TOWN OF ST. MICHAELS, MD

ROUTE ASSESSMENT
FOR THE PROPOSED
TALBOT STREET BEAUTIFICATION PROJECT

Preliminary – For Review Purposes Only

July 24, 2017

PREPARED BY:

BOOTH & ASSOCIATES, LLC

3108 LORD BALTIMORE DRIVE

WINDSOR MILL, MARYLAND 21244

Table of Contents

EXECUTIVE SUMMARY 3

OVERALL ROUTE MAP 6

ROUTE EVALUATIONS 7

RECOMMENDATIONS 8

SERVICE DUCT REQUIREMENTS 23

EVALUATION MATRIX 24

ROUTE DETAILS 25

COST ANALYSIS DETAILS 39

TYPICAL DUCT BANK DETAIL 40

STREET LIGHT CONCEPTUAL DRAWING 41

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Booth and Associates, LLC was requested by the Town of St. Michaels to evaluate the feasibility of relocating the existing overhead utilities along Talbot Street as part of an effort to improve the aesthetics of the downtown area. Booth conducted a field evaluation of the existing overhead electric and telecommunications facilities on Talbot Street in St. Michaels, Maryland. The results of our evaluation are contained in this report and are presented in the following paragraphs. The recommended route represents the best balanced solution for the Town of St. Michaels, MD and the electric and telecommunication utilities present.

Choptank Electric Cooperative, Verizon, and Atlantic Broadband were identified as the three utilities operating electric and telecommunication facilities on Talbot Street. There was also the presence of a town-owned electric service on some poles that served holiday lighting and signage. All of the utilities with facilities on Talbot Street expressed that they were not interested in joint ownership of any duct bank facilities to assist the other utilities, but they would be willing to relocate their facilities to a duct bank owned by the town of St. Michaels provided the town were to pay for the relocation and demolition costs of their facilities.

Three potential routes were identified as feasible relocation options for the utilities along Talbot Street. The preferred route, Option B, transitions from overhead lines to an underground duct bank at the intersection of Talbot Street and Seymour Avenue. The duct bank will then follow side streets parallel to Talbot Street until reaching the intersection of Talbot Street and Mill Street. This route allows for the removal of all existing overhead distribution and telecommunication lines on Talbot Street while providing the least invasive impact to the town's residents and businesses. This underground option was preferred because of the cost factors as well as the engineering factors considered in the design of the project.

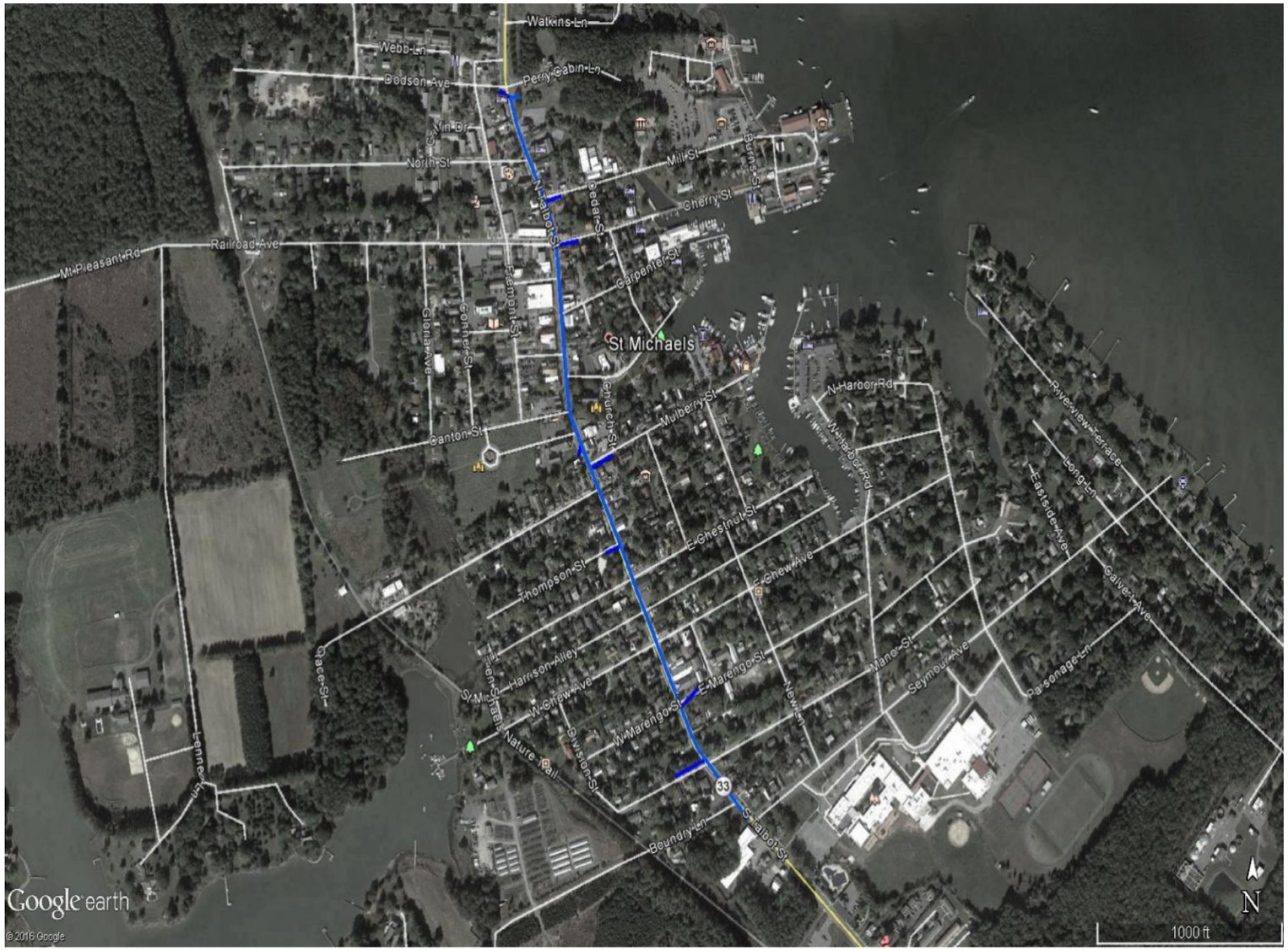
The preferred alternate route, Option C, utilizes the same duct bank as mentioned in Option B. However, overhead facilities are utilized instead of the underground duct bank on Seymour Avenue, on New Lane until the intersection of Marengo Street, and on Church Street. Otherwise the routing for the new facilities will be the same and have the same starting and ending point. This option adds ~$178,000 to option B and is not preferred due to the engineering problems associated with designing the overhead facilities in this congested area.

The estimated costs for the project are within 3% of each other for the 3 proposed routes, while the estimated accuracy of these cost estimates is ±10%. Since the variance in costs between routes is less than the proposed accuracy of the cost estimate, it is not feasible to compare the routes to each other from a cost perspective. Therefore, the deciding factor on the route should be which route has the least impact and presumed risk to infrastructure, residents, and businesses during construction.

It should be taken into consideration that the existing Verizon twisted pair copper telecommunication infrastructure located along Talbot Street is quickly becoming antiquated technology. In other regions of the state and the country, Verizon has replaced their twisted pair copper systems with new fiber optic systems (FiOS™ for example). It is possible that Verizon may make the decision within the next decade to replace their copper system along Talbot street

with a fiber optic system. The replacement fiber optic system would be significantly smaller than the current arrangement of multiple large diameter cables attached to every pole, with only 1 or 2 smaller diameter fiber optic cables being required. Since Verizon accounts for over half of the project costs, it is highly recommended for the town of St. Michaels and Verizon to discuss if Verizon has any plans to convert their facilities in this area to fiber optic at any point in the distant future. If the town of St. Michaels were to move forward with the relocation of the overhead Verizon facilities only for Verizon to decide a few years later to convert the system to fiber optic, a signification portion of the project costs would simply be economic waste.

