

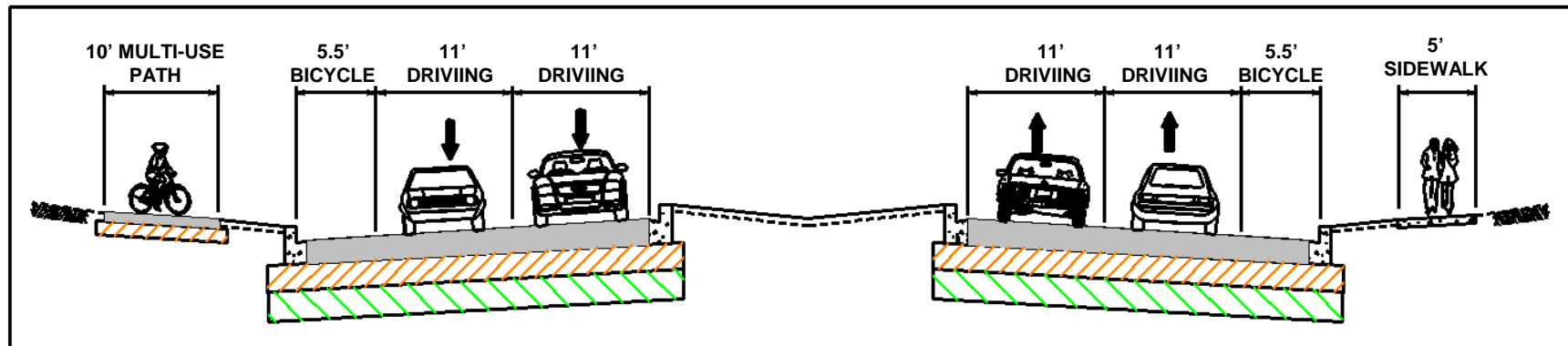
# Existing Roadway Conditions

- Poor pavement condition
- Substandard Intersections
  - Turn lanes
  - Sight distance
  - Full access
  - Safety/crashes/congestion
- Substandard bike/pedestrian/transit accommodations
  - Corridor and intersections
- Driveway access
- Environmental concerns
  - Storm water
  - Erosion



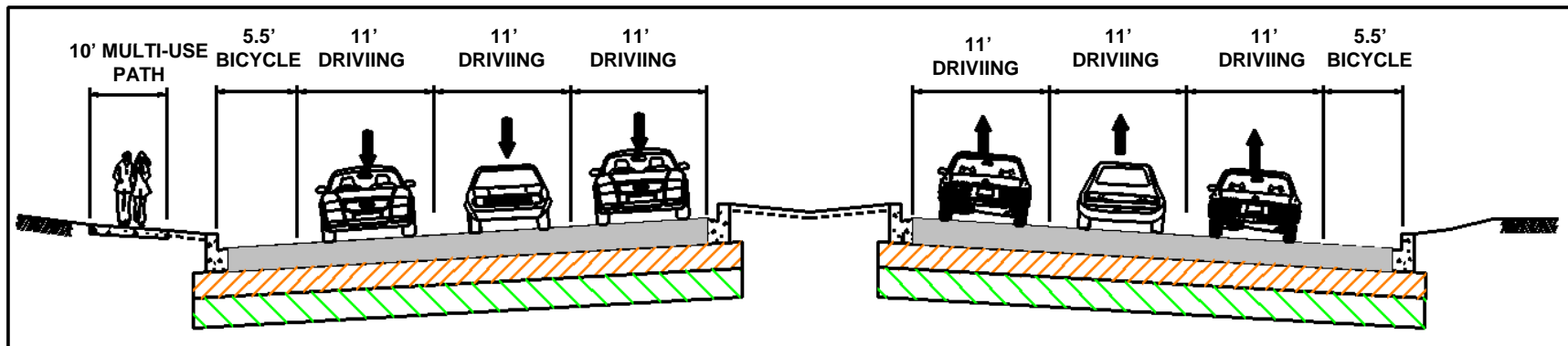
# Proposed Roadway Improvements

- Proposed typical section 4-lane divided roadway (Allen Boulevard to Whitney Way)



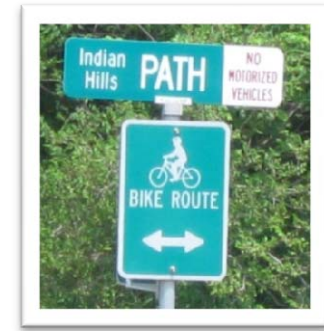
# Proposed Roadway Improvements

- Proposed typical section 6-lane roadway  
(Old Middleton Road to Segoe Road)  
(Match Adjacent Project)



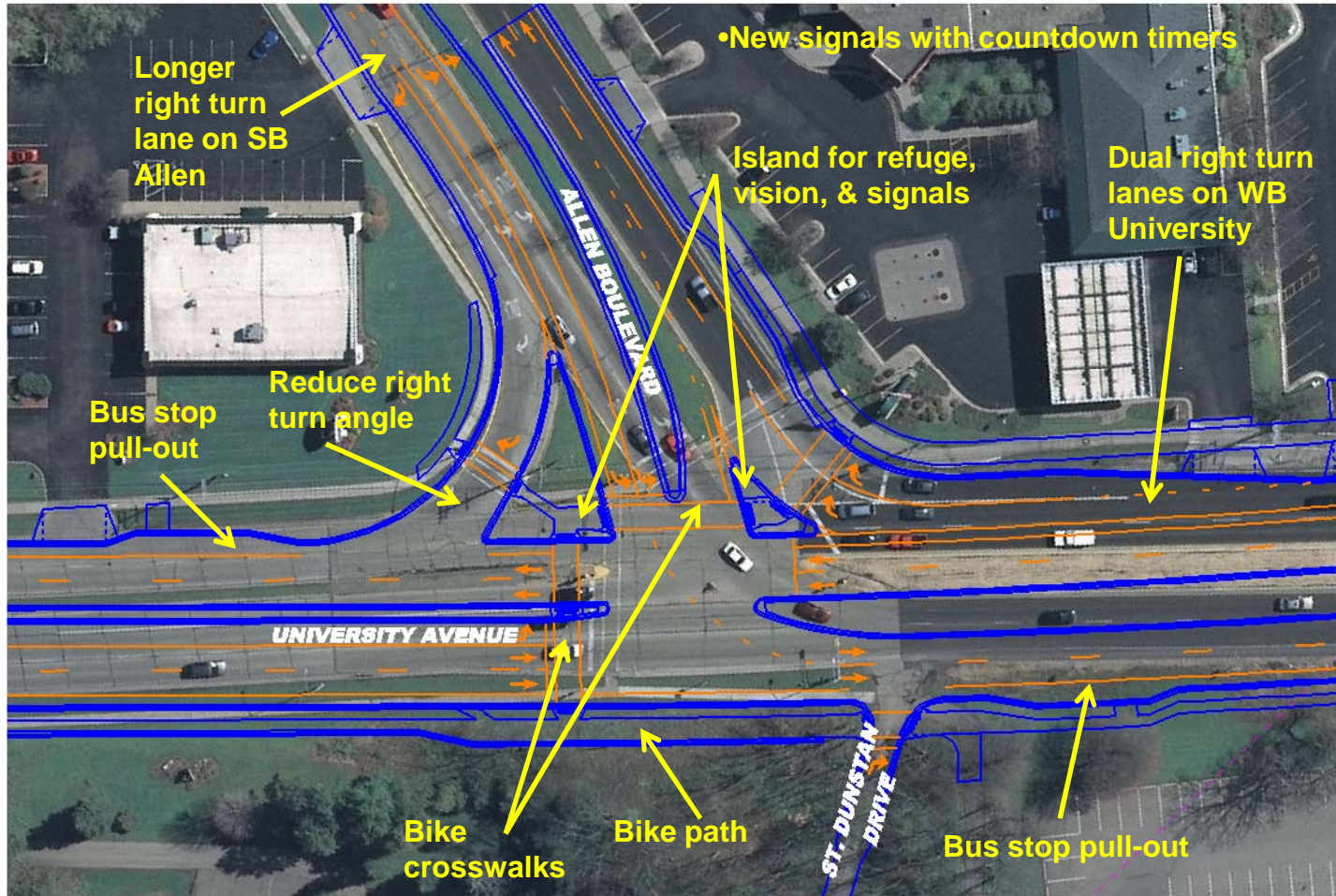
# Proposed Roadway Improvements

- Bike, Pedestrian, & Transit Accommodations
  - 4.5' on-street bike lanes on both sides of University
    - No bike lanes on approaches to Old Middleton Road/Railroad bridge
    - Accommodations provided on parallel routes (Whitney Way, Old Middleton Road, Old Middleton Road Ramps, Blackhawk Path)
  - 10' off-street multi-use path on north side of University
    - Connect to existing path at Allen Boulevard
    - Connect to Indian Hills Path at Whitney Way
  - 5' sidewalk on south side of University
    - Allen Boulevard to Whitney Way
  - Bus stops replaced and relocated
    - Bus stop pull-outs constructed where feasible
    - Concrete landing pads at all stops
  - Intersections
    - Medians provide crossing refuge
    - Countdown timers on traffic signals
    - Special colored pavement marking for multi-use path side-street crossings



