ORIGINAL TO GENERAL FILES

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

OFFICE OF DESIGN POLICY & SUPPORT
INTERDEPARTMENTAL CORRESPONDENCE

FILE P.I. # 0008355
CSNHS-0008-00(355)
Richmond County
GDOT District 2 - Tennille
SR 121/US 25 Widening
from CR 1513/Browns Rd to CR 1503/Tobacco Rd
No Build

OFFICE Design Policy & Support

DATE 11/12/2015

FROM for Brent Story, State Design Policy Engineer

TO SEE DISTRIBUTION

SUBJECT **APPROVED CONCEPT REPORT**

Attached is the approved Concept Report for the above subject project.

Attachment

DISTRIBUTION:

Glenn Bowman, Director of Engineering
Joe Carpenter, Director of P3/Program Delivery
Genetha Rice-Singleton, Assistant Director of P3/Program Delivery
Albert Shelby, State Program Delivery Engineer
Darryl VanMeter, State Innovative Delivery Engineer
Bobby Hilliard, Program Control Administrator
Cindy VanDyke, State Transportation Planning Administrator
Hiral Patel, State Environmental Administrator
Bill DuVall or Lyn Clements for State Bridge Engineer
Andrew Heath, State Traffic Engineer
Angela Robinson, Financial Management Administrator
Lisa Myers, State Project Review Engineer
Charles "Chuck" Hasty, State Materials Engineer
Lee Upkins, State Utilities Engineer
Richard Cobb, Statewide Location Bureau Chief
Andy Casey, State Roadway Design Engineer
Attn: Mac Cranford, Design Group Manager
Jimmy Smith, District Engineer
Neal O'Brien, District Preconstruction Engineer
Jaime Lindsey, District Utilities Engineer
Marshall Troup, Project Manager
BOARD MEMBER - 12th Congressional District

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

LIMITED SCOPE PROJECT CONCEPT REPORT

Project Type:	Widening	P.I. Number:	0008355
GDOT District:	2	County:	Richmond
Federal Route Number:	25	State Route Number:	121
Project Number:	CSNHS-0008-00(355)		

The proposed project is to retain the existing typical section of SR 121/US 25/Peach Orchard Road and proceed with the No-Build Alternative.

Submitted for approval:

C. Andy Cuny — State Roadway Design Engineer — 9-8-15 — Date

Albert Shelby (for) — State Program Delivery Engineer — 9/28/15 — Date

CCB

Lisa W. Allen — GDOT Project Manager — 9-14-15 — Date

* Recommendation on file

Recommendation for approval:

* Hiral Patel/KLP — State Environmental Administrator — 10-4-15 — Date

* FOR Ken Werho/KLP — State Traffic Engineer — 10-1-15 — Date

Ben Rabun — State Bridge Engineer — 10-7-15 — Date

☒ MPO Area: This project is consistent with the MPO adopted Regional Transportation Plan (RTP)/Long Range Transportation Plan (LRTP).

☐ Rural Area: This project is consistent with the goals outlined in the Statewide Transportation Plan (SWTP) and/or is included in the State Transportation Improvement Program (STIP).

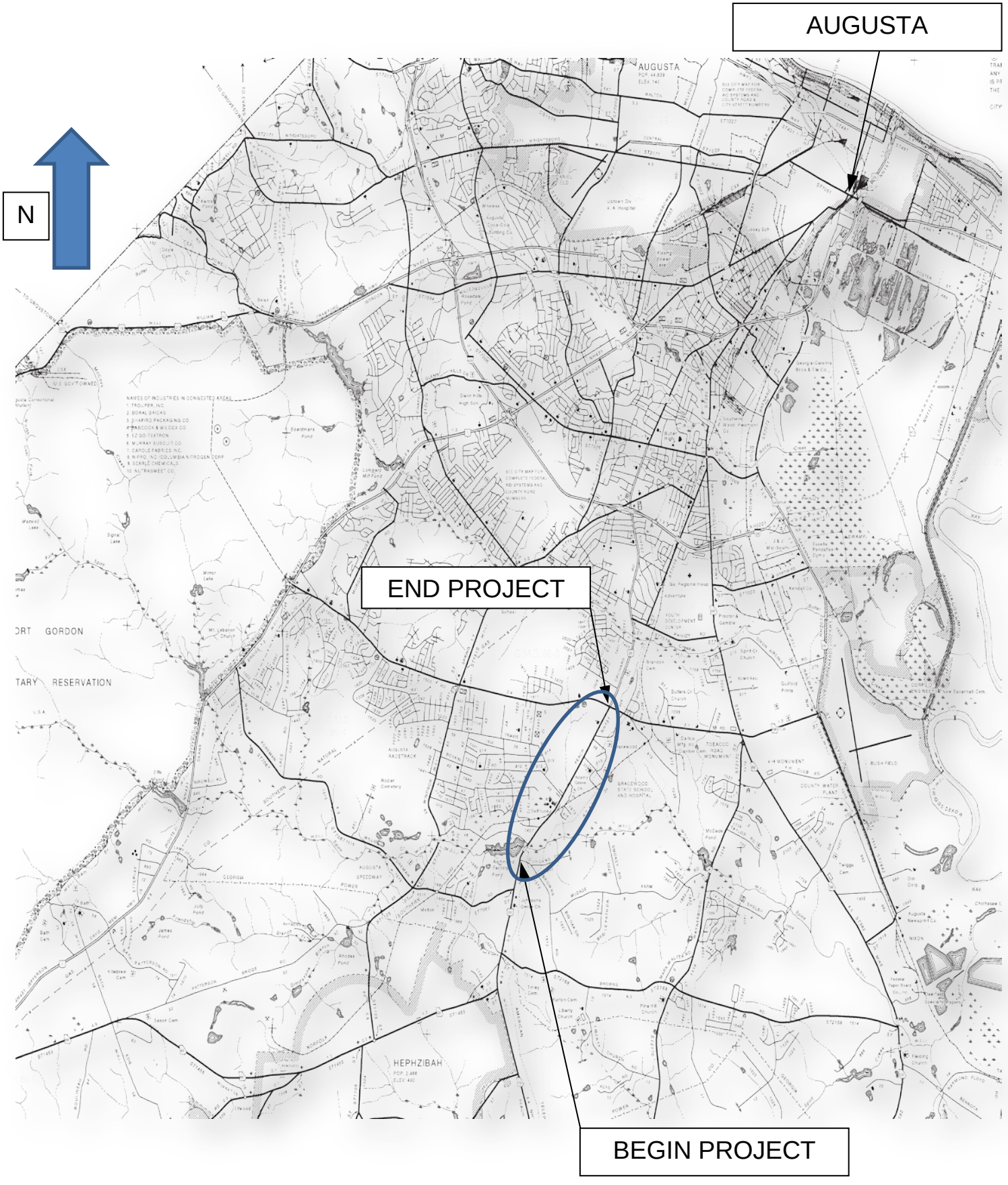
Cynthia L Vanke — State Transportation Planning Administrator — 10-1-15 — Date

Approval:

Concur: — GDOT Director of Engineering — 11/4/2015 — Date

Approve: Margaret B. Pinkl — GDOT Chief Engineer — 11.4.15 — Date

PROJECT LOCATION



PLANNING & BACKGROUND DATA

Project Justification Statement:

The subject project proposes to improve the capacity of SR 121 between Brown Road and Tobacco Road as identified through the Augusta Regional Transportation Study (ARTS) planning process and listed in its adopted year 2035 LRTP. The project is programmed within the approved ARTS FY 2013-2016 Transportation Improvement Program (TIP) with the P.E. phase identified for Fiscal Year 2015. The remaining phases (right-of-way and construction) are currently outside of the TIP years.

The proposed project is shown in the location sketch on page 2 of this concept report. Logical termini for the project will be officially determined as part of the NEPA process.

Currently, this two-mile section of the corridor is characterized as an undivided urban principal arterial. This corridor is also listed on the Federal Highway Strategic Highway Network (STRAHNET) due to its proximity to Fort Gordon and subsequent importance to U.S. strategic defense. Throughout the length of the proposed project area, the Augusta-Richmond County Comprehensive Plan identified the corridor as a developing commercial corridor, with the northern portion of the corridor near SR 121 and Tobacco Road noted as a minor commercial node (shown in Figure 2). The corridor currently has a total of five lanes (four through lanes and a center turn lane, with additional turning lanes in varying locations.)

Year 2012 traffic counts were collected from the GDOT STARS traffic count database (design-level traffic counts were not available). In 2012, volumes on this corridor were shown to range up to 22,590 vehicles per day, which translates to a level of service (LOS) of “B.” Year 2035 traffic volumes available from the ARTS travel demand model indicates that volumes are expected to increase up to just over 30,000 vehicles per day, translating to a continued level of service (LOS) of “B.” Additionally, the corridor averages eight percent truck traffic on the roadway, which is significant.

However, with continued expected commercial development, travel demand is expected to continue to increase along the corridor, thus impacting the efficiency of the roadway. As the project corridor provides access to existing and growing neighborhoods, commercial nodes, and industrial areas southwest of the project area, traffic volumes are expected to increase, and infrastructure improvements in this developing area will be needed.

Existing conditions:

The project location is on the corridor of SR121/US 25/Peach Orchard Rd between the intersections with Brown Road and Tobacco Road. The current typical section of SR 121/US 25/Peach Orchard Road consists of four 12-foot wide travel lanes, a 14-foot wide center two-way left turn lane, and graded rural shoulders (2 feet of which are paved). There is a railroad crossing at 0.25 mile northeast from the intersection of SR 121 with Nellie Drive. The bridge on SR 121 crosses Spirit Creek, which is fed by the dam at Richmond Factory Pond. There is a small double-barrel culvert underneath Boykin Road close to its intersection with SR 121 that is integral to the drainage of the shoulder of SR 121 at that location, and it links to another larger culvert that spans SR 121 at 0.2 mile southwest of Boykin Road.

Other projects in the area:

1) PI # M004886, SR 121 from south of CR 1503/Tobacco Road to CR 199/Lumpkin Road, is a maintenance resurfacing project under the Construction Work Program that is scheduled to let January 2016.

2) PI # 0013703, CR 1515/Willis Foreman Road from SR 4/US 1 to SR 121/US 25, is a proposed widening project. PE is to begin in FY 2018.

Description of the proposed project: The preferred alternative for this project is the "No-Build" alternative.

MPO: Augusta Regional Transportation Study (ARTS)

TIP #: NHS-3

TIA Regional Commission: N/A

Congressional District(s): 12

Federal Oversight: ☒Exempt ☐State Funded ☐Other

Projected Traffic: ADT 24 HR T: 11%
Current Year (2013): 26,050 Open Year (2024): 32,450 Design Year (2044): 48,200
Traffic Projections Performed by: Office of Planning

Functional Classification (Mainline): Urban Principal Arterial

Complete Streets - Bicycle, Pedestrian, and/or Transit Standards Warrants:
Warrants met: ☒None ☐Bicycle ☐Pedestrian ☐Transit

Pavement Evaluation and Recommendations
Initial Pavement Evaluation Summary Report Required? ☒No ☐Yes
Initial Pavement Type Selection Report Required? ☒No ☐Yes
Feasible Pavement Alternatives: ☐HMA ☐PCC ☐HMA & PCC

DESIGN AND STRUCTURAL

Description of Proposed Project: The "No Build" alternative was selected.

Major Structures:

Structure ID	Existing	Proposed
245-0114-0	3-bent, 2-span bridge	
	Double-barrel culvert under Boykin Road	
	Double-barrel culvert spanning SR 121	

Mainline Design Features: SR 121/US 25/Peach Orchard Road – all design features to remain unchanged
Major Interchanges/Intersections: Tobacco Road/CR 1503

Lighting required: ☒ No ☐ Yes

Transportation Management Plan [TMP] Required: ☒ No ☐ Yes
If Yes: Project classified as: ☐ Non-Significant ☐ Significant
TMP Components Anticipated: ☐ TTC ☐ TO ☐ PI

Will Context Sensitive Solutions procedures be utilized? ☒ No ☐ Yes

Design Exceptions to FHWA/AASHTO controlling criteria anticipated: None

Design Variances to GDOT Standard Criteria anticipated: None

UTILITY AND PROPERTY

Temporary State Route Needed: ☒ No ☐ Yes ☐ Undetermined

Railroad Involvement: Norfolk Southern

Utility Involvements: N/A

SUE Required: ☒ No ☐Yes

Public Interest Determination Policy and Procedure recommended? ☒ No ☐ Yes

Right-of-Way: Existing width: 100 ft. Proposed width: N/A
Required Right-of-Way anticipated: ☒ No ☐ Yes ☐ Undetermined
Easements anticipated: ☒ None ☐ Temporary ☐ Permanent ☐ Utility ☐ Other

Anticipated total number of impacted parcels: 0
Displacements anticipated: Businesses: 0
Residences: 0
Other: 0
Total Displacements: 0

Impacts to USACE property anticipated? ☒ No ☐ Yes ☐ Undetermined

ENVIRONMENTAL AND PERMITS

Anticipated Environmental Document: N/A – The "No Build" alternative was selected.
GEPA: ☐ **NEPA:** ☐ CE ☐ PCE

MS4 Compliance – Is the project located in an MS4 area? ☐ No ☒ Yes

Environmental Permits, Variances, Commitments, and Coordination anticipated: N/A – The "No Build" alternative was selected.

Air Quality: N/A – The "No Build" alternative was selected.
Is the project located in a PM 2.5 Non-attainment area? ☐ No ☐ Yes
Is the project located in an Ozone Non-attainment area? ☐ No ☐ Yes
Carbon Monoxide hotspot analysis: ☐ Required ☐ Not Required ☐ TBD

NEPA/GEPA Comments & Information: N/A – The "No Build" alternative was selected.

COORDINATION, ACTIVITIES, RESPONSIBILITIES, AND COSTS

Project Meetings:

1) The Project Team Initiation Process (PTIP) Meeting was held on October 31, 2013. Minutes of the PTIP are attached.

2) The Initial Concept Team Meeting was held on July 1, 2015. Minutes of the Initial Concept Team Meeting are attached.

Project Activity	Party Responsible for Performing Task(s)
Concept Development	GDOT Roadway Design
Design	N/A
Right-of-Way Acquisition	N/A
Utility Coordination (Preconstruction)	N/A
Utility Relocation (Construction)	N/A
Letting to Contract	N/A
Construction Supervision	N/A
Providing Material Pits	N/A
Providing Detours	N/A
Environmental Studies, Documents, & Permits	N/A
Environmental Mitigation	N/A
Construction Inspection & Materials Testing	N/A

Other coordination to date: N/A

Project Cost Estimate and Funding Responsibilities:

	Breakdown of PE	ROW	Reimbursable Utility	CST*	Environmental Mitigation	Total Cost
Funded By						
$ Amount	$0.00	N/A	None	$0.00	None	$0.00
Date of Estimate						

*CST Cost includes: Construction, Engineering and Inspection, Contingencies and Liquid AC Cost Adjustment.

ALTERNATIVES DISCUSSION

Preferred Alternative: The preferred alternative is the "No Build" alternative. The "No Build" alternative intends to retain the existing typical section of SR 121/US 25/Peach Orchard Road, which consists of four 12-foot wide travel lanes, a 14-foot wide center two-way left turn lane, and graded rural shoulders (2 feet of which are paved).

Estimated Property Impacts:	0 acres	**Estimated Total Cost:**	$0.00
Estimated ROW Cost:	$0.00	**Estimated CST Time:**	0 months

Rationale: Under the "Build" condition in both the build year (2024) and the design year (2044), SR 121 would be expected to operate at a level of service (LOS) of B and C, respectively. Likewise, under the "No Build" condition in both build (2024) and design (2044) years, SR 121 is expected to operate at a LOS of B.
Projected traffic numbers are higher in the "Build" condition because the growth factor for the "Build" condition is higher than the growth factor for the "No Build" condition. For that reason, SR 121 is actually expected to perform at a better LOS under the "No Build" condition.
There is essentially no change in the operational LOS between "Build" and "No Build" conditions; therefore, the "No Build" alternative was chosen.