OVERALL ROUTE MAP



Not Preferred

$12.10 million

0.67 miles

Talbot Street Beautification Assessment

Talbot Street Underground

Option A:

Option A consist of removing all overhead distribution and telecommunication facilities from Talbot Street and placing them underground in a duct bank below Talbot Street. The duct bank would include electric distribution, Verizon communications, and ABB communications. This duct bank would run down Talbot Street from Seymour Avenue to the Maritime Museum entrance with branches running off at various points to connect the existing service facilities of the electric distribution and telecommunications. Three separate types of manholes/handholes would need to be installed at various points along the route for construction and operational purposes as well as to ensure Choptank, Verizon, MDBC, and ABB are able to continue to serve the existing customers as well as be able to serve any future customers.

This route is not preferred due to the impact on the residents and business of Talbot Street. This design would require a complete shutdown of portions of Talbot Street for an extended period of time for construction purposes. Also, the assumed existing underground utilities already on Talbot Street make this option a logistical and engineering ordeal. We foresee a great economic impact beyond the cost of engineering and construction for the local businesses on Talbot Street if this option is chosen.

Preferred Route

$11.79 million

0.76 miles

Talbot Street Beautification Assessment

New Lane Underground

Option B:

Option B consist of removing all overhead distribution and telecommunication facilities from Talbot Street and placing them underground in a duct bank east of Talbot Street. The duct bank would include electric distribution, Verizon communications, and ABB and MDBC fiber optic facilities. This duct bank would begin at the intersection of Talbot Street and Seymour Avenue and follow Seymour Avenue to New Lane. It would then follow New Lane to Chestnut Street turning left down Chestnut Street until turning right on St. Mary's Square. From Mary's Square the route will turn left onto Mulberry Street and then right onto Church Street. From Church Street the route turns right onto Willow Street and left onto Locust Street. The duct bank runs the length of Locust Street and turns left onto Cherry Street and then immediately right onto Cedar Street before ending at the intersection of Cedar Street and Mill Street. Three separate types of manholes/handholes would need to be installed at various points along the route for construction and operational purposes as well as to ensure Choptank, Verizon, and ABB are able to continue to serve the existing customers as well as be able to serve any future customers.

A separate conduit system would be installed along the sidewalk on either side of Talbot Street to provide for streetlight service and for ABB and Verizon service to existing customers along Talbot Street.

This route is the preferred route because of both cost and construction feasibility factors. An underground option was chosen because of the lack of clearance down these side streets for overhead wires, and because Choptank does not allow for covered tree wire to be used. This route allows for the least economic impact on the local businesses and residents on Talbot Street.

Preferred Alternate

$11.97 million

0.76 miles

Talbot Street Beautification Assessment

New Lane OH/UG (Option C)

Option C consist of removing all overhead distribution and telecommunication facilities from Talbot Street and placing them partially overhead and also in a duct bank east of Talbot Street. The duct bank would include electric distribution, Verizon communications, and ABB communications. This route would begin at the intersection of Talbot Street and Seymour Avenue and follow Seymour Avenue to New Lane as overhead facilities. It would then follow New Lane to the intersection of Marengo Street and change from overhead to an underground duct bank. The duct bank would continue down New lane to Chestnut Street turning left down Chestnut Street until turning right on St. Mary's Square. From Mary's Square the route will turn left onto Mulberry Street and then right onto Church Street. The entire length of Church Street would utilize an overhead design returning underground at Willow Street. From Church Street the route turns right onto Willow Street and left onto Locust Street. The duct bank runs the length of Locust Street and turns left onto Cherry Street and then immediately right onto Cedar Street before ending at the intersection of Cedar Street and Mill Street. Three separate types of manholes/handholes would need to be installed at various points along the route for construction and operational purposes.

A separate conduit system would be installed along the sidewalk on either side of Talbot Street to provide for streetlight service and for ABB and Verizon service to existing customers along Talbot Street.

This route is the preferred alternate route because of both cost and construction feasibility factors. An underground option was chosen because of the lack of clearance down these side streets for overhead wires, and because Choptank does not allow for covered tree wire to be used. This route adds cost in engineering and construction from Option B due to the difficulty of adding riser points to transition from an underground to an overhead design.

ROUTE EVALUATIONS

RECOMMENDATIONS

Option A – Talbot Street Underground
Pros:

- Removes overhead power and communication lines from Talbot Street
- Creates a shorter overall duct bank for underground facilities

Cons:

- Large duct bank created under Talbot Street would require a major shut down of entire section of road during construction
- Will negatively impact businesses and residents economically during construction
- Major traffic control expense during construction to reroute traffic away from Talbot street
- Higher cost due to congestion
- More risk of undermining road and sidewalk during dewatering efforts
- There is existing concrete under Talbot street which will make trenching more difficult
- The roads have recently been resurfaced and it is unlikely the saw cut patches will be allowed to remain. This require a complete milling and overlay restoration.
- Verbally the SHA has conveyed that a conduit in their road will not be allowed.

Option B – New Lane Underground
Pros:

- Removes overhead power and communication lines from Talbot Street
- Less economic impact on businesses and residents of Talbot street during construction
- Minor traffic control during duct bank installation away from Talbot Street

Cons:

- A smaller conduit system for street lights and telecommunication to local businesses is still required on Talbot Street, but these are mostly sidewalk construction and will not close down the road entirely.
- Will close side streets temporarily during construction limiting access to some residents
- Longer duct bank needed as well as extra duct banks to serve customers that were being previously served directly from Talbot Street
- The roads have recently been resurfaced and it is unlikely the saw cut patches will be allowed to remain. This require a complete milling and overlay restoration.

Option C – New lane Underground with Partial Overhead
Pros:

- Less invasive construction of short overhead sections as opposed to full underground construction
- Allows for less permitting on sections of overhead construction as overhead is already in place in some sections

Cons:

- Difficulty in down guying areas that switch from overhead to underground
- A smaller conduit system for street lights and telecommunication to local businesses is still required on Talbot Street, but these are mostly sidewalk construction and will not close down the road entirely.
- Will close side streets temporarily during construction limiting access to some residents
- Longer duct bank needed as well as extra duct banks in order to serve customers that were being previously served directly from Talbot Street.
- The roads have recently been resurfaced and it is unlikely the saw cut patches will be allowed to remain. This will require a complete milling and overlay restoration.

Invasiveness of Project Construction

The impact of construction of underground utilities in urban areas, while temporary, can be extensive. The tools and equipment needed, such as excavators, dump trucks, material trucks, cranes for manhole placement, dewatering equipment, and shore boxes will cause vehicle and pedestrian traffic to be rerouted around the construction area. Considerations will have to be taken as to what time of year construction should take place as to limit the effect on the town's peak seasons. As Talbot Street is the main street of St. Michaels and has businesses as well as residents in close proximity of the construction site, considerations must be taken as to what times of day construction is allowed from both a general disturbance and noise level. If crews are not allowed to work during the nighttime hours, the construction period can be lengthened greatly. Traffic control will be a major concern of the construction of the project. Businesses will likely be negatively affected by the project as sidewalks and roadways will likely have to be shut down for extended periods of time during construction.

Due to the narrow nature of Talbot Street and surrounding streets, this construction will likely have to be done in phases as to limit the road closures during construction and have as little impact on the town's businesses and residents as possible. The underground construction of a joint use duct bank down Talbot Street would require dump trucks, excavators, and other equipment to transport and install materials such as precast manholes. The following pictures show just how large of an area a construction crew can occupy while installing a duct bank.

Excavation efforts in the St. Michaels area are further complicated by the high water table in the surrounding soils. Groundwater will quickly fill any excavated area more than 2-3' deep, and this groundwater will have to be removed from the site to allow for the placement of conduit, manholes, handholes, and concrete. All dewatering efforts will require filtration of the water to prevent sediment and other soil contaminants to be pumped into adjacent areas and storm water systems. In heavily congested areas where nearby buildings foundations and storm water pipes are in close proximity to the proposed duct bank excavations, there is a risk that dewatering efforts could displace nearby soils and cause settlement and displacement of these structures. Initial route analysis indicates this to be a higher risk on Option A than the other two route options.

The soil in the project area has a high sand content. With the high-water table and sandy soil composition, there is a high risk of soil erosion and the creation of voids in neighboring soils during excavation and dewatering of the trench. As a result, adjacent underground utilities, sidewalks, and even building foundations could become undermined and damaged during construction. While this risk exists in some form on all 3 route options, the potential for damage is far greater on Option A due to the close proximity of buildings, water, sewer, and storm water systems to the proposed construction.