# Proposed Roadway Improvements

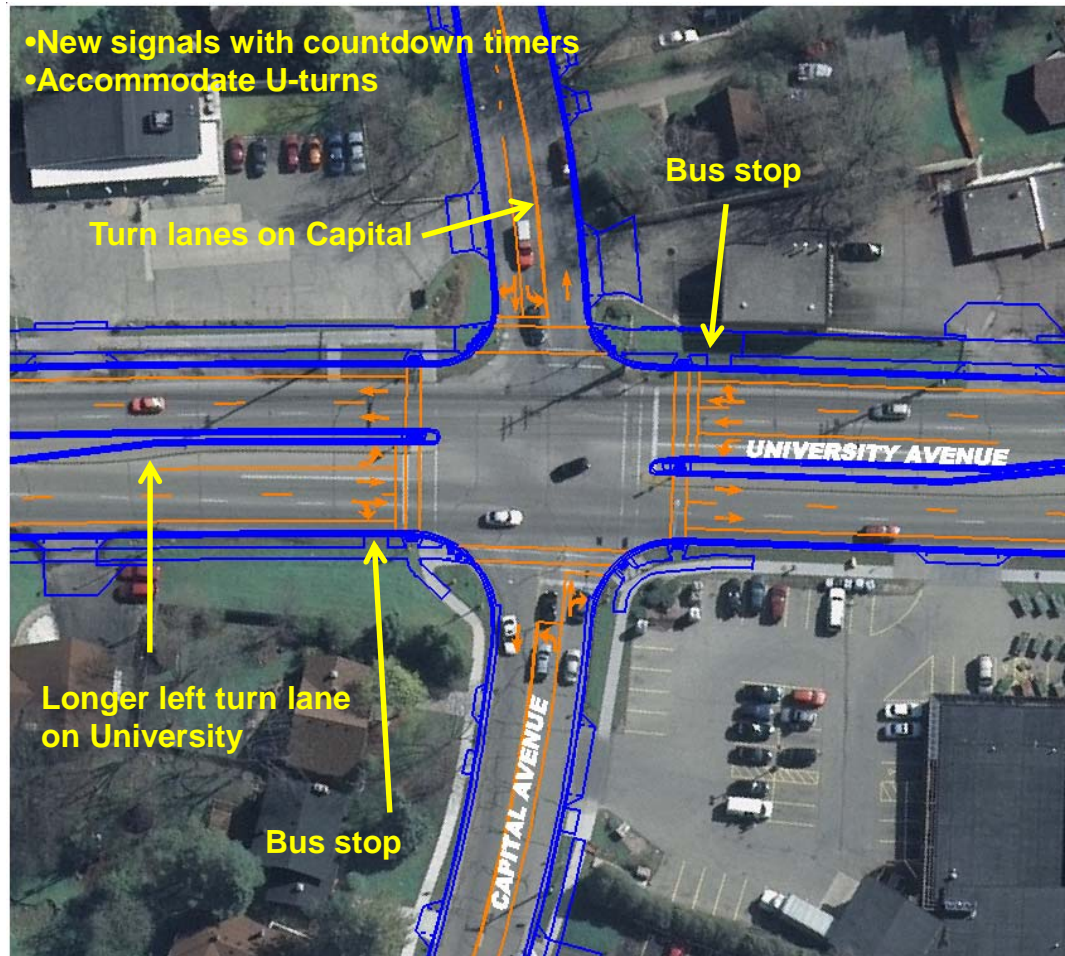
- Signalized Intersection (Allen Boulevard)





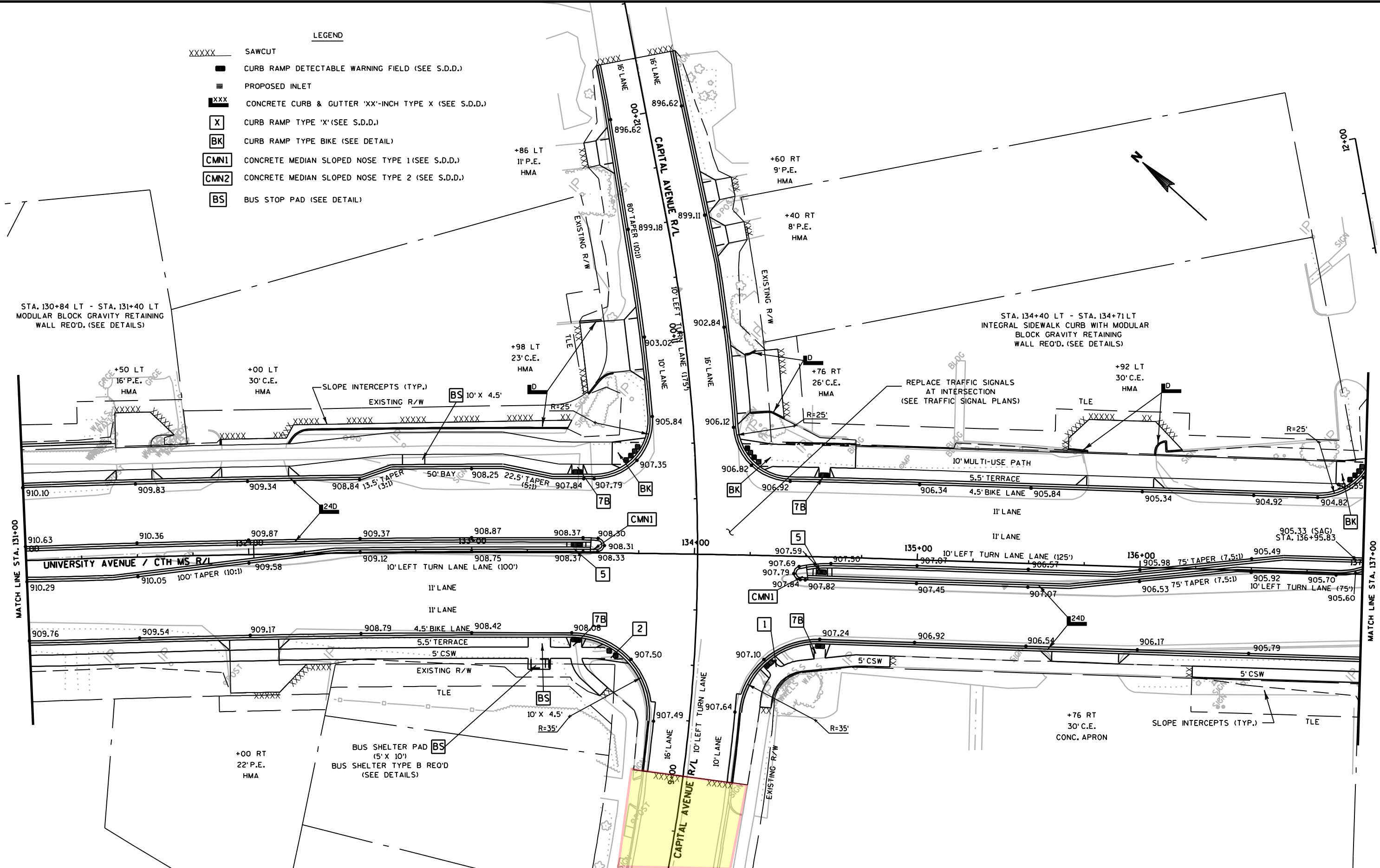
# Proposed Roadway Improvements

- Signalized Intersection (Capital Avenue)





- LEGEND**
- XXXXX SAWCUT
  - CURB RAMP DETECTABLE WARNING FIELD (SEE S.D.D.)
  - PROPOSED INLET
  - CONCRETE CURB & GUTTER 'XX'-INCH TYPE X (SEE S.D.D.)
  - X CURB RAMP TYPE 'X' (SEE S.D.D.)
  - BK CURB RAMP TYPE BIKE (SEE DETAIL)
  - CMN1 CONCRETE MEDIAN SLOPED NOSE TYPE 1 (SEE S.D.D.)
  - CMN2 CONCRETE MEDIAN SLOPED NOSE TYPE 2 (SEE S.D.D.)
  - BS BUS STOP PAD (SEE DETAIL)



STA. 130+84 LT - STA. 131+40 LT  
MODULAR BLOCK GRAVITY RETAINING  
WALL REQ'D. (SEE DETAILS)

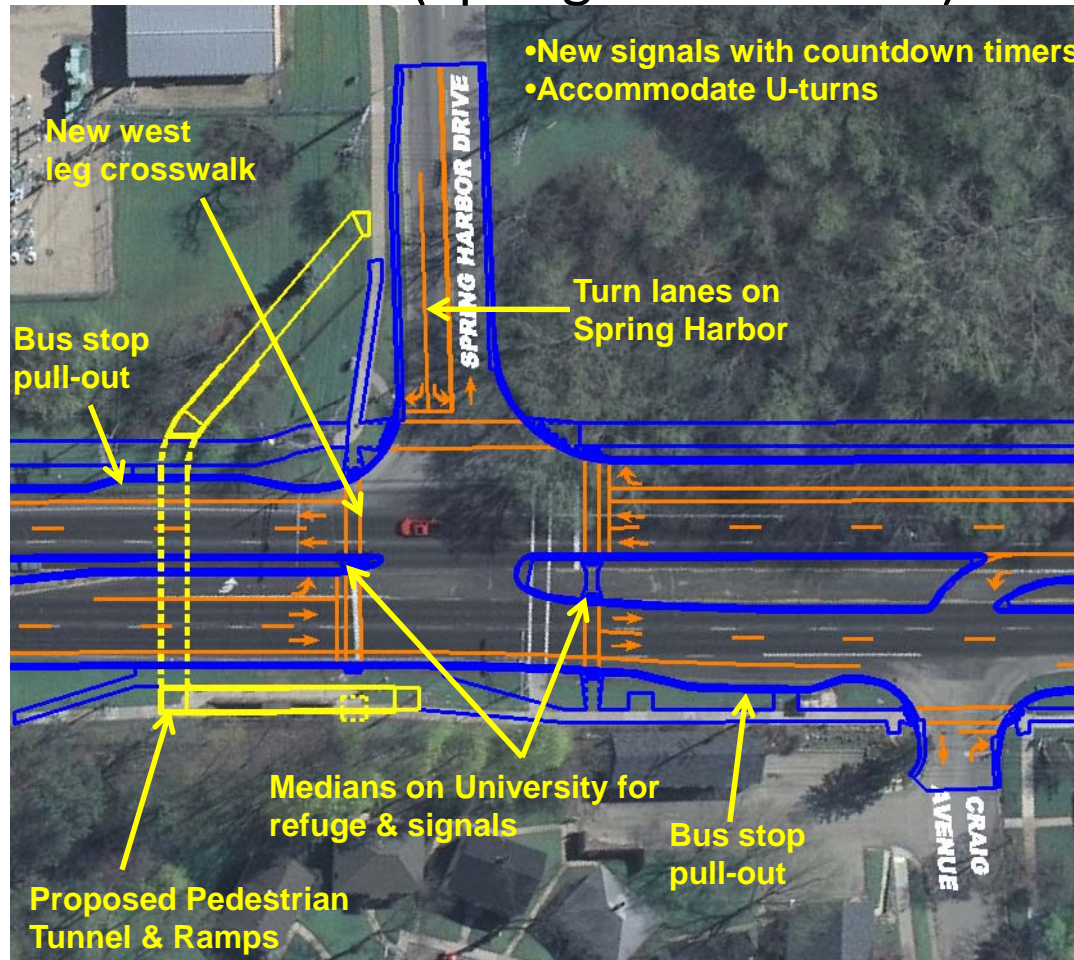
STA. 134+40 LT - STA. 134+71 LT  
INTEGRAL SIDEWALK CURB WITH MODULAR  
BLOCK GRAVITY RETAINING  
WALL REQ'D. (SEE DETAILS)

