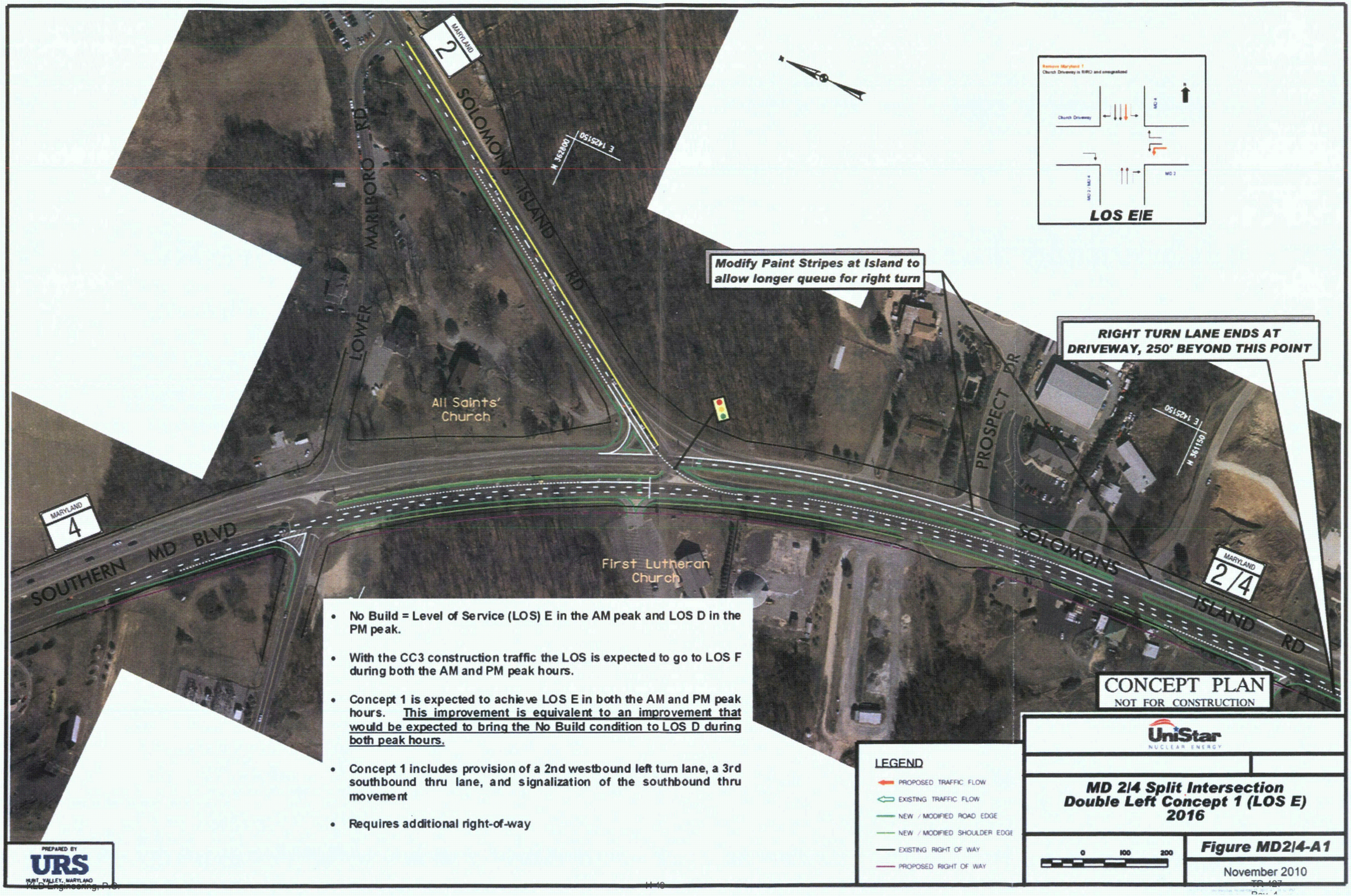
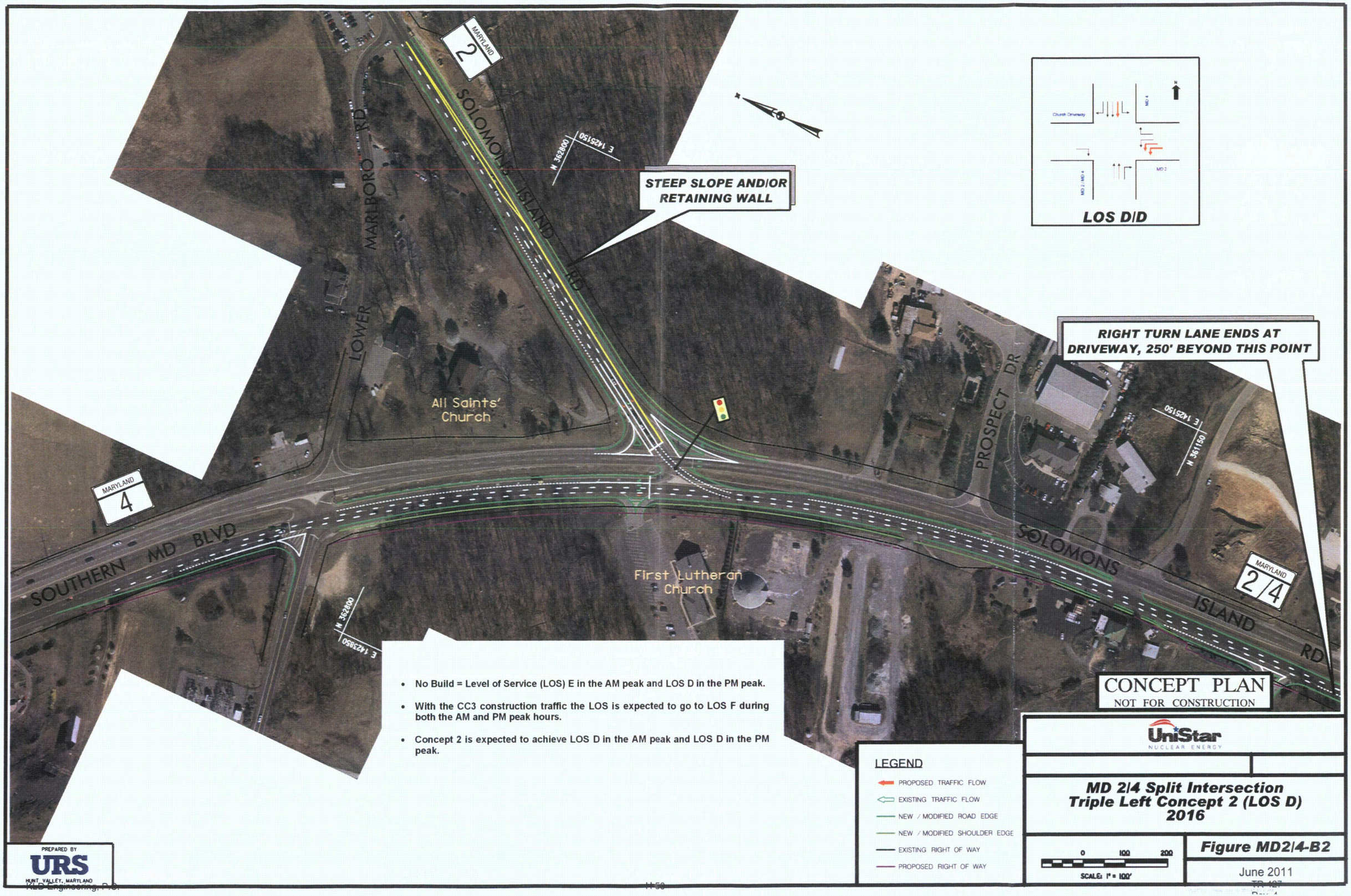


- No Build = Level of Service (LOS) E in the AM peak and LOS D in the PM peak.
- With the CC3 construction traffic the LOS is expected to go to LOS F during both the AM and PM peak hours.
- Concept 1 is expected to achieve LOS E in both the AM and PM peak hours. <u>This improvement is equivalent to an improvement that would be expected to bring the No Build condition to LOS D during both peak hours.</u>
- Concept 1 includes provision of a 2nd westbound left turn lane, a 3rd southbound thru lane, and signalization of the southbound thru movement
- Requires additional right-of-way



- No Build = Level of Service (LOS) E in the AM peak and LOS D in the PM peak.
- With the CC3 construction traffic the LOS is expected to go to LOS F during both the AM and PM peak hours.
- Concept 2 is expected to achieve LOS D in the AM peak and LOS D in the PM peak.

LEGEND

- PROPOSED TRAFFIC FLOW
- EXISTING TRAFFIC FLOW
- NEW / MODIFIED ROAD EDGE
- NEW / MODIFIED SHOULDER EDGE
- EXISTING RIGHT OF WAY
- PROPOSED RIGHT OF WAY