Figure 1: Pre-cast Manhole Installation

Figure 2: Typical Duct Bank Installation

Figure 3: Duct Bank Installation Through Manhole

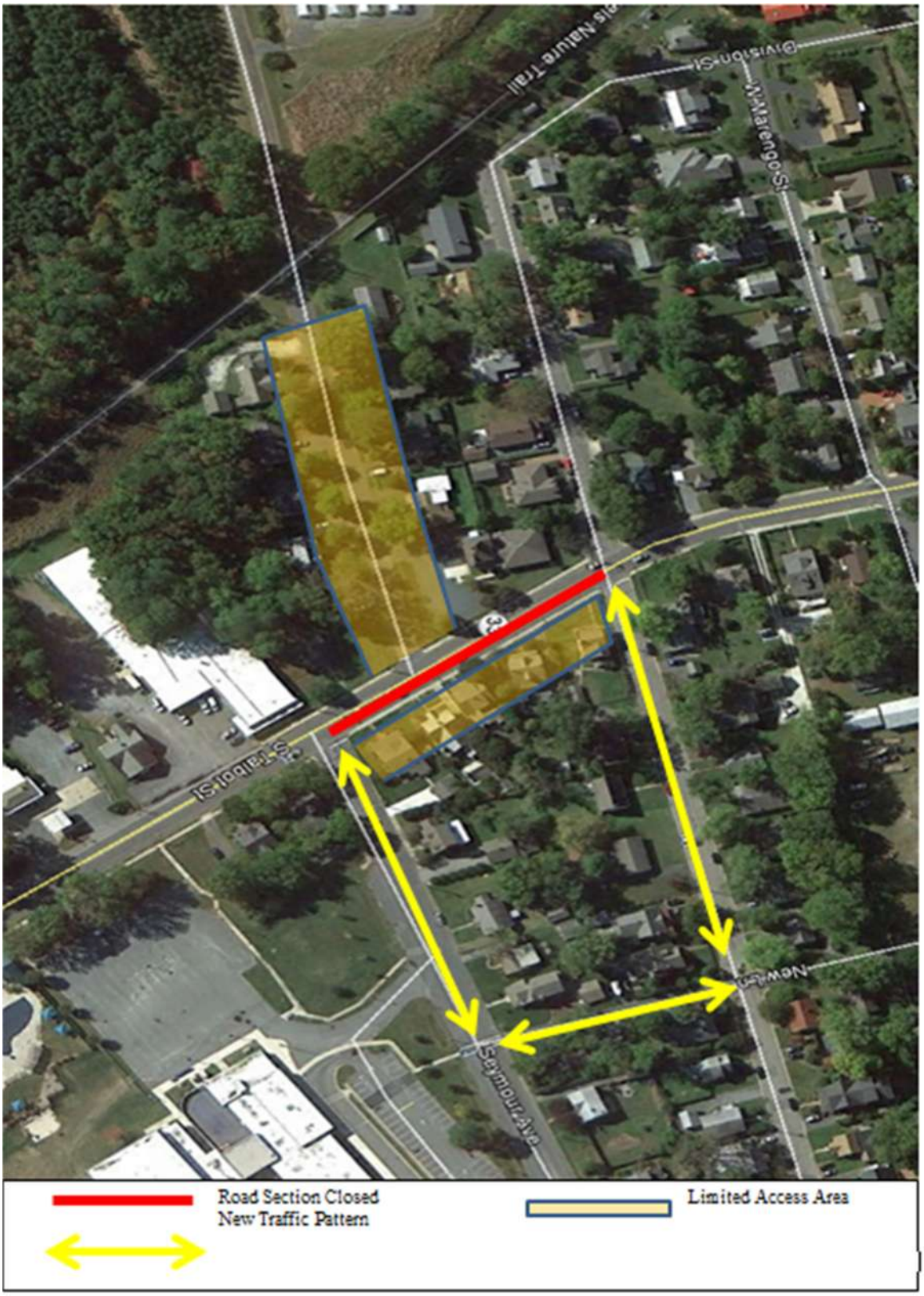
Figure 4: Duct Bank Installation Through Manhole

While the construction area would be maintained to as small an area as possible as to mitigate the impact on the town, some sections of the road will likely have to be completely shut down during construction. This would also close the pedestrian traffic of the construction area which would negatively impact businesses on Talbot Street. The constructability of this project requires it to be done in phases. In order to maintain a flow of traffic throughout the town, traffic control and detours would have to be used during construction in order to safely and efficiently complete the project. No matter which option is chosen, phases of construction would have to be implemented so to keep the ability of navigating around the construction open. Implementing this type of construction would require a complete construction of each phase in order to move on to the next section. This means excavation and installation of the duct bank, manholes, handholes, and wires as well as complete resurfacing the roadways and sidewalks would have to be complete before the next phase can take place. During each phase of the project, the businesses and residents in each section would have very limited access to driveways and parking lots.

It would be reasonable to expect the trenches in the road to be left open daily during construction and closed after the shift with steel plates for up to a week. Due to the congestion and number of utilities an estimate of a general rate of progress may be 100 feet per week of conduit installation. In addition, after the conduit is installed there will be temporary restoration and patches. It would be reasonable to expect the final restoration would not be completed until the following year of the project.

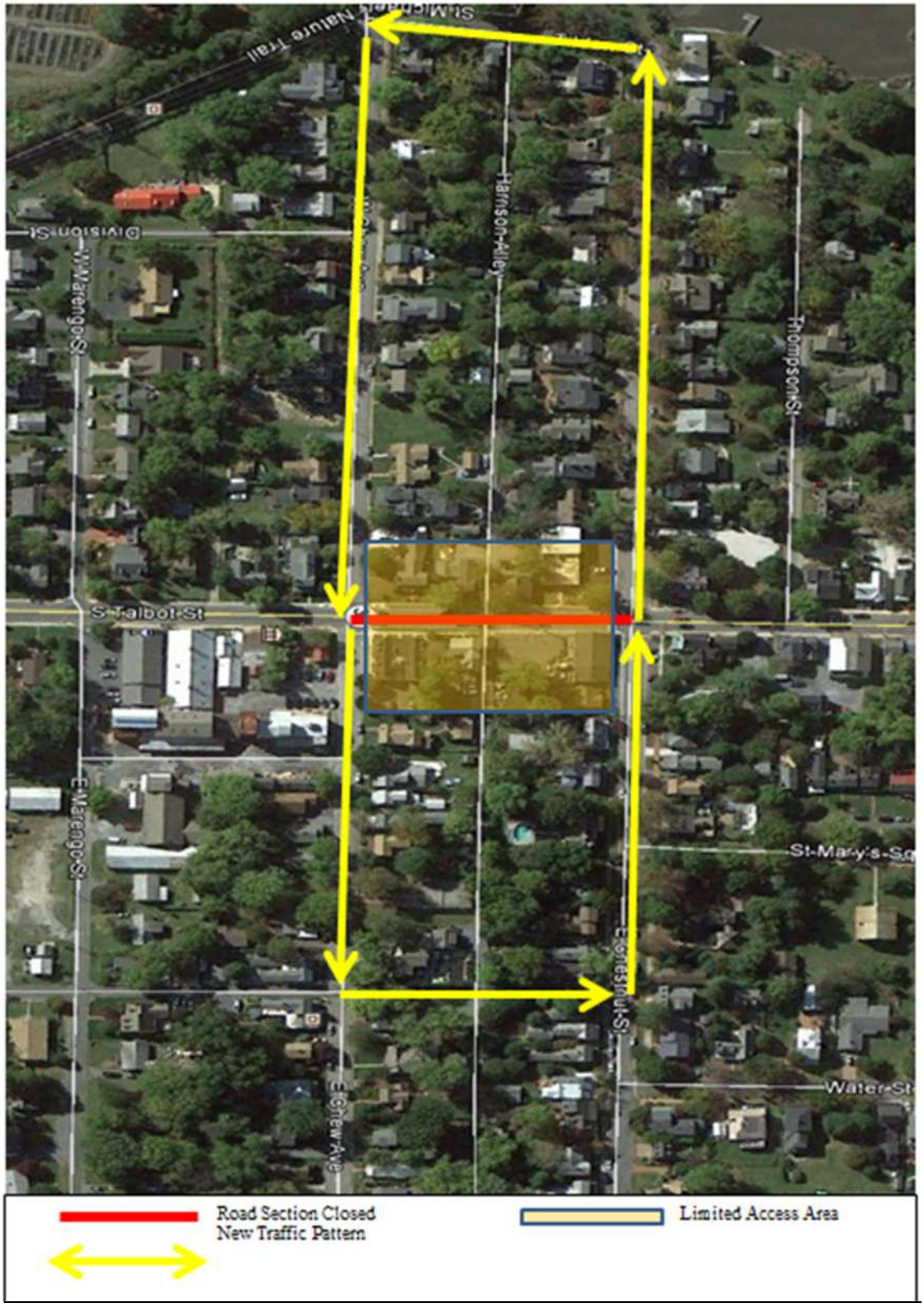
A sample of construction phases of Option A is outlined below as well as the impact on the flow of traffic and access to the construction area.