Alternative 2: The originally proposed "Build" alternative is the option of continuous six lanes throughout the length of the project. The typical section for the six-lane alternative would consist of six 12-foot wide travel lanes, a raised median, and graded, partially paved rural shoulders.

Estimated Property Impacts:	41.46 acres	**Estimated Total Cost:**	$52,090,060
Estimated ROW Cost:	$14,055,190	**Estimated CST Time:**	24 months

Rationale: This alternative was not selected because the LOS would not improve with added capacity.

Comments/Additional Information: N/A

LIST OF ATTACHMENTS/SUPPORTING DATA

Attachment 1	Crash data summary
Attachment 2	Traffic diagrams
Attachment 3-1	SR 121/US 25 at Tobacco Road - Existing Condition 2013 DHV
Attachment 3-2	SR 121/US 25 at Tobacco Road - No-Build Condition 2024 DHV
Attachment 3-3	SR 121/US 25 at Tobacco Road - No-Build Condition 2044 DHV
Attachment 3-4	SR 121/US 25 at Tobacco Road - Build Condition 2024 DHV
Attachment 3-5	SR 121/US 25 at Tobacco Road - Build Condition 2044 DHV
Attachment 3-6	Capacity Analysis LOS for several intersections
Attachment 3-7	Capacity Analysis LOS for segments
Attachment 4	Schematic of the project corridor SR 121/US 25/Peach Orchard Road
Attachment 5	Minutes from the Project Team Initiation Process Meeting held 10/31/2013
Attachment 6	Minutes from the Initial Concept Team Meeting held 7/1/2015

Crash Data for the Corridor along SR 121/US 25/Peach Orchard Road from SR 88 to Tobacco Road

Year	Number of Crashes	Number of Injuries	Number of Fatalities
2013	60	33	0
2014	60	24	2
2015	35	14	0

The SR 121/US 25/Peach Orchard Road corridor from State Route 88 to Tobacco Road has a crash rate of 138.38 crashes per 100 MVM (million vehicle-miles), which is 2.67 times the statewide average rate of 51.87 crashes per 100 MVM.

SHEET 1 OF 12

GEORGIA DEPARTMENT OF TRANSPORTATION

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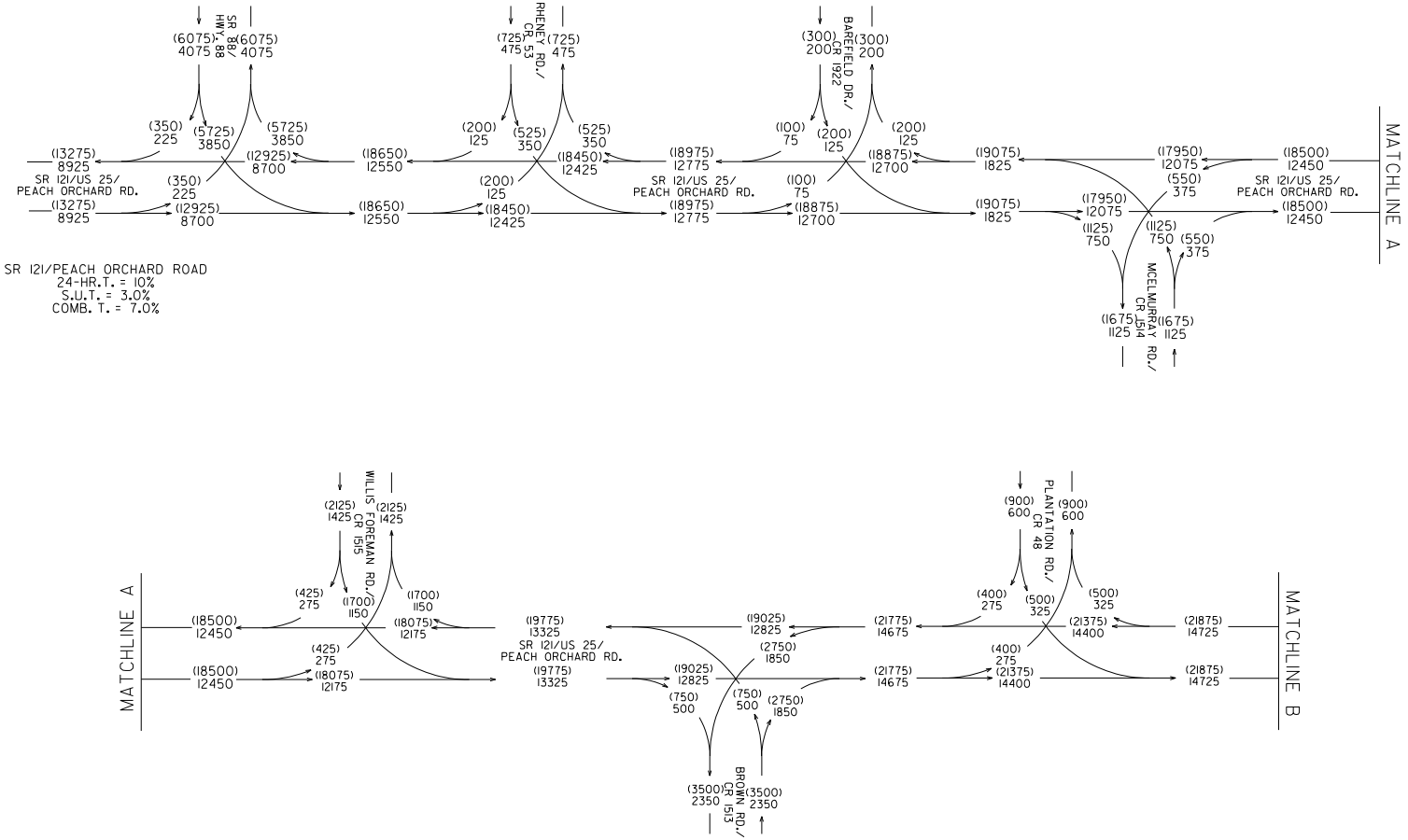
RICHMOND COUNTY



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CR 1503/TOBACCO RD.
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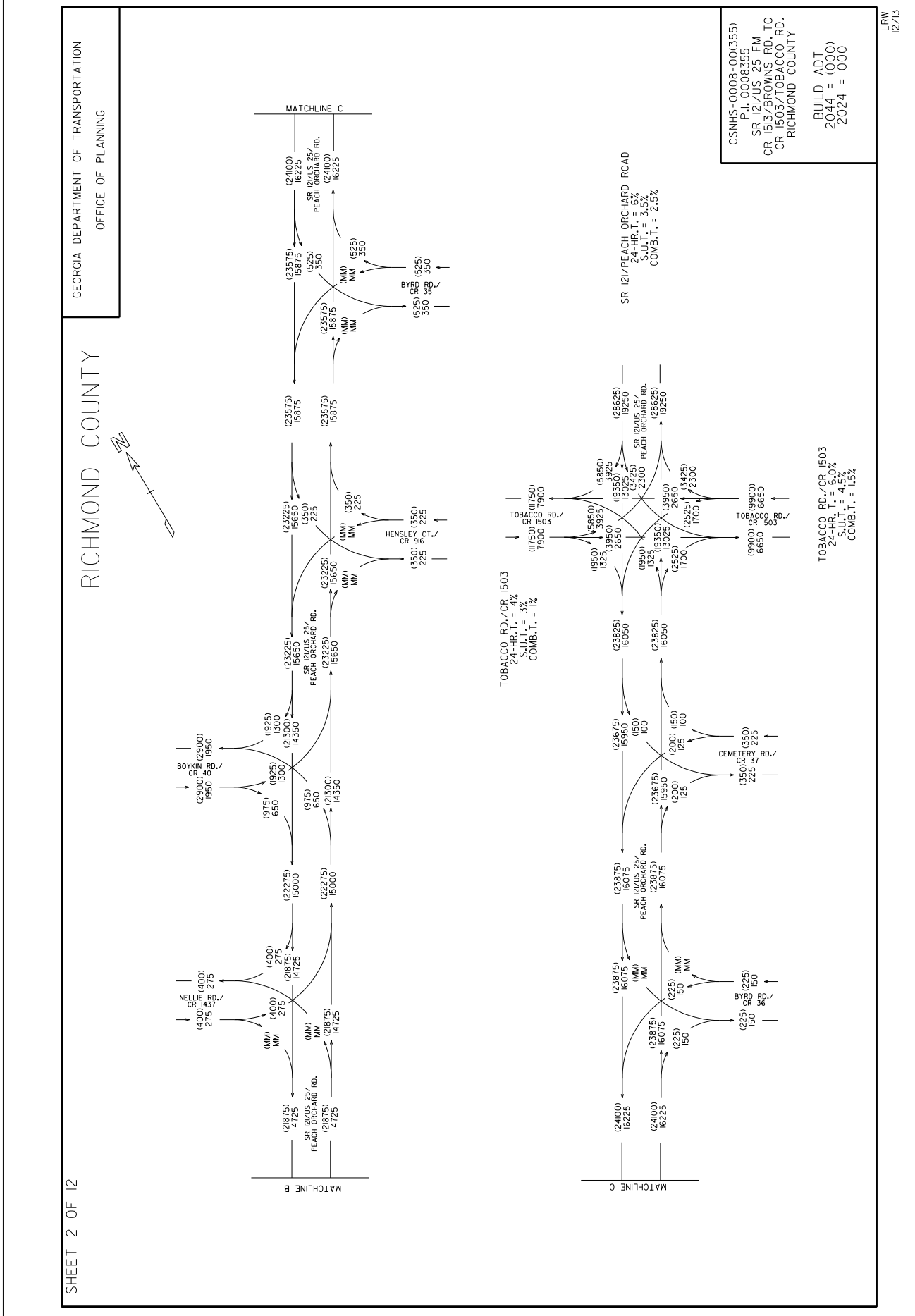
BUILD ADT
2044 = (000)
2024 = 000

LRW
12/13

Attachment 2 - Traffic Diagrams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CR 1503/TOBACCO RD.
RICHMOND COUNTY
BUILD ADT
2044 = (000)
2024 = 000
LRW
12/13
MATCHLINE C
MATCHLINE B
SR 121/PEACH ORCHARD ROAD
24-HR. T. = 6%
S.U.T. = 3.5%
COMB.T. = 2.5%
TOBACCO RD./CR 1503
24-HR. T. = 4%
S.U.T. = 3%
COMB.T. = 1%
TOBACCO RD./CR 1503
24-HR. T. = 6.0%
S.U.T. = 4.5%
COMB.T. = 1.5%
SR 121/US 25/
PEACH ORCHARD RD.
BOYKIN RD./
CR 40
NELLIE RD./
CR 1437
HENSLEY CT./
CR 96
BYRD RD./
CR 36
TOBACCO RD./
CR 1503
CEMETERY RD./
CR 37

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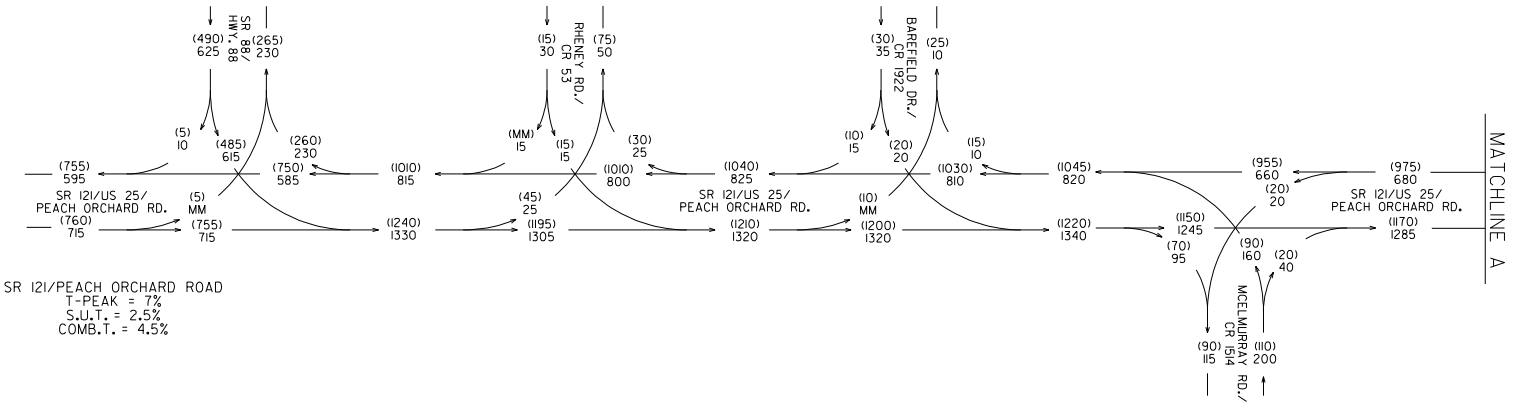
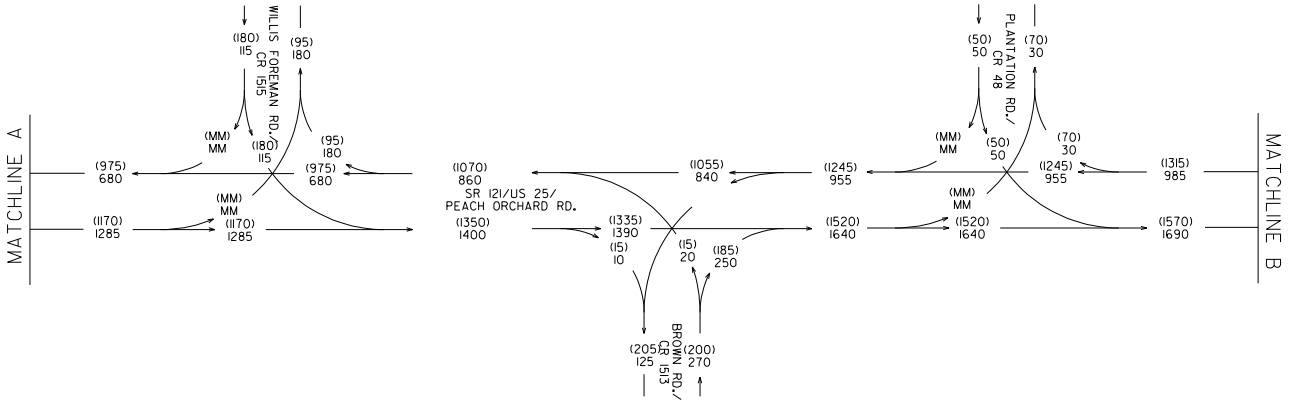


SR 121/PEACH ORCHARD ROAD
T-PEAK = 7%
S.U.T. = 2.5%
COMB.T. = 4.5%



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BUILD 2024 DHV
PM = (000)
AM = 000