CONCEPT PLAN
NOT FOR CONSTRUCTION

PREPARED BY
URS
HUNT VALLEY, MARYLAND

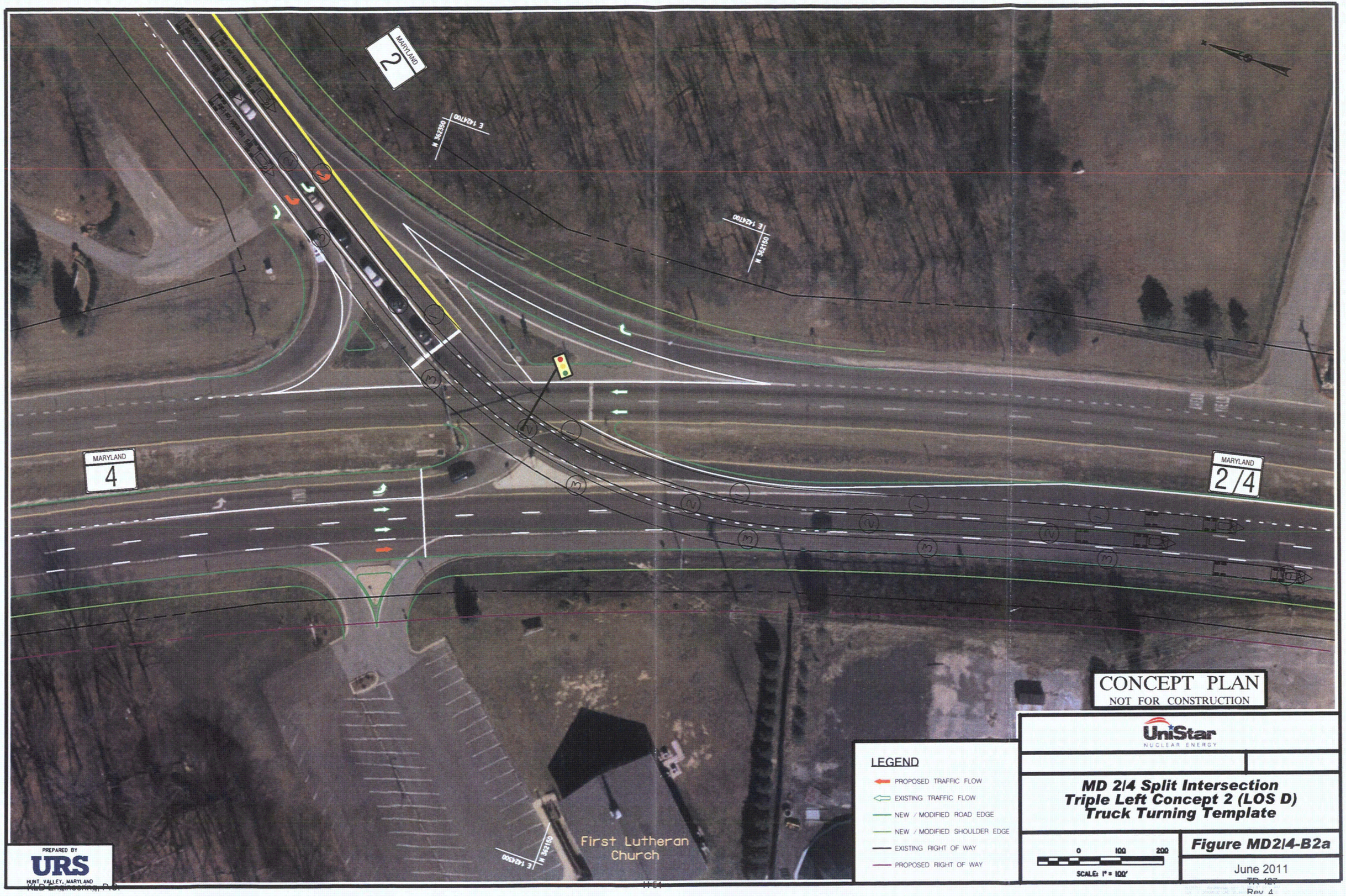
UniStar NUCLEAR ENERGY

MD 2/4 Split Intersection
Triple Left Concept 2 (LOS D)
2016

0 100 200
SCALE: 1" = 100'

Figure MD2/4-B2

June 2011



CONCEPT PLAN
NOT FOR CONSTRUCTION

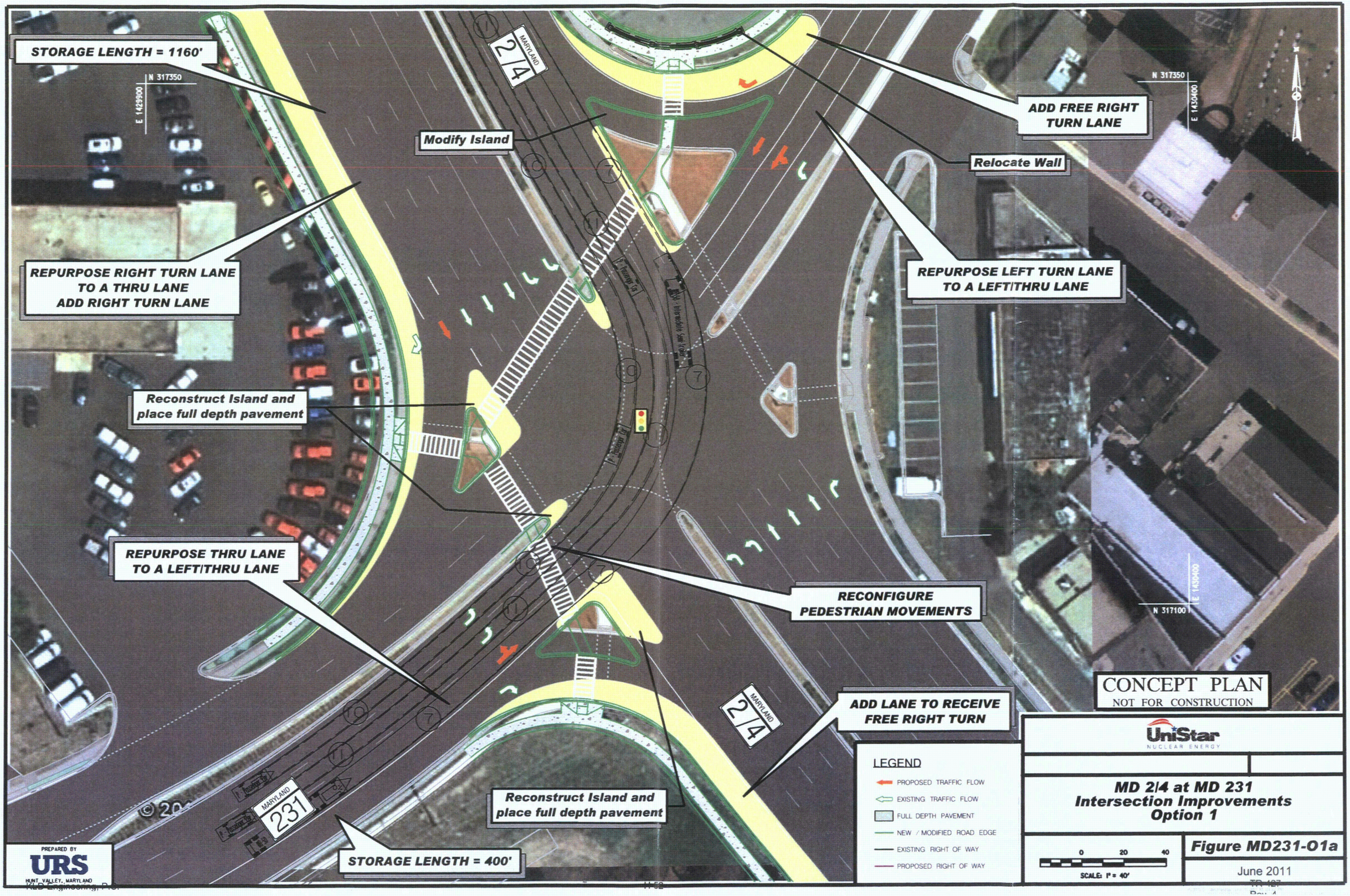
PREPARED BY
URS
HUNT VALLEY, MARYLAND
KLD Engineering, P.A.

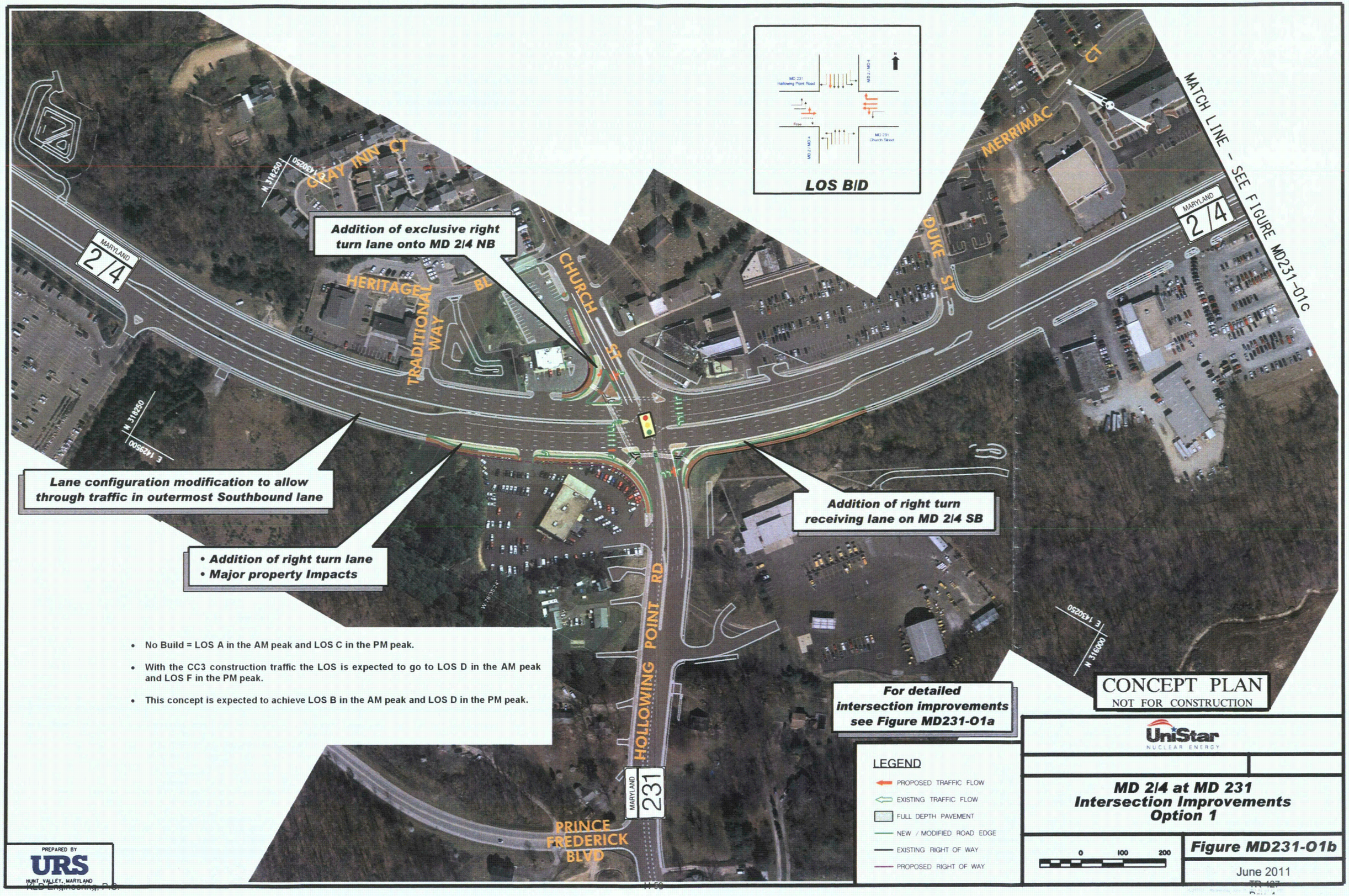
UniStar
NUCLEAR ENERGY

MD 2/4 Split Intersection
Triple Left Concept 2 (LOS D)
Truck Turning Template

Figure MD2/4-B2a

June 2011
TR 427
Rev 4


STORAGE LENGTH = 1160'
N 317350
E 1429900
Modify Island
MARYLAND 2/4
ADD FREE RIGHT TURN LANE
Relocate Wall
N 317350
E 1430400
REPURPOSE RIGHT TURN LANE TO A THRU LANE ADD RIGHT TURN LANE
REPURPOSE LEFT TURN LANE TO A LEFT/THRU LANE
Reconstruct Island and place full depth pavement
REPURPOSE THRU LANE TO A LEFT/THRU LANE
RECONFIGURE PEDESTRIAN MOVEMENTS
N 317100
E 1430400
CONCEPT PLAN
NOT FOR CONSTRUCTION
ADD LANE TO RECEIVE FREE RIGHT TURN
MARYLAND 2/4
MARYLAND 231
Reconstruct Island and place full depth pavement
STORAGE LENGTH = 400'
LEGEND
PROPOSED TRAFFIC FLOW
EXISTING TRAFFIC FLOW
FULL DEPTH PAVEMENT
NEW / MODIFIED ROAD EDGE
EXISTING RIGHT OF WAY
PROPOSED RIGHT OF WAY
UniStar NUCLEAR ENERGY
MD 2/4 at MD 231
Intersection Improvements
Option 1
0 20 40
SCALE: 1" = 40'
Figure MD231-01a
June 2011
TR-127
Rev. 1
PREPARED BY
URS
HUNT VALLEY, MARYLAND
KLD Engineering, P.C.