Phase 1: Seymour Avenue to Maple Avenue
This phase would shut down Talbot Street from Seymour Avenue to Maple Avenue. Vehicle traffic would be directed to New Lane as a detour. Pedestrian traffic could potentially have access on one side of the road. Boundary Lane local area traffic would have limited access during construction hours. Residents of Talbot Street in this area would be directly affected and have limited access.

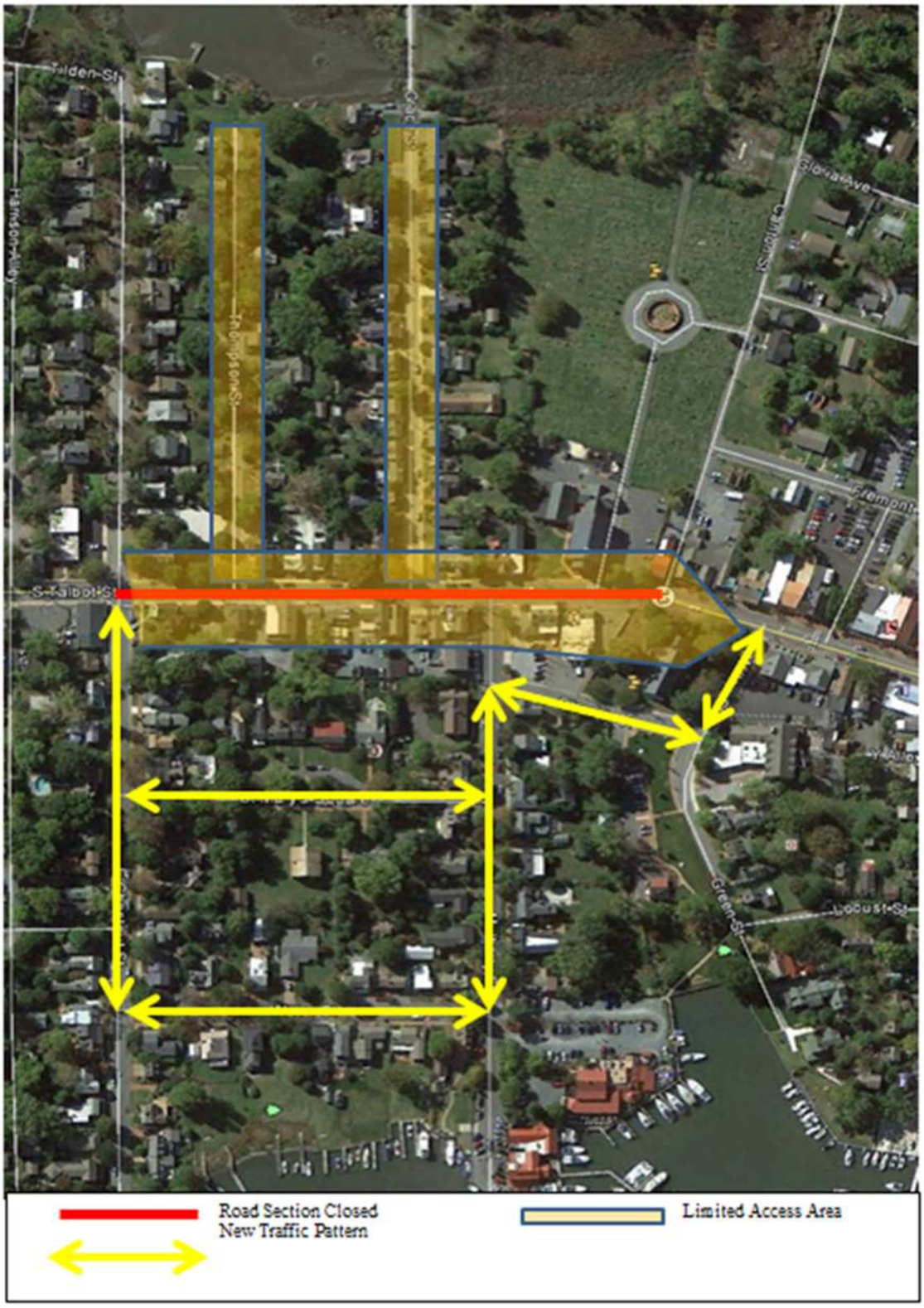


Phase 2: Maple Avenue to Chew Avenue
Southbound traffic of Talbot Street will be directed down West Chew Avenue to Division Street. North bound traffic will be direction down East Maple Avenue to New Lane. Through traffic of Talbot Street shutdown while pedestrian traffic could remain on one side of the road. Local vehicle traffic to residents in this section will be limited.

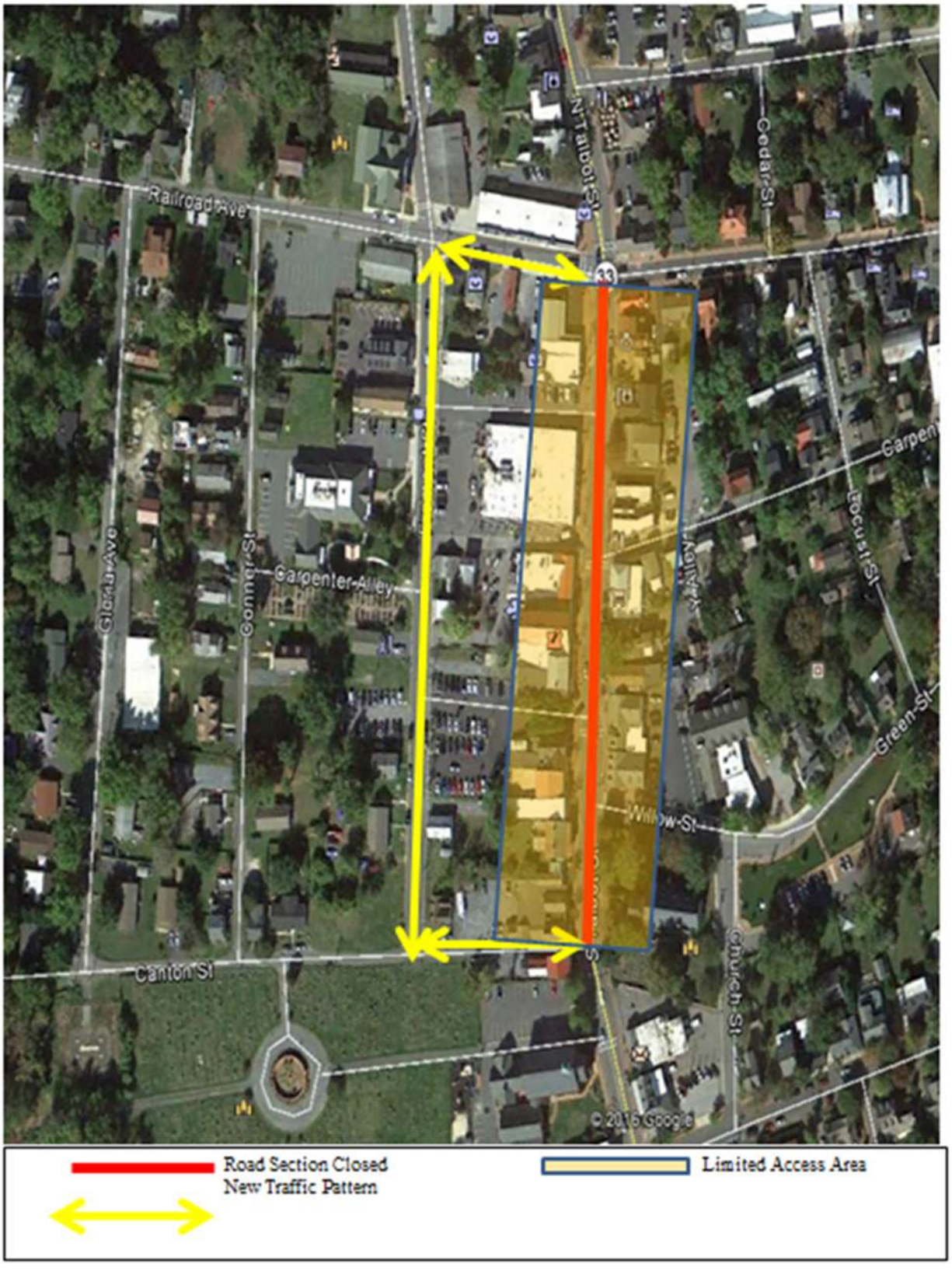
Phase 3: Chew Avenue to Chestnut Street
Talbot Street vehicle traffic closed in this area with controlled vehicle access to businesses and residents in this area. Pedestrian traffic limited to one side of the street. Southbound traffic direct down West Chestnut Street to Tilden Street. Northbound traffic directed down Chew Avenue to New Lane.