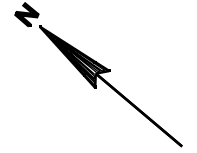
MATCH LINE STA. 131+00

MATCH LINE STA. 137+00

# Proposed Roadway Improvements

- Signalized Intersection (Spring Harbor Drive)



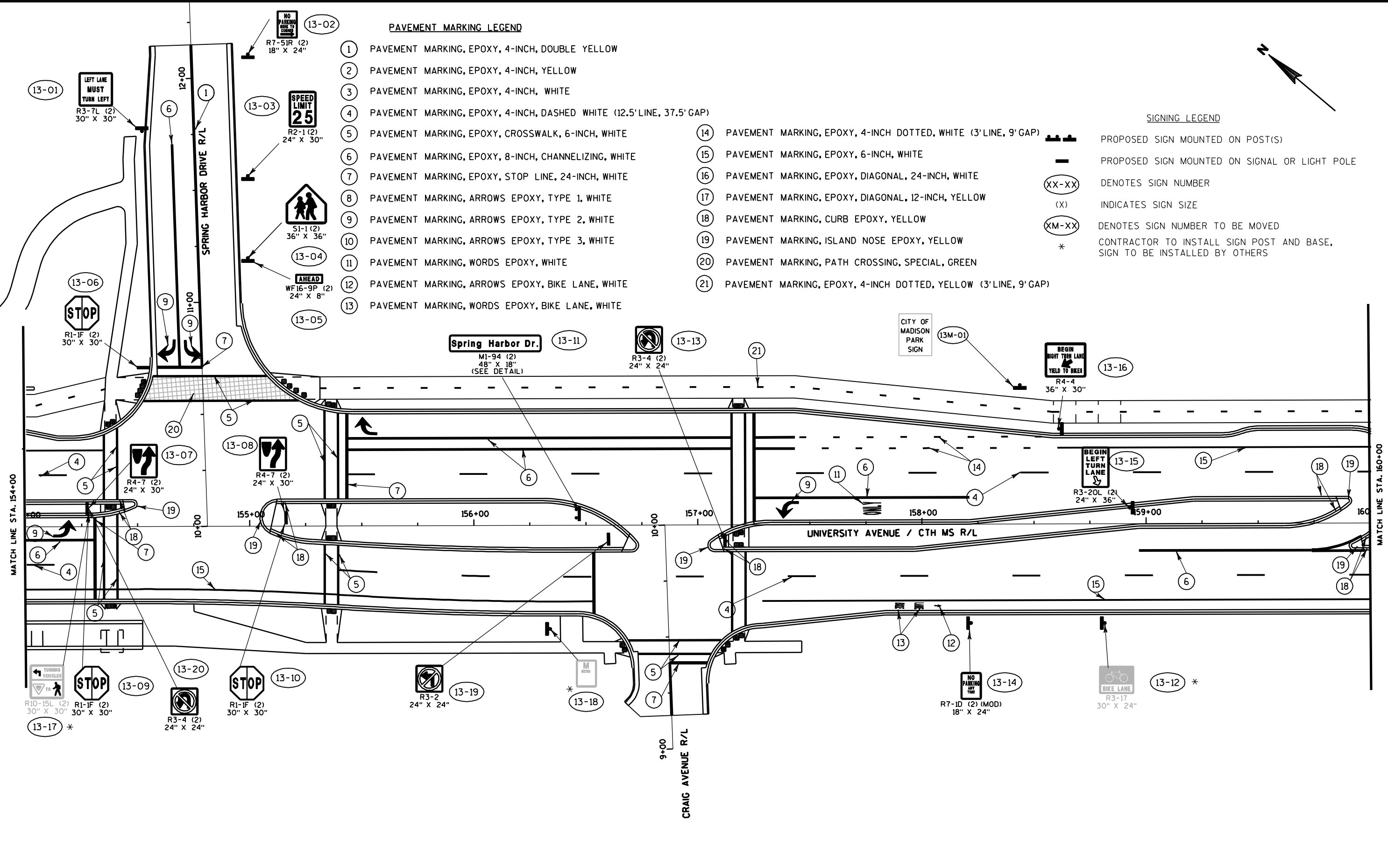


PAVEMENT MARKING LEGEND

- ① PAVEMENT MARKING, EPOXY, 4-INCH, DOUBLE YELLOW
- ② PAVEMENT MARKING, EPOXY, 4-INCH, YELLOW
- ③ PAVEMENT MARKING, EPOXY, 4-INCH, WHITE
- ④ PAVEMENT MARKING, EPOXY, 4-INCH, DASHED WHITE (12.5' LINE, 37.5' GAP)
- ⑤ PAVEMENT MARKING, EPOXY, CROSSWALK, 6-INCH, WHITE
- ⑥ PAVEMENT MARKING, EPOXY, 8-INCH, CHANNELIZING, WHITE
- ⑦ PAVEMENT MARKING, EPOXY, STOP LINE, 24-INCH, WHITE
- ⑧ PAVEMENT MARKING, ARROWS EPOXY, TYPE 1, WHITE
- ⑨ PAVEMENT MARKING, ARROWS EPOXY, TYPE 2, WHITE
- ⑩ PAVEMENT MARKING, ARROWS EPOXY, TYPE 3, WHITE
- ⑪ PAVEMENT MARKING, WORDS EPOXY, WHITE
- ⑫ PAVEMENT MARKING, ARROWS EPOXY, BIKE LANE, WHITE
- ⑬ PAVEMENT MARKING, WORDS EPOXY, BIKE LANE, WHITE
- ⑭ PAVEMENT MARKING, EPOXY, 4-INCH DOTTED, WHITE (3' LINE, 9' GAP)
- ⑮ PAVEMENT MARKING, EPOXY, 6-INCH, WHITE
- ⑯ PAVEMENT MARKING, EPOXY, DIAGONAL, 24-INCH, WHITE
- ⑰ PAVEMENT MARKING, EPOXY, DIAGONAL, 12-INCH, YELLOW
- ⑱ PAVEMENT MARKING, CURB EPOXY, YELLOW
- ⑲ PAVEMENT MARKING, ISLAND NOSE EPOXY, YELLOW
- ⑳ PAVEMENT MARKING, PATH CROSSING, SPECIAL, GREEN
- ㉑ PAVEMENT MARKING, EPOXY, 4-INCH DOTTED, YELLOW (3' LINE, 9' GAP)

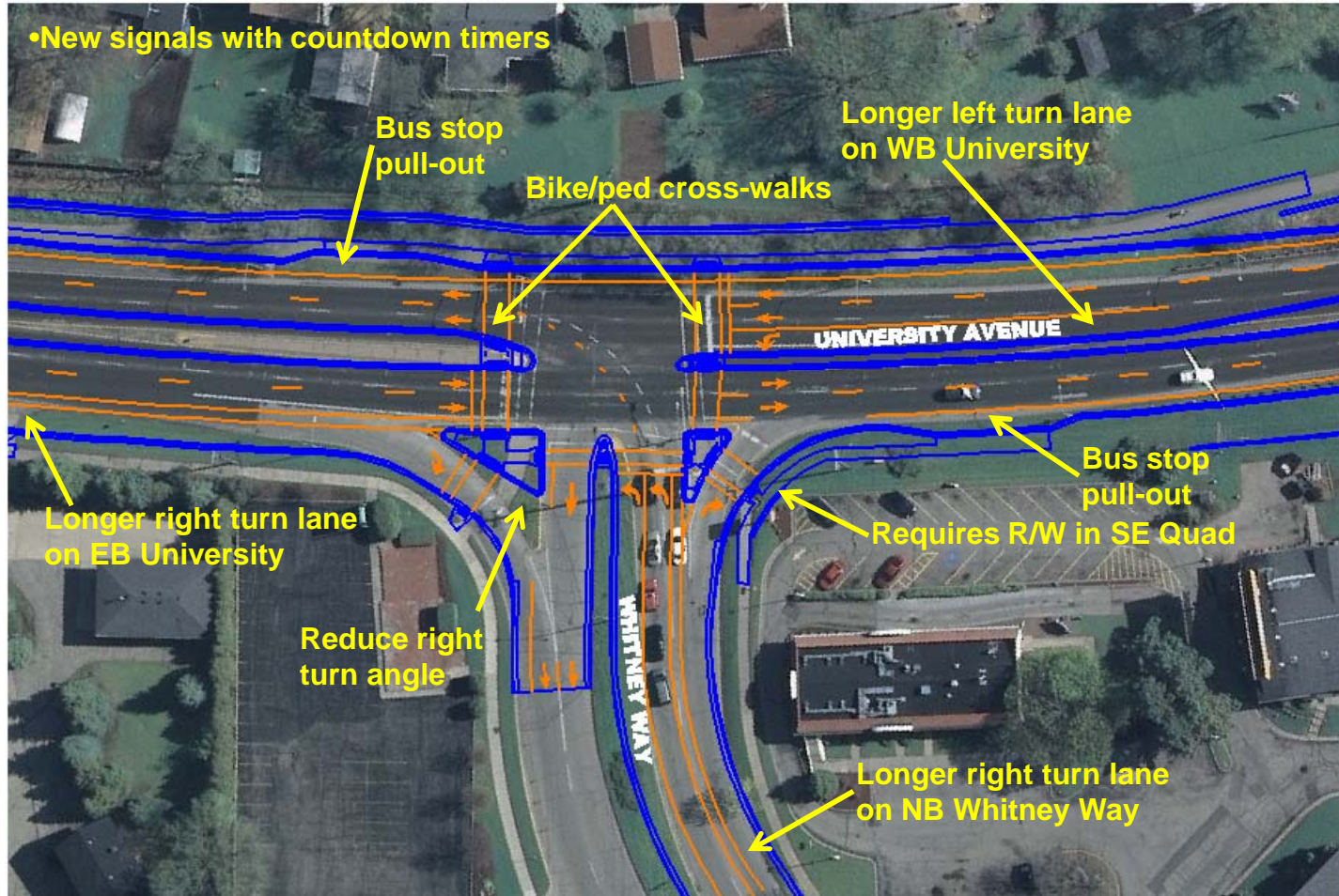
SIGNING LEGEND

- PROPOSED SIGN MOUNTED ON POST(S)
- PROPOSED SIGN MOUNTED ON SIGNAL OR LIGHT POLE
- XX-XX** DENOTES SIGN NUMBER
- (X) INDICATES SIGN SIZE
- XM-XX** DENOTES SIGN NUMBER TO BE MOVED
- \*