- No Build = LOS A in the AM peak and LOS C in the PM peak.
- With the CC3 construction traffic the LOS is expected to go to LOS D in the AM peak and LOS F in the PM peak.
- This concept is expected to achieve LOS B in the AM peak and LOS D in the PM peak.

LEGEND

- PROPOSED TRAFFIC FLOW
- EXISTING TRAFFIC FLOW
- FULL DEPTH PAVEMENT
- NEW / MODIFIED ROAD EDGE
- EXISTING RIGHT OF WAY
- PROPOSED RIGHT OF WAY

CONCEPT PLAN
NOT FOR CONSTRUCTION

UniStar NUCLEAR ENERGY

MD 2/4 at MD 231
Intersection Improvements
Option 1

0 100 200

Figure MD231-01b

June 2011

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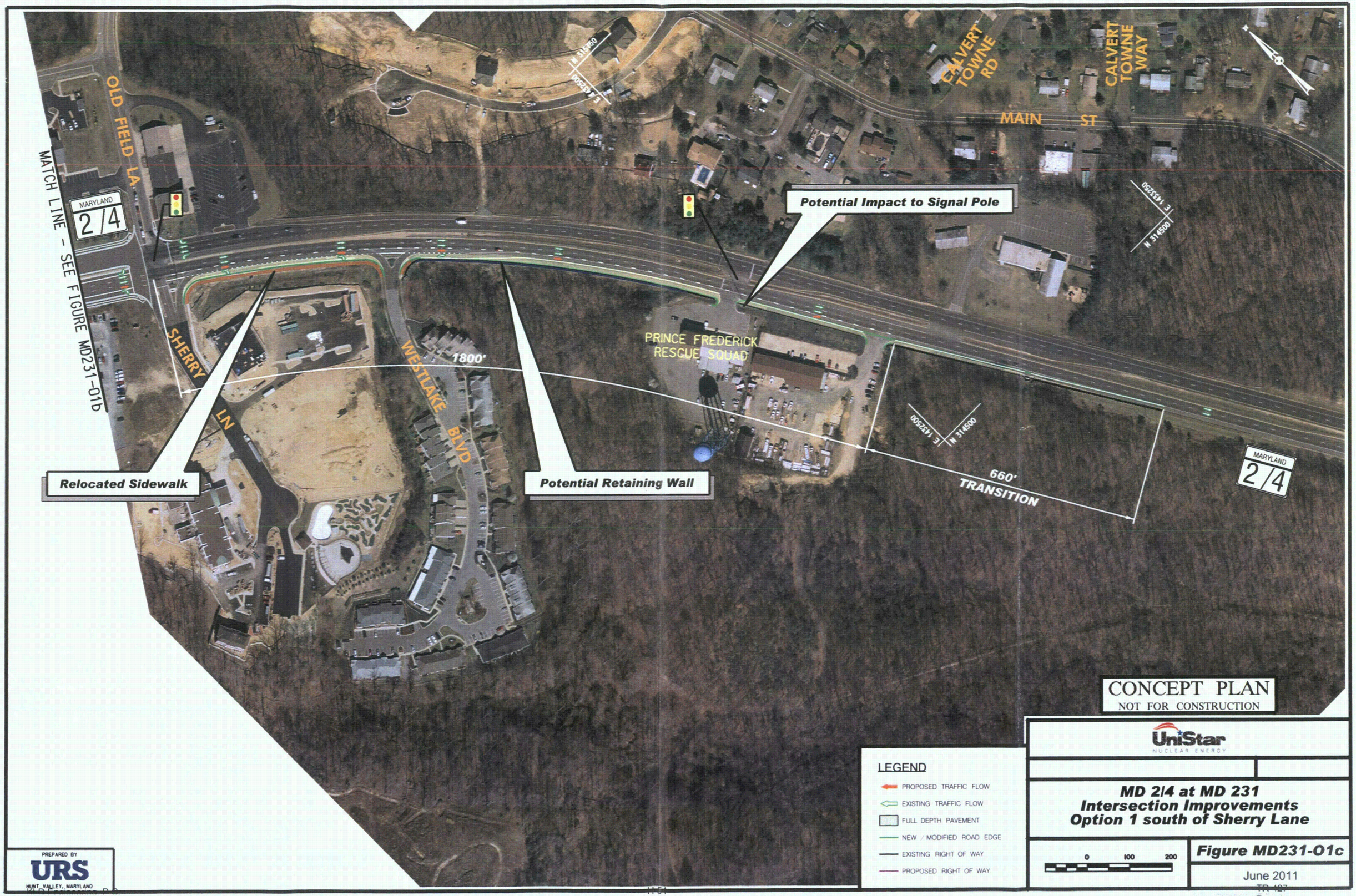
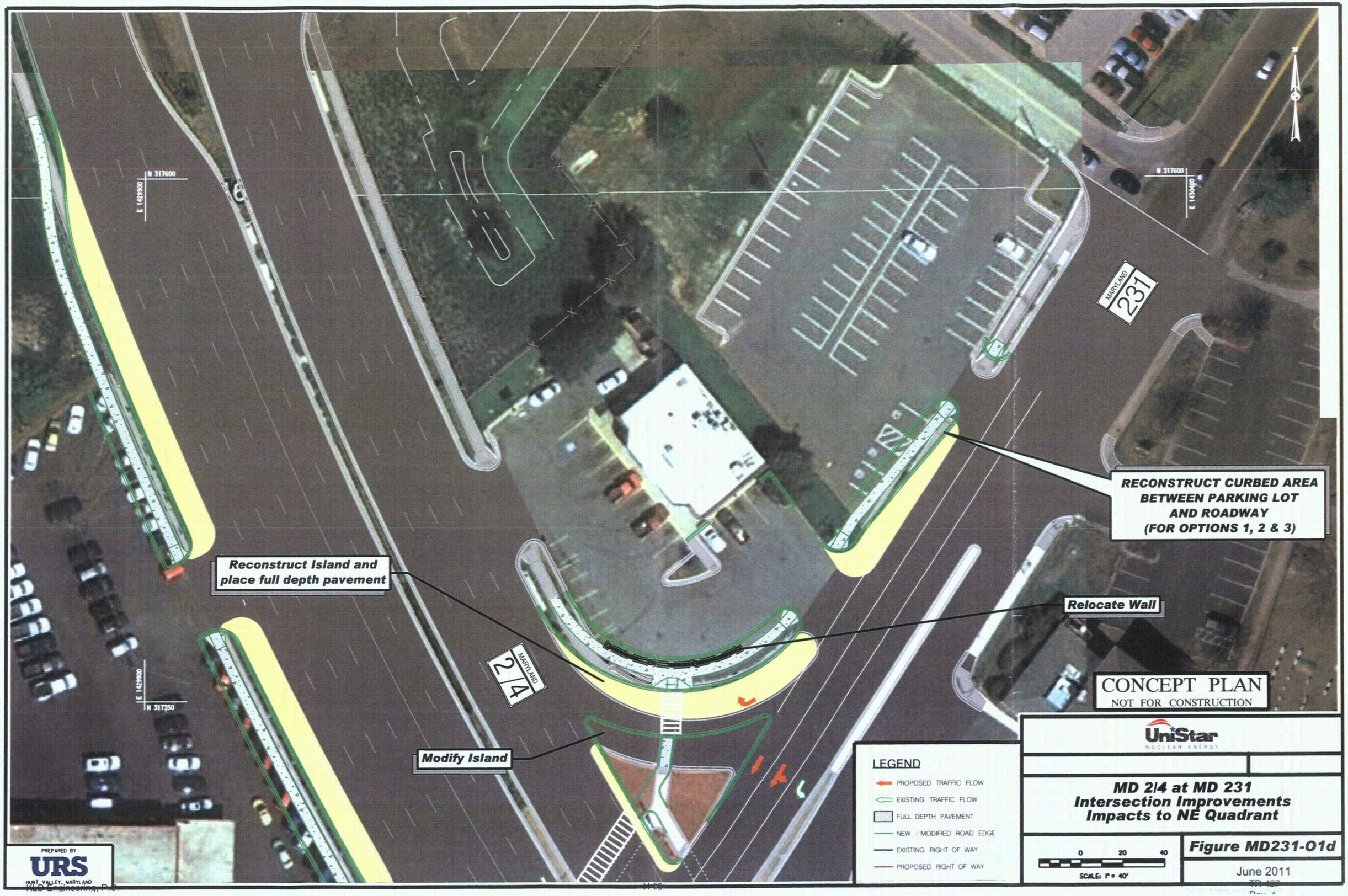

OLD FIELD LA
MATCH LINE – SEE FIGURE MD231-01b
MARYLAND 2/4
SHERRY LN
WESTLAKE BLVD
1800'
CALVERT TOWNE RD
CALVERT TOWNE WAY
MAIN ST
E 1432500
N 314500
Potential Impact to Signal Pole
PRINCE FREDERICK RESCUE SQUAD
660' TRANSITION
Relocated Sidewalk
Potential Retaining Wall
CONCEPT PLAN
NOT FOR CONSTRUCTION
LEGEND
PROPOSED TRAFFIC FLOW
EXISTING TRAFFIC FLOW
FULL DEPTH PAVEMENT
NEW / MODIFIED ROAD EDGE
EXISTING RIGHT OF WAY
PROPOSED RIGHT OF WAY
UniStar NUCLEAR ENERGY
MD 2/4 at MD 231
Intersection Improvements
Option 1 south of Sherry Lane
0 100 200
Figure MD231-01c
June 2011
PREPARED BY URS HUNT VALLEY, MARYLAND


N 317600
E 1429900
N 317600
E 1430400
MARYLAND
231
RECONSTRUCT CURBED AREA
BETWEEN PARKING LOT
AND ROADWAY
(FOR OPTIONS 1, 2 & 3)
Reconstruct Island and
place full depth pavement
Relocate Wall
MARYLAND
2
4
E 1429900
N 317350
Modify Island
CONCEPT PLAN
NOT FOR CONSTRUCTION
LEGEND
PROPOSED TRAFFIC FLOW
EXISTING TRAFFIC FLOW
FULL DEPTH PAVEMENT
NEW / MODIFIED ROAD EDGE
EXISTING RIGHT OF WAY
PROPOSED RIGHT OF WAY
UniStar
NUCLEAR ENERGY
MD 2/4 at MD 231
Intersection Improvements
Impacts to NE Quadrant
0
20
40
SCALE: 1" = 40'
Figure MD231-01d
June 2011
PREPARED BY
URS
HUNT VALLEY, MARYLAND
KLD Engineering, P.S.