LRW
12/13

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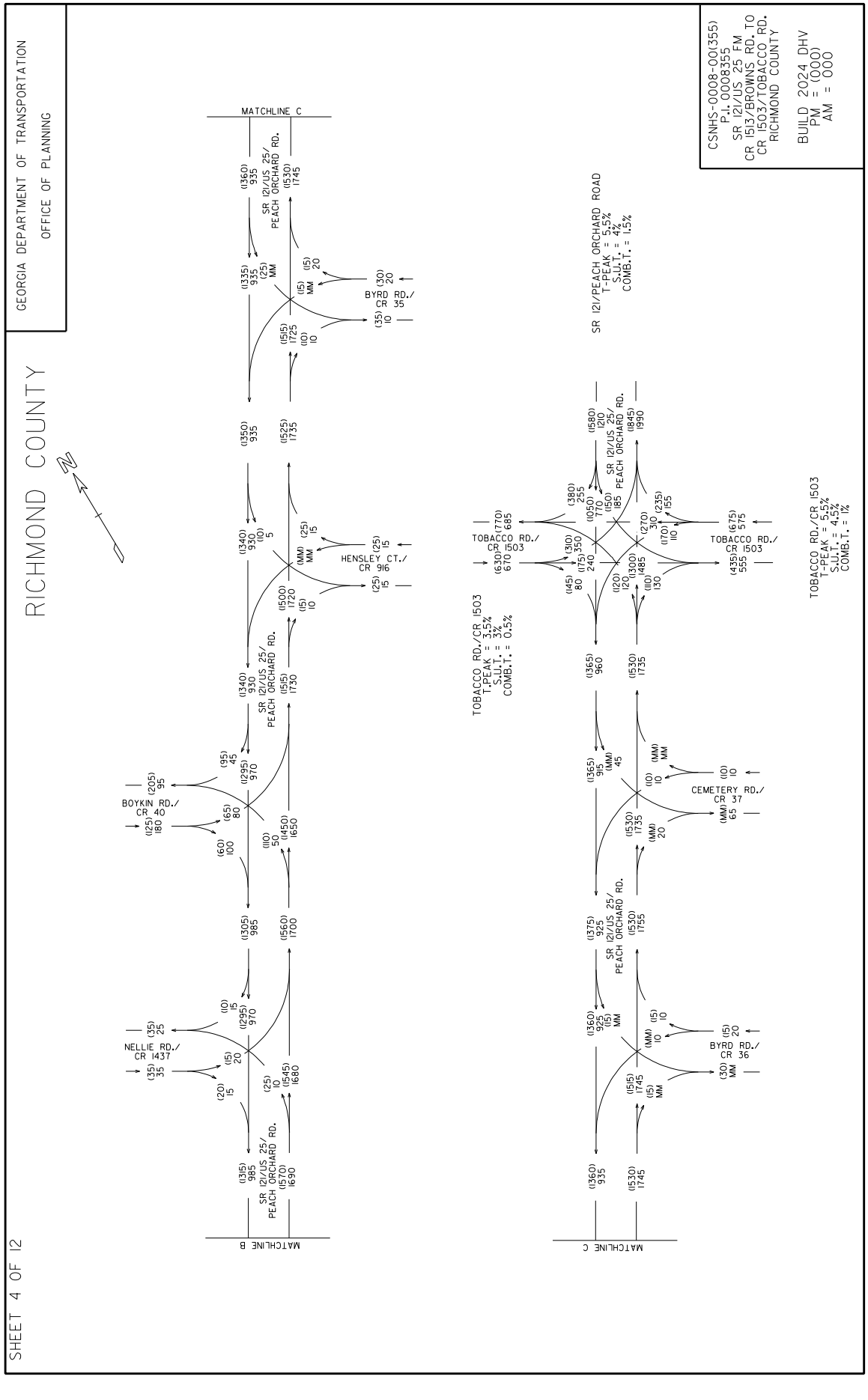
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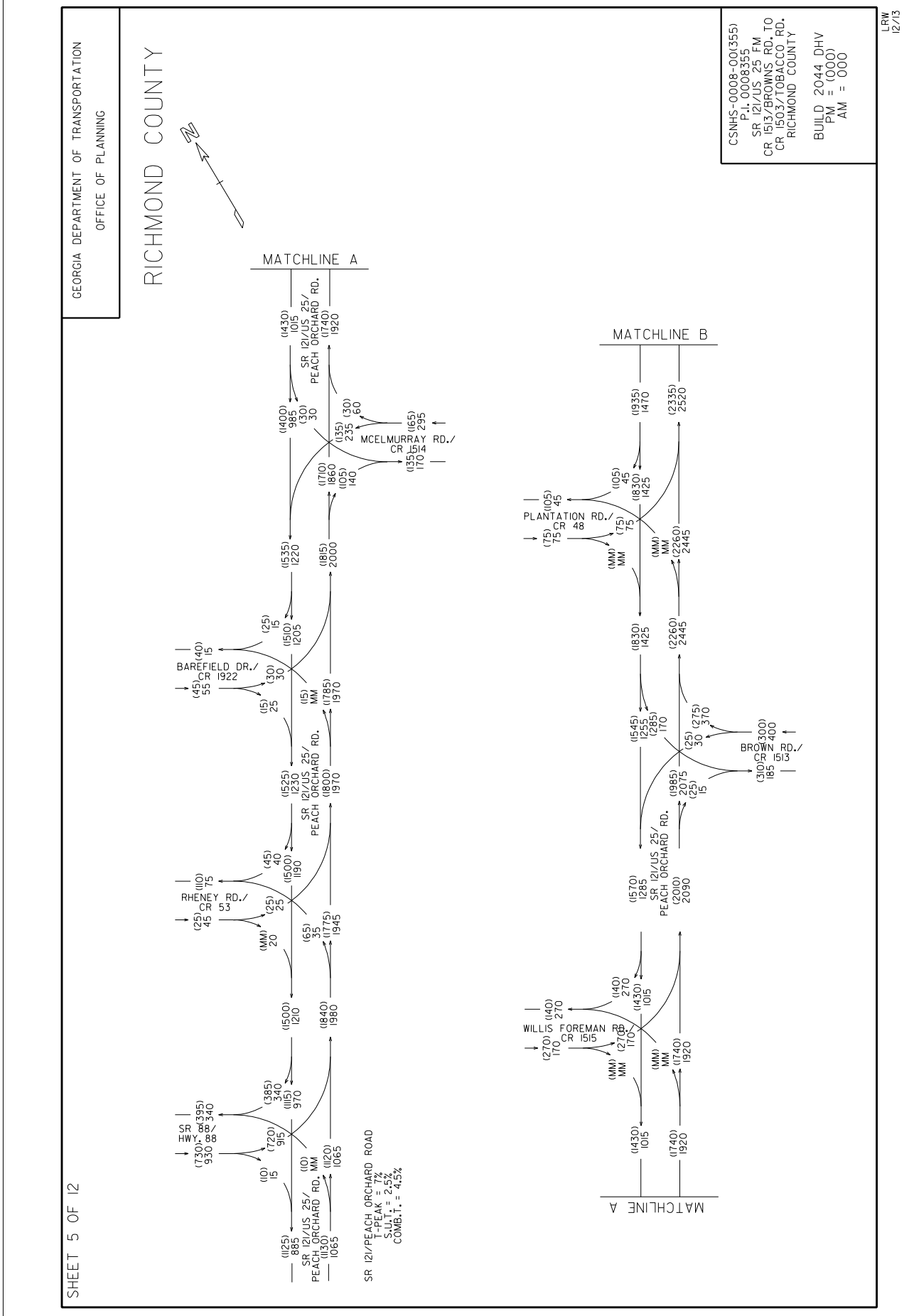
RICHMOND COUNTY
BUILD 2024 DHV
PM = (000)
AM = 000
LRW
12/13
RICHMOND COUNTY
N
SHEET 4 OF 12
MATCHLINE C
MATCHLINE B
MATCHLINE C
SR 121/PEACH ORCHARD ROAD
T-PEAK = 5.5%
S.U.T. = 4%
COMB.T. = 1.5%
TOBACCO RD./CR 1503
T.PEAK = 3.5%
S.U.T. = 3%
COMB.T. = 0.5%
TOBACCO RD./CR 1503
T-PEAK = 5.5%
S.U.T. = 4.5%
COMB.T. = 1%
SR 121/US 25/
PEACH ORCHARD RD.
BYRD RD./
CR 35
HENSLEY CT./
CR 916
BOYKIN RD./
CR 40
NELLIE RD./
CR 1437
TOBACCO RD./
CR 1503
CEMETERY RD./
CR 37
BYRD RD./
CR 36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SR 121/US 25 FM
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BUILD 2044 DHV
PM = (000)
AM = 000
LRW
12/13
MATCHLINE A
MATCHLINE B
SR 121/US 25/
PEACH ORCHARD RD.
MCELMURRAY RD./
CR 1514
BAREFIELD DR./
CR 1922
RHENEY RD./
CR 53
SR
HWY 88
PLANTATION RD./
CR 48
BROWN RD./
CR 1513
WILLIS FOREMAN RD./
CR 1515
SR 121/PEACH ORCHARD ROAD
K-PEAK = 7%
D.D.H. = 2.5%
COMB.T. = 4.5%

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RICHMOND COUNTY

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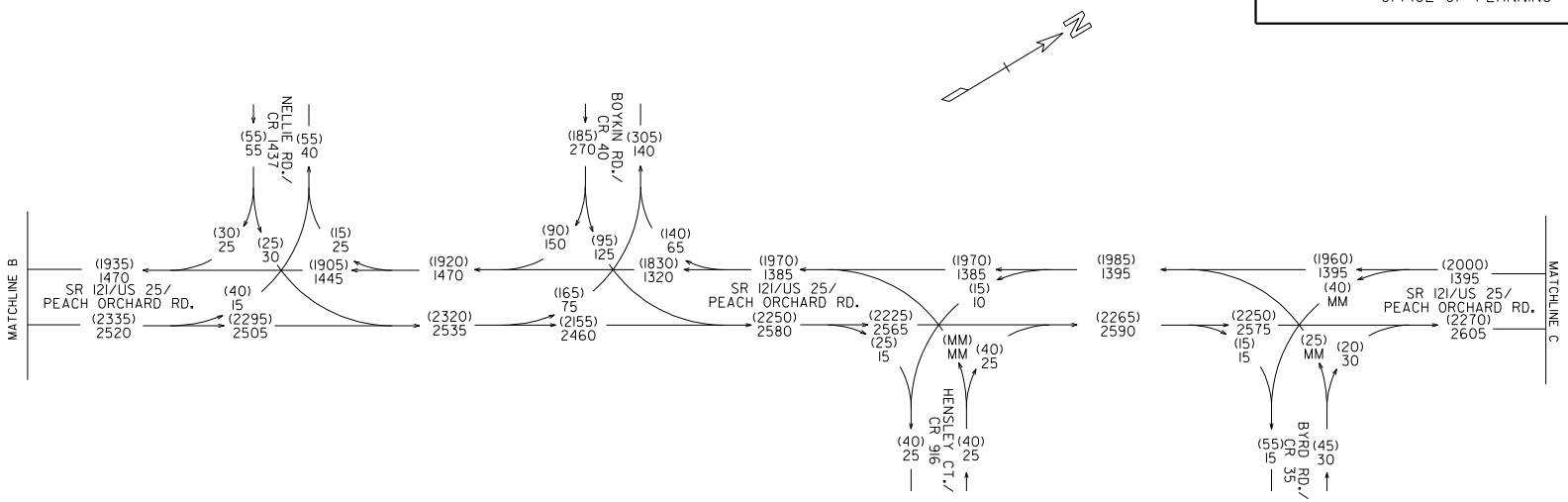

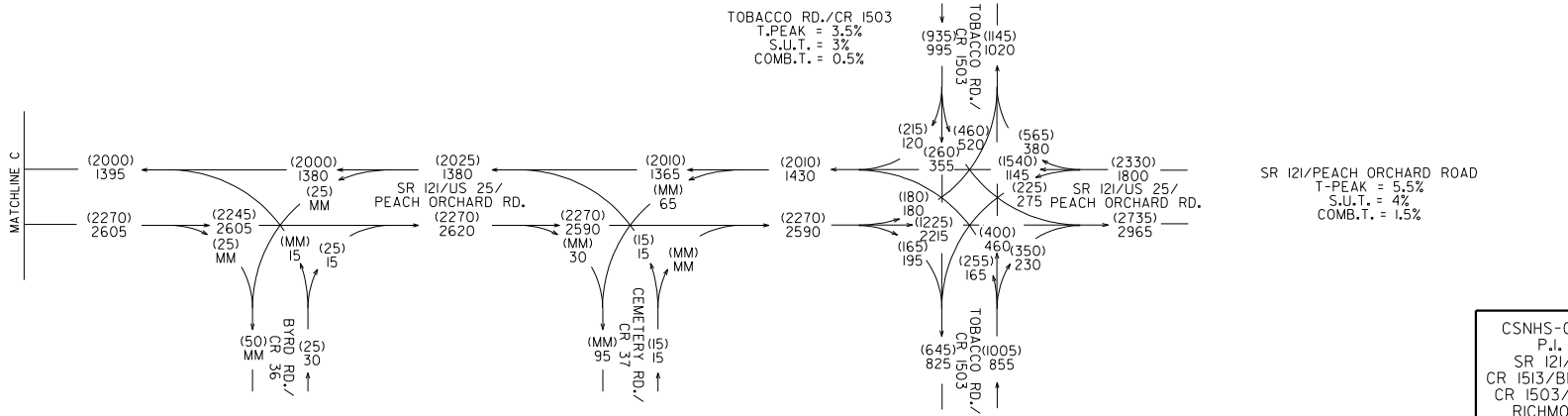

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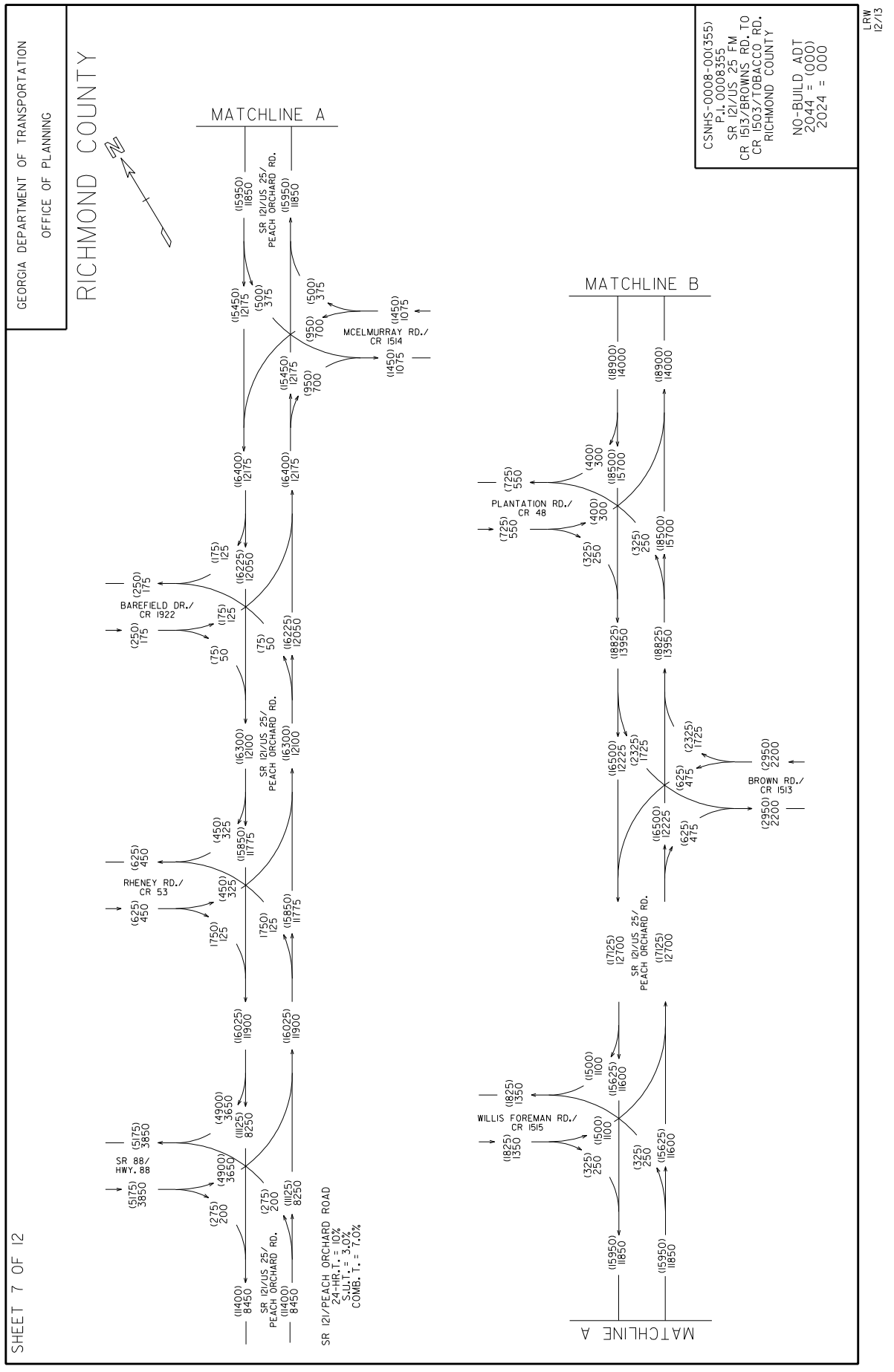
BUILD 2044 DHV
PM = (000)
AM = 000

