16 – Left	A (9.5)	A (9.3)	B (10.1)	A (9.6)	A (9.3)	B (10.1)
Westbound Delaware Route 16 – Left	A (8.3)	A (9.9)	B (10.1)	A (8.3)	B (10.1)	B (10.4)
Northbound North Old State Road	F (79.0)	F (625.6)	F (1794)	F (94.9)	F (861.4)	F (2747)
Southbound North Old State Road	F (67.5)	F (653.9)	F (1629)	F (80.7)	F (876.0)	F (2722)

[3] For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.
[4] For the future conditions, the TIS assumed PHF of either existing PHF or 0.92, whichever was greater, for all the approaches. McCormick Taylor assumed future PHF of either existing PHF or 0.92, whichever was greater, for the westbound Delaware Route 16 approach (within the Town of Ellendale) and either existing PHF or 0.88, whichever was greater, for all other approaches.

Table 5
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Ingram Village
Report dated April 2008
Prepared by Davis, Bowen & Friedel, Inc.

Signalized Intersection [5]	**LOS per TIS**			**LOS per McCormick Taylor** [6]		
North Old State Road & Delaware Route 16	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
2013 without Ingram Village (Case 2)	A (0.45)	A (0.44)	A (0.53)	B (0.45)	B (0.45)	B (0.53)
2013 with Ingram Village (Case 3)	B (0.49)	A (0.58)	B (0.63)	B (0.50)	B (0.61)	B (0.66)
2013 with Ingram Village plus Villages of Elizabethtown (Case 4)	B (0.69)	B (0.85)	B (0.90)	B (0.70)	C (0.82)	C (0.87)

[5] For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.
[6] For the future conditions, the TIS assumed PHF of either existing PHF or 0.92, whichever was greater, for all the approaches. McCormick Taylor assumed future PHF of either existing PHF or 0.92, whichever was greater, for the westbound Delaware Route 16 approach (within the Town of Ellendale) and either existing PHF or 0.88, whichever was greater, for all other approaches.

Table 6
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Ingram Village
Report dated April 2008
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection [7] **Two-Way Stop Control**	**LOS per TIS**			**LOS per McCormick Taylor**		
Washington Avenue & Delaware Route 16	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
2007 Existing (Case 1)						
Eastbound Delaware Route 16 – Left	A (7.7)	A (7.7)	A (7.9)	A (7.9)	A (7.8)	A (8.0)
Westbound Delaware Route 16 – Left	A (7.6)	A (7.7)	A (7.9)	A (7.8)	A (7.7)	A (8.0)
Northbound Washington Avenue	B (11.3)	B (10.4)	C (15.2)	B (11.2)	B (10.4)	C (15.2)
Southbound Washington Avenue	A (9.9)	B (11.3)	B (12.0)	A (9.9)	B (11.3)	B (12.0)
2013 without Ingram Village (Case 2)						
Eastbound Delaware Route 16 – Left	A (8.3)	A (8.2)	A (8.6)	A (8.5)	A (8.2)	A (8.6)
Westbound Delaware Route 16 – Left	A (7.9)	A (8.3)	A (8.5)	A (8.0)	A (8.4)	A (8.6)
Northbound Washington Avenue	B (14.8)	B (14.4)	D (25.2)	B (14.6)	B (14.4)	D (25.2)
Southbound Washington Avenue	B (12.0)	C (16.2)	C (17.0)	B (11.9)	C (16.6)	C (17.0)
2013 with Ingram Village (Case 3)						
Eastbound Delaware Route 16 – Left	A (8.4)	A (8.4)	A (8.7)	A (8.6)	A (8.4)	A (8.8)
Westbound Delaware Route 16 – Left	A (7.9)	A (8.4)	A (8.6)	A (8.0)	A (8.4)	A (8.6)
Northbound Washington Avenue	C (15.5)	C (15.3)	D (27.6)	C (15.2)	C (15.3)	D (27.6)
Southbound Washington Avenue	C (16.2)	C (19.6)	C (23.5)	C (16.2)	C (19.7)	C (23.5)
2013 with Ingram Village plus Villages of Elizabethtown (Case 4)						
Eastbound Delaware Route 16 – Left	A (9.3)	A (9.1)	A (9.9)	A (9.5)	A (9.1)	A (10.0)
Westbound Delaware Route 16 – Left	A (8.2)	A (9.6)	A (9.8)	A (8.3)	A (9.7)	A (9.9)
Northbound Washington Avenue	C (24.6)	D (28.7)	F (86.7)	C (23.4)	D (28.7)	F (86.7) [8]
Southbound Washington Avenue	D (27.6)	E (46.1)	F (98.8)	D (27.4)	E (46.6)	F (98.8) [9]