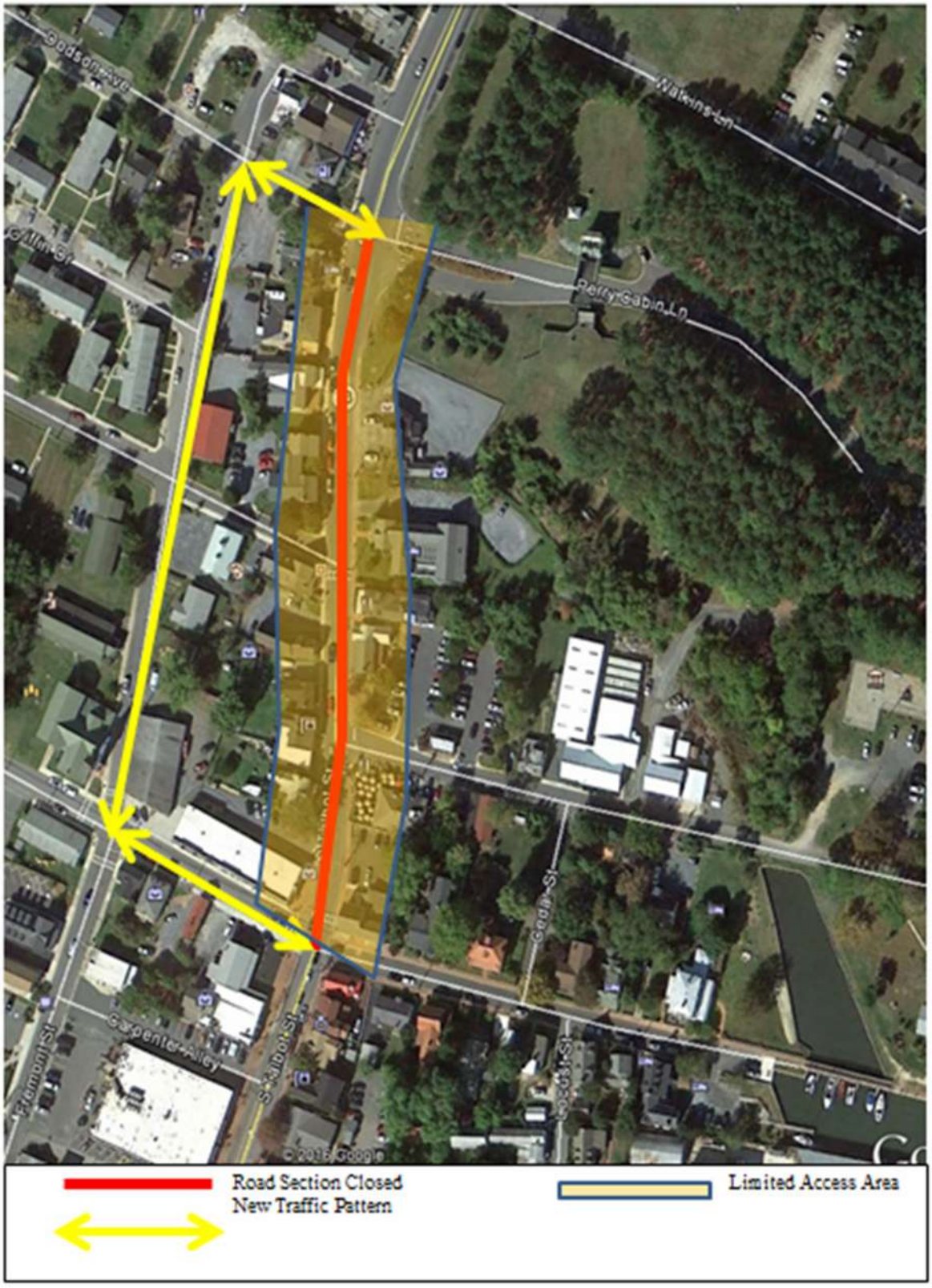
Phase 4: Chestnut Street to Canton Street
Talbot Street would be closed to through traffic. All northbound traffic will be directed down East Chestnut Street to St. Mary's Square and Water Street. Southbound traffic will be directed to Willow Street to Church Street. Mulberry Street would see heavy congestion of two way traffic. Pedestrian traffic on Talbot Street would be limited to one side of the road. Residents of Thompson Street and Grace Street would have controlled access during construction. Businesses in this section would be greatly affected.



Phase 5: Canton Street to Cherry Street
Through traffic on Talbot Street will be closed. All traffic will be directed west using Canton Street and Railroad Avenue to access Fremont Street. Pedestrian traffic in this area would likely be closed and directed to Fremont Street and Locust Street in order to access businesses and residents. Business in this area would be greatly affected negatively.



Phase 6: Cherry Street to Dodson Avenue
Talbot Street through traffic as well as pedestrian traffic will be closed. Traffic would be directed to use Fremont Street to bypass this area. Cherry Street can be used to access Cedar Street and Mill Street. Businesses on Talbot Street would have limited, controlled access during construction. Cedar Street could become heavily congested. Traffic to the Chesapeake Bay Maritime Museum could be heavily affected.



Each phase would have to be constructed to completion in order for the next phase to begin. This sample phase construction outlines which businesses and residents would be the most affected during construction. This example only shows construction for Option A. If Options B or C are chosen, greater detail would have to be provided for traffic control as these areas have even more limited access. The number of phases that may be needed for these options could increase in number as construction may need to be accomplished from driveway to driveway as to not completely eliminate access to a place of residents during construction.

These lane closures would likely have to be repeated multiple times, as the cabling efforts by Choptank Electric Company, Verizon, Atlantic Broadband, and Maryland Broadband would all require closures at different times. A lane and sidewalk closure would also be required for removal of the old poles.

Care must be taken during construction of a duct bank in urban areas as to not disturb gas, water, and other utility lines during construction. Proper identification must be done prior to construction in order to ensure the best route available. Sometimes the data provided as to what already exist in the roadway is not 100 percent accurate and obstacles may arise during construction that could cause delays to reroute duct banks. This could cause the need for more extensive engineering to find the best possible solution around these obstacles, increasing both the cost and duration of the project.