LRW
12/13

Attachment 2 - Traffic Diagrams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NO-BUILD ADT
2044 = (000)
2024 = 000
LRW
12/13
MATCHLINE A
MATCHLINE B
MATCHLINE A
SR 88/
HWY. 88
SR 121/US 25/
PEACH ORCHARD RD.
RHENEY RD./
CR 53
BAREFIELD DR./
CR 1922
MCELMURRAY RD./
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CR 48
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CR 1515
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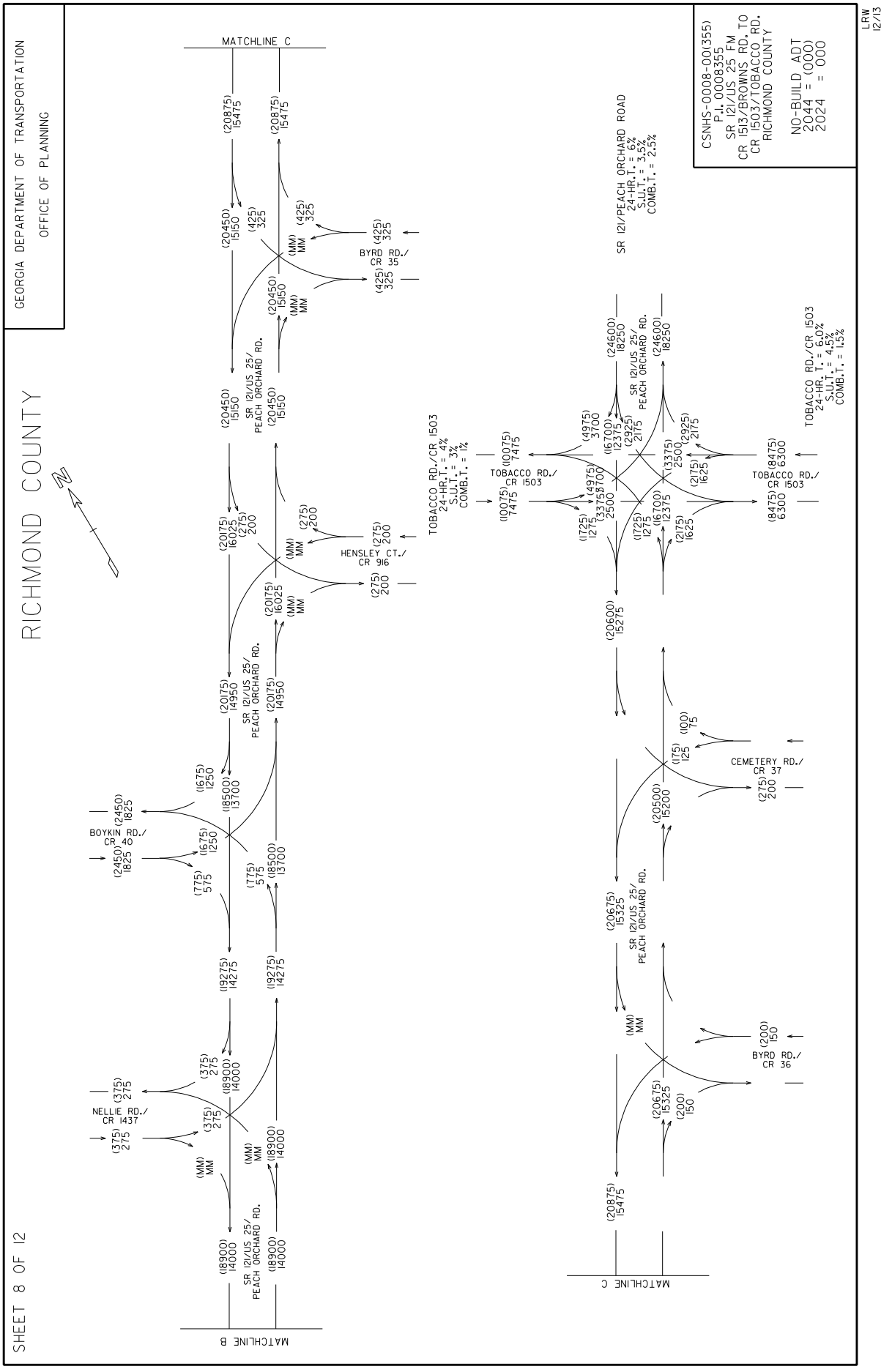
CR 1513
SR 121/PEACH ORCHARD ROAD
24-HR. T. = 10%
S.U.T. = 3.0%
COMB. T. = 7.0%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NO-BUILD ADT
2044 = (000)
2024 = 000
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SR 121/PEACH ORCHARD ROAD
24-HR.T. = 6%
S.U.T. = 3.5%
COMB.T. = 2.5%
TOBACCO RD./CR 1503
24-HR.T. = 4%
S.U.T. = 3%
COMB.T. = 1%
TOBACCO RD./CR 1503
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CR 36
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CR 37
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CR 1503

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GEORGIA DEPARTMENT OF TRANSPORTATION
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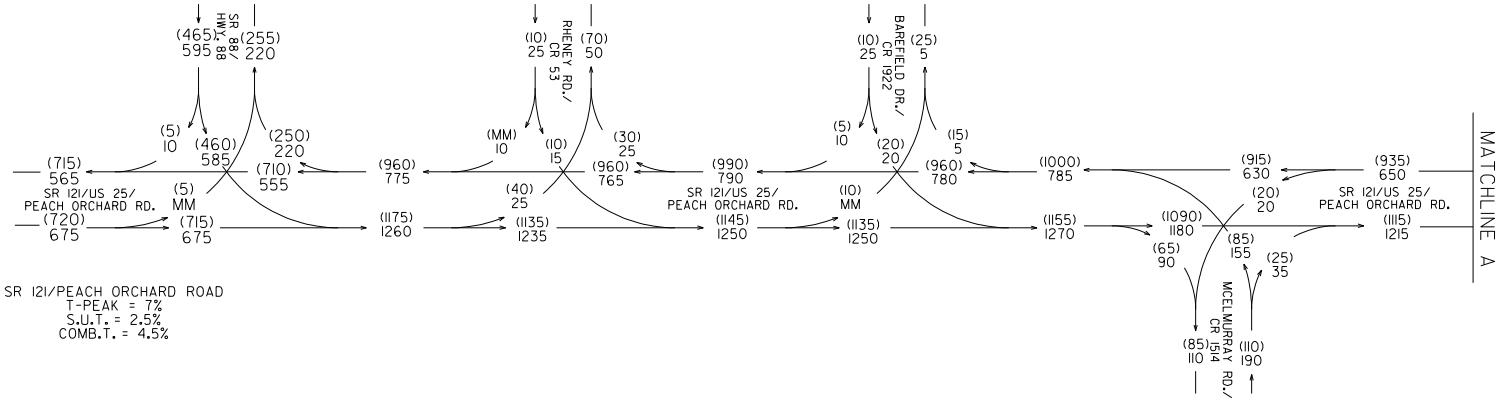
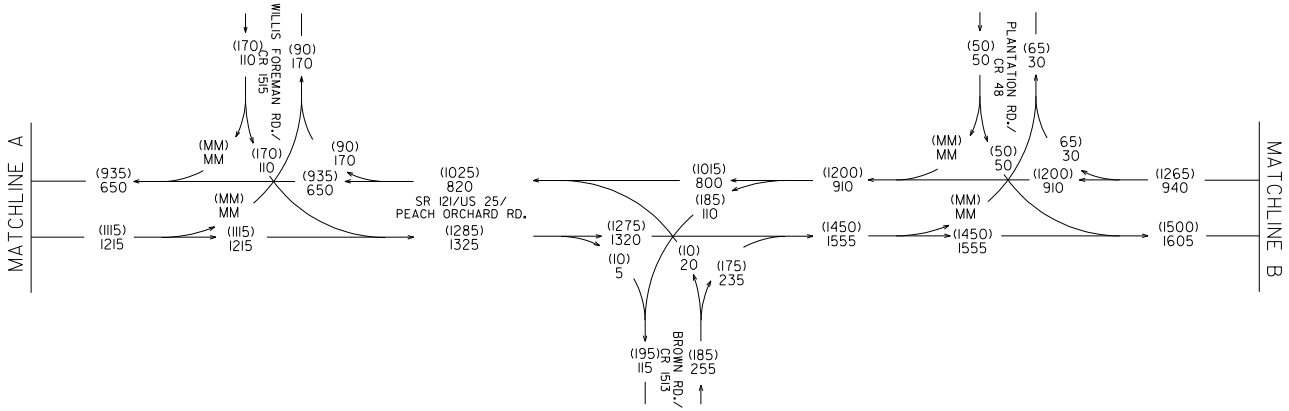
RICHMOND COUNTY





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NO-BUILD 2024 DHV
PM = (000)
AM = 000

LRW
12/13

Attachment 2 - Traffic Diagrams

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RICHMOND COUNTY

GEORGIA DEPARTMENT OF TRANSPORTATION
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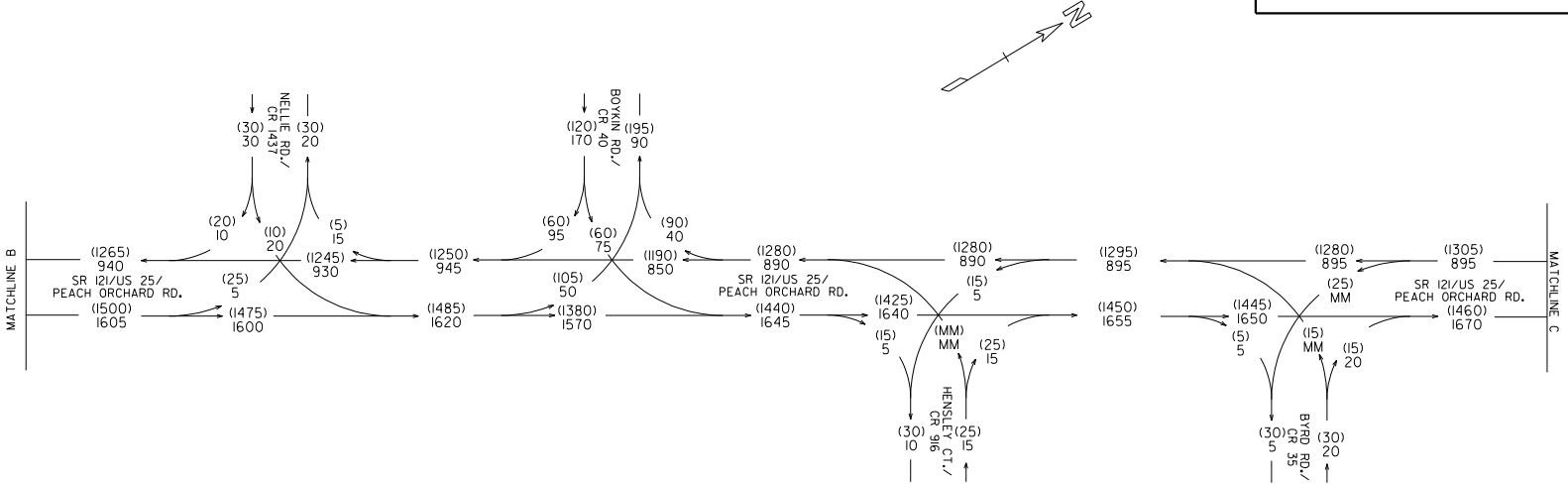
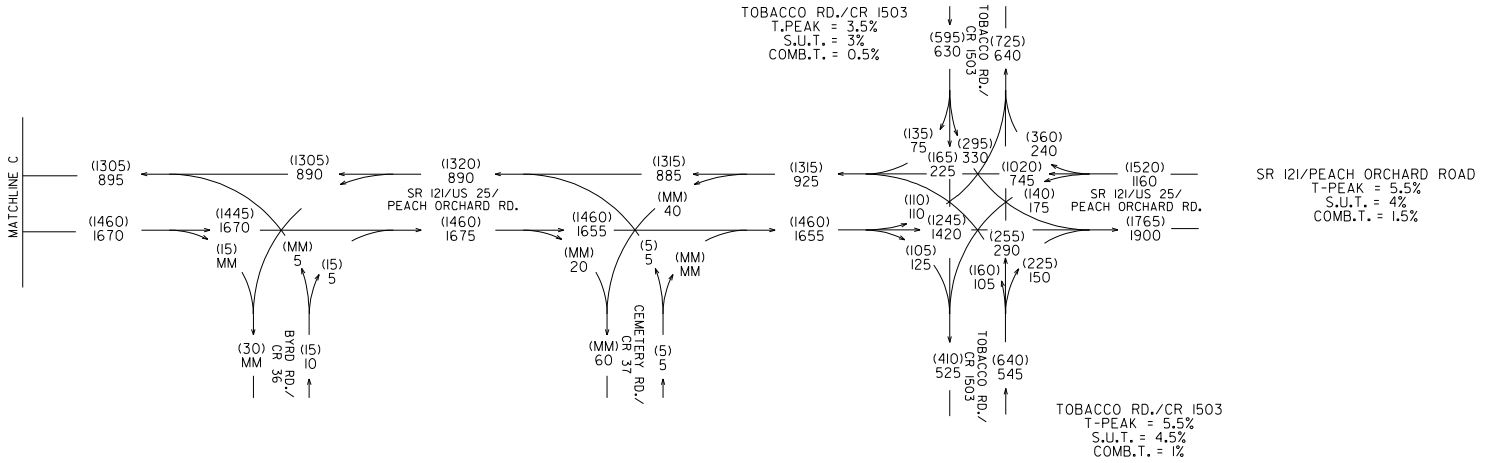