N 317350
E 1429900

MARYLAND 2/4

Modify Island

STORAGE LENGTH = 1160'

Reconstruct Island to accomodate reconfigured pedestrian movements

Modify Median

ADD FREE RIGHT TURN LANE

Relocate Wall

REPURPOSE LEFT TURN LANE TO A LEFT/THRU LANE

N 317350
E 1430400

REPURPOSE THRU LANE TO A LEFT/THRU LANE

RECONFIGURE PEDESTRIAN MOVEMENTS

N 317100
E 1430400

MARYLAND 2/4

ADD LANE TO RECEIVE FREE RIGHT TURN

MARYLAND 231

STORAGE LENGTH = 400'

LEGEND

- PROPOSED TRAFFIC FLOW
- EXISTING TRAFFIC FLOW
- FULL DEPTH PAVEMENT
- NEW / MODIFIED ROAD EDGE
- EXISTING RIGHT OF WAY
- PROPOSED RIGHT OF WAY

CONCEPT PLAN
NOT FOR CONSTRUCTION

PREPARED BY
URS
HUNT VALLEY, MARYLAND
KLD Engineering, P.C.

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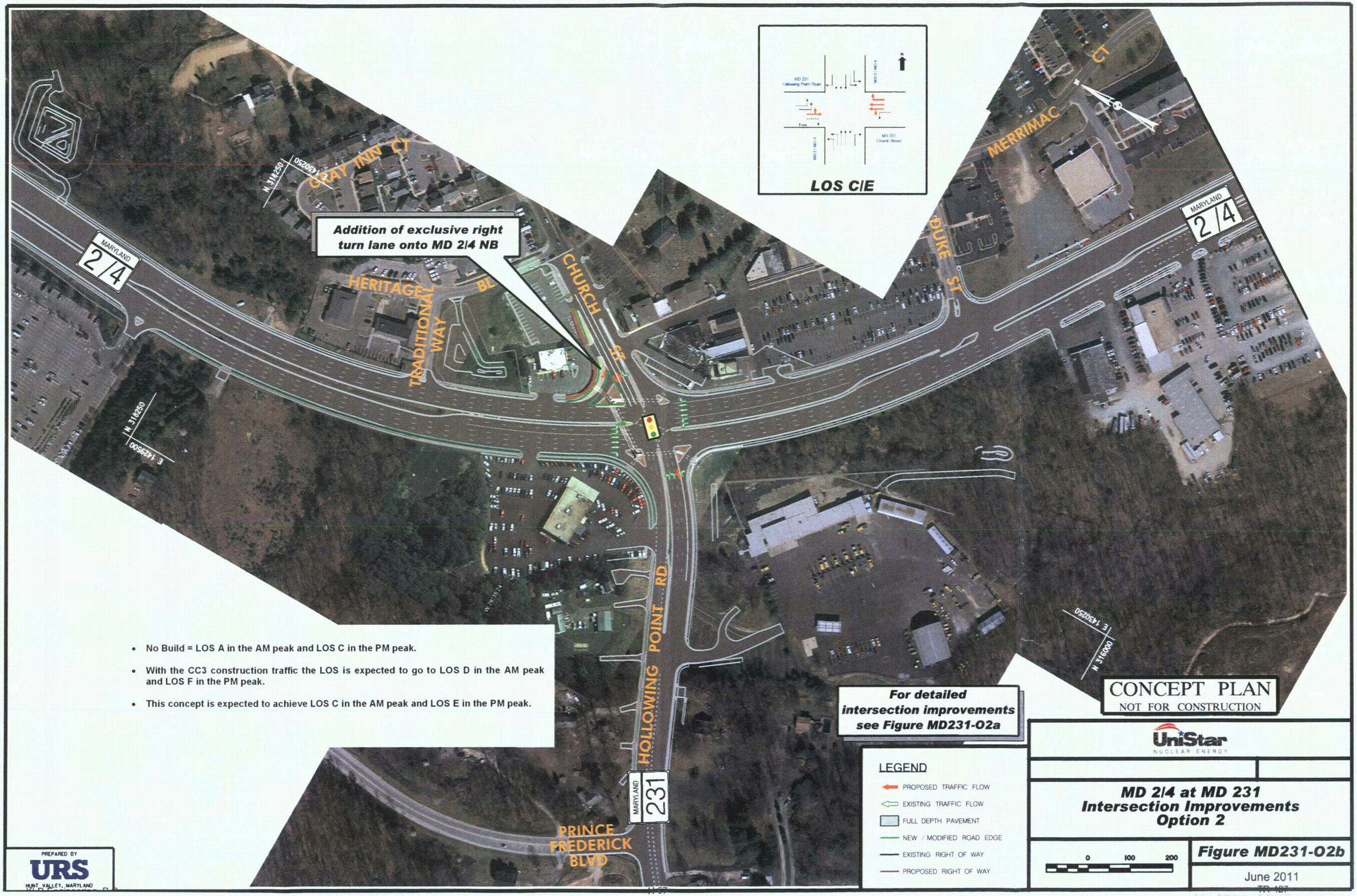
MD 2/4 at MD 231
Intersection Improvements
Option 2

0 20 40
SCALE: 1" = 40'

Figure MD231-02a

June 2011
TR-127
Rev. 4



- No Build = LOS A in the AM peak and LOS C in the PM peak.
- With the CC3 construction traffic the LOS is expected to go to LOS D in the AM peak and LOS F in the PM peak.
- This concept is expected to achieve LOS C in the AM peak and LOS E in the PM peak.