Signalized Intersection [7]	**LOS per TIS**			**LOS per McCormick Taylor**		
Washington Avenue & Delaware Route 16	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
2013 with Ingram Village plus Villages of Elizabethtown (Case 4)	N/A	N/A	N/A	B (0.58)	B (0.63)	B (0.74)

[7] For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.
[8] The 95th percentile queue length for the northbound Washington Avenue approach during the Case 4 Saturday peak hour is less than 2 vehicles.
[9] The 95th percentile queue length for the southbound Washington Avenue approach during the Case 4 Saturday peak hour is less than 4 vehicles.

Table 7
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Ingram Village
Report dated April 2008
Prepared by Davis, Bowen & Friedel, Inc.

Signalized Intersection [10]	**LOS per TIS**			**LOS per McCormick Taylor**		
US Route 113 & Delaware Route 16	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
2007 Existing (Case 1)	C (0.62)	C (0.73)	D (0.89)	C (0.61)	C (0.65)	D (0.84)
2013 without Ingram Village (Case 2)	C (0.80)	D (0.83)	E (0.97)	C (0.75)	D (0.77)	E (0.97)
2013 without Ingram Village (Case 2) *With Improvement Option 1* [11]	N/A	N/A	N/A	C (0.73)	C (0.68)	D (0.84)
2013 with Ingram Village (Case 3)	C (0.80)	D (0.84)	E (1.00) [12]	D (0.80)	D (0.80)	E (0.99)
2013 with Ingram Village (Case 3) *With Improvement Option 1* [11]	N/A	N/A	N/A	C (0.74)	C (0.69)	D (0.86)
2013 with Ingram Village plus Villages of Elizabethtown (Case 4)	D (0.91)	F (0.99)	F (1.15)	D (0.87)	E (0.94)	F (1.18)
2013 with Ingram Village plus Villages of Elizabethtown (Case 4) *With Improvement Option 1* [11]	N/A	N/A	N/A	D (0.76)	D (0.85)	F (1.16)
2013 with Ingram Village plus Villages of Elizabethtown (Case 4) *With Improvement Option 2* [13]	N/A	C (0.81)	D (0.93)	C (0.65)	D (0.66)	D (0.89)

[10] For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.
[11] Improvement Option 1 includes converting the eastbound and westbound approaches to concurrent phasing with protected/permitted left-turn operation for those approaches.
[12] The TIS also analyzed Case 3 Saturday peak hour conditions with greater PHF values for the northbound and southbound through movements along US Route 113. Using a PHF of 0.96 for those movements, the TIS Case 3 Saturday analysis showed LOS E (X-critical of 0.97). Using a PHF of 1.00 for those movements, the TIS Case 3 Saturday analysis showed LOS D (X-critical of 0.95). McCormick Taylor did not perform analyses using these higher PHF values.
[13] Improvement Option 2 includes the addition of a second through lane on the eastbound Delaware Route 16 approach, a second left-turn lane on the southbound US Route 113 approach, a second eastbound receiving lane on the eastern leg of Delaware Route 16, and converting the eastbound and westbound approaches to concurrent phasing with protected/permitted left-turn operation for those approaches.