SR 121/PEACH ORCHARD ROAD
T-PEAK = 5.5%
S.U.T. = 4%
COMB.T. = 1.5%

TOBACCO RD./CR 1503
T-PEAK = 5.5%
S.U.T. = 4.5%
COMB.T. = 1%

CSNHS-0008-00(355)
P.I. 0008355
SR 121/US 25 FM
CR 1513/BROWNS RD. TO
CR 1503/TOBACCO RD.
RICHMOND COUNTY

NO-BUILD 2024 DHV
PM = (000)
AM = 000

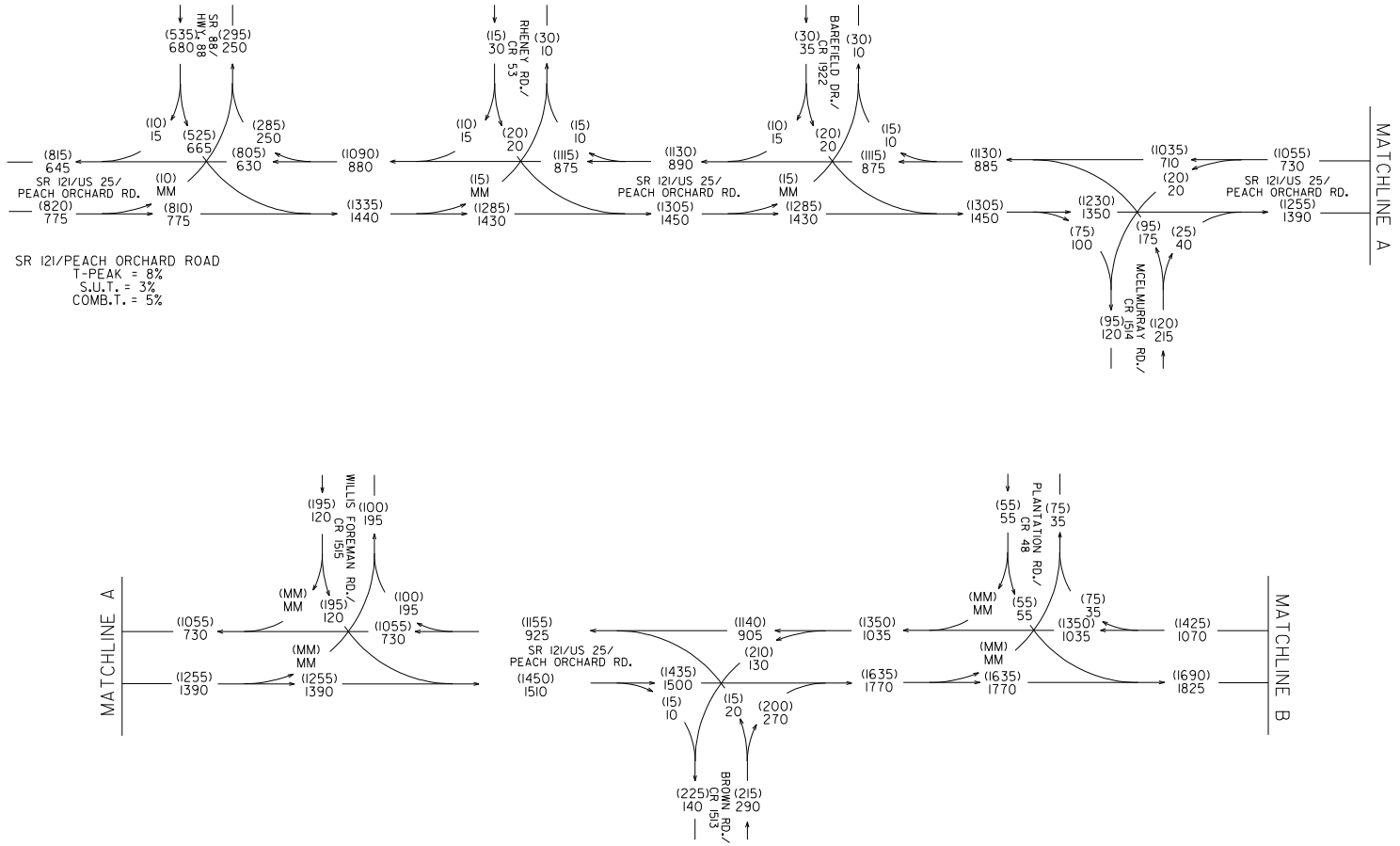
LRW
12/13

Attachment 2 - Traffic Diagrams

SHEET 11 OF 12

GEORGIA DEPARTMENT OF TRANSPORTATION
OFFICE OF PLANNING

RICHMOND COUNTY



CSNHS-0008-00(355)
P.I. 0008355
SR 121/US 25 FM
CR 1513/BROWNS RD. TO
CR 1503/TOBACCO RD.
RICHMOND COUNTY

NO-BUILD 2044 DHV
PM = (000)
AM = 000

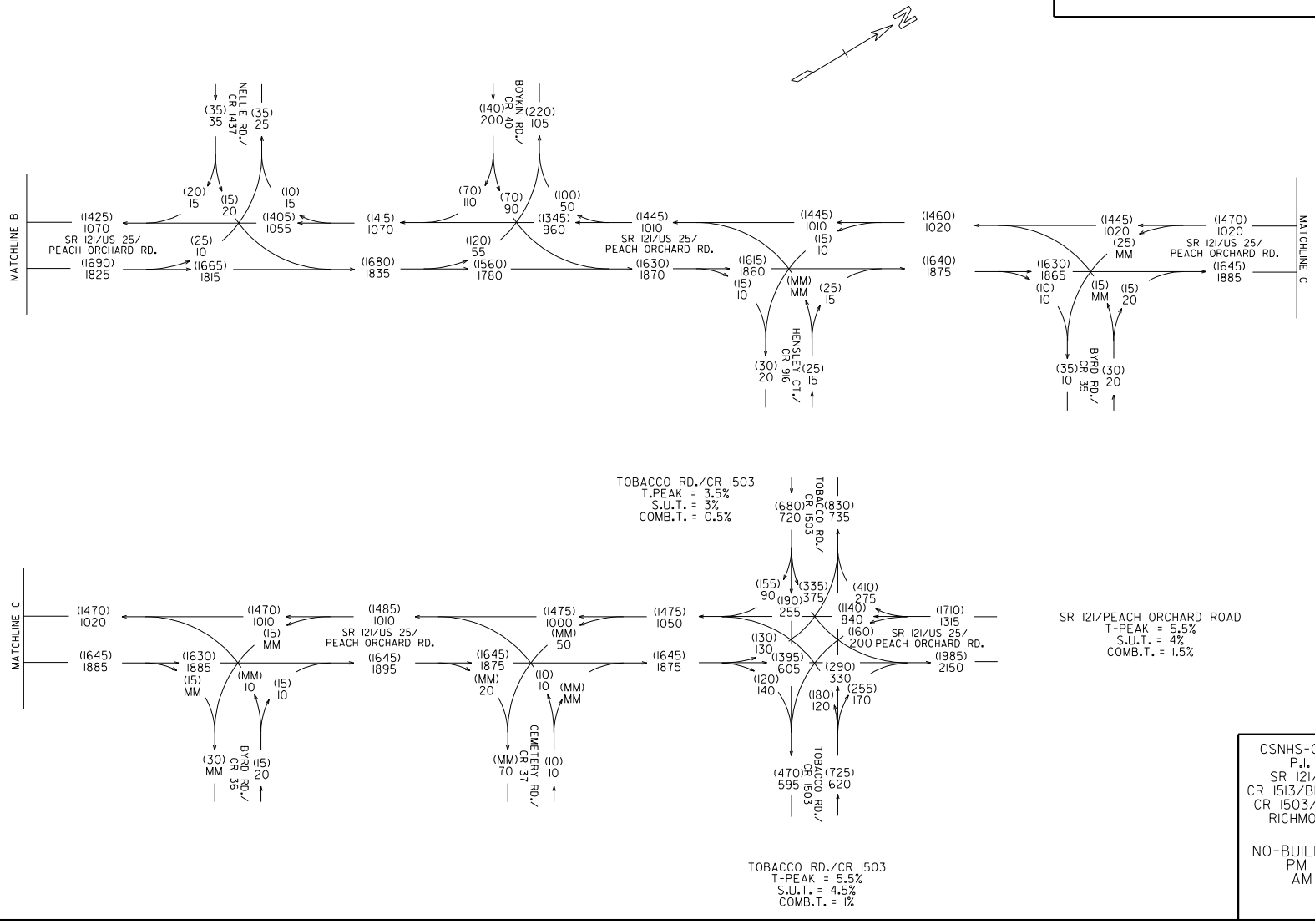
LRW
12/13

Attachment 2 - Traffic Diagrams

SHEET 12 OF 12

RICHMOND COUNTY

GEORGIA DEPARTMENT OF TRANSPORTATION
OFFICE OF PLANNING



CSNHS-0008-00(355)
P.I. 0008355
SR 121/US 25 FM
CR 1513/BROWNS RD. TO
CR 1503/TOBACCO RD.
RICHMOND COUNTY

NO-BUILD 2044 DHV
PM = (000)
AM = 000

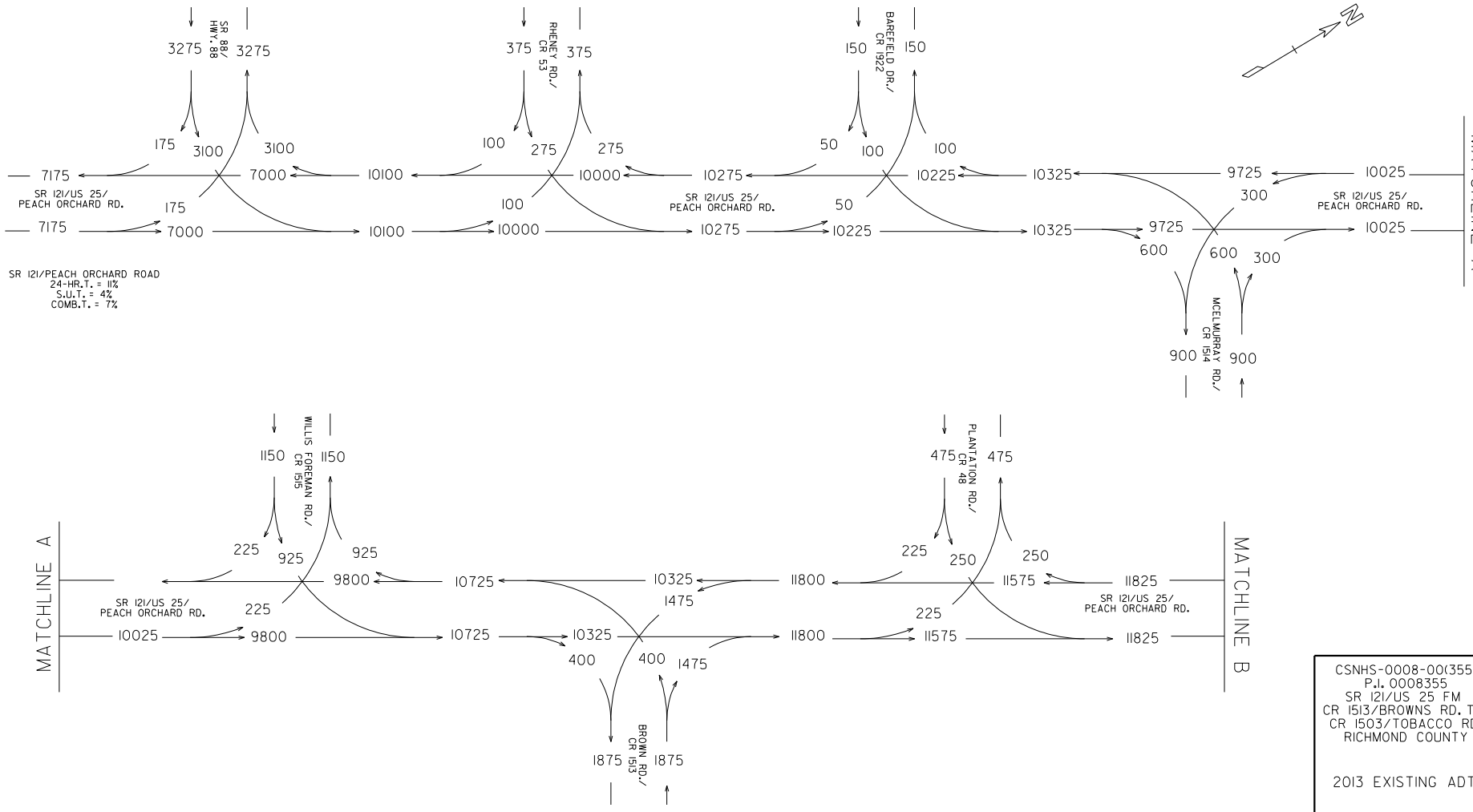
LRW
12/13

Attachment 2 - Traffic Diagrams

SHEET 1 OF 4

GEORGIA DEPARTMENT OF TRANSPORTATION
OFFICE OF PLANNING

RICHMOND COUNTY



SR 121/PEACH ORCHARD ROAD
24-HR.T. = 11%
S.U.T. = 4%
COMB.T. = 7%

CSNHS-0008-00(355)
P.I. 0008355
SR 121/US 25 FM
CR 1513/BROWNS RD. TO
CR 1503/TOBACCO RD.
RICHMOND COUNTY

2013 EXISTING ADT

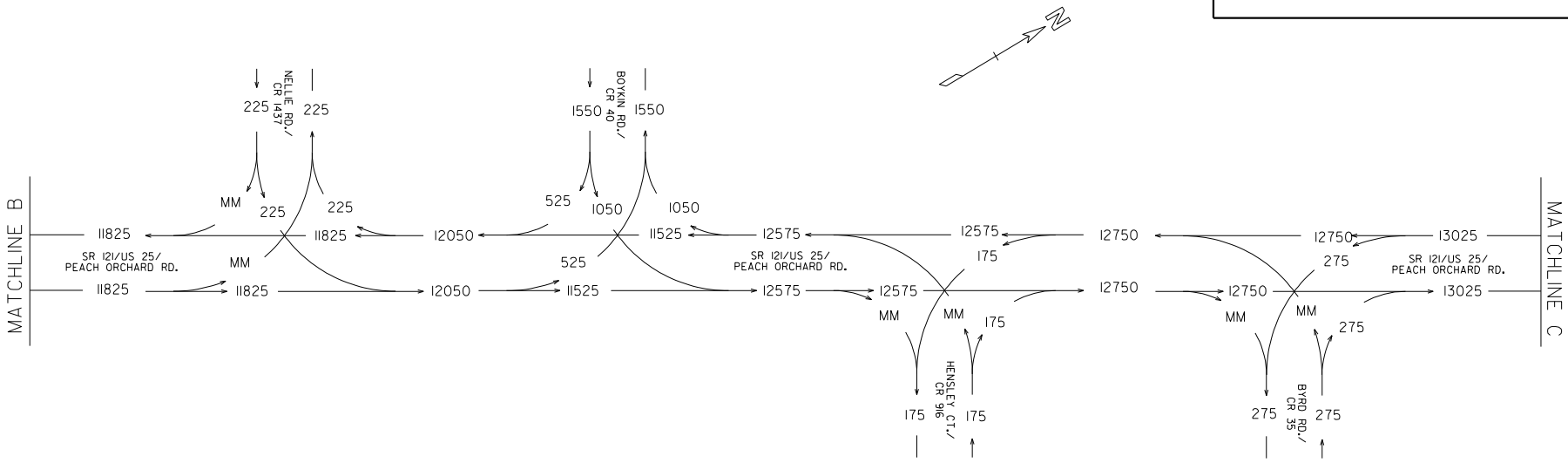
LRW
12/13

Attachment 2 - Traffic Diagrams

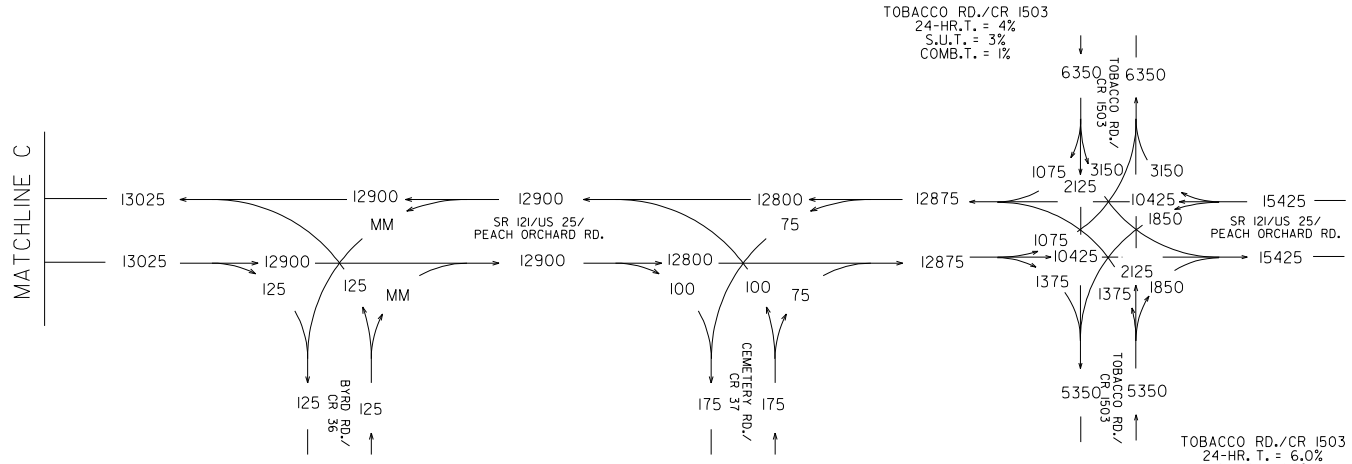
SHEET 2 OF 4

RICHMOND COUNTY

GEORGIA DEPARTMENT OF TRANSPORTATION
OFFICE OF PLANNING



TOBACCO RD./CR 1503
24-HR.T. = 4%
S.U.T. = 3%
COMB.T. = 1%



SR 121/PEACH ORCHARD ROAD
24-HR.T. = 6%
S.U.T. = 3.5%
COMB.T. = 2.5%

TOBACCO RD./CR 1503
24-HR. T. = 6.0%
S.U.T. = 4.5%
COMB.T. = 1.5%

CSNHS-0008-00(355)
P.I. 0008355
SR 121/US 25 FM
CR 1513/BROWNS RD. TO
CR 1503/TOBACCO RD.
RICHMOND COUNTY

2013 EXISTING ADT

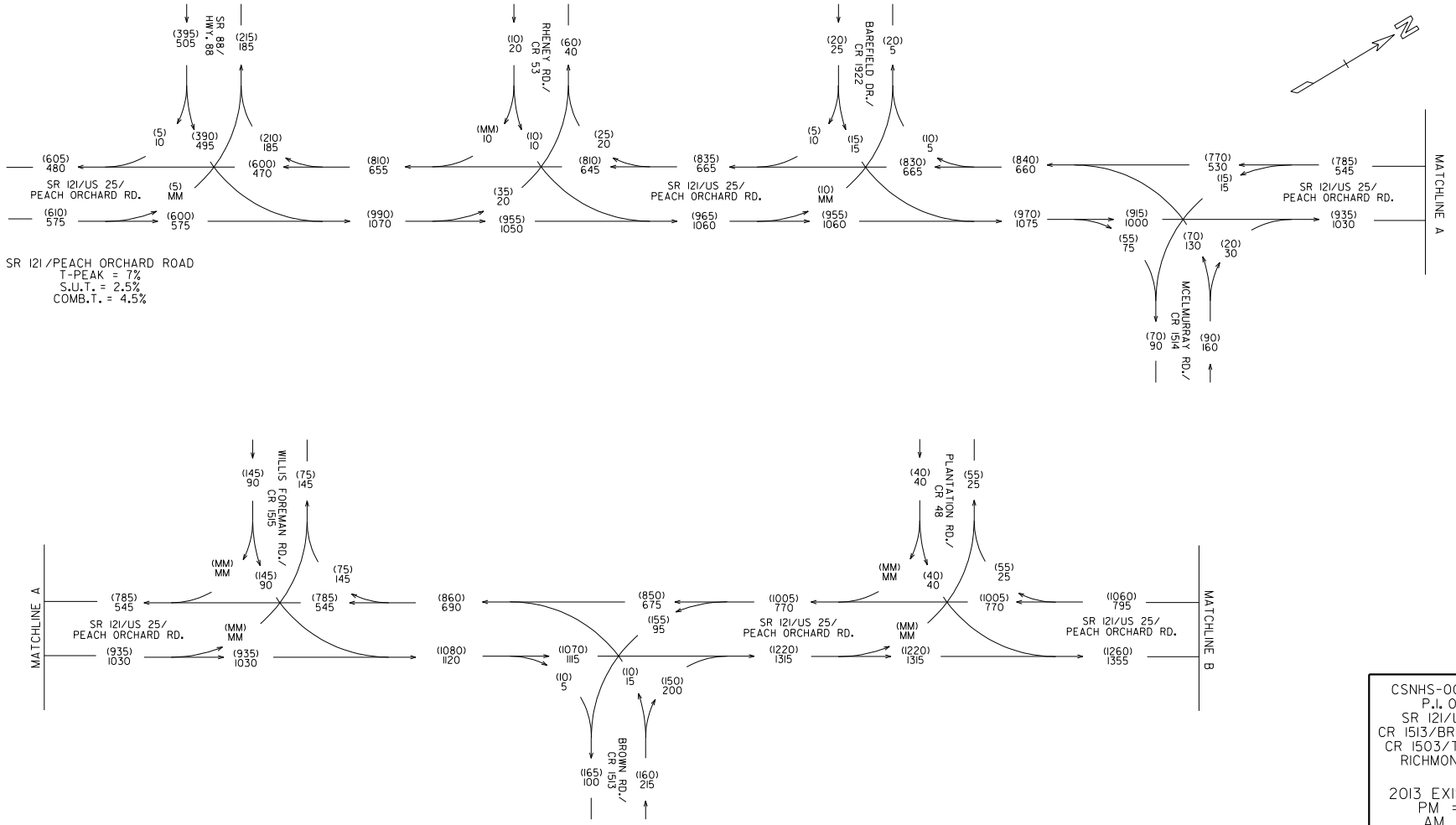
LRW
12/13

Attachment 2 - Traffic Diagrams

SHEET 3 OF 4

GEORGIA DEPARTMENT OF TRANSPORTATION
OFFICE OF PLANNING

RICHMOND COUNTY

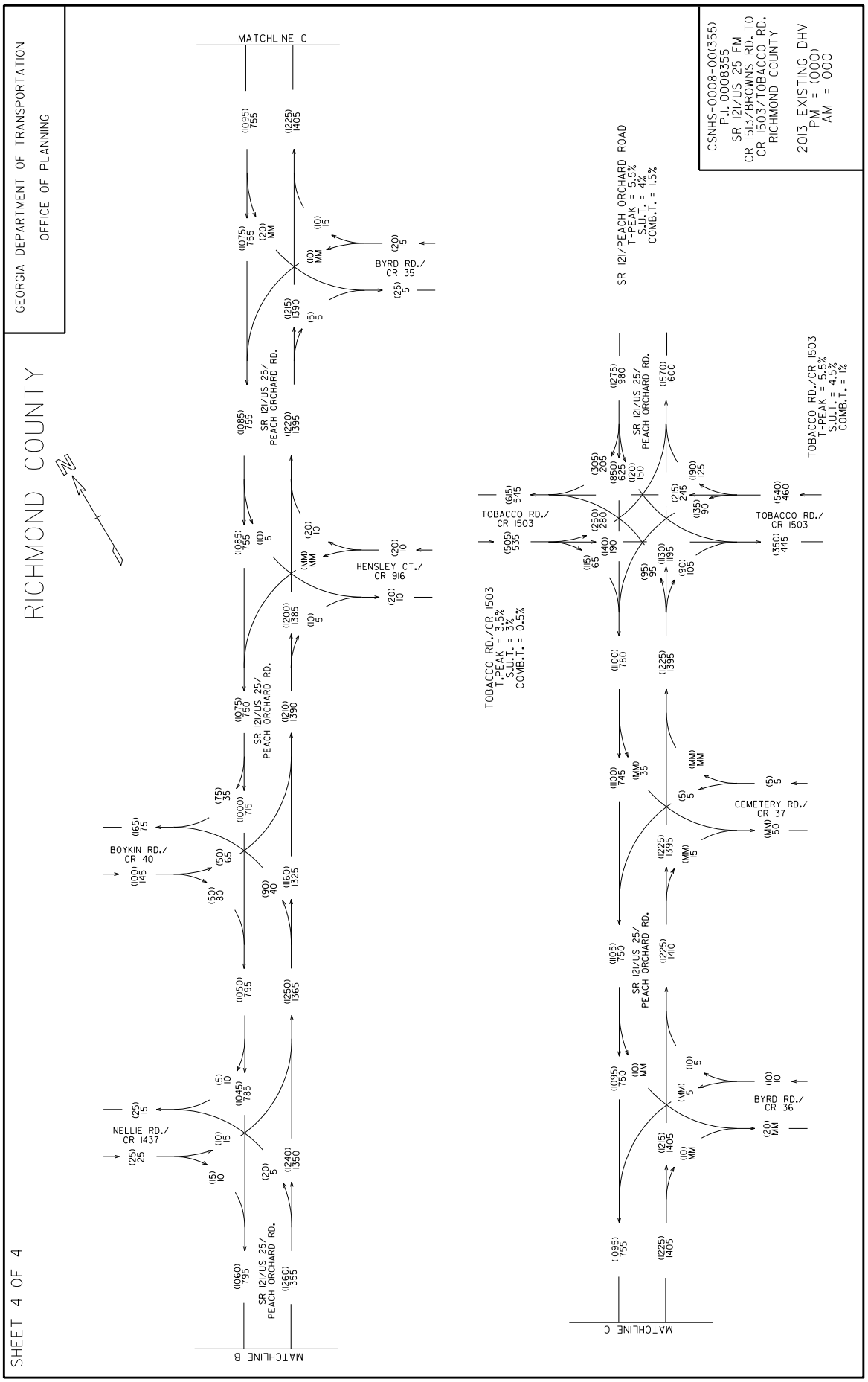


CSNHS-0008-00(355)
P.I. 0008355
SR 121/US 25 FM
CR 1513/BROWNS RD. TO
CR 1503/TOBACCO RD.
RICHMOND COUNTY

2013 EXISTING DHV
PM = (000)
AM = 000

LRW
12/13

Attachment 2 - Traffic Diagrams


GEORGIA DEPARTMENT OF TRANSPORTATION
OFFICE OF PLANNING
CSNHS-0008-00(355)
P.I. 0008355
SR 121/US 25 FM
CR 1513/BROWNS RD. TO
CR 1503/TOBACCO RD.
RICHMOND COUNTY
2013 EXISTING DHV
PM = (000)
AM = 000
LRW
12/13
SHEET 4 OF 4
RICHMOND COUNTY
N
MATCHLINE C
MATCHLINE B
SR 121/US 25/
PEACH ORCHARD RD.
SR 121/PEACH ORCHARD ROAD
T-PEAK = 5.5%
S.U.T. = 4%
COMB.T. = 1.5%
BOYKIN RD./
CR 40
NELLIE RD./
CR 1437
HENSLEY CT./
CR 916
BYRD RD./
CR 35
BYRD RD./
CR 36
CEMETERY RD./
CR 37
TOBACCO RD./
CR 1503
TOBACCO RD./CR 1503
T-PEAK = 3.5%
S.U.T. = 3%
COMB.T. = 0.5%
TOBACCO RD./CR 1503
T-PEAK = 5.5%