ABB Requirements

- ABB has the strictest requirements for relocation underground, as the only facility of theirs that can be located off of Talbot Street is their fiber optic cable
- Their existing coax service equipment cannot be installed in below ground equipment due to issues with water intrusion. There is limited space on Talbot Street for above ground pedestals.
- Their coax cables have a minimum bending radius of approximately 3', which requires their conduits on Talbot Street to be installed relatively deep below the sidewalk. They also require individual conduits for each customer, which in many areas may cause issues with not enough space being available for their conduit requirements.
- If ABB were to convert their services in the Town of St. Michaels to fiber optic, their conduit and burial depth requirements would be substantially reduced. Their fiber optic system could also be spliced in below grade handhole enclosures without concerns regarding water intrusion.
- It is Booth's recommendation that the Town of St. Michaels discuss with ABB the conversion to a fiber optic system in the event that this project moves forward. While the conversion to a fiber optic system would require converting all of the customers in the town that are fed from Talbot Street, the reduction in cost of conduit and cabling on Talbot Street should offset that cost of the additional overhead conversion from coax to fiber.

Maryland Broadband Cooperative Requirements

- Maryland Broadband indicated that they do not possess any facilities in this area. It is believed that they may be in a fiber leasing agreement with Choptank EC; the details for relocation of the Choptank EC fiber optic facilities are covered under their requirements.

Verizon Requirements

- Six 4” conduits in main duct
- 6’Wx7’Dx10’L manhole every 200 feet on main duct route
- Hand holes along Talbot Street for existing and future services

Choptank Requirements

- Five 4” conduits in main duct (one per phase, one spare, one for their fiber)
- 6’Wx7’Dx’7’L manhole every 600 feet on main duct route
- Two padmount switchgear units for services to Post Office and existing tie circuit
- Insulated aerial tree wire is not an approved construction method due to safety concerns.
- Choptank would prefer for the town to own their own decorative lighting along Talbot Street, as they are not interested in providing streetlight service to the town. Streetlights would be required approximately every 100’ on both sides of the road.

SERVICE DUCT REQUIREMENTS

A smaller service conduit system will be required regardless of the option chosen for the main duct bank. This duct bank will be directionally bored under the sidewalk of Talbot Street. The purpose of this duct bank will be to serve the new town-owned street lights as well as to allow Verizon and ABB to service existing and possible future customers in the area. The duct bank will run the length of the project area down Talbot Street from Seymour Avenue to Dodson Avenue. This duct bank will require hand holes for ABB and Verizon to be able to access their respective facilities. Each company will require their own individual hand holes as to limit access to their facilities from non-authorized personnel. Hand holes will be placed approximately 200' apart.

It is important to note directional drilling still requires excavations to cross sewers and water laterals and other utilities to minimize the risk of a utility strike.

EVALUATION MATRIX

Route	Nickname	Preference	Length(mi)	Cost	Dewatering Concerns	Constructability	Public Impact
A	Talbot Street UG	Not Preferred	Short	High	Yes	Poor	High
B	New Lane UG	1st	Short	Medium	Medium	Fair	Medium
C	New Lane OH/UG	2nd	Short	Low	Low	Fair	Medium

ROUTE DETAILS

Intersection of Talbot Street and Seymour Avenue

Intersection of Talbot Street and Boundary Lane

Intersection of Talbot Street and Maple Avenue

Intersection of Talbot Street and Marengo Street

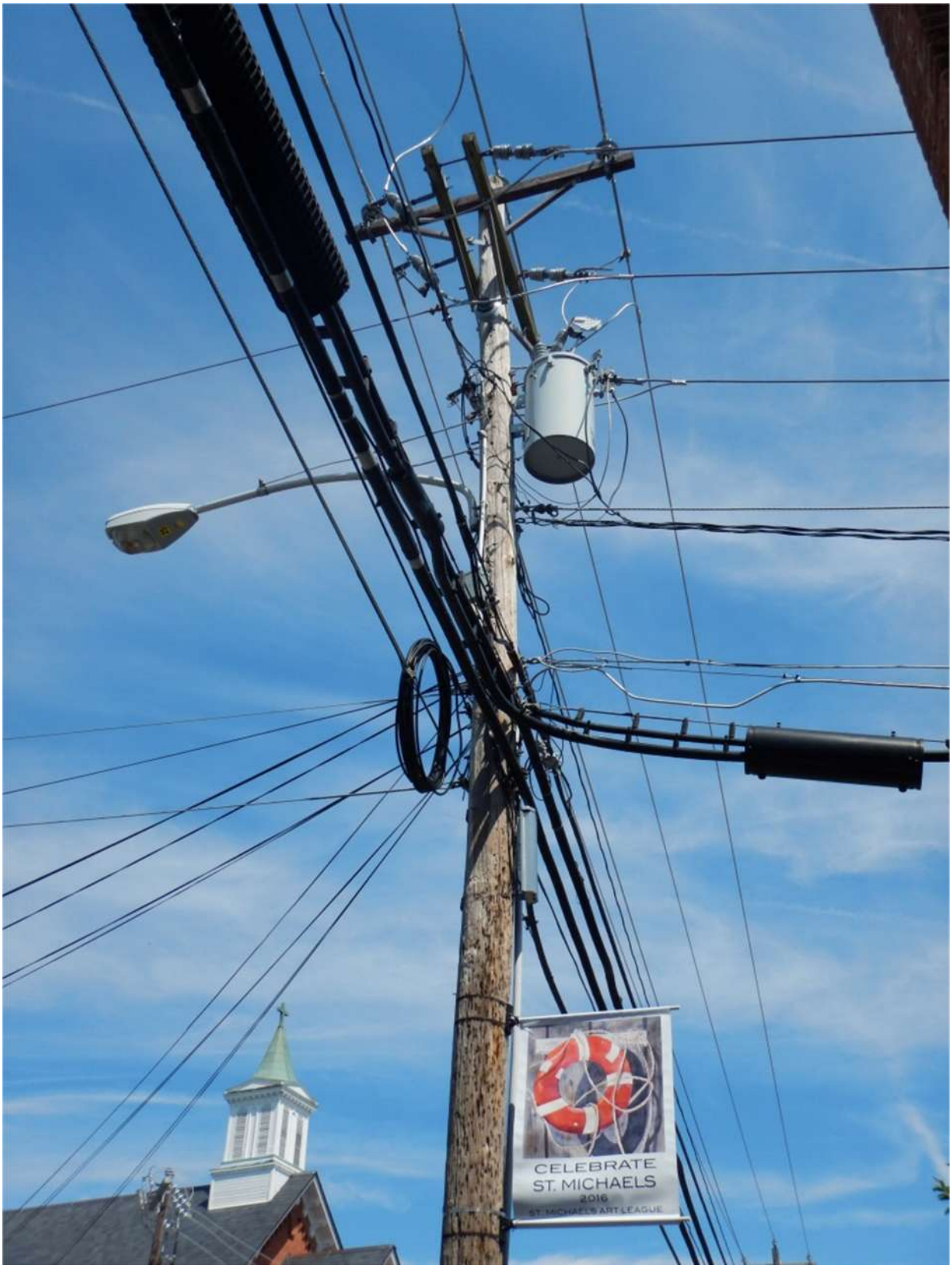
Intersection of Talbot Street and Chew Avenue