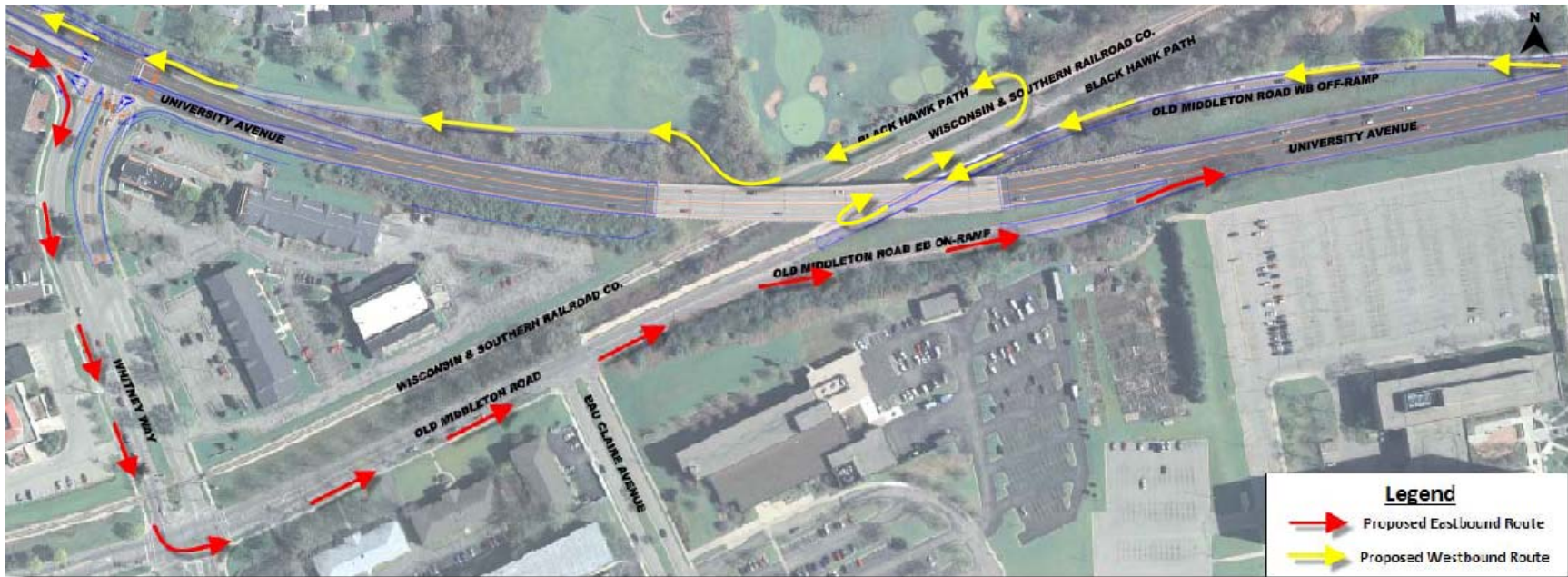
# Proposed Roadway Improvements

- Signalized Intersection (Whitney Way)



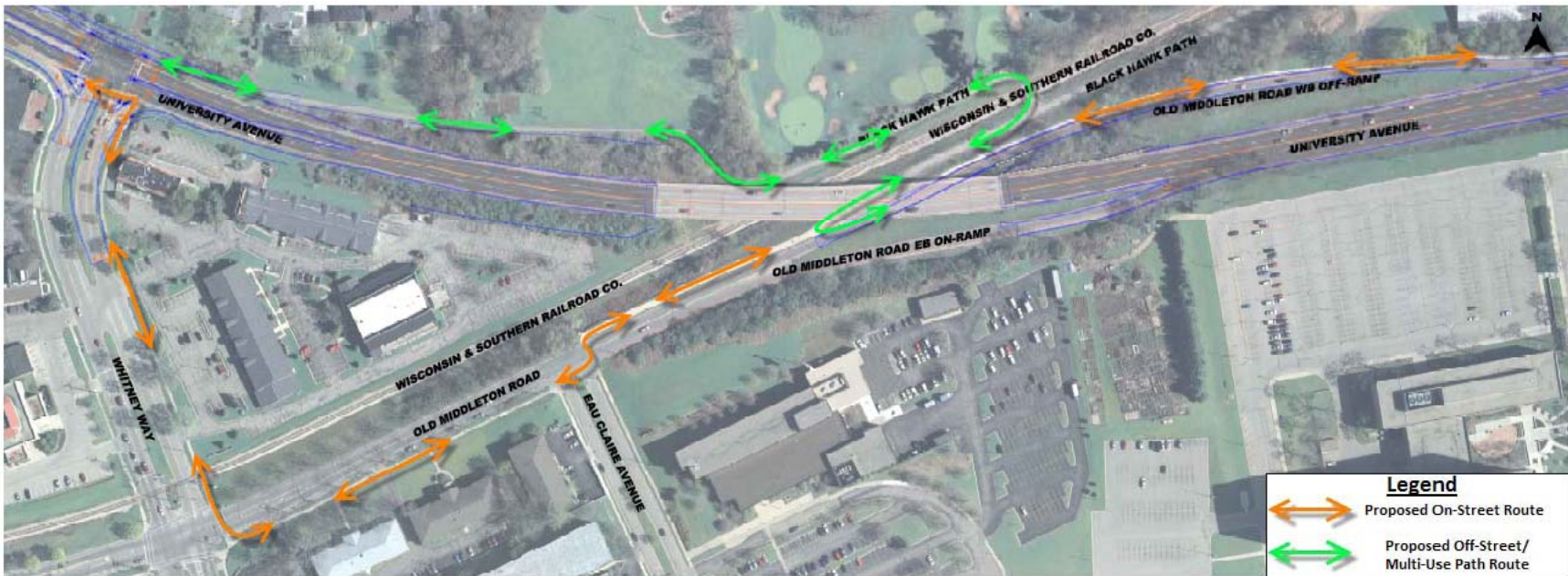
# Proposed Roadway Improvements

- Bike way connectivity (Whitney Way and Old Middleton Road)



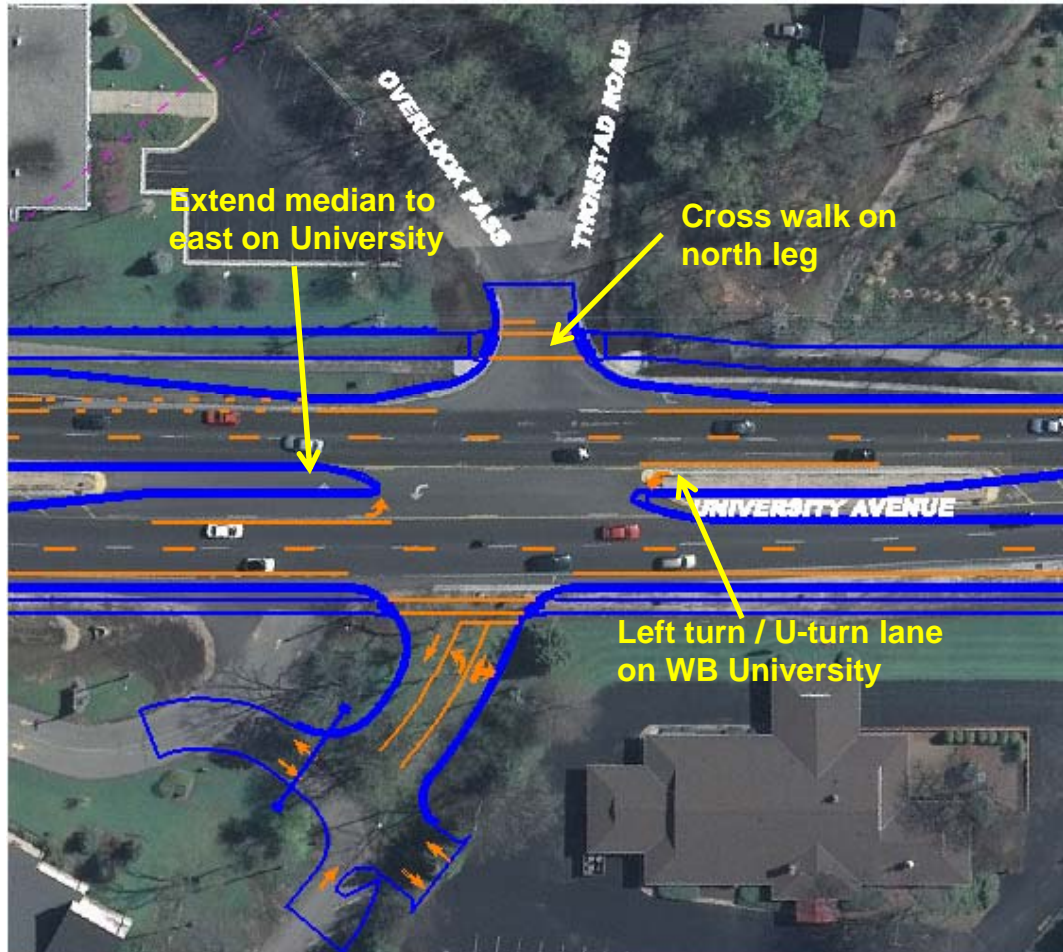
# Proposed Roadway Improvements

- Pedestrian connectivity (Whitney Way and Old Middleton Road)