S.U.T. = 4.5%
COMB.T. = 1%

Lanes, Volumes, Timings
7: SR 121/US 25 & TOBACCO ROAD

10/8/2015

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	250	140	115	135	215	190	95	1130	90	120	850	305
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.606			0.656			0.175			0.160		
Satd. Flow (perm)	1129	3539	1583	1222	3539	1583	326	3539	1583	298	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			151			169			151			332
Link Speed (mph)		30			30			55			55	
Link Distance (ft)		3322			3720			6811			2986	
Travel Time (s)		75.5			84.5			84.4			37.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	272	152	125	147	234	207	103	1228	98	130	924	332
Shared Lane Traffic (%)												
Lane Group Flow (vph)	272	152	125	147	234	207	103	1228	98	130	924	332
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	8.0	20.0	20.0	8.0	20.0	20.0	8.0	29.0	29.0	8.0	29.0	29.0
Total Split (%)	12.3%	30.8%	30.8%	12.3%	30.8%	30.8%	12.3%	44.6%	44.6%	12.3%	44.6%	44.6%
Maximum Green (s)	4.0	16.0	16.0	4.0	16.0	16.0	4.0	25.0	25.0	4.0	25.0	25.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Walk Time (s)		5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	20.0	16.0	16.0	20.0	16.0	16.0	29.0	25.0	25.0	29.0	25.0	25.0
Actuated g/C Ratio	0.31	0.25	0.25	0.31	0.25	0.25	0.45	0.38	0.38	0.45	0.38	0.38
v/c Ratio	0.70	0.17	0.25	0.36	0.27	0.40	0.44	0.90	0.14	0.58	0.68	0.41
Control Delay	29.8	20.0	4.3	17.9	20.8	8.4	14.8	30.1	1.5	21.4	19.8	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.8	20.0	4.3	17.9	20.8	8.4	14.8	30.1	1.5	21.4	19.8	3.6
LOS	C	B	A	B	C	A	B	C	A	C	B	A

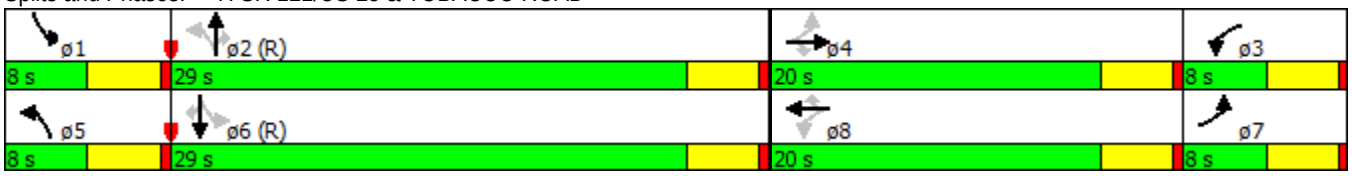
Lanes, Volumes, Timings
7: SR 121/US 25 & TOBACCO ROAD

10/8/2015

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		21.2			15.7			27.1			16.0	
Approach LOS		C			B			C			B	
Stops (vph)	188	104	14	94	165	47	49	962	5	62	673	32
Fuel Used(gal)	9	5	3	5	8	6	5	74	4	4	32	7
CO Emissions (g/hr)	631	333	221	344	563	426	370	5142	280	276	2237	460
NOx Emissions (g/hr)	123	65	43	67	110	83	72	1000	54	54	435	90
VOC Emissions (g/hr)	146	77	51	80	131	99	86	1192	65	64	518	107
Dilemma Vehicles (#)	0	0	0	0	0	0	0	84	0	0	65	0
Queue Length 50th (ft)	78	24	0	39	39	12	20	233	0	25	155	0
Queue Length 95th (ft)	#157	46	27	76	66	59	42	#361	11	#59	216	44
Internal Link Dist (ft)		3242			3640			6731			2906	
Turn Bay Length (ft)												
Base Capacity (vph)	386	871	503	409	871	517	234	1361	701	223	1361	813
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.17	0.25	0.36	0.27	0.40	0.44	0.90	0.14	0.58	0.68	0.41

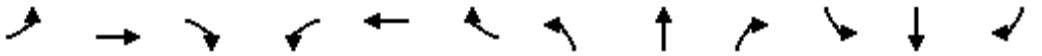
Intersection Summary			
Area Type:	Other		
Cycle Length: 65			
Actuated Cycle Length: 65			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 20.7		Intersection LOS: C	
Intersection Capacity Utilization 71.0%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 7: SR 121/US 25 & TOBACCO ROAD