CONCEPT PLAN
NOT FOR CONSTRUCTION

PREPARED BY
URS
HUNT VALLEY, MARYLAND

UniStar
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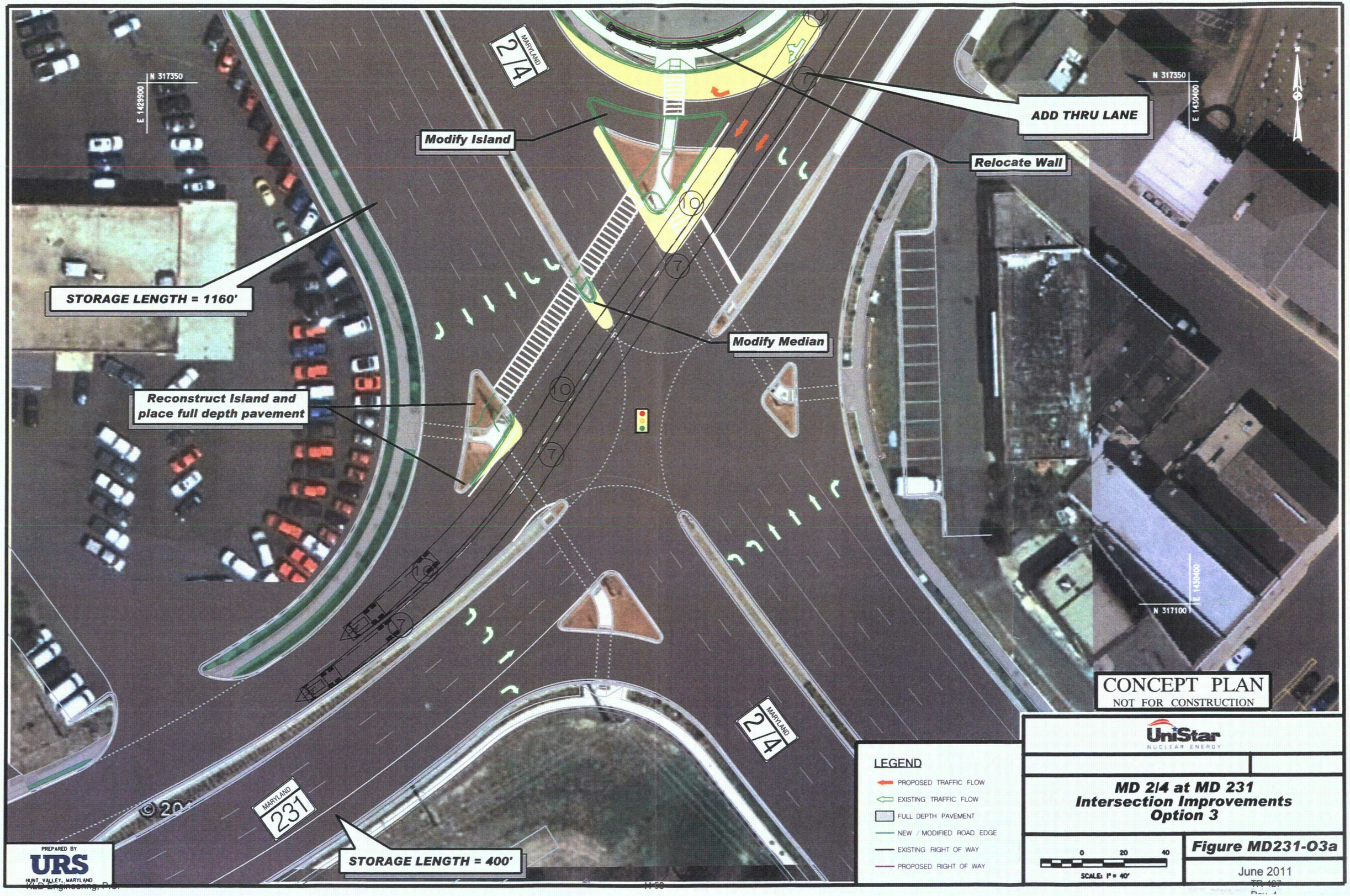
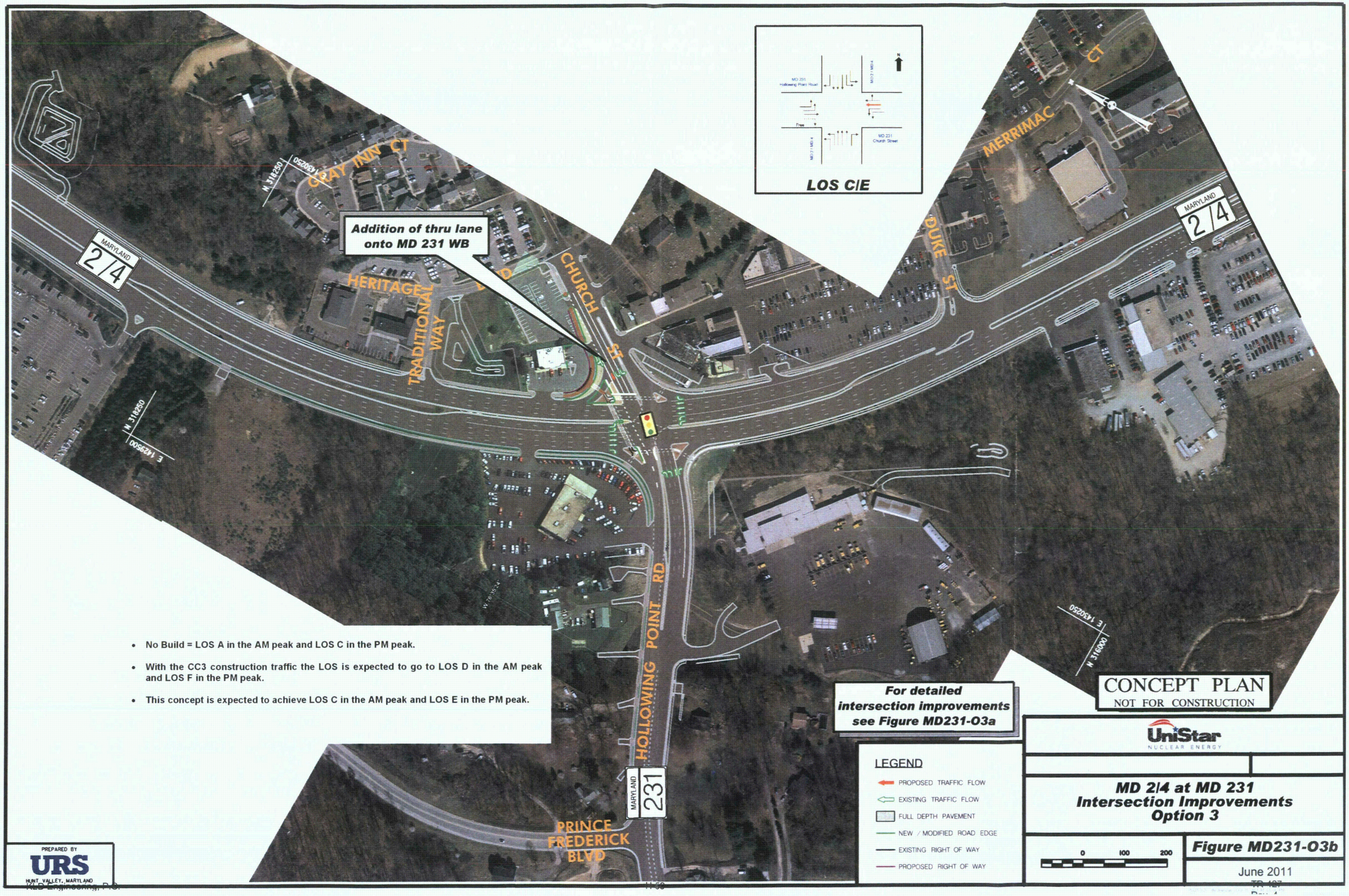
MD 2/4 at MD 231
Intersection Improvements
Option 2

Figure MD231-02b

June 2011


MARYLAND 2/4
N 317350
E 1429900
Modify Island
ADD THRU LANE
Relocate Wall
N 317350
E 1430400
STORAGE LENGTH = 1160'
Modify Median
Reconstruct Island and place full depth pavement
N 317100
E 1430400
MARYLAND 2/4
MARYLAND 231
STORAGE LENGTH = 400'
© 20
CONCEPT PLAN
NOT FOR CONSTRUCTION
LEGEND
PROPOSED TRAFFIC FLOW
EXISTING TRAFFIC FLOW
FULL DEPTH PAVEMENT
NEW / MODIFIED ROAD EDGE
EXISTING RIGHT OF WAY
PROPOSED RIGHT OF WAY
PREPARED BY
URS
HUNT VALLEY, MARYLAND
UniStar
NUCLEAR ENERGY
MD 2/4 at MD 231
Intersection Improvements
Option 3
0 20 40
SCALE: 1" = 40'
Figure MD231-03a
June 2011



- No Build = LOS A in the AM peak and LOS C in the PM peak.
- With the CC3 construction traffic the LOS is expected to go to LOS D in the AM peak and LOS F in the PM peak.
- This concept is expected to achieve LOS C in the AM peak and LOS E in the PM peak.

For detailed intersection improvements see Figure MD231-03a

LEGEND

- PROPOSED TRAFFIC FLOW
- EXISTING TRAFFIC FLOW
- FULL DEPTH PAVEMENT
- NEW / MODIFIED ROAD EDGE
- EXISTING RIGHT OF WAY
- PROPOSED RIGHT OF WAY

CONCEPT PLAN
NOT FOR CONSTRUCTION

UniStar NUCLEAR ENERGY

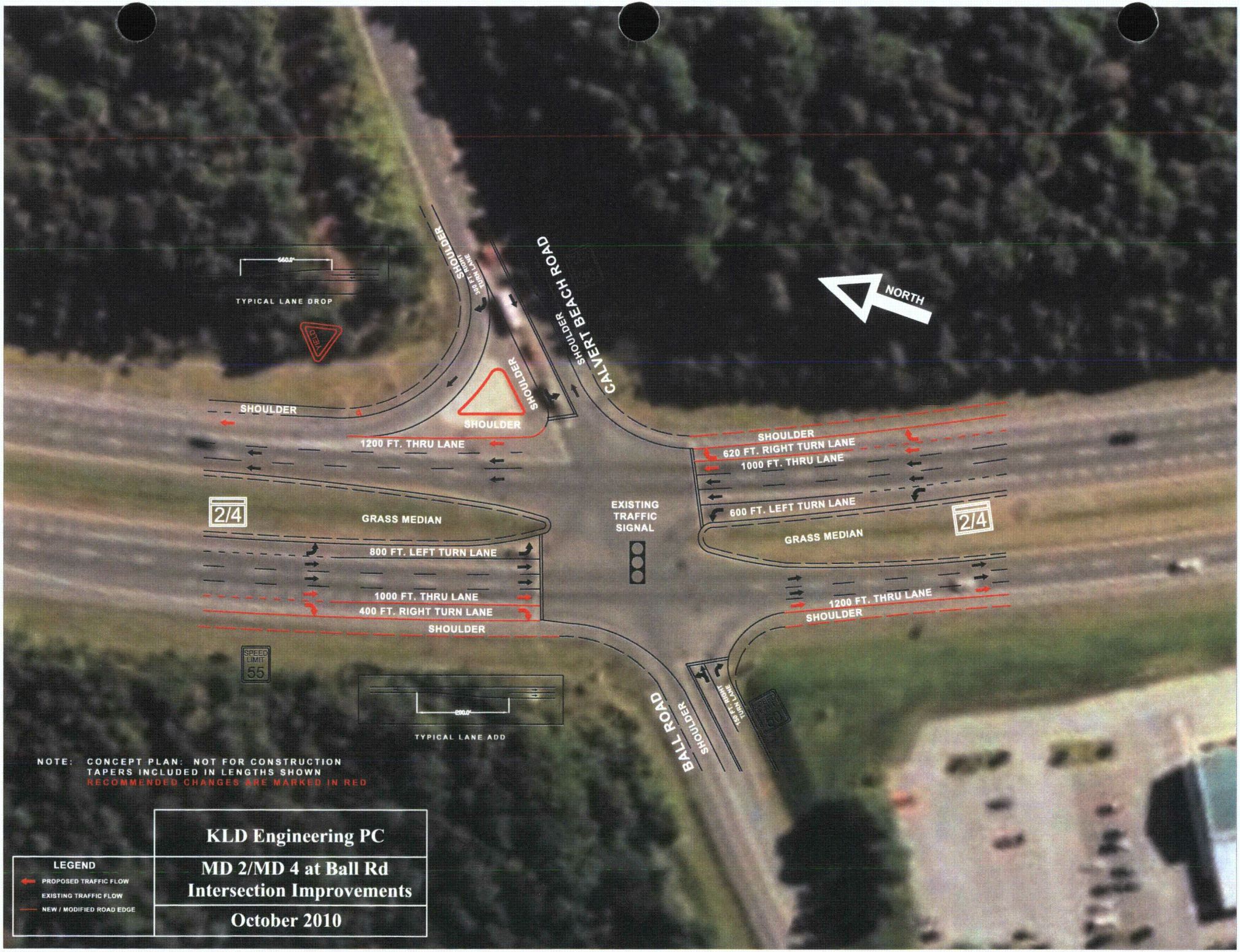
MD 2/4 at MD 231 Intersection Improvements Option 3

0 100 200

Figure MD231-03b

June 2011

PREPARED BY URS HUNT VALLEY, MARYLAND



TR-427

H-60

KLD Engineering, P.C.


CALVERT CLIFFS PKWY
NEW ACCESS ROAD
MARYLAND
2/4
NURSERY ROAD
BAY MILL ROAD
CONCEPT PLAN
NOT FOR CONSTRUCTION
UniStar
LEGEND
Calvert Cliffs Parkway
New Access Road
Banner NAR
December 2010

URS

In reply, please refer to: 20834532

May 17, 2011

MEMORANDUM

To: File

From: Timothy Ryan TR
Rebecca Myrick RLM
URS Corporation

Reference: Calvert Cliffs Nuclear Power Plant #3 TIS
Response to Comments from SHA with respect to Intersection Improvements for the MD 2 / MD 4 Intersection

---

Following submittal of the Traffic Impact Study for the Calvert Cliffs Nuclear Power Plant #3, we received comments from Maryland State Highway Administration (SHA) with respect to the improvements recommended for the MD 2 / MD 4 intersection at the north end of the study area, which required further analysis.