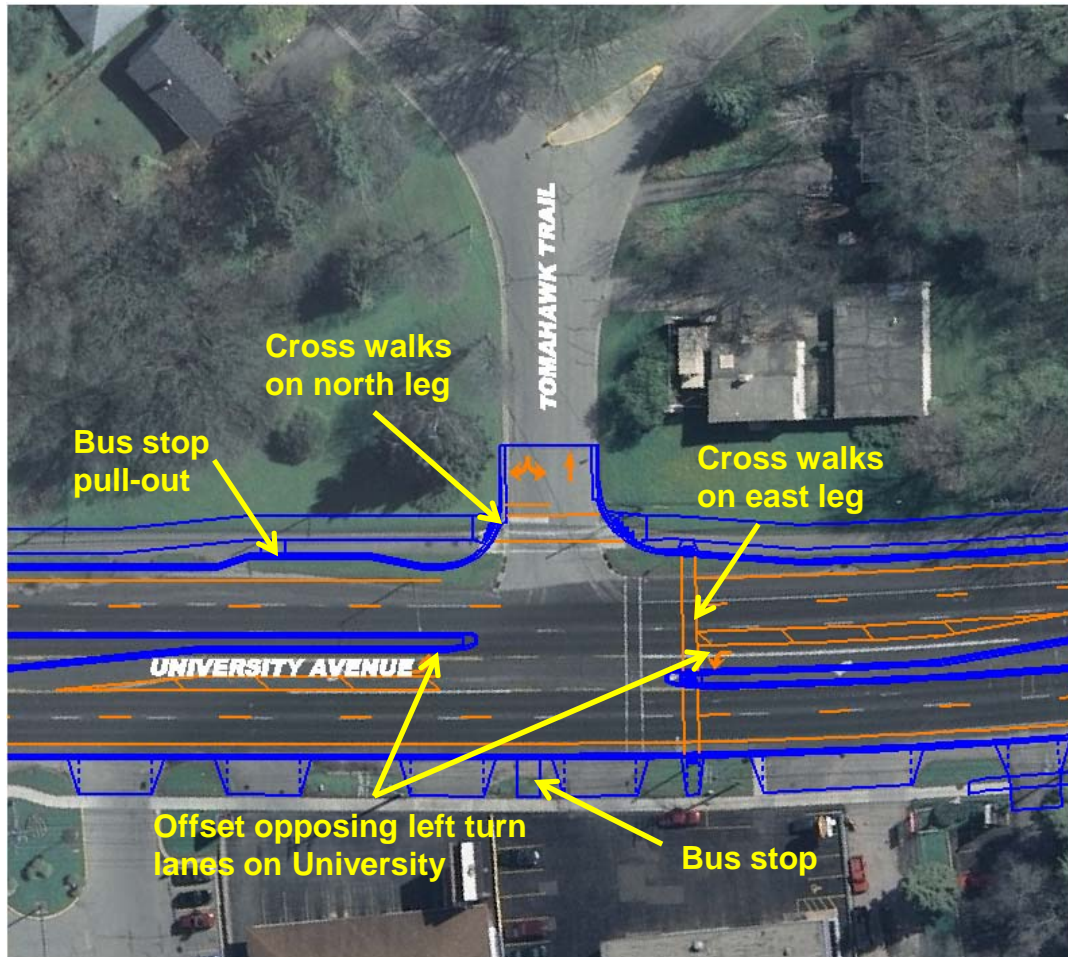
# Proposed Roadway Improvements

- Non-Signalized Intersection (Overlook Pass)



# Proposed Roadway Improvements

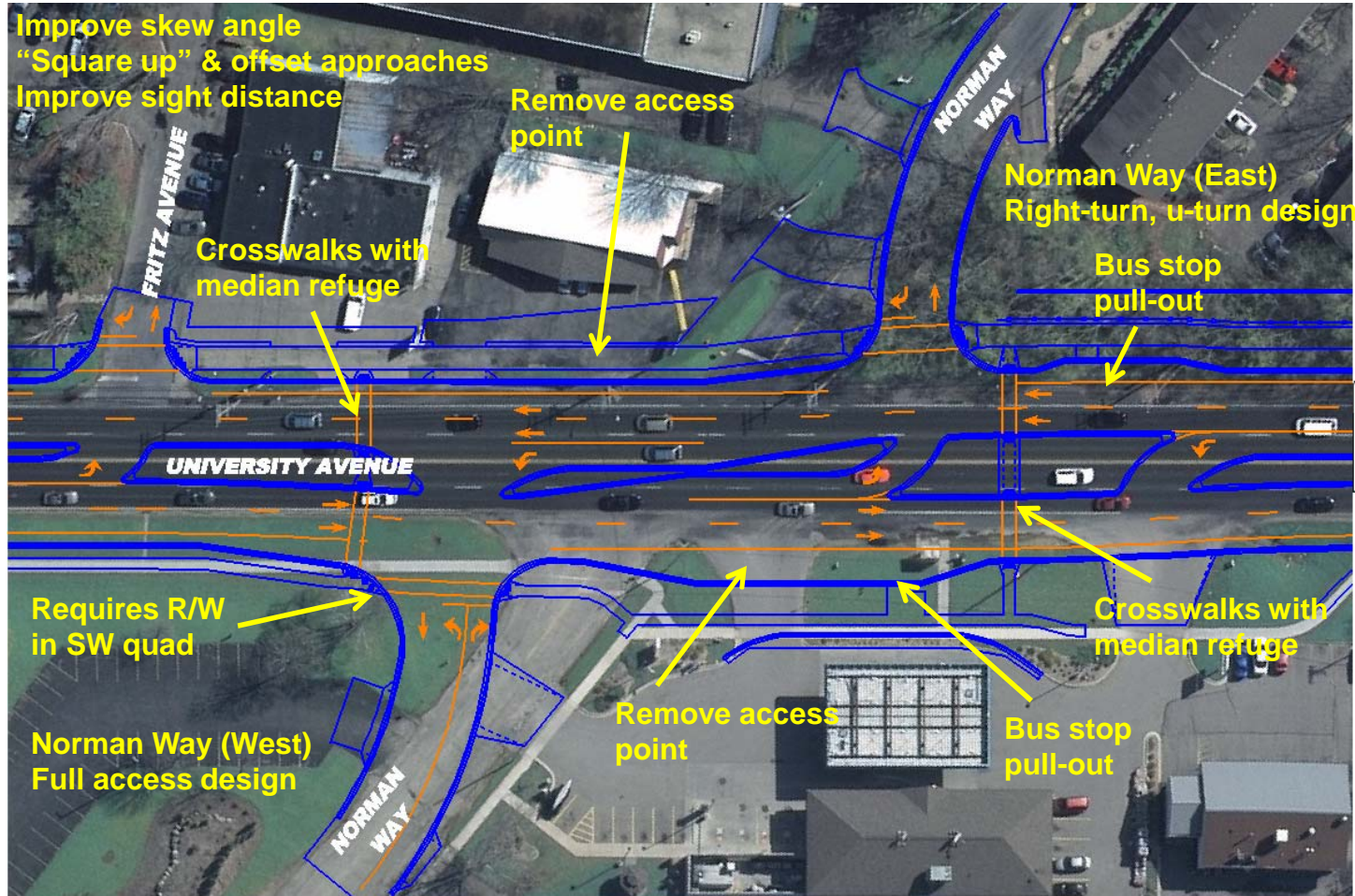
- Non-Signalized Intersection (Tomahawk Trail)