Intersection of Talbot Street and Harrison Alley

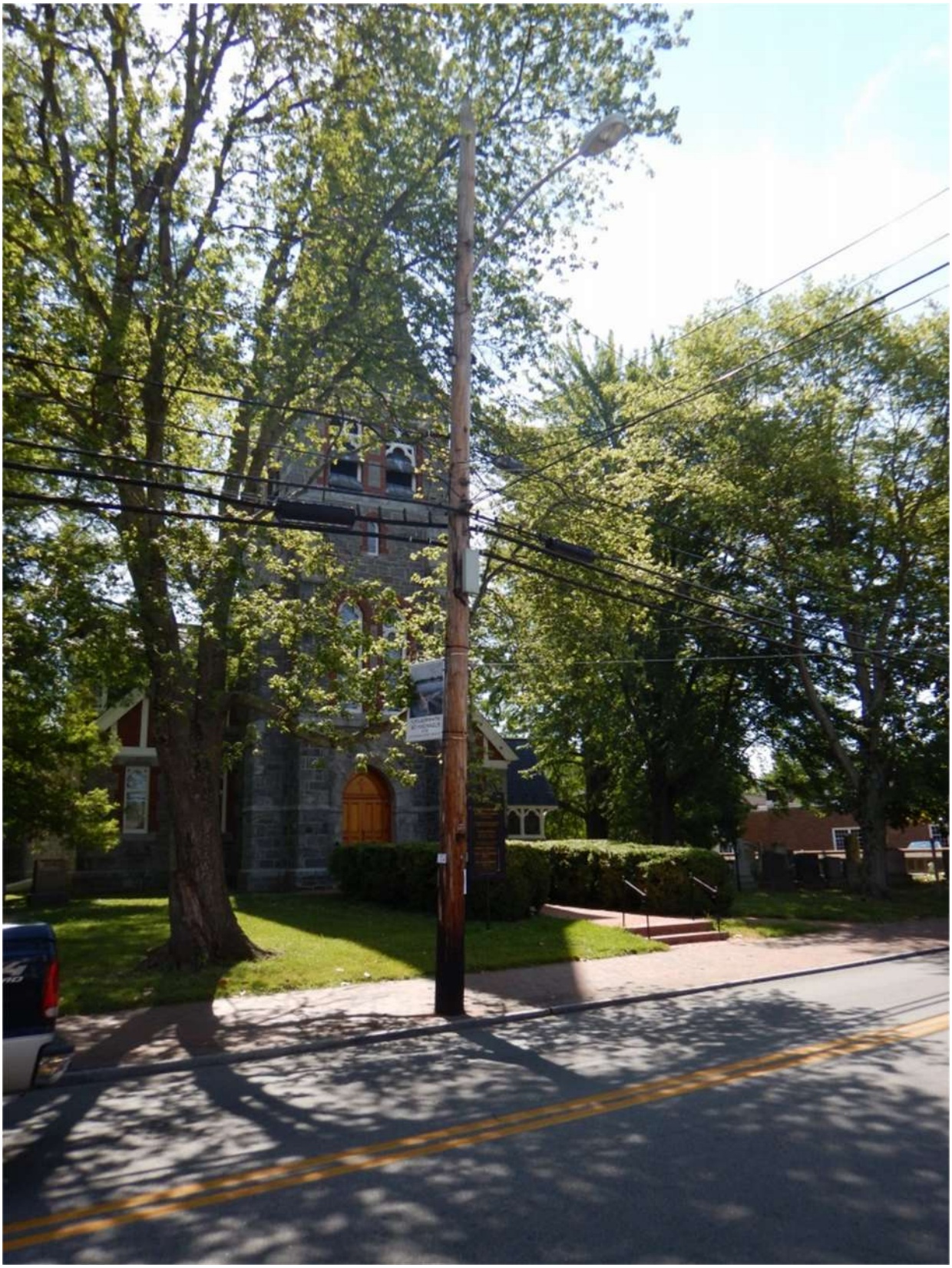
Intersection of Talbot Street and Chestnut Avenue

Intersection of Talbot Street and Thompson Avenue

Intersection of Talbot Street and Grace Street



Intersection of Talbot Street and Mulberry Street



Intersection of Talbot Street and Canton Street

Intersection of Talbot Street and Cherry Street

Intersection of Talbot Street and Mill Street

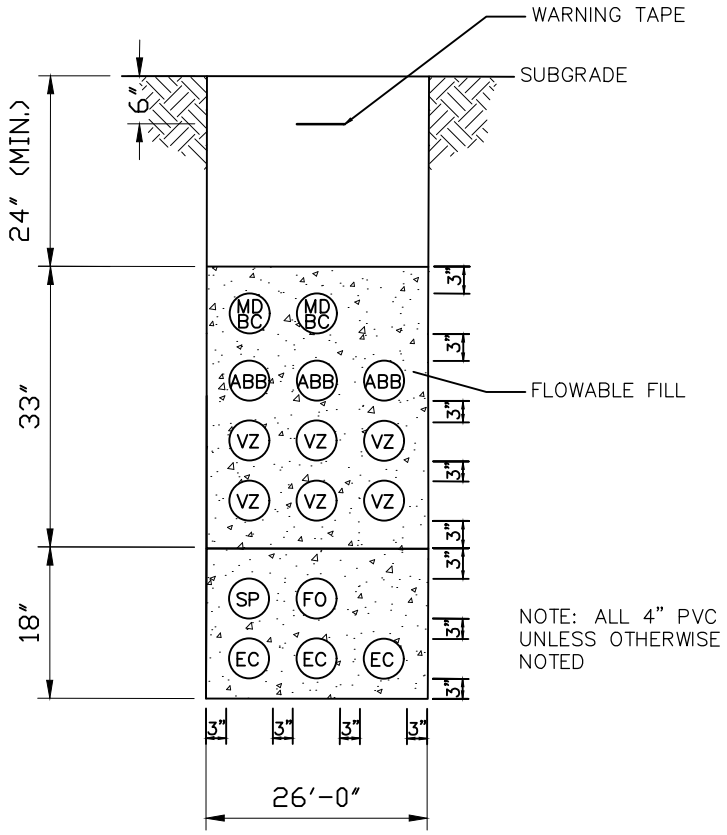
COST ANALYSIS DETAILS

Town of St. Michaels
Talbot Street - Route Study
Cost Analysis

Option	Unit Cost	A	B	C
Nickname		Talbot Road Underground	New Lane Underground	New Lane Overhead/ Underground
Properties Crossed		96	96	97
Residential		22	30	30
Commericial		74	66	67
Street Lights	$ 2,300.00	65	65	65
Verizon Manholes Main Duct Bank	$ 23,000.00	19	17	14
ABB handholes Main Duct Bank	$ 1,500.00	19	17	14
Choptank Manholes Main Duct Bank	$ 23,000.00	9	8	7
Joint Use Main Duct Bank (ft.)	$ 200.00	3900	4200	3200
Joint Use Service Run Duct Bank (ft.)	$ 60.00	1000	2500	2500
Service HDD	$ 50.00	6600	6600	6600
Verizon Handholes for HDD	$ 1,500.00	65	65	65
ABB Handholes for HDD	$ 1,500.00	65	65	65
Engineering	$ 500,000.00	1	1	1
Project Management	$ 400,000.00	1	1	1
Traffic Control	$ 1,000.00	600	200	200
Street Cutting and Repair	$ 25.00	3900	4200	3200
Sidewalk Cutting and Repair	$ 200.00	6600	6600	6600
Choptank Electric Company Cost	1	$ 1,000,000.00	$ 1,000,000.00	$ 1,500,000.00
Verizon Cost	1	$ 5,000,000.00	$ 5,000,000.00	$ 5,000,000.00
ABB Cost	1	$ 1,000,000.00	$ 1,000,000.00	$ 1,000,000.00
	Total Cost	$ 12,104,500.00	$ 11,790,000.00	$ 11,968,500.00

1st Preference
Estimated Costs - to be provided by corresponding utility

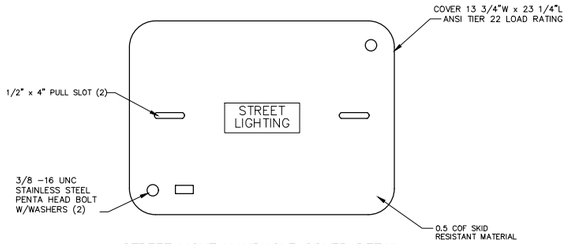
TYPICAL DUCT BANK DETAIL



SECTION A–A

TOWN OF ST. MICHAELS ST. MICHAELS, MARYLAND			
DUCT BANK DETAIL (TYPICAL)			
Booth & Associates, LLC 5811 Glenwood Avenue | Raleigh, NC 27612 CONSULTING ENGINEERS			
DWN. AAI	DATE: 12/12/16		DWG. NO.
CKD. JBW	APPD. JBW		
SCALE: N.T.S.	FILE: 6688248DB		DB–1
JOB NO. 668–8248	DATE	REVISION	
© 12/16			

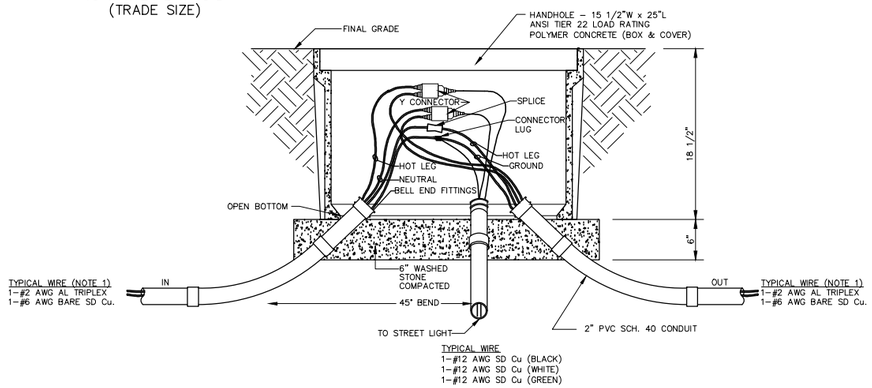
STREET LIGHT CONCEPTUAL DRAWING



STREET LIGHT HANDHOLE COVER DETAIL

N.T.S.