Relocate the Southbound MD 4 Left Turn Movement

The first comment asked about the feasibility of relocating the left turn movement on southbound MD 4 to the intersection of MD 4 and MD 262/MD 262A (Lower Marlboro Road), just north of the MD 2 / MD 4 intersection. The relocation of this movement would allow the left turn movement from southbound MD 4 and the left turn movement from southbound MD 2 to operate concurrently, since the two movements would now be occurring at different intersections, which may improve the overall level of service (LOS) of the MD 2 / MD 4 intersection.

To answer this question, critical lane analyses were performed to determine if there is any benefit to the MD 2 / MD 4 intersection if the left turn movement from southbound MD 4 is relocated.

Using the 2016 peak construction traffic volumes, and Concept 1, which adds only a 3rd southbound through lane to MD 4 and a 2nd southbound left turn lane to MD 2, the intersection is expected to operate at LOS E in the AM peak hour with a volume to capacity (v/c) ratio of 0.97, and LOS E in the PM peak hour with a v/c ratio of 0.99 with the southbound MD 4 left turn lane still in place. With the removal of the southbound left turn volume from MD 4, the LOS is expected to remain at LOS E for both the AM and PM peak hours. The AM peak hour v/c ratio is expected to improve from 0.97 to 0.92, but the PM peak hour v/c ratio is expected to remain at 0.99. (The PM peak hour critical lane volume (CLV) is expected to improve by only two vehicles with the relocation of the southbound MD 4 left turn movement.)

Using the 2016 peak construction traffic volumes, and Concept 2, which adds a 3rd southbound through lane to MD 4, a 2nd and 3rd southbound left turn lane to MD 2, and a 3rd northbound through lane to MD 2/MD 4, the intersection is expected to operate at LOS C in the AM peak hour with a volume to capacity (v/c) ratio of 0.72, and LOS D in the PM peak hour with a v/c ratio of 0.90 with the southbound MD 4 left turn lane still in place. With the removal of the southbound left turn volume from MD 4, the LOS is expected to improve to LOS B in the AM peak hour and remain at LOS D in the PM peak hour. The AM peak hour v/c ratio is expected to improve from 0.72 to 0.67, but the PM peak hour v/c ratio is expected to remain at 0.90. (The PM peak hour CLV is not expected to change at all with the relocation of the southbound MD 4 left turn movement.)

These analyses, which are attached, show that relocating the southbound MD 4 left turn movement could improve operations in the AM peak hour, but that the relocation would be expected to have little to no effect on operations during the PM peak hour, which is the peak hour with the worst LOS for this intersection.

Additionally, the left turns that will be relocated from southbound MD 4 at MD 2 would appear both as southbound left turns on MD 4 at Lower Marlboro Road and eastbound left turns on Lower Marlboro Road at MD 2. Relocation of the southbound MD 4 left turn movement to the MD 4 / Lower Marlboro Road intersection would require signalization of the northbound MD 4 through movement at Lower Marlboro Road. This movement is free-flow under existing conditions, and, throughout this study, SHA has emphasized that new traffic signals are not desired. Also, the relocated traffic may have difficulty turning left from Lower Marlboro Road onto MD 2 at a currently unsignalized intersection.

Therefore, based on the results of the critical lane analyses and the guidance from SHA that new traffic signals are not desired, this concept was not considered further.

Coordinate Intersections to allow the Southbound MD 4 Through Movement to Remain Free-flow

Under existing conditions, the MD 2 / MD 4 intersection is a "Maryland T" intersection, and the southbound MD 4 through movement is free-flow. Both of the recommended improvement concepts for the MD 2 / MD 4 intersection would require the southbound MD 4 through movement to be signalized. In response, the second comment from SHA asked about the possibility of coordinating the traffic signals at the MD 2 / MD 4 and MD 4 / Lower Marlboro Road intersections such that the southbound MD 4 through movement would be detained at Lower Marlboro Road while the southbound MD 2 approach had a green signal at MD 4. This concept would allow the southbound MD 4 through movement and the southbound MD 2 left turn movement to operate separately and use the same receiving lanes without requiring the installation of a traffic signal for the southbound MD 4 through movement at MD 2.

A Synchro analysis was performed to assess this concept, coordinating the signals at the two intersections (MD 2 at MD 4 and MD 4 at Lower Marlboro Road) so they operate as one traffic signal. To allow the intersections to function as described above, the traffic signal at the intersection of MD 4 and Marlboro Road would have to stop the southbound MD 4 through movement approximately 20 seconds before the southbound MD 2 left turn movement would get a green signal to ensure that there wouldn't be a conflict between southbound MD 4 through vehicles and southbound MD 2 left turn vehicles, both of which would be flowing into the same receiving lanes.

The results of the Synchro/SimTraffic analysis show that, under Concept 1 (described above), the queues for the southbound MD 4 approach to Lower Marlboro Road would be expected to be approximately 325 feet long with approximately 10 seconds of delay per vehicle, and the queues for the southbound MD 4 approach to MD 2 would be expected to be approximately 390 feet long with approximately 30 seconds of delay per vehicle in the PM peak hour.

Adjusting the signal timings and phasings for Concept 1 to coordinate the two traffic signals and allow the southbound MD 4 through movement to be free-flow at MD 2, the results of the Synchro/SimTraffic analysis show that the queues for the southbound MD 4 approach to Lower Marlboro Road would be expected to be approximately 1,850 feet long with approximately 230 seconds of delay per vehicle in the PM peak hour.

Additionally, comparing the overall network performance for each model (which includes the intersections of MD 2 and MD 4, MD 4 and Lower Marlboro Road, and MD 2 and Lower Marlboro Road) Concept 1, as included in the TIS, estimates approximately 55 seconds of delay per vehicle during the PM peak hour. The model of Concept 1 that includes coordination of the traffic signals along MD 4 to allow the southbound MD 4 through movement to be unsignalized at MD 2 estimates approximately 170 seconds of delay per vehicle during the PM peak hour.

The analyses described above show that the MD 4 corridor would be expected to operate more efficiently if the southbound MD 4 through movement was signalized at MD 2 than if the signal at the intersection of MD 4 and Lower Marlboro Road was to control the southbound MD 4 through traffic's approach to the MD 2 / MD 4 intersection.

Further, even with careful traffic signal timing and coordination, it could not be guaranteed that all of the traffic flowing southbound on MD 4 would clear the MD 2 / MD 4 intersection before the southbound MD 2 left turn traffic received a green signal. As a result, there would be safety concerns with the southbound MD 4 through traffic and the southbound MD 2 left turn traffic sharing receiving lanes without both approaches being signalized at the MD 2 / MD 4 intersection.

For these reasons, this concept was not considered further.

Turning Movement Summary and Level of Service

Count Date:
Condition: Construction Traffic
Design Year: 2016
Computed by: RLM Date: 10/15/2010

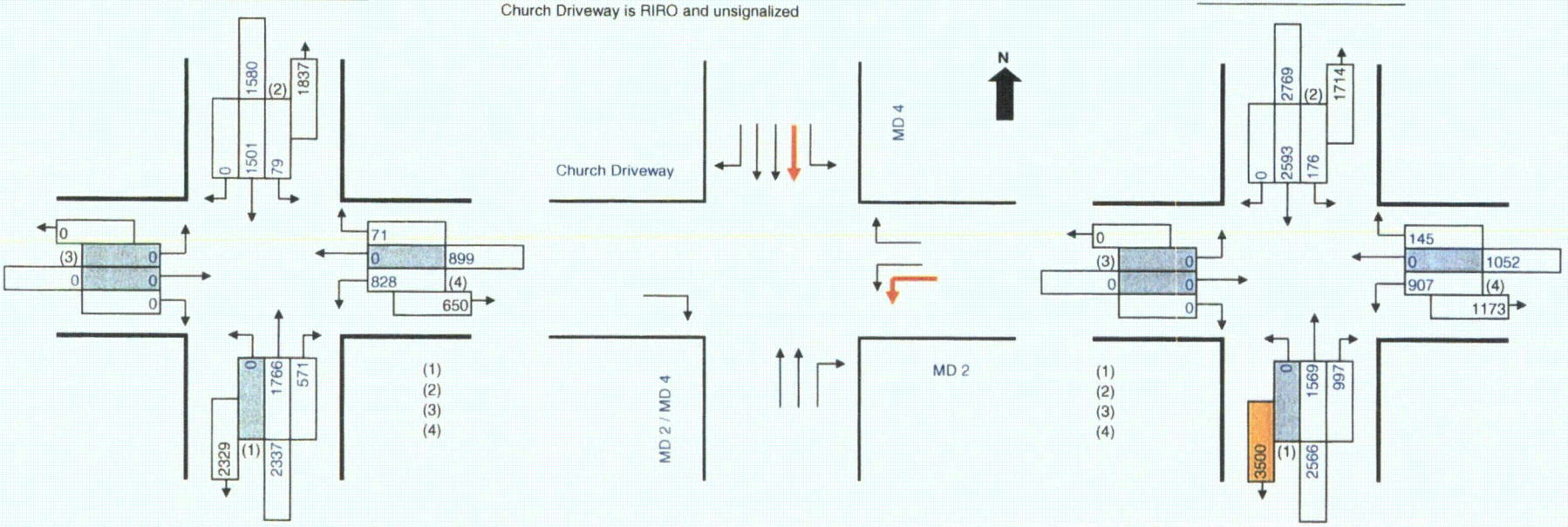
Location: MD 2 at MD 4
Checked by: TAR Date: 10/15/2010

URS

AM PEAK HOUR:

Remove Florida T
Church Driveway is RIRO and unsignalized

PM PEAK HOUR:



Phasing (Φ)

1	2	3	4
5	6	7	8

Intersection Control Type:
Signal X Stop ____ Ways ____

No. of Lanes		Lane Use Factor
1	=	1.00
2	=	0.55
3	=	0.40
4	=	0.30
Dble. Left	=	0.60
Trpl. Left	=	0.45

Level of Service		Critical Lane Vol. Total
A	≤	1000
B	≤	1150
C	≤	1300
D	≤	1450
E	≤	1600
F	>	1600

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
>	1000	5.0

Φ	Movement	Volume (1)	Lane Use Factor (2)	Lane Volume (1)*(2)=(3)	Opposing Lefts (4)	Lefts Lane Use Factor (5)	Left Volume (4)*(5)=(6)	Critical Lane Volume (3)+(6)	*
	NBT	1766	0.55	971	79	1.00	79	1050	*
	WBL	828	0.60	497	0	1.00	0	497	*
	SBT	1501	0.40	600	0	1.00	0	600	

Remarks:

* Critical Volume.