Lanes, Volumes, Timings
7: TOBACCO ROAD

10/8/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	295	165	135	160	255	225	110	1245	105	140	1020	360
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.521			0.639			0.138			0.138		
Satd. Flow (perm)	970	3539	1583	1190	3539	1583	257	3539	1583	257	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			147			143			140			379
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3322			3720			3298			2986	
Travel Time (s)		75.5			84.5			75.0			67.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	321	179	147	174	277	245	120	1353	114	152	1109	391
Shared Lane Traffic (%)												
Lane Group Flow (vph)	321	179	147	174	277	245	120	1353	114	152	1109	391
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	9.0	21.0	21.0	8.0	20.0	20.0	8.0	33.0	33.0	8.0	33.0	33.0
Total Split (%)	12.9%	30.0%	30.0%	11.4%	28.6%	28.6%	11.4%	47.1%	47.1%	11.4%	47.1%	47.1%
Maximum Green (s)	5.0	17.0	17.0	4.0	16.0	16.0	4.0	29.0	29.0	4.0	29.0	29.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Walk Time (s)		5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	22.0	17.0	17.0	20.0	16.0	16.0	33.0	29.0	29.0	33.0	29.0	29.0
Actuated g/C Ratio	0.31	0.24	0.24	0.29	0.23	0.23	0.47	0.41	0.41	0.47	0.41	0.41
v/c Ratio	0.89	0.21	0.30	0.47	0.34	0.52	0.58	0.92	0.15	0.73	0.76	0.45
Control Delay	49.6	21.9	6.1	22.4	24.0	14.8	21.8	31.9	2.3	33.8	21.6	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.6	21.9	6.1	22.4	24.0	14.8	21.8	31.9	2.3	33.8	21.6	3.7
LOS	D	C	A	C	C	B	C	C	A	C	C	A

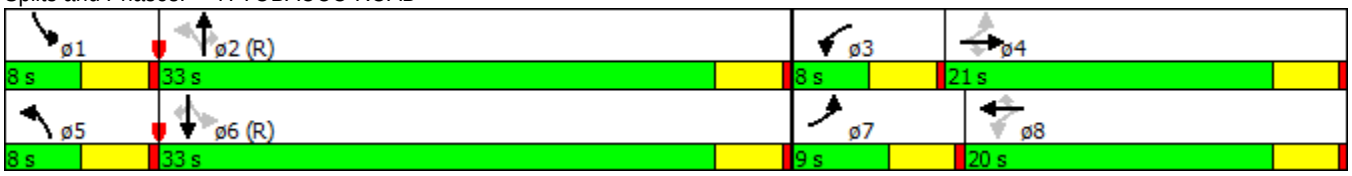
Lanes, Volumes, Timings
7: TOBACCO ROAD

10/8/2015

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		32.1			20.4			29.0			18.5	
Approach LOS		C			C			C			B	
Stops (vph)	233	125	23	135	204	91	55	1057	9	67	831	38
Fuel Used(gal)	12	6	4	6	10	8	4	46	3	5	33	9
CO Emissions (g/hr)	833	399	265	428	683	539	253	3211	196	321	2294	619
NOx Emissions (g/hr)	162	78	52	83	133	105	49	625	38	62	446	121
VOC Emissions (g/hr)	193	92	61	99	158	125	59	744	45	74	532	144
Dilemma Vehicles (#)	0	0	0	0	0	0	0	0	0	0	0	0
Queue Length 50th (ft)	106	32	0	52	52	36	24	280	0	31	206	3
Queue Length 95th (ft)	#246	56	40	97	84	100	#56	#422	19	#87	280	50
Internal Link Dist (ft)		3242			3640			3218			2906	
Turn Bay Length (ft)												
Base Capacity (vph)	362	859	495	373	808	472	207	1466	737	207	1466	877
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.21	0.30	0.47	0.34	0.52	0.58	0.92	0.15	0.73	0.76	0.45

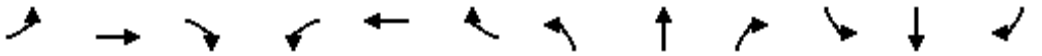
Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Pretimed			
Maximum v/c Ratio: 0.92			
Intersection Signal Delay: 24.3		Intersection LOS: C	
Intersection Capacity Utilization 78.9%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 7: TOBACCO ROAD



Lanes, Volumes, Timings
7: TOBACCO ROAD

10/8/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	335	190	155	180	290	255	130	1395	120	160	1140	410
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.389			0.622			0.100			0.100		
Satd. Flow (perm)	725	3539	1583	1159	3539	1583	186	3539	1583	186	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			168			145			129			433
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3322			3720			3298			2986	
Travel Time (s)		75.5			84.5			75.0			67.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	364	207	168	196	315	277	141	1516	130	174	1239	446
Shared Lane Traffic (%)												
Lane Group Flow (vph)	364	207	168	196	315	277	141	1516	130	174	1239	446
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	16.0	22.0	22.0	14.0	20.0	20.0	10.0	44.0	44.0	10.0	44.0	44.0
Total Split (%)	17.8%	24.4%	24.4%	15.6%	22.2%	22.2%	11.1%	48.9%	48.9%	11.1%	48.9%	48.9%
Maximum Green (s)	12.0	18.0	18.0	10.0	16.0	16.0	6.0	40.0	40.0	6.0	40.0	40.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Walk Time (s)		5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	30.0	18.0	18.0	26.0	16.0	16.0	46.0	40.0	40.0	46.0	40.0	40.0
Actuated g/C Ratio	0.33	0.20	0.20	0.29	0.18	0.18	0.51	0.44	0.44	0.51	0.44	0.44
v/c Ratio	0.96	0.29	0.37	0.49	0.50	0.69	0.70	0.96	0.17	0.87	0.79	0.47
Control Delay	64.0	31.9	7.8	26.2	36.6	26.5	33.8	41.0	3.5	55.6	25.9	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.0	31.9	7.8	26.2	36.6	26.5	33.8	41.0	3.5	55.6	25.9	3.7
LOS	E	C	A	C	D	C	C	D	A	E	C	A

Lanes, Volumes, Timings
7: TOBACCO ROAD

10/8/2015

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		42.2			30.5			37.7			23.3	
Approach LOS		D			C			D			C	
Stops (vph)	244	157	23	139	254	117	62	1205	14	75	939	35
Fuel Used(gal)	14	7	4	7	12	9	5	54	3	6	38	10
CO Emissions (g/hr)	1006	491	307	486	837	658	320	3787	227	416	2638	702
NOx Emissions (g/hr)	196	96	60	95	163	128	62	737	44	81	513	137
VOC Emissions (g/hr)	233	114	71	113	194	153	74	878	53	96	611	163
Dilemma Vehicles (#)	0	0	0	0	0	0	0	0	0	0	0	0
Queue Length 50th (ft)	166	53	0	80	85	68	36	426	0	47	306	4
Queue Length 95th (ft)	#287	85	52	135	127	#161	#115	#593	31	#165	393	57
Internal Link Dist (ft)		3242			3640			3218			2906	
Turn Bay Length (ft)												
Base Capacity (vph)	381	707	451	402	629	400	200	1572	775	200	1572	944
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.29	0.37	0.49	0.50	0.69	0.70	0.96	0.17	0.87	0.79	0.47

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Pretimed			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 32.1		Intersection LOS: C	
Intersection Capacity Utilization 87.3%		ICU Level of Service E	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: TOBACCO ROAD

Lanes, Volumes, Timings
7: TOBACCO ROAD

10/8/2015

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	310	175	145	170	270	235	120	1300	110	150	1050	380
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.501			0.632			0.114			0.118		
Satd. Flow (perm)	933	3539	1583	1177	3539	1583	212	3539	1583	220	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			158			129			123			413
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3322			3720			3298			2986	
Travel Time (s)		75.5			84.5			75.0			67.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	337	190	158	185	293	255	130	1413	120	163	1141	413
Shared Lane Traffic (%)												
Lane Group Flow (vph)	337	190	158	185	293	255	130	1413	120	163	1141	413
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	13.0	20.0	20.0	13.0	20.0	20.0	9.0	39.0	39.0	8.0	38.0	38.0
Total Split (%)	16.3%	25.0%	25.0%	16.3%	25.0%	25.0%	11.3%	48.8%	48.8%	10.0%	47.5%	47.5%
Maximum Green (s)	9.0	16.0	16.0	9.0	16.0	16.0	5.0	35.0	35.0	4.0	34.0	34.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Walk Time (s)		5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	25.0	16.0	16.0	25.0	16.0	16.0	40.0	35.0	35.0	38.0	34.0	34.0
Actuated g/C Ratio	0.31	0.20	0.20	0.31	0.20	0.20	0.50	0.44	0.44	0.48	0.42	0.42
v/c Ratio	0.88	0.27	0.36	0.43	0.41	0.61	0.64	0.91	0.16	0.90	0.76	0.45
Control Delay	47.8	28.3	7.5	21.9	30.0	21.3	26.5	31.8	3.3	61.5	23.6	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.8	28.3	7.5	21.9	30.0	21.3	26.5	31.8	3.3	61.5	23.6	3.4
LOS	D	C	A	C	C	C	C	C	A	E	C	A

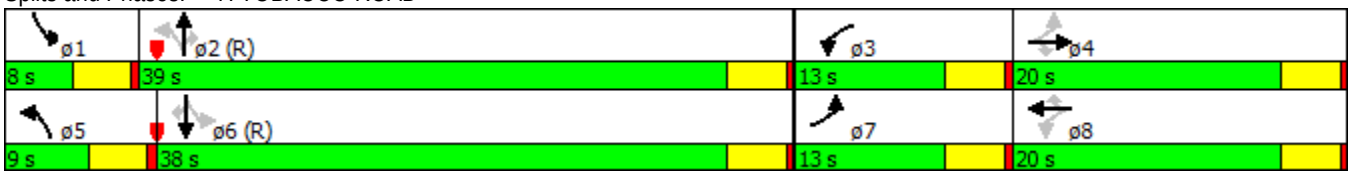
Lanes, Volumes, Timings
7: TOBACCO ROAD

10/8/2015

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		33.1			24.9			29.3			22.3	
Approach LOS		C			C			C			C	
Stops (vph)	246	143	24	123	228	110	56	1114	13	69	855	32
Fuel Used(gal)	12	6	4	6	11	8	4	48	3	6	34	9
CO Emissions (g/hr)	867	442	287	445	751	590	283	3355	208	402	2391	649
NOx Emissions (g/hr)	169	86	56	87	146	115	55	653	40	78	465	126
VOC Emissions (g/hr)	201	103	67	103	174	137	65	778	48	93	554	150
Dilemma Vehicles (#)	0	0	0	0	0	0	0	0	0	0	0	0
Queue Length 50th (ft)	130	42	0	65	67	55	30	335	0	39	246	0
Queue Length 95th (ft)	#207	71	47	114	104	131	#85	#484	27	#121	324	50
Internal Link Dist (ft)		3242			3640			3218			2906	
Turn Bay Length (ft)												
Base Capacity (vph)	385	707	443	434	707	419	203	1548	761	182	1504	910
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.27	0.36	0.43	0.41	0.61	0.64	0.91	0.16	0.90	0.76	0.45

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Pretimed			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 26.7		Intersection LOS: C	
Intersection Capacity Utilization 82.2%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 7: TOBACCO ROAD



Lanes, Volumes, Timings
7: TOBACCO ROAD

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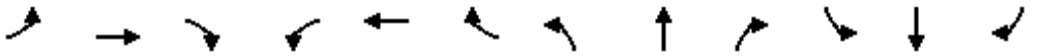


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	460	260	215	255	400	350	180	1225	165	225	1540	565
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	5085	1583	1770	5085	1583
Flt Permitted	0.356			0.578			0.174			0.148		
Satd. Flow (perm)	663	3539	1583	1077	3539	1583	324	5085	1583	276	5085	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			196			171			179			293
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3322			3720			3298			2986	
Travel Time (s)		75.5			84.5			75.0			67.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	500	283	234	277	435	380	196	1332	179	245	1674	614
Shared Lane Traffic (%)												
Lane Group Flow (vph)	500	283	234	277	435	380	196	1332	179	245	1674	614
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	10.0	21.0	21.0	9.0	20.0	20.0	9.0	27.0	27.0	13.0	31.0	31.0
Total Split (%)	14.3%	30.0%	30.0%	12.9%	28.6%	28.6%	12.9%	38.6%	38.6%	18.6%	44.3%	44.3%
Maximum Green (s)	6.0	17.0	17.0	5.0	16.0	16.0	5.0	23.0	23.0	9.0	27.0	27.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Walk Time (s)		5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	23.0	17.0	17.0	21.0	16.0	16.0	28.0	23.0	23.0	36.0	27.0	27.0
Actuated g/C Ratio	0.33	0.24	0.24	0.30	0.23	0.23	0.40	0.33	0.33	0.51	0.39	0.39
v/c Ratio	1.60	0.33	0.44	0.74	0.54	0.77	0.84	0.80	0.28	0.73	0.85	0.78
Control Delay	307.5	23.1	8.6	33.8	26.6	26.3	46.0	25.7	4.4	26.8	25.3	18.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	307.5	23.1	8.6	33.8	26.6	26.3	46.0	25.7	4.4	26.8	25.3	18.0
LOS	F	C	A	C	C	C	D	C	A	C	C	B

Lanes, Volumes, Timings
7: TOBACCO ROAD

10/8/2015

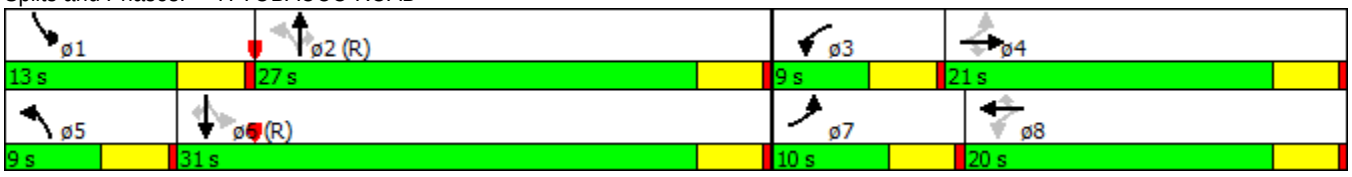
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		159.6			28.3			25.8			23.6	
Approach LOS		F			C			C			C	
Stops (vph)	316	205	49	223	338	176	97	1063	23	121	1317	273
Fuel Used(gal)	42	9	6	10	16	13	7	44	5	7	51	17
CO Emissions (g/hr)	2968	635	434	726	1093	908	479	3061	316	499	3568	1169
NOx Emissions (g/hr)	577	124	85	141	213	177	93	596	61	97	694	228
VOC Emissions (g/hr)	688	147	101	168	253	211	111	709	73	116	827	271
Dilemma Vehicles (#)	0	0	0	0	0	0	0	0	0	0	0	0
Queue Length 50th (ft)	~297	53	13	87	86	82	43	188	0	55	235	115
Queue Length 95th (ft)	#488	84	65	#178	130	#215	#142	240	38	#152	295	#298
Internal Link Dist (ft)		3242			3640			3218			2906	
Turn Bay Length (ft)												
Base Capacity (vph)	312	859	532	372	808	493	232	1670	640	334	1961	790
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.60	0.33	0.44	0.74	0.54	0.77	0.84	0.80	0.28	0.73	0.85	0.78

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Pretimed			
Maximum v/c Ratio: 1.60			
Intersection Signal Delay: 46.8		Intersection LOS: D	
Intersection Capacity Utilization 89.6%		ICU Level of Service E	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: TOBACCO ROAD



SIGNALIZED INTERSECTIONS IN PROJECT CORRIDOR					
INTERSECTION	2013 EXISTING	BUILD 2024	BUILD 2044	NO BUILD 2024	NO BUILD 2044
Tobacco Road	C	C	C	C	D
NOTE: Tobacco Road is a signalized intersection. This analysis was performed in Synchro 8.					

SELECT NON-SIGNALIZED INTERSECTIONS IN PROJECT CORRIDOR (PM TRAFFIC COUNTS)					
INTERSECTION	2013 EXISTING (PM)	BUILD 2024 (PM)	BUILD 2044 (PM)	NO BUILD 2024 (PM)	NO BUILD 2044 (PM)
Brown Road	C	D	F	F	E
Plantation Rd	D	D	F	D	E
Boykin Road	C	F	F	D	F
NOTE: All the intersections in this table are side streets under stop control. The LOS results were achieved by using HCS 2010.					