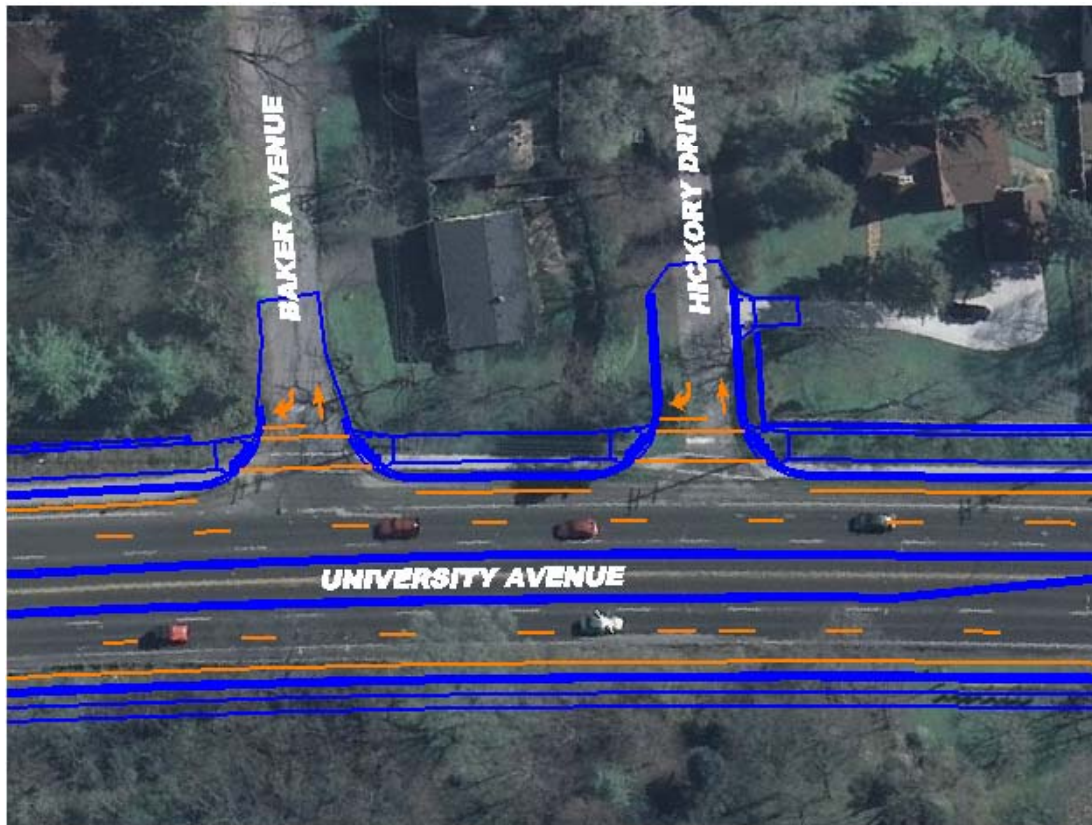
# Proposed Roadway Improvements

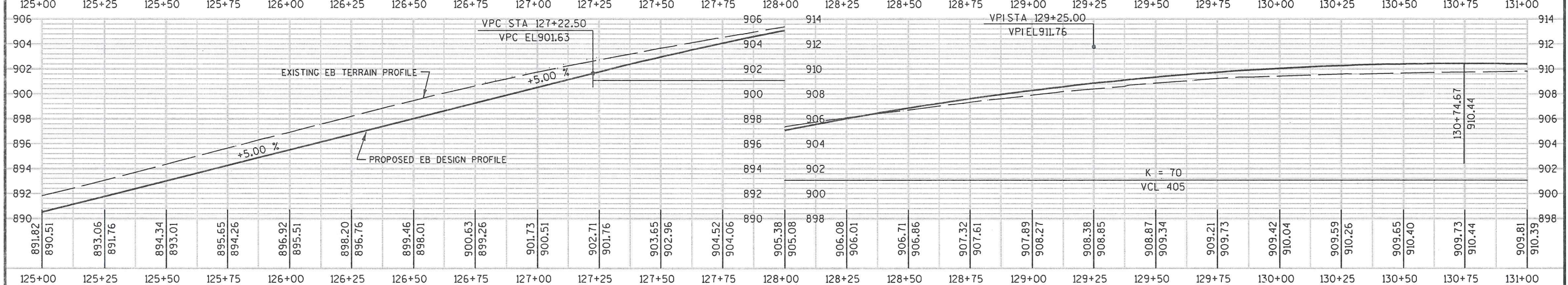
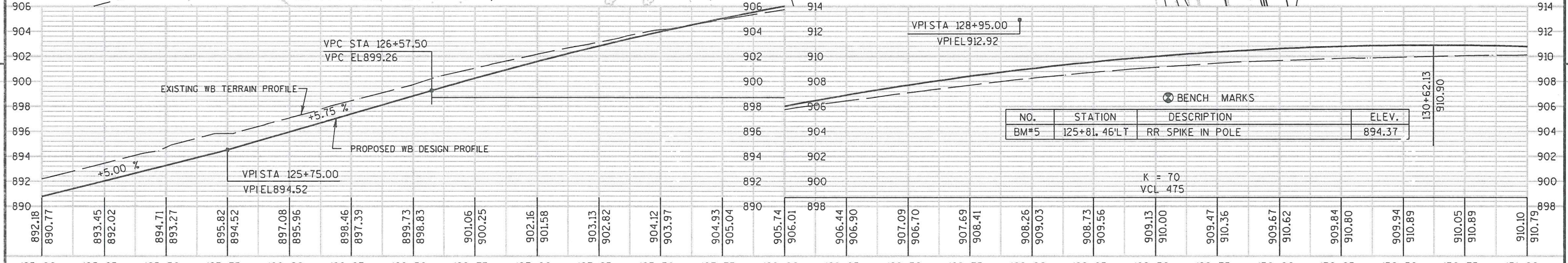
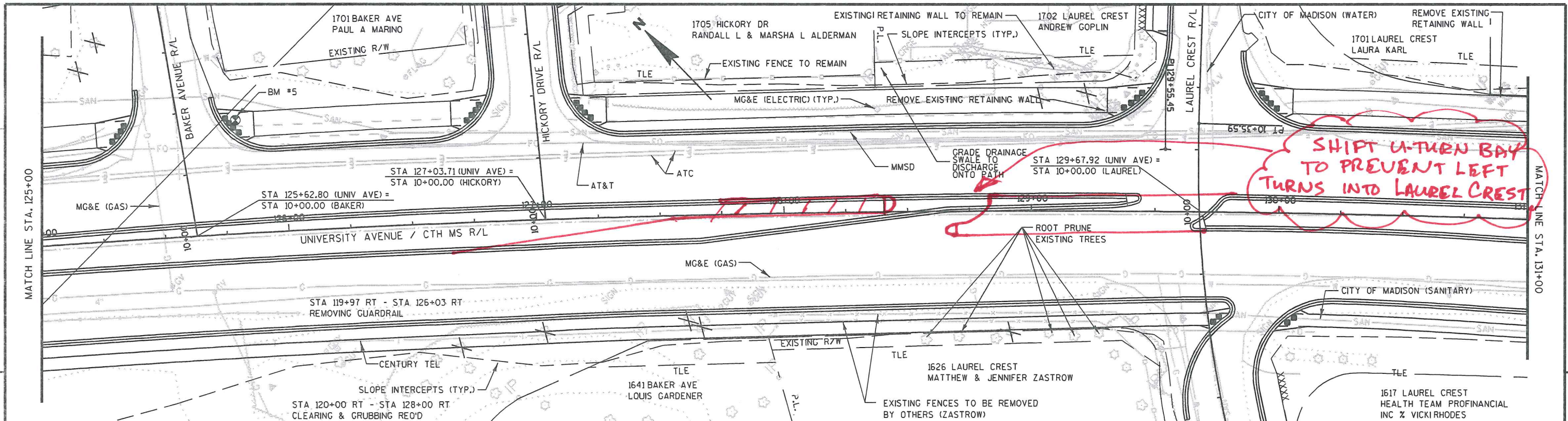
- Non-Signalized Intersection (Proposed Norman Way)



# Proposed Roadway Improvements

- Non-Signalized Intersections (Hickory Dr. & Baker Ave.)
    - Curbed median on University
- |                           |                                     |
|---------------------------|-------------------------------------|
| •Right-in access allowed  | •Left-out access <u>not</u> allowed |
| •Right-out access allowed | •Left-in access <u>not</u> allowed  |





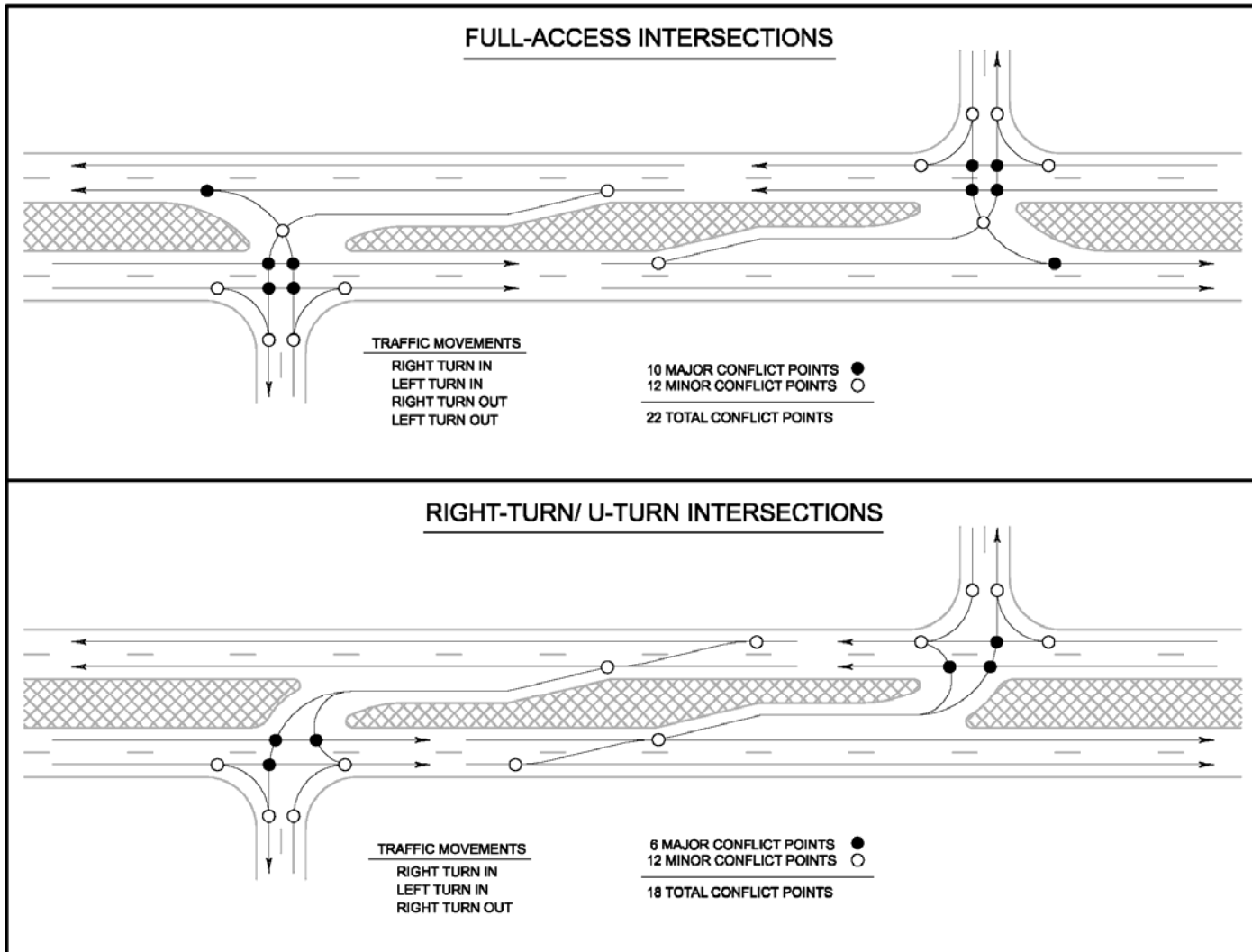
PROJECT NO: 5992-08-79      HWY: CTH MS      COUNTY: DANE      PLAN & PROFILE (UNIVERSITY AVENUE)      SHEET **E**

# Proposed Roadway Improvements

- Right-Turn, U-Turn Concept
  - Unique solution for a unique roadway
    - Not built on grid system and lack of sufficient parallel routes
  - Reduces total conflict and major conflict points
    - Increase safety/ Reduce severe injuries
  - Drivers turn right then perform a u-turn at next intersection or median opening
    - All intersections and median openings designed to accommodate u-turn movement (passenger vehicle)
    - Improve traffic capacity and reduce congestion
  - Studies show increased safety
    - University of South Florida Study (2001)
      - 18% reduction in total crashes
      - 27% reduction in injury/fatality crashes
    - National Cooperative Highway Research Program (Report 524)
      - 26% reduction in total crashes
    - Concept used in Michigan, Florida, New Jersey, Maryland, and Louisiana