AM TOTAL 1547
v/c = 0.97 LOS E

Φ	Movement	Volume (1)	Lane Use Factor (2)	Lane Volume (1)*(2)=(3)	Opposing Lefts (4)	Lefts Lane Use Factor (5)	Left Volume (4)*(5)=(6)	Critical Lane Volume (3)+(6)	*
	NBT	1569	0.55	863	176	1.00	176	1039	*
	WBL	907	0.60	544	0	1.00	0	544	*
	SBT	2593	0.40	1037	0	1.00	0	1037	

Remarks:
NBR = 997 - 907*0.6 = 453

* Critical Volume.

PM TOTAL 1583
v/c = 0.99 LOS E

Turning Movement Summary and Level of Service

Count Date:
Condition: Construction Traffic
Design Year: 2016
Computed by: RLM Date: 5/16/2011

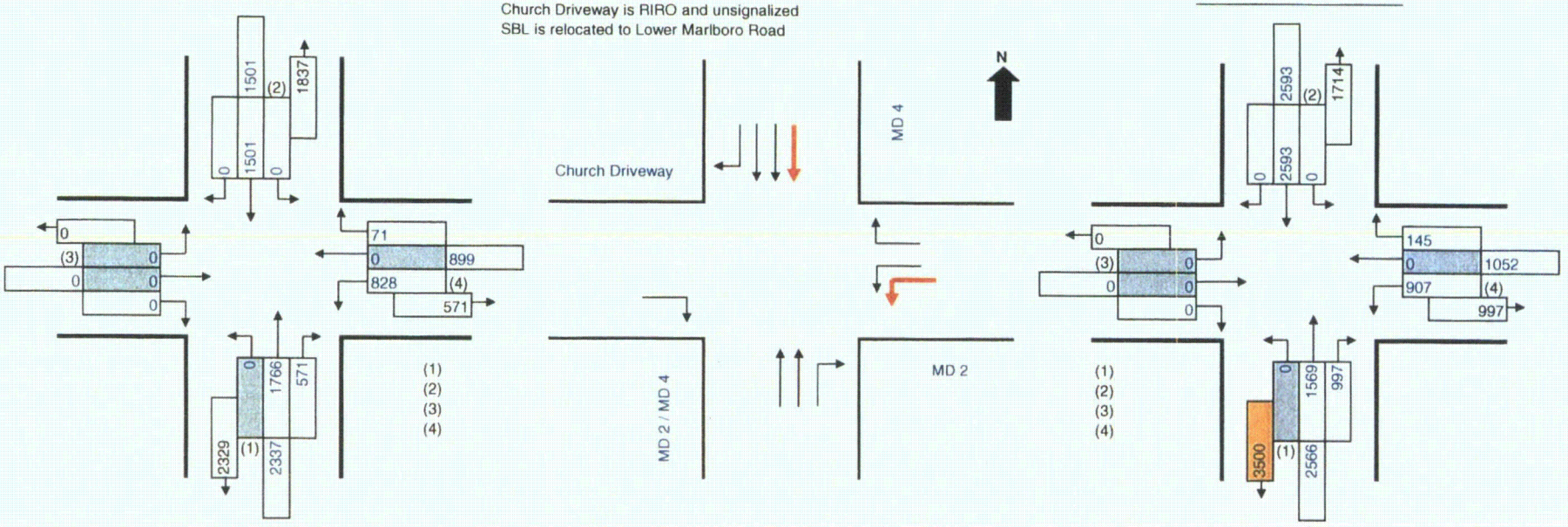
Location: MD 2 at MD 4
Checked by: Date:

URS

AM PEAK HOUR:

PM PEAK HOUR:

Remove Florida T
Church Driveway is RIRO and unsignalized
SBL is relocated to Lower Marlboro Road



Phasing (Φ)

1	2	3	4
5	6	7	8

Intersection Control Type:
Signal X Stop ____ Ways ____

No. of Lanes		Lane Use Factor
1	=	1.00
2	=	0.55
3	=	0.40
4	=	0.30
Dble. Left	=	0.60
Trpl. Left	=	0.45

Level of Service		Critical Lane Vol. Total
A	≤	1000
B	≤	1150
C	≤	1300
D	≤	1450
E	≤	1600
F	>	1600

Opposing Volume (vph)		PCE
	≤ 199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
>	1000	5.0

Φ	Movement	Volume (1)	Lane Use Factor (2)	Lane Volume (1)*(2)=(3)	Opposing Lefts (4)	Lefts Lane Use Factor (5)	Left Volume (4)*(5)=(6)	Critical Lane Volume (3)+(6)	*
	NBT	1766	0.55	971	0	1.00	0	971	*
	WBL	828	0.60	497	0	1.00	0	497	*
	SBT	1501	0.40	600	0	1.00	0	600	

Remarks:
* Critical Volume.

AM TOTAL 1468
v/c = 0.92 LOS E

Φ	Movement	Volume (1)	Lane Use Factor (2)	Lane Volume (1)*(2)=(3)	Opposing Lefts (4)	Lefts Lane Use Factor (5)	Left Volume (4)*(5)=(6)	Critical Lane Volume (3)+(6)	*
	NBT	1569	0.55	863	0	1.00	0	863	
	WBL	907	0.60	544	0	1.00	0	544	*
	SBT	2593	0.40	1037	0	1.00	0	1037	*

Remarks:
NBR = 997 - 907*0.6 = 453
* Critical Volume.

PM TOTAL 1581
v/c = 0.99 LOS E

Turning Movement Summary and Level of Service

Count Date:
Condition: Construction Traffic
Design Year: 2016
Computed by: RLM Date: 10/15/2010

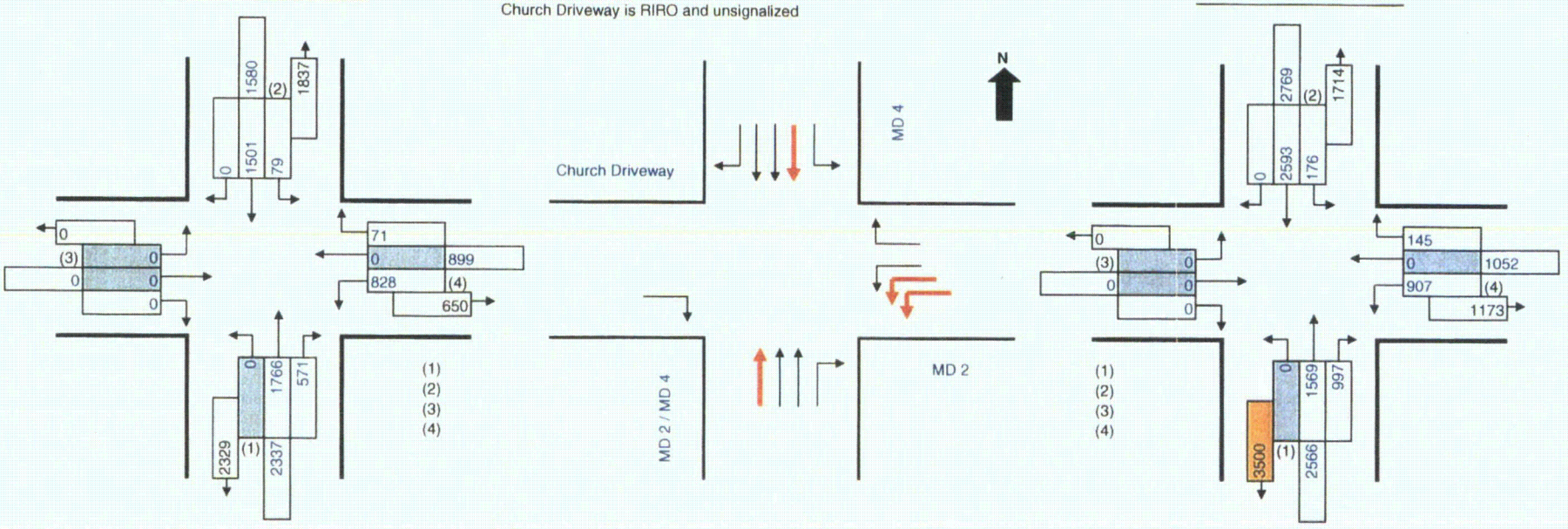
Location: MD 2 at MD 4
Checked by: TAR Date: 10/15/2010

URS

AM PEAK HOUR:

Remove Florida T
Church Driveway is RIRO and unsignalized

PM PEAK HOUR:



Phasing (Φ)

1	2	3	4
5	6	7	8

Intersection Control Type:
Signal X Stop _____ Ways _____

No. of Lanes		Lane Use Factor
1	=	1.00
2	=	0.55
3	=	0.40
4	=	0.30
Dble. Left	=	0.60
Trpl. Left	=	0.45

Level of Service		Critical Lane Vol. Total
A	≤	1000
B	≤	1150
C	≤	1300
D	≤	1450
E	≤	1600
F	>	1600

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
>	1000	5.0

Φ	Movement	Volume (1)	Lane Use Factor (2)	Lane Volume (1)*(2)=(3)	Opposing Lefts (4)	Lefts Lane Use Factor (5)	Left Volume (4)*(5)=(6)	Critical Lane Volume (3)+(6)	*
	NBT	1766	0.40	706	79	1.00	79	785	*
	WBL	828	0.45	373	0	1.00	0	373	*
	SBT	1501	0.40	600	0	1.00	0	600	

Remarks:

* Critical Volume.

AM TOTAL 1158
v/c = 0.72 LOS C

Φ	Movement	Volume (1)	Lane Use Factor (2)	Lane Volume (1)*(2)=(3)	Opposing Lefts (4)	Lefts Lane Use Factor (5)	Left Volume (4)*(5)=(6)	Critical Lane Volume (3)+(6)	*
	NBT	1569	0.40	628	176	1.00	176	804	
	WBL	907	0.45	408	0	1.00	0	408	*
	SBT	2593	0.40	1037	0	1.00	0	1037	*

Remarks:
NBR = 997 - 907*0.45 = 589

* Critical Volume.