TYPE
13"W x 24"L x 18"D
(TRADE SIZE)

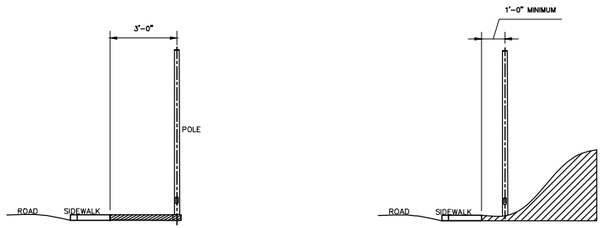


STREET LIGHT HANDHOLE (SL#) DETAIL

N.T.S.

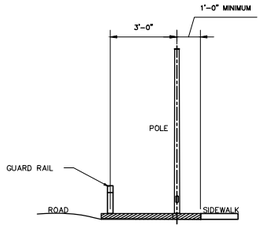
NOTES:

1. #6 AWG BARE SOFT DRAWN COPPER GROUND WIRE SHALL BE INSTALLED WITH LIGHTING SERVICE WIRE. THE GROUND WIRE SHALL BE PROPERLY BONDED TO EACH TRANSFORMER GROUND BUS, EACH LIGHT FIXTURE HOUSING AS RECOMMENDED BY THE MANUFACTURER, AND TO EACH GFCI OUTLET INSTALLED.
2. MAINTAIN MINIMUM BURIAL DEPTH OF THIRTY-SIX INCHES (36") FOR ALL LIGHTING CONDUITS INSTALLED VIA DIRECT BURIAL. DIRECTIONALLY BORED CONDUITS UNDER ROAD SHOULD MAINTAIN MINIMUM INSTALLATION DEPTH OF TEN FEET (10'-0").



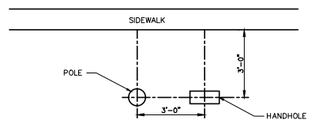
TYPICAL SETBACK POLES BEHIND SIDEWALK (PROFILE VIEW)

N.T.S.



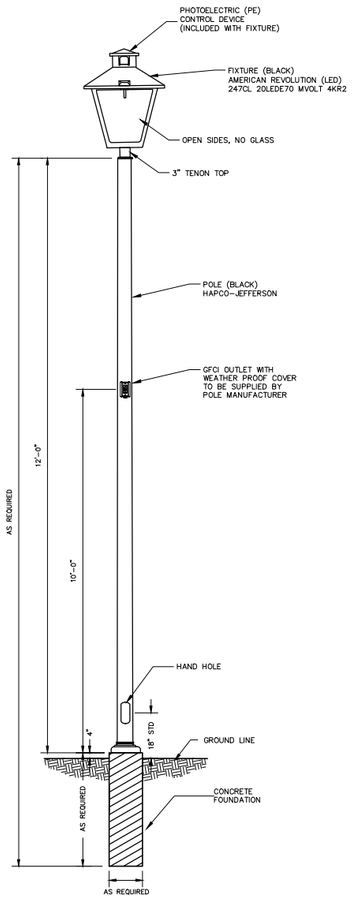
TYPICAL SETBACK POLES BEHIND GUARDRAIL IN FRONT OF SIDEWALK (PROFILE VIEW)

N.T.S.



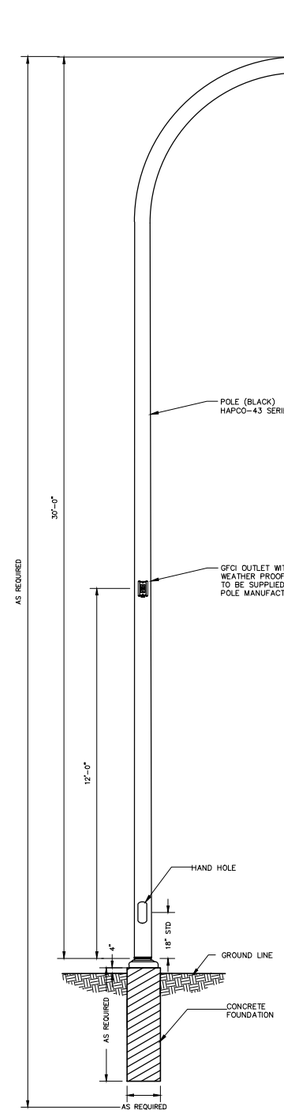
TYPICAL HANDHOLE BESIDE POLE (PLAN VIEW)

N.T.S.



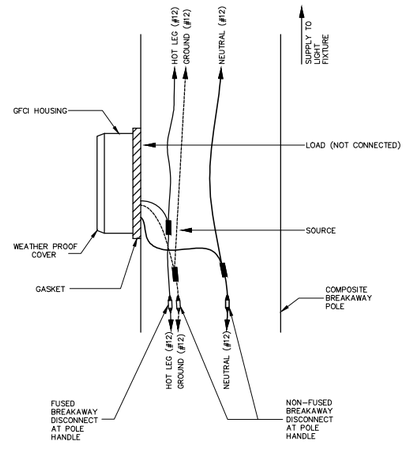
SIDEWALK LIGHT DETAIL

N.T.S.



INTERSECTION LIGHT DETAIL

N.T.S.



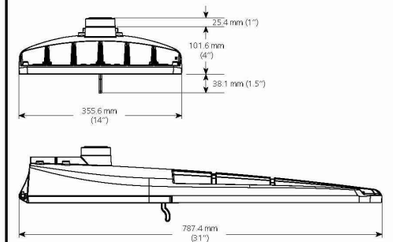
GFCI WIRING DETAIL

N.T.S.

NOTES:

1. BREAKAWAY DISCONNECTS TO BE INSTALLED AT POLE BASES.

DIMENSIONS



Effective Projected Area (EPA)
The EPA for the ATB2 is 0.78 sq. ft.,
Approx. Wt. = 21 lbs. (9.53 kg)

INTERSECTION LUMINAIRE DETAILS

N.T.S.

NOTES:

1. LIGHT POLES SHALL BE ACCEPTED PER AASHTO BREAKAWAY SPECIFICATIONS BY THE FEDERAL HIGHWAY ADMINISTRATION.
2. POLES AND LIGHT FIXTURES SHALL BE BLACK IN COLOR.
3. POLES SHALL BE PRE-DRILLED BY THE MANUFACTURER AS REQUIRED FOR THE SPECIFIC LIGHT FIXTURE TO BE INSTALLED.
4. POLES TO BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
5. REFER TO DRAWING 1406.01 OF NCDOT ENGLISH STANDARD DRAWING ENTITLED "LIGHT STANDARD LUMINARIES" FOR TYPICAL INSTALLATION OF BREAKAWAY FUSE HOLDERS REQUIRED AT ALL LIGHT POLES.

NO.	REVISIONS	DATE

TOWN OF ST. MICHAELS
ST. MICHAELS, MARYLAND

STREET LIGHT SERVICE
CONCEPTUAL

Booth&Associates LLC
5011 Glenwood Avenue | Raleigh, NC 27612 CONSULTING ENGINEERS NC F-0221

DWN. AAI	DATE 12/12/16	DWG. NO. 668-8248
CKD. JBW	APPD. JBW	LD1 OF 1
SCALE: NONE	© DECEMBER 2016	