Table 8
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Ingram Village
Report dated April 2008
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection [14] **Two-Way Stop Control**	**LOS per TIS**		**LOS per McCormick Taylor** [15]	
North Old State Road & Fleatown Road [16]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2007 Existing (Case 1)				
Eastbound Fleatown Road	A (9.7)	B (10.1)	A (9.7)	B (10.1)
Westbound Fleatown Road	A (10.0)	A (10.0)	B (10.0)	A (10.0)
Northbound North Old State Road – Left	A (7.3)	A (7.3)	A (7.4)	A (7.3)
Southbound North Old State Road – Left	A (7.4)	A (7.3)	A (7.4)	A (7.4)
2013 without Ingram Village (Case 2)				
Eastbound Fleatown Road	A (9.9)	B (10.4)	A (9.9)	B (10.4)
Westbound Fleatown Road	B (10.1)	B (10.2)	B (10.2)	B (10.2)
Northbound North Old State Road – Left	A (7.3)	A (7.3)	A (7.4)	A (7.4)
Southbound North Old State Road – Left	A (7.5)	A (7.3)	A (7.4)	A (7.4)
2013 with Ingram Village (Case 3)				
Eastbound Fleatown Road	B (10.7)	B (11.0)	B (10.5)	B (10.3)
Westbound Fleatown Road	B (12.1)	B (12.0)	B (12.1)	B (12.0)
Northbound North Old State Road – Left	A (7.4)	A (7.5)	A (7.4)	A (7.5)
Southbound North Old State Road – Left	A (7.5)	A (7.4)	A (7.5)	A (7.4)
2013 with Ingram Village plus Villages of Elizabethtown (Case 4)				
Eastbound Fleatown Road	B (10.7)	B (11.0)	B (10.5)	B (10.3)
Westbound Fleatown Road	B (12.1)	B (12.0)	B (12.1)	B (12.0)
Northbound North Old State Road – Left	A (7.4)	A (7.5)	A (7.4)	A (7.5)
Southbound North Old State Road – Left	A (7.5)	A (7.4)	A (7.5)	A (7.4)

[14] For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.
[15] The TIS configured the eastbound and westbound approaches as each having a single lane without flare. McCormick Taylor configured these approaches as flared single lane approaches with storage for one vehicle.
[16] Saturday analysis was not required for this intersection.

Table 9
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Ingram Village
Report dated April 2008
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection [17] **Two-Way Stop Control**	**LOS per TIS**		**LOS per McCormick Taylor** [18]	
US Route 113 & Fleatown Road / Staytonville Road [19]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2007 Existing (Case 1)				
Eastbound Staytonville Road	C (19.4)	C (22.3)	C (16.9)	C (19.1)
Westbound Fleatown Road	C (17.5)	D (26.9)	B (14.9)	C (21.7)
Northbound US Route 113 – Left	A (9.3)	A (9.3)	A (9.3)	A (9.3)
Southbound US Route 113 – Left	A (8.5)	B (10.3)	A (8.5)	B (10.3)
2013 without Ingram Village (Case 2)				
Eastbound Staytonville Road	C (23.5)	D (29.0)	C (19.8)	C (24.0)
Westbound Fleatown Road	C (22.8)	E (38.8)	C (18.5)	D (28.7)
Northbound US Route 113 – Left	A (10.0)	B (10.6)	B (10.1)	B (10.7)
Southbound US Route 113 – Left	A (9.3)	B (11.0)	A (9.3)	B (11.0)
2013 with Ingram Village (Case 3)				
Eastbound Staytonville Road	D (25.6)	E (38.9)	C (21.2)	D (31.5)
Westbound Fleatown Road	C (20.9)	E (40.7)	C (15.5)	D (25.2)
Northbound US Route 113 – Left	A (10.0)	B (10.6)	B (10.1)	B (10.7)
Southbound US Route 113 – Left	A (9.4)	B (11.6)	A (9.4)	B (11.6)
2013 with Ingram Village plus Villages of Elizabethtown (Case 4)				
Eastbound Staytonville Road	D (28.3)	E (48.7)	C (22.9)	E (38.5) [20]
Westbound Fleatown Road	C (24.3)	F (54.3)	C (17.0)	D (30.3)
Northbound US Route 113 – Left	B (10.2)	B (11.4)	B (10.3)	B (11.5)
Southbound US Route 113 – Left	A (9.9)	B (12.3)	A (9.9)	B (12.3)

[17] For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.
[18] The TIS configured the eastbound and westbound approaches as each having a single lane without flare. McCormick Taylor configured these approaches as flared single lane approaches with storage for two vehicles.
[19] Saturday analysis was not required for this intersection.
[20] The 95th percentile queue length for the eastbound Staytonville Road approach during the Case 4 PM peak hour is less than 1 vehicle.