PM TOTAL 1445
v/c = 0.90 LOS D

Turning Movement Summary and Level of Service

Count Date:
Condition: Construction Traffic
Design Year: 2016
Computed by: RLM Date: 5/16/2011

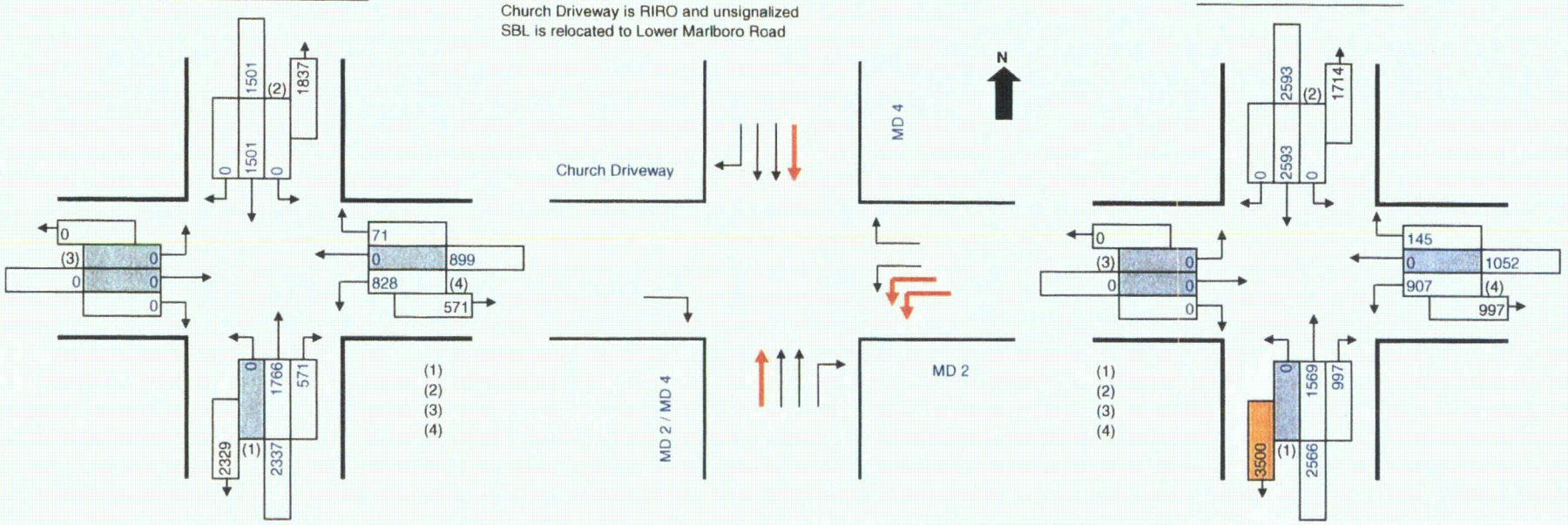
Location: MD 2 at MD 4
Checked by: TAR Date: 5/17/2011

URS

AM PEAK HOUR:

PM PEAK HOUR:

Remove Florida T
Church Driveway is RIRO and unsignalized
SBL is relocated to Lower Marlboro Road



Phasing (Φ)

1	2	3	4
5	6	7	8

Intersection Control Type:
Signal X Stop ____ Ways ____

No. of Lanes		Lane Use Factor
1	=	1.00
2	=	0.55
3	=	0.40
4	=	0.30
Dble. Left	=	0.60
Trpl. Left	=	0.45

Level of Service		Critical Lane Vol. Total
A	≤	1000
B	≤	1150
C	≤	1300
D	≤	1450
E	≤	1600
F	>	1600

Opposing Volume (vph)		PCE
≤	199	1.1
≤	599	2.0
≤	799	3.0
≤	999	4.0
>	1000	5.0

Φ	Movement	Volume (1)	Lane Use Factor (2)	Lane Volume (1)*(2)=(3)	Opposing Lefts (4)	Lefts Lane Use Factor (5)	Left Volume (4)*(5)=(6)	Critical Lane Volume (3)+(6)	*
	NBT	1766	0.40	706	0	1.00	0	706	*
	WBL	828	0.45	373	0	1.00	0	373	*
	SBT	1501	0.40	600	0	1.00	0	600	

Remarks:
* Critical Volume.

AM TOTAL 1079
v/c = 0.67 LOS B

Φ	Movement	Volume (1)	Lane Use Factor (2)	Lane Volume (1)*(2)=(3)	Opposing Lefts (4)	Lefts Lane Use Factor (5)	Left Volume (4)*(5)=(6)	Critical Lane Volume (3)+(6)	*
	NBT	1569	0.40	628	0	1.00	0	628	
	WBL	907	0.45	408	0	1.00	0	408	*
	SBT	2593	0.40	1037	0	1.00	0	1037	*

Remarks:
NBR = 997 - 907*0.45 = 589
* Critical Volume.

PM TOTAL 1445
v/c = 0.90 LOS D

Appendix I

Response to SHA Comments on Traffic Impact Study Dated

February 2, 2011

RESPONSE TO MARCH 17, 2011 SHA COMMENTS ON TRAFFIC IMPACT STUDY DATED FEBRUARY 2, 2011

June 16, 2011

Based upon the SHA review comments provided on March 17, 2011 of the Traffic Study related to the proposed expansion at the Calvert Cliffs site in Lusby, MD prepared by KLD in cooperation with URS for UniStar, and follow up discussions with SHA, the comments are addressed below one by one, following each section of the review comments.

1) Figure 9 Illustrates a left turn lane from Calvert Cliffs Parkway to southbound MD 2-4. The left turn movement is to be eliminated while temporary access is in operation. In addition, the proposed traffic control at the intersection of MD 2-4 with Calvert Cliffs Parkway must be clarified.

   Response: Figure 9 will be revised accordingly. During construction, the signal at the MD 2-4/Calvert Cliffs Parkway intersection will continue to operate, but the WB phase will be eliminated. The text and figures have been revised to explicitly indicate this.

2) Impacts to operations caused by the diverted left turn traffic from Calvert Cliffs Parkway must be considered at the adjacent crossover.

   Response: The diverted left turn traffic from CC1&2 will be directed to the temporary CC3 access intersection, internal to the site. The Synchro and critical lane analysis for Calvert Cliffs Parkway and the Synchro analysis for the temporary CC3 access intersection have been updated to reflect this change in the routing.

3) The lane configuration along MD 2-4 at the proposed temporary site access is not consistent throughout the analysis

   Response: The final configuration at the proposed temporary site access is 2 thru and 1 right turn lane. Figures 9 and 10 have been revised accordingly.

4) The proposed temporary site access intersection should be included in Table 11 and H-1.

   Response: This has been done. Note that these tables present CLVs. It was agreed with the SHA that the analysis of the temporary site access intersection would be based on Synchro and therefore Synchro results will be presented in the tables where applicable. This point will be clarified whenever Synchro results are shown in the summary tables.

5) The Critical Lane analyses for MD 2-4 Split intersection are not correct for the existing, background and build no mitigation options in the evening peak hour.

Response: We believe that these analyses (shown on pages C-13, G-34 and H-5) are correct. We have added a note to each of these sheets, indicating that the NB right turn movement is assumed to be accommodated by right-turn-on-red while the WB left turn phase movement receives a green signal.

6) A plan must be developed for maintaining the access to CC3 from Nursery Road during construction of the new temporary access once the new connection is open to traffic. In addition, the proposed construction schedule does not appear to include any buffer in the schedule to cover unforeseen construction difficulties or increased traffic flow. Additional time must be added to the schedule to ensure construction of the new temporary access is complete, well before the Nursery Road access reaches unacceptable operations.

Response: The access to CC3 from Nursery Road will be closed after the temporary site access intersection is complete. The text in Chapter 6.4 has been modified to demonstrate that a 6 month buffer has been provided in the schedule before the Nursery Road access reaches unacceptable operations. Currently this cut-off date for the opening of temporary access road is estimated as March 2015. Using a 24 month period for design, permitting, and construction the latest start date is March 2013. Adding the 6 month buffer, the report presents the "Design start date" of September 2012.

7) The queue analysis for the gate was not available and must be provided for review. Previous reviews have indicated gate queues could be problematic.

Response: Appendix G presents the gate queue analysis. The Synchro files these files have been included in the companion CD. Also, the ftp site noted on page G-28 has been re-opened to allow SHA to download the SimTraffic files at this time. Please contact URS immediately if you are unable to access the files. The configuration of 4 lanes was identified as being sufficient.

8) The calculations to project traffic to the "current year" (2010) should be provided.

Response: This has been included in Appendix C.

9) Queue analyses for the offsite intersections must be provided based on the SHA's 95% Probability methodology. If deficient queue storage is identified, UniStar will be responsible for providing additional storage capacity.

Response: Queue analyses based on the SHA 95% Probability method are given, imbedded in the CLA worksheets in the appendices. They are now summarized into a tabular form based on SHA provided sample. The design configuration proposed for the turn bays at the study intersections are such that they accommodate the queue estimates based on the SHA method.

10) It is important to include a constructability review of proposed mitigation measures. It appears that some of the proposed concepts have major right-of-way and utility impacts; however, no attempt was made to mitigate impacts.

Response: The proposed concepts were developed with the following goals in mind:

- provide the required traffic movements and queue lengths outlined in the Traffic Study;
- meet SHA and AASHTO criteria;
- minimize impacts to right-of-way, utilities, and environmental and cultural features; and
- minimize construction costs.

In developing the proposed concepts we evaluated constructibility and balancing the goals outlined above. For example, the Concept Plan for the MD 2/4 Split Intersection was designed to avoid impacts to the All Saints Church property (which includes a cemetery near the right-of-way line) while minimizing impacts to forested area and right-of-way on the other side of MD 2, which may require a geo-reinforced steep slope or a retaining wall. The widening along MD 4 is based upon the assumption that the bifurcated median should remain as-is due to geometric constraints, drainage, and safety. This assumption is an example of an issue that will be addressed later in the detailed engineering phase.

We believe the Traffic Study now represents the final list of intersections agreed to by both parties requiring mitigation and includes a general description of the necessary mitigation. The MOA could capture more specific mitigation details under scope and schedule sections.

11) The existing third lane along southbound MD 2-4 at MD 231 becomes a lane drop at the next intersection 1500ft to the south (Old Field Lane/Sherry Lane). The concept plans must clearly indicate how two lanes would be dropped within 1500 ft., or if one of the lanes would be extended beyond the adjacent intersection.

Response: The proposed configuration extends the third lane beyond the adjacent intersection. The drawings related to the intersection of MD2-4 at MD 231 have been modified to include the adjacent intersection of MD 2-4/Old Field Lane/Sherry Lane and are included in the report.