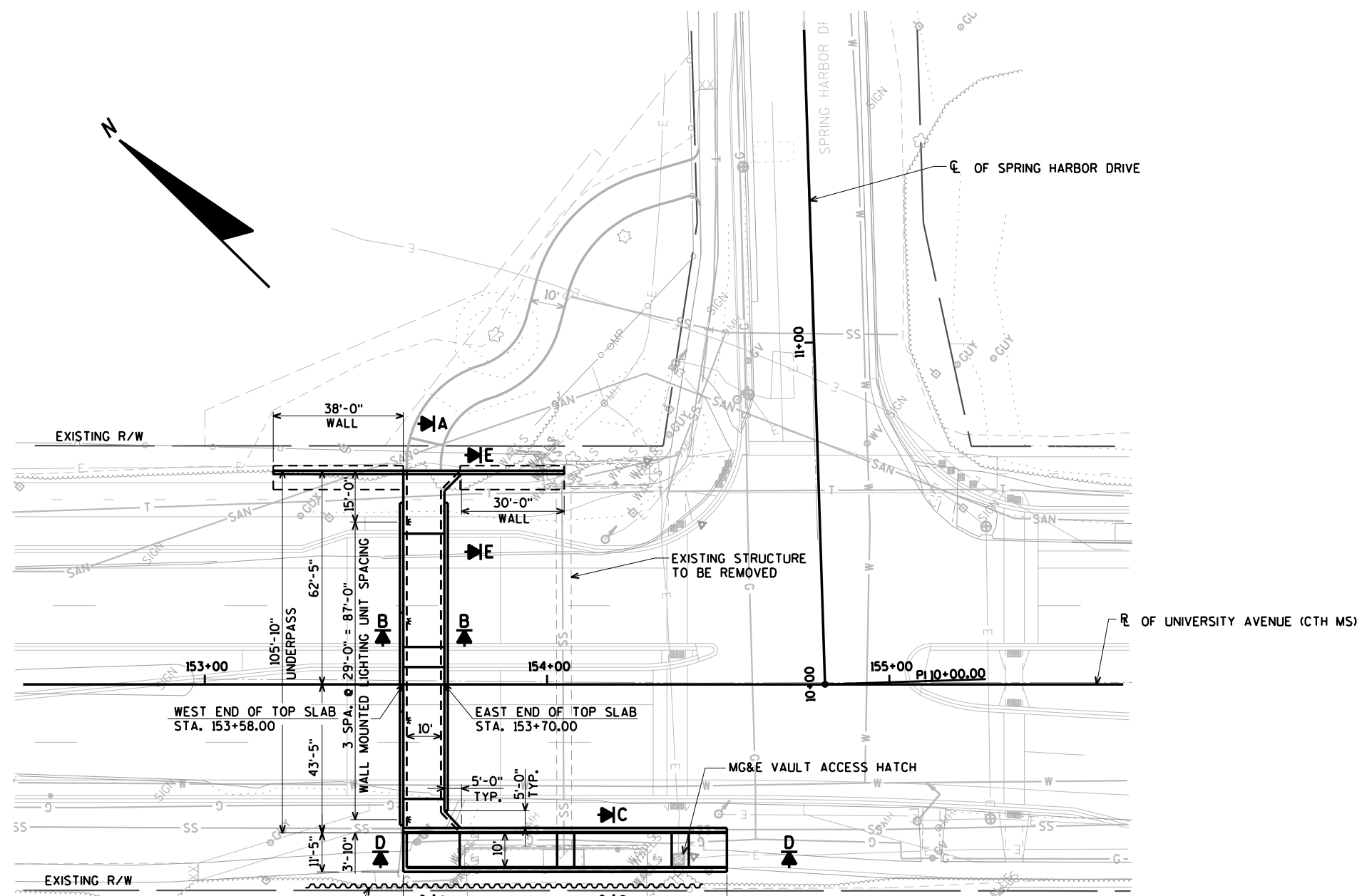
# Proposed Roadway Improvements



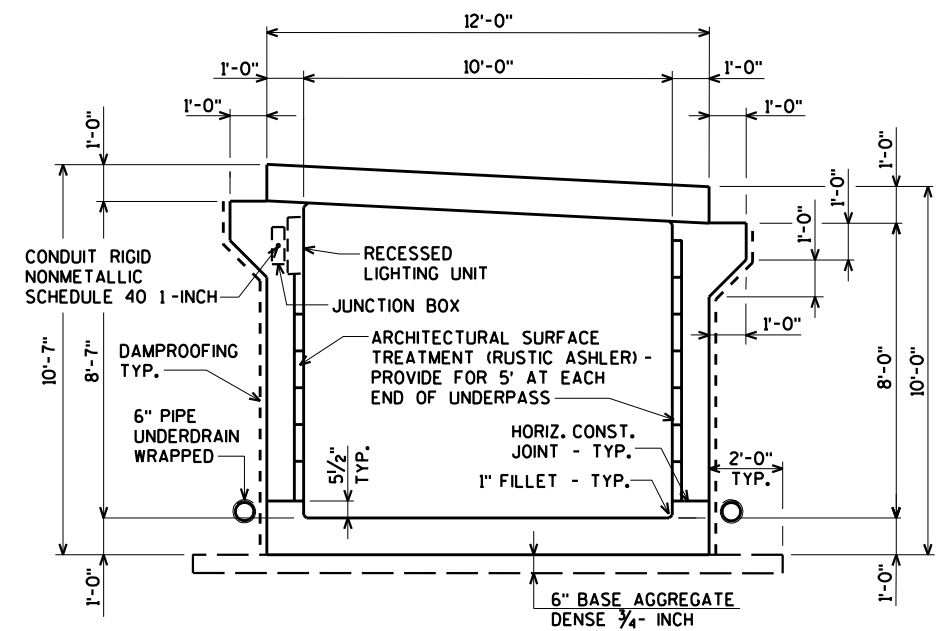
# Proposed Roadway Improvements

- Existing Spring Harbor Pedestrian Underpass
  - Deteriorating and needs to be removed or replaced
  - Tunnel is narrow and stairs are not ADA compliant
  - Poor lighting, drainage and aesthetics
  - Safety concerns of night-time users





**PLAN**  
PEDESTRIAN UNDERPASS



**SECTION B**  
(LOOKING NORTH)

**TOP OF SLAB ELEVATIONS** (TAKEN ALONG FRONT FACE OF WALLS)

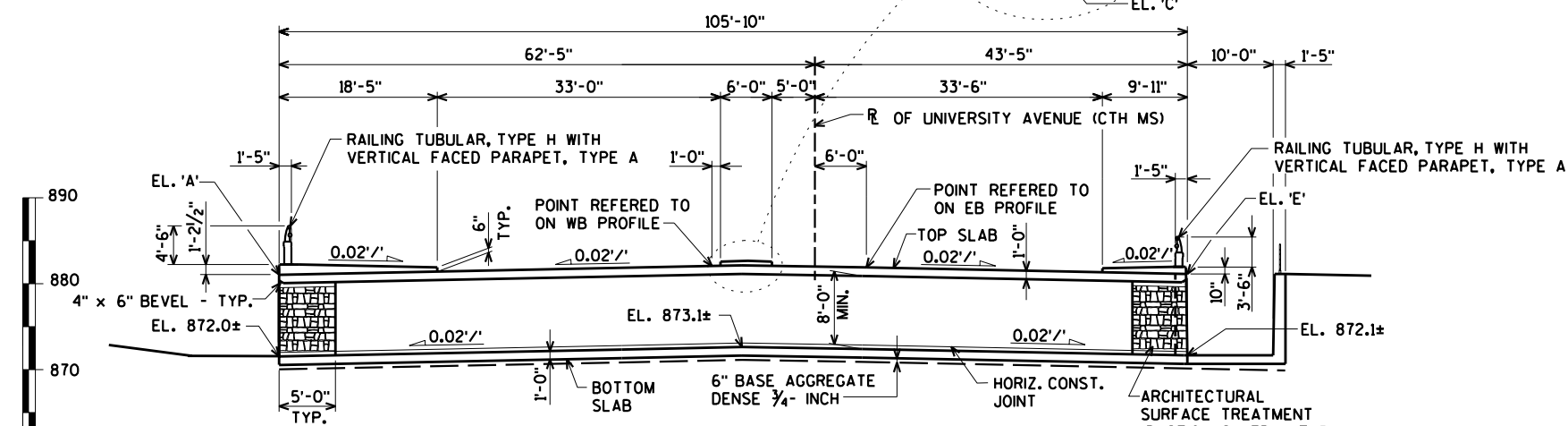
WALL	EL. 'A'	EL. 'B'	EL. 'C'	EL. 'D'	EL. 'E'
WEST					
EAST					

FOR SECTIONS C, D, & E  
SEE SHEET 3

**LIST OF DRAWINGS**

1. PRELIMINARY PLAN
2. QUANTITIES AND NOTES
3. UNDERPASS DETAILS

FOR GENERAL NOTES,  
DESIGN DATA, AND  
QUANTITIES SEE SHEET 2



**SECTION A**  
(LOOKING EAST)

BUREAU OF STRUCTURES CONTACT:  
WILLIAM DREHER  
(608)-266-8489

CONSULTANT CONTACT:  
DAN SYDOW  
(715)-834-3161

NO.	DATE	REVISION	BY
ORIGINAL PLANS PREPARED BY <b>AYRES ASSOCIATES</b> 3433 Oakwood Hills Parkway Eau Claire, WI 54701 www.AyresAssociates.com			
APPROVED		CHIEF STRUCTURES DESIGN ENGINEER	DATE
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION			
<b>STRUCTURE C-13-2047</b>			
UNIVERSITY AVENUE (CTH MS) OVER PEDESTRIAN UNDERPASS			
COUNTY	DANE	TOWN/CITY/VILLAGE	MADISON
DESIGN SPEC. AASHTO LRFD DESIGN SPEC. 5th EDITION			
DESIGNED BY	DNS	DESIGN CK'D.	CLM
DRAWN BY	CLS	PLANS CK'D.	
<b>PRELIMINARY PLAN</b>			SHEET 1 OF 3 409