SELECT NON-SIGNALIZED INTERSECTIONS IN PROJECT CORRIDOR (AM TRAFFIC COUNTS)					
INTERSECTION	2013 EXISTING (AM)	BUILD 2024 (AM)	BUILD 2044 (AM)	NO BUILD 2024 (AM)	NO BUILD 2044 (AM)
Brown Road	C	D	F	E	F
Plantation Rd	C	C	F	C	C
Boykin Road	C	E	F	C	D
NOTE: All the intersections in this table are side streets under stop control. The LOS results were achieved by using HCS 2010.					

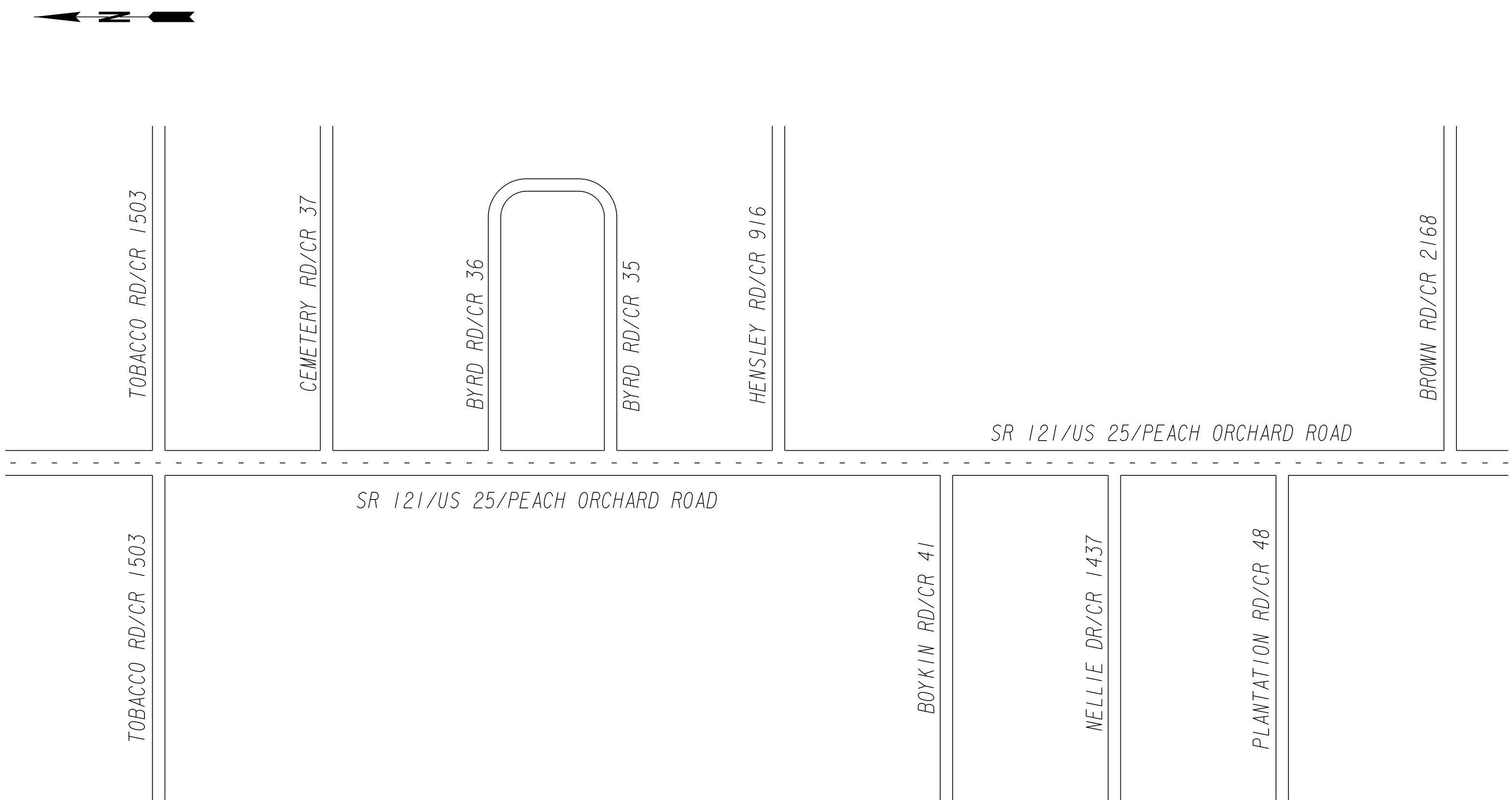
LEVEL OF SERVICE ANALYSIS FOR SELECT SEGMENTS FROM RICHMOND COUNTY TRAFFIC ON SR 121/US 25/PEACH ORCHARD ROAD

LEVEL OF SERVICE FOR SEGMENTS USING A.M. TRAFFIC COUNTS			
SEGMENT	CONDITION/YEAR	LOS NORTH	LOS SOUTH
Cemetery Road to Tobacco Road	BUILD 2024	B	A
Cemetery Road to Tobacco Road	BUILD 2044	D	B
Cemetery Road to Tobacco Road	NO BUILD 2024	C	A
Cemetery Road to Tobacco Road	NO BUILD 2044	C	B
Hensley Court to Byrd Road	BUILD 2024	B	A
Hensley Court to Byrd Road	BUILD 2044	D	B
Hensley Court to Byrd Road	NO BUILD 2024	B	A
Hensley Court to Byrd Road	NO BUILD 2044	C	B
Nellie Road to Boykin Road	BUILD 2024	B	A
Nellie Road to Boykin Road	BUILD 2044	C	B
Nellie Road to Boykin Road	NO BUILD 2024	B	A
Nellie Road to Boykin Road	NO BUILD 2044	C	B

LEVEL OF SERVICE FOR SEGMENTS USING P.M. TRAFFIC COUNTS			
SEGMENT	CONDITION/YEAR	LOS NORTH	LOS SOUTH
Cemetery Road to Tobacco Road	BUILD 2024	B	B
Cemetery Road to Tobacco Road	BUILD 2044	C	C
Cemetery Road to Tobacco Road	NO BUILD 2024	B	B
Cemetery Road to Tobacco Road	NO BUILD 2044	B	B
Hensley Court to Byrd Road	BUILD 2024	B	B
Hensley Court to Byrd Road	BUILD 2044	C	C
Hensley Court to Byrd Road	NO BUILD 2024	B	B
Hensley Court to Byrd Road	NO BUILD 2044	B	B
Nellie Road to Boykin Road	BUILD 2024	B	B
Nellie Road to Boykin Road	BUILD 2044	C	C
Nellie Road to Boykin Road	NO BUILD 2024	B	B
Nellie Road to Boykin Road	NO BUILD 2044	B	B

10/16/2015	11:53:35 AM	GPLOT-V8	schematic.dgn	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
astramiello		gplotborder-V81-P0.tbl		GA	0008355		

Attachment 4
Project Corridor Schematic



SCALE IN FEET
0 100 200 400

REVISION DATES

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE: ROADWAY DESIGN

CONSTRUCTION LAYOUT

SR 121/US 25 FROM BROWN RD
TO TOBACCO RD

DRAWING No.
11-

01/26/2015 GPLN

PROJECT TEAM INITIATION MEETING AGENDA
PI 0008355 – Richmond County
PSR 121/US 25 FM Brown Road to Tobacco Road
Existing Bridge IDs in Project Limits: 245-0114-0

1. **WELCOME** – Eric Wilkinson
2. **Introductions of Attendees** – *Initiated by Project Manager*
3. **Project Overview – *Project Manager***

   Eric began the meeting describing the project and discussing the Project Justification. He explained the typical is on the northern end of the project just past Tobacco Rd.

   a. **Project Description:** Widening of SR 121/US 25 FM Browns Road to Tobacco Rd
   b. **TIP/STIP Information:** TIP #NHS-4, PE 2015: ROW 2017: CST 2020
   c. **Programming Information:** Widening Project with M001 funding
4. **Project Justification Statement – *Planning, Bridge, Traffic Ops, as appropriate***

   The subject project proposes to improve the capacity of SR 121 between Brown Rd and Tobacco Rd as identified through the Augusta Regional Transportation Study (ARTS) planning process and listed in its adopted year 2035 LRTP. The project is programmed within the approved ARTS FY 2013-2016 Transportation Improvement Program (TIP) with the P.E. phase identified for fiscal year 2015. The remaining phases (ROW and CST) are currently outside the TIP years.

   Currently, this two-mile section of the corridor is characterized as an undivided urban principal arterial. This corridor is also listed on the Federal Highway Strategic Highway Network (STRAHNET) due to its proximity to Fort Gordon and subsequent importance to US strategic defense. Throughout the length of the proposed project area, the Augusta-Richmond County Comprehensive Plan identified the corridor as a developing commercial corridor, with the northern portion of the corridor near SR 121 and Tobacco Road noted as a minor commercial node (shown in Figure 2). The corridor now has a total of five lanes (four through lanes and a center turn lane, with additional turning lanes in varying locations.)

   Year 2012 traffic counts were collected from the GDOT STARS traffic count database (design-level traffic counts were not available.) In 2012, volumes on this corridor were shown to range up to 22,590 vehicles per day, which translates to a level-of-service "B". Year 2035 traffic volumes available from the ARTS travel demand model indicates that volumes are expected to increase up to just over 30,000 vehicles per day translating to a continued level of service "B". Additionally, the corridor averages eight percent truck traffic on the roadway, which is significant.

   However, with continued expected commercial development, travel demand is expected to continue to increase along t he corridor; thus, impacting the efficiency of the roadway. As the project corridor provides access to existing and growing neighborhoods, commercial

nodes, and industrial areas southwest of the project area, traffic volumes are expected to increase and infrastructure improvements in t his developing area will be needed.
An analysis of crash statistics between the years 2007 and 2009 revealed that crash rates on t his section of roadway were below the corresponding statewide average.

The purpose of the project is to improve the traffic flow on State Route 121 from Browns Road to Tobacco Road. The corridor has been identified as a commercial corridor with a minor commercial node at SR 121/Peach Orchard Rd and Browns Rd. The implementation of the project will support continued north-south mobility, support of future economic growth and viability, and accommodate truck traffic.

5. **Traffic Counts** – *SR 121 22900 AADT*
6. **Functional Classification** – undivided urban principal arterial
7. **Planning Study, Logical Termini, IJR or IMR, Benefit Cost – *Planning***
   Logical Termini: After visiting the site and looking at traffic counts logical termini may be an issue when going through NEPA. The project may need to continue 1.5 miles south down SR 121 to the intersection of SR 121 and SR 88. Traffic Counts drop from 22900-16150 at SR 88
8. **BIMS Report(s)** – *Sufficient rating is 82.72 as of 7/8/2013*
9. **Other Projects in the Area** – *0008356:Widening of SR 4 from Tobacco Rd to Meadowbrook Dr*
10. **Project Scope -** Each office will discuss the major tasks associated with the scope of services and any additional scope required.
    The Division Director of P3/Program Delivery, Joe Carpenter, questioned the justification statement, due to the level of service not getting better after building the additional lanes. He suggested that we add a scoping phase for the project.

11. **Potential Project Risks** – Discussion Points for all: MPOs, municipalities, level of environmental document, known environmental considerations in the area, potential ROW parcel count, potential detour routes, traffic counts, public involvement, unique design features, etc.
    a. Relocations
    b. Railroad Coordination
    c. Justification of project
    d. Logical Termini @ Brown Rd
12. **Initial Recommendations for Consultant/In-House Resources**
    a. Roadway Design- In house
    b. Bridge Office – In House
    c. Environmental – In House

d. Survey – In House
e. Materials – In House

13. Comments on the Artemis Schedule Template, Including In-House Start Date.

a. Project Manager – status of PE funds
b. Roadway Design
c. Bridge Design
d. Environmental – seasonal surveys, etc.
e. Right-of-Way
f. Survey
g. District
h. Materials
i. Utilities
j. Railroad

14. Additional Comments & Concerns from Attendees

15. Expected Deliverables and Timeframe for Receipt

a. Additional Schedule Comments (1 week)
b. Man-hours
c. Other

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

MEETING SUMMARY: Initial Concept Meeting for PI 0008355
DATE: July 1, 2015

LOCATION: Room 202 @ District 2 GDOT Office from 10:00 AM to 12:00PM

ATTENDEES:

PI# 00083550 Richmond County
SIGN-IN SHEET

PERSONNEL ATTENDING MEETING

Please print and provide all requested information!

NAME	TITLE	FIRM	TELEPHONE #	EMAIL
Eric Wilkinson	Project Manager	GDOT	478-538-8522	ewilkinson@dot.ga.gov
Todd Price	D2 - Design	GDOT	478-553-3504	tprice@dot.ga.gov
Neal O'Brien	D2 - Preconstruction	GDOT	478-553-3400	nobrien@dot.ga.gov
Mike Thomas	D2 - Utilities	GDOT	478-232-3375	david.thomas@dot.ga.gov
Justin Churchwell	Intern	GDOT	706-288-5775	jachurchwell@dot.ga.gov
Rodney Wang	Area Engineer	GDOT	706.855.3464	rwang@dot.ga.gov
Kedrick Collins	D2 - Traffic	GDOT	478-553-3368	kecollins@dot.ga.gov
Corbett Reynolds	D2 - Construction	GDOT	478-553-3396	creynolds@dot.ga.gov
Andrea Stramiello	Roadway Design	GDOT	404-631-1648	astramiello@dot.ga.gov
Mac Cranford	Road Design	GDOT	404-631-1681	mcranford@dot.ga.gov

SUBJECT: Initial Concept Meeting 0008355

Notes below summarize discussions from the meeting.

Agenda Items:

June 16, 2015

I. Welcome

II. Introductions

III. Overview

Eric started the meeting by describing the project as the widening of SR 121/Peach Orchard Rd from Brown Rd to Tobacco Rd. He discussed the logical termini issues that could become present at Brown Rd and the potential to have to program a new project down to SR 88.

- Project Justification

Traffic Numbers are not justifying a capacity issue. Planning stated that if the design traffic is not shwoing a capacity need then it is hard to justify spending federal funds.

During the meeting Eric Discussed about how the Augusta Regional Transportation Study's traffic counts for design year matched GDOT's, but the Level of Service (LOS) did not match. Mac stated that when he ran the LOS calculations that he had existing is a LOS "B" and for the design year traffic the LOS was still "B".

Kedrick then spoke of the development in the area and that a Dollar General was requesting a permit to place a store across from Boykin Rd. He stated in the permit they will have to install a right turn on Boykin.

Mac Recommended moving forward with a no build concept because there is no major accident concerns and traffic does not reflect a capacity problem.

- Project Risk

  I. Environmental

     A. Environmental assessment is expected for this project

  II. Railroad

      Kedrick stated that the railroad is a maintenance issue. Also the railroad has a county road that parralels it and will have to be realigned for access to the parcels. Mac stated we would have to have another at grade crossing to maintain access to the houses along the railroad.

  III. Displacements

      Mac stated that we will have one commercial displacement and one residential displacement

- Design Speed

  Andrea stated that the design speed is 55 MPH

- Access Control

  Mac stated that Raised medians could help control access, but Eric would need to get with the locals on their opinions

- Bridge Widening

  Mac stated the bridge will have to be widened to the east, due to the lake on the west side of the project. This will cause a displacement to a commercial property.

- Other projects in the area

Widening of Windsor Springs

- Utilities

  Power is all on west side

  Gas

- After meeting discussion with Augusta

  Eric spoke with Andrew with Augusta after the meeting and informed him of GDOTs discussion. Andrew met back with Augusta Engineers and they will be recommending drafting language that recommends not widening Peach Orchard Road.