CHECKED BY: DATE: BACK CHECKED BY: DATE: CORRECTED BY: DATE:

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**LIST OF BID ITEMS**

203.0200	REMOVING OLD STRUCTURE STA. 154+00	1 LS
206.2000	EXCAVATION FOR STRUCTURES CULVERTS C-13-2047	1 LS
206.6000.S	TEMPORARY SHORING	SF
210.0100	BACKFILL STRUCTURE	CY
305.0110	BASE AGGREGATE DENSE 3/4" INCH	TON
502.3200	PROTECTIVE SURFACE TREATMENT	SY
504.0100	CONCRETE MASONRY CULVERTS	CY
505.0410	BAR STEEL REINFORCEMENT HS CULVERTS	LB
505.0610	BAR STEEL REINFORCEMENT HS COATED CULVERTS	LB
513.2000	RAILING PIPE C-13-2047	1 LS
513.4055	RAILING TUBULAR TYPE H C-13-2047	1 LS
516.0100	DAMPROOFING	SY
516.0500	RUBBERIZED MEMBRANE WATERPROOFING	SY
517.1010.S	CONCRETE STAINING	SF
517.1050.S	ARCHITECTURAL SURFACE TREATMENT	SF
612.0406	PIPE UNDERDRAIN WRAPPED 6-INCH	LF
652.0110	CONDUIT RIGID METALLIC 1-INCH	LF
652.0210	CONDUIT RIGID NONMETALLIC SCHEDULE 40 1-INCH	LF
653.0208	JUNCTION BOXES 8x8x8 - INCH	EACH
SPV.0060	WALL PACK OUTLET BOXES AND RECESSED HOUSING	EACH

**NON-BID ITEMS**  
 FILLER 3/4" SIZE

**GENERAL NOTES**

DRAWINGS SHALL NOT BE SCALED.  
 BAR STEEL REINFORCEMENT SHALL BE EMBEDDED 2" CLEAR UNLESS SHOWN OR NOTED OTHERWISE.  
 THE FIRST DIGIT OF A THREE DIGIT BAR NO. AND THE FIRST TWO DIGITS OF A FOUR DIGIT BAR NO. SIGNIFIES THE BAR SIZE. JOINT FILLER SHALL CONFORM TO THE REQUIREMENTS OF A.A.S.H.T.O. DESIGNATION M 153, TYPE I, II OR III OR A.A.S.H.T.O. DESIGNATION M 213.  
 THE UPPER LIMITS OF "EXCAVATION FOR STRUCTURES" SHALL BE THE EXISTING GROUND LINE.  
 ALL SPACES EXCAVATED AND NOT OCCUPIED BY THE NEW STRUCTURE SHALL BE BACKFILLED WITH BACKFILL STRUCTURE TO THE BOTTOM OF THE SUBGRADE WITHIN THE LENGTH OF THE BOX. THE PAY LIMITS OF THE BACKFILL STRUCTURAL ARE 3'-0" BEYOND THE HORIZONTAL PLAN LIMITS AT THE BOTTOM OF THE BOX AND APRON AND UP AT A 1:1.5 BACKFILL SLOPE FROM BOTTOM OF SLAB TO TOP OF BOX.  
 PROTECTIVE SURFACE TREATMENT IS TO BE APPLIED TO THE TOP OF BOX, THE TOP AND FACE OF MEDIAN, THE TOP AND FACE OF SIDEWALK AND THE TOP AND INSIDE FACE OF PARAPETS.  
 ALL EXPOSED CONCRETE SURFACES EXCEPT FOR THE TOP OF SLAB, SHALL HAVE CONCRETE STAINING.  
 THE EXISTING STRUCTURE TO BE REMOVED IS A 104 FT. LONG 7.8 FT. HIGH x 7 FT. WIDE CORRUGATED STEEL CULVERT PIPE WITH CONCRETE RETAINING WALLS AND STAIRS AT EACH END.

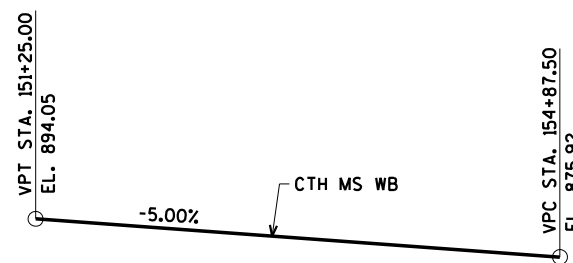
**DESIGN DATA**

**LIVE LOAD:**  
 DESIGN LOADING: HL-93  
 INVENTORY RATING FACTOR: 1.05  
 OPERATING RATING FACTOR: 1.35  
 WISCONSIN STANDARD PERMIT VEHICLE (WIS-SPV) = 255 KIPS  
 STRUCTURE IS DESIGNED FOR A FUTURE WEARING SURFACE OF 20 #/S.F.

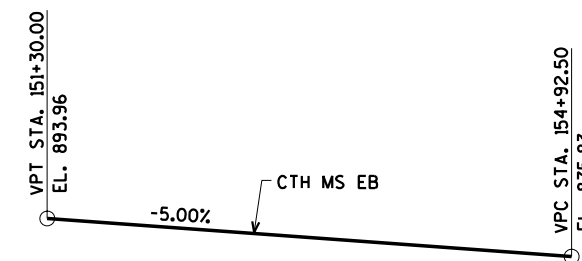
**ULTIMATE DESIGN STRESSES:**  
 CONCRETE MASONRY TOP SLAB  $f'_c = 4,000$  p.s.i.  
 ALL OTHER  $f'_c = 3,500$  p.s.i.  
 HIGH STRENGTH BAR STEEL REINFORCEMENT (GRADE 60)  $f_y = 60,000$  p.s.i.

**FOUNDATION DATA:**  
 THE MAXIMUM DESIGN SOIL PRESSURE IS 1.25 TONS PER SQ. FT.

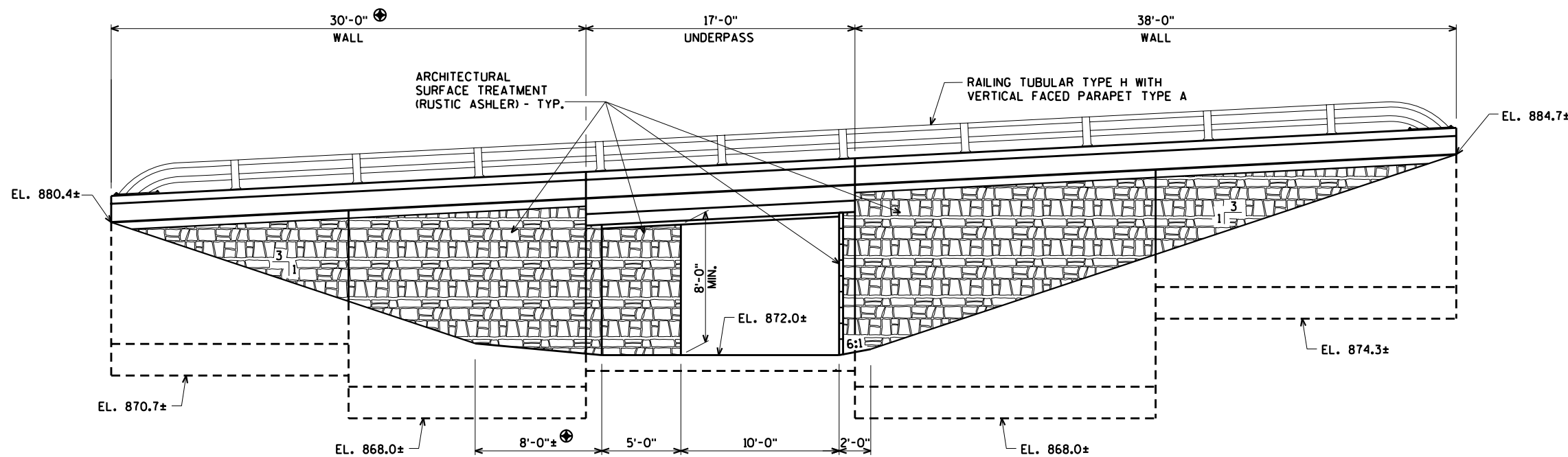
**TRAFFIC DATA:**  
 A.D.T. = 45,900 (2012)  
 A.D.T. = 64,300 (2032)  
 R.D.S. = 40 M.P.H.



**PROFILE GRADE LINE**  
(CTH MS WB)



**PROFILE GRADE LINE**  
(CTH MS EB)



⊕ LENGTH CONTINGENT ON DRAINAGE PLAN

**ELEVATION**  
(LOOKING SOUTH)

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STRUCTURES DESIGN SECTION			
<b>STRUCTURE C-13-2047</b>			
DRAWN BY		CLS	PLANS CK'D.
<b>QUANTITIES AND NOTES</b>			SHEET 2 OF 3 410

ORIGINAL PLANS PREPARED BY  
**AYRES ASSOCIATES**  
 3433 Oakwood Hills Parkway  
 Eau Claire, WI 54701  
 www.AyresAssociates.com

ecp.dwg.plt  
C-13-2047\_GP.dgn

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# Proposed Roadway Improvements

- Street lighting
  - Throughout corridor
  - LED fixtures
    - Use less energy
    - Last longer
- Water main
  - Hickory Hollow – Laurel Crest
  - Tomahawk Trail – Segoe Road
- Sanitary sewer
  - Spring Harbor Drive – Tomahawk Trail



# Environmental Concerns

## Storm water

- Treatment devices will be installed prior to discharge locations from project site
  - Sumped catch basins/manholes
  - Screened collection structure
- The City of Madison is working on other storm water treatment projects in the area such as detention ponds and bio-retention



## Erosion

- Curb and gutter will help roadside slope erosion
- Embankments at Hickory Gulch will be flattened
- Embankments at bridge approach will be flattened



## Trees

- Efforts have been made to minimize tree removal
- City will replace trees and plant additional throughout corridor in medians and terraces after completion of the project



# Construction

- Traffic Control / Construction Staging
  - One lane of traffic in each direction
    - Allen Boulevard to Old Middleton Road
  - Temporary turn lanes at intersections
  - Temporary signals
  - Temporary crosswalks
  - Temporary bus stops
  - Access open to businesses